

May 21, 2012

Advice Letter 4026-E-A

(Pacific Gas and Electric Company ID U39 E)

Public Utilities Commission of the State of California

Subject: Supplement To Pacific Gas and Electric Company's Bundled Procurement Plan Compliance Filing

As indicated in Pacific Gas and Electric Company's ("PG&E") April 20th Request for Suspension of Protest Period for Advice Letter 4026-E, PG&E respectfully submits this supplement to its compliance filing and conformed Bundled Procurement Plan ("Conformed BPP") for Commission review and approval. This supplemental filing replaces previously submitted Advice Letter 4026-E in its entirety.

This supplemental filing is intended to incorporate updates consistent with Decision ("D.") 12-04-046. This cover letter describes these updates to PG&E's Conformed BPP. Included as Attachments A and B are red-line and clean public versions of PG&E's Conformed BPP that include the modifications from Advice Letter 4026-E filed on April 11, 2012 and the modifications described below in this supplemental filing. Attachments C and D are red-line and clean confidential versions of PG&E's Conformed BPP that include the modifications from Advice Letter 4026-E and the modifications described below in this supplemental filing.

I. BACKGROUND FOR SUPPLEMENTAL CONFORMED BPP

In D.12-01-033, the Commission adopted PG&E's BPP with modifications, and required PG&E to file a conformed copy of the BPP within ninety days of the decision.¹ PG&E filed Advice Letter 4026-E on April 11, 2012 that included PG&E's Conformed BPP. In D.12-04-046, which was voted out by the Commission on April 19, 2012, the Commission addressed a number of additional issues that impact PG&E's Conformed BPP.² On April 20, 2012, PG&E filed a request for a suspension of the protest period to

¹ D.12-01-033 at p. 53, Ordering Paragraph ("OP") 22.

² D.12-04-046 at p.2.

Advice Letter 4026-E and indicated that it intended to file a supplement to the Conformed BPP that incorporated changes required by D.12-04-046. This supplemental filing identifies and incorporates the changes to the Conformed BPP so that it is consistent with both D.12-01-033 and D.12-04-046.

II. DESCRIPTION OF CONFORMED BPP SECTIONS

This section describes the Sections and Appendices in PG&E's Conformed BPP that have been updated to incorporate modifications required by D.12-04-046.

A. Section I

Section I of the Conformed BPP is an introduction to PG&E's filing. Substantive modifications include:

- Updated Section I.B.1 to introduce, consistent with OP 3 of D.12-04-046, a high-level description of the various procedural steps required for contracting with generation units that use once-through cooling ("OTC") technology.
- Created a new Section I.B.16 to introduce, consistent with OP 7 of D.12-04-046, Appendix L describing PG&E's approved procurement authority for greenhouse gas ("GHG")-related products, processes, and procurement strategies.

B. Section II

Section II of the Conformed BPP describes how PG&E will implement its BPP. Substantive modifications include:

- Updated Table II-1 ("Electric Products") to introduce, consistent with OP 8.a of D.12-04-046, GHG allowances and offsets as approved products that provide the right to emit one metric ton of carbon dioxide equivalent ("mtCO₂e") to satisfy obligations under the Cap-and-Trade regulation.
- Updated Section II.A.4.f ("Solicitations and Request for Offers") to note new restrictions on utility-owned generation ("UOG") bidding into utility-run Request for Offers ("RFOs"), and describing conditions under which UOG may be procured consistent with OP 7 of D.12-04-046
- Updated Table II-6 ("Procurement Methods and Practices") to reflect Renewable Portfolio Standard ("RPS")-eligible and non-RPS eligible UOG transaction processes, as well as the California Air Resource Board ("CARB") auction and Allowance Price Containment Reserve, consistent with D.07-12-052, D.08-11-008, and D.12-04-046.

- Updated Section II.A.6 (“Electrical Capacity Procurement Limits and Ratable Rates”) to provide further detail on how PG&E may transition to the two-times ratable rate and the timing under which procurement activities apply to the capacity procurement limits.
- Introduced new Section II.A.7 (“Contracting Rule for Once-Through Cooling Units”) to describe the conditions under which PG&E may procure authorized products from OTC facilities consistent with OP 3 of D.12-04-046.
- Updated Section II.A.9 (“PG&E’s Use of the PRG Process”) to reflect how PG&E will consult with the Procurement Review Group (“PRG”) on various aspects of procurement of authorized GHG products consistent with OP 8 of D.12-04-046.
- Updated Section II.A.10 (“PG&E’s Use of the Independent Evaluator”) to reflect the language in OP 15 of D.12-04-046 requiring that the public and confidential versions of the Independent Evaluator (“IE”) report be identical except for the visible redaction of confidential material.

C. Section III

- Updated Section III.A (“Load Forecast (Appendix A, Table PGE-1, Lines 1-8”) to note PG&E’s treatment of Community Choice Aggregation (“CCA”) load and timing for updating CCA load data concurrent with updates to electrical capacity procurement limits.

D. Section VI

Substantive modifications include:

- Updating Section VI.C.4 (“Quarterly Filings”) to note that, consistent with D.12-04-046, Energy Division Staff’s audits of Quarterly Compliance reports (“QCR”) shall be made public. A link to any PG&E’s response or rebuttal on PG&E’s website shall be posted on the Commission website with the audit report.
- Updating Section VI.D (“Description of Costs Recovered Through ERR”) to reflect, consistent with OP 10 of D.12-04-046, that costs incurred for GHG products will be recovered through PG&E’s Energy Resource Recovery Account.
- Updating Section VI.E (“Pre-Approval, Approval and Filing Requirements”) to reflect new filing requirements consistent with D.12-04-

046 for RPS-eligible UOG, non-RPS-eligible UOG, contracts with OTC resources, and GHG products.

III. DESCRIPTION OF CONFORMED BPP APPENDICES

A. Appendix B

Appendix B is PG&E's Electric Portfolio Hedging Plan. PG&E has updated Section A.1 of the Plan ("Greenhouse Gas Emissions Not Included") to remove language related to future hedging plan filings.

B. Appendix I

Appendix I includes the requirements for the PRG, IE and RFOs from D.07-12-052, Appendix E, D.10-12-035 which discusses cost-allocation for combined heat and power ("CHP") across all benefitting customers, OPs 17, 18, and 19 in D.12-01-033, and OP 14 in D.12-04-046. PG&E modified Appendix I to reflect new rules and timing for circulating summaries of PRG meetings consistent with OP 14 and the language in D.12-04-046.

C. Appendix L

Appendix L is PG&E's GHG Procurement Plan. This Appendix includes the upfront and achievable standards for participation in GHG markets and procurement of GHG-related products to comply with Assembly Bill ("AB") 32. PG&E's GHG Procurement Plan includes authorized products, procurement limits, conditions for procurement of offsets, approved processes for GHG-related products, PRG notification requirements, and cost recovery consistent with OPs 8-10 in D.12-04-046.

IV. CONFIDENTIAL INFORMATION

PG&E filed a *Motion to Adopt Model Protective Order* on March 18, 2011 when it initially filed its BPP. PG&E's motion was granted on April 19, 2011. Most of the confidential information in the Conformed BPP is the same information that was included in PG&E's initial BPP filing, and thus remains confidential. The BPP also includes some additional confidential information that was not included in the March 25, 2011 filing. PG&E is including in this advice letter a supplemental confidentiality declaration and matrix that addresses the additional confidential material included in this filing.

PROTESTS

Anyone wishing to protest this filing may do so by letter sent via U.S. mail, by facsimile or electronically any of which must be received no later than **June 11, 2012**,

which is 21 days³ from the date of this filing. The protest must state the grounds upon which it is based, including such items and financial and service impact, and should be submitted expeditiously. Protests should be mailed to:

CPUC Energy Division
Tariff Files, Room 4005
DMS Branch
505 Van Ness Avenue
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: EDTariffUnit@cpuc.ca.gov

Copies should also be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest also should be sent via U.S. mail (and by facsimile and electronically, if possible) to PG&E at the address shown below on the same date it is mailed or delivered to the Commission.

Pacific Gas and Electric Company
Attention: Brian Cherry
Vice President, Regulation and Rates
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-6520
E-Mail: PGETariffs@pge.com

EFFECTIVE DATE

PG&E requests that its Conformed BPP become effective on **January 12, 2012**.

NOTICE

In accordance with General Order 96-B, Section IV, a copy of this Advice Letter excluding the confidential appendices is being sent electronically and via U.S. mail to parties shown on the attached list and the service lists for R.10-05-006. Non-market participants who are members of PG&E's Procurement Review Group and have signed appropriate Non-Disclosure Certificates will also receive the Advice Letter and accompanying confidential attachments by overnight mail. Address changes to the

³ The 20 day protest period concludes on a weekend. PG&E hereby moves this date to the following business day.

General Order 96-B list and electronic approvals should be directed to PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Advice letter filings can also be accessed electronically at: <http://www.pge.com/tariffs>.

A handwritten signature in black ink, reading "Brian Cherry". The signature is written in a cursive, flowing style. There is a diagonal line drawn through the bottom right portion of the signature, possibly indicating a date or a mark.

Brian K. Cherry
Vice President - Regulation and Rates

Attachments

- Attachment A – Public Redline Version of PG&E's Conformed BPP
- Attachment B – Public Clean Version of PG&E's Conformed BPP
- Attachment C – Confidential Redline Version of PG&E's Conformed BPP
- Attachment D – Confidential Clean Version of PG&E's Conformed BPP

cc: Service List for R.10-05-006
Donald Brooks - Energy Division

CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No. **Pacific Gas and Electric Company (ID U39 E)**

Utility type:

☒ ELC

☐ GAS

☐ PLC

☐ HEAT

☐ WATER

Contact Person: Kimberly Chang

Phone #: (415) 972-5472

E-mail: kwcc@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric

GAS = Gas

PLC = Pipeline

HEAT = Heat

WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: **4026-E-A**

Tier: 3

Subject of AL: **Supplement To Pacific Gas and Electric Company's Bundled Procurement Plan Compliance Filing**

Keywords (choose from CPUC listing): Compliance, Agreements, Procurement

AL filing type: ☐ Monthly ☐ Quarterly ☐ Annual ☒ One-Time ☐ Other _____

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: D. 12-04-046

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL: _____

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: Yes. See the attached matrix that identifies all of the confidential information.

Confidential information will be made available to those who have executed a nondisclosure agreement: ☒ Yes ☐ No

Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information: Charles Middlekauff (415) 973-6971, Dan Patry (415) 9736146

Resolution Required? ☒ Yes ☐ No

Requested effective date: January 12, 2012

No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: N/A

Service affected and changes proposed: N/A

Pending advice letters that revise the same tariff sheets: N/A

Protests, dispositions, and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division

Tariff Files, Room 4005

DMS Branch

505 Van Ness Ave.,

San Francisco, CA 94102

E-mail: EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company

Attn: Brian Cherry

Vice President, Regulation and Rates

77 Beale Street, Mail Code B10C

P.O. Box 770000

San Francisco, CA 94177

E-mail: PGETariffs@pge.com

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF GEORGE P. CLAVIER IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF APPENDIX A
OF PG&E'S BUNDLED PROCUREMENT PLAN AND
SECTION V OF SUPPORTING TESTIMONY**

I, George P. Clavier, declare:

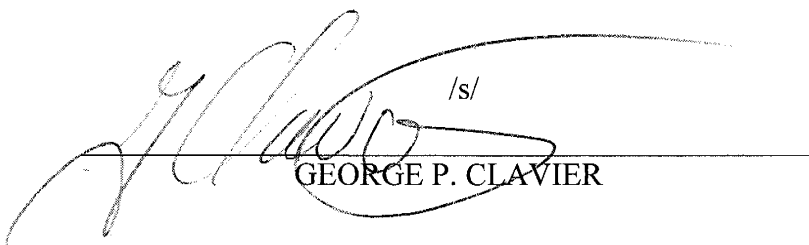
1. I am a principal analyst of the Long-Term Procurement Department at Pacific Gas and Electric Company (PG&E). I am responsible for developing the electric energy procurement cost forecast and Commission-mandated Case which PG&E is required to submit in Appendix A and Section V as part of its Bundled Procurement Plan and Supporting Testimony. This declaration is based on my personal knowledge of PG&E's electric energy procurement cost forecast function and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning electric procurement of an investor-owned utility.

2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for PG&E's Bundled Procurement Plan and Supporting Testimony submitted to the California Public Utilities Commission on March 25, 2011.

3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the

limitations specified in the IOU Matrix for that type of data or information; (2) the information is not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on March 25, 2011 at San Francisco, California.

 /s/
GEORGE P. CLAVIER

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF PETER E. KOSZALKA IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF APPENDICES B AND D
OF PG&E'S BUNDLED PROCUREMENT PLAN AND
SUPPORTING TESTIMONY**

I, Peter K. Koszalka, declare:

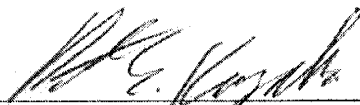
1. I am the director of the electric gas supply in the Energy Supply Management Department at Pacific Gas and Electric Company (PG&E). I am responsible for the physical and financial trading of gas in support of PG&E's electric fuel portfolio which PG&E is required to submit in Appendices B and D as part of its Bundled Procurement Plan and Supporting Testimony. This declaration is based on my personal knowledge of PG&E's electric fuel portfolio and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning fuels management of an investor-owned utility.

2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for PG&E's Bundled Procurement Plan and Supporting Testimony submitted to the California Public Utilities Commission on March 25, 2011.

3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the limitations specified in the IOU Matrix for that type of data or information; (2) the information is

not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on March 25, 2011 at San Francisco, California.

A handwritten signature in black ink, appearing to read "P. E. Koszalka", is written over a horizontal line.

PETER E. KOSZALKA

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF CHRISTOPHER R. GROFF IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF APPENDIX C
OF PG&E'S BUNDLED PROCUREMENT PLAN AND
SUPPORTING TESTIMONY**

I, Christopher R. Groff, declare:

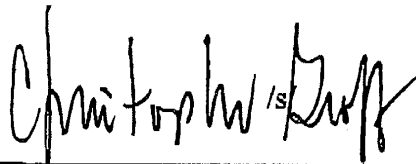
1. I am the manager of the Nuclear Fuels Purchasing group at the Diablo Canyon Power Plant at Pacific Gas and Electric Company (PG&E). I am responsible for the fuel fabrication contract and support the purchase of feed materials for each fuel reload which PG&E is required to submit in Appendix C as part of its Bundled Procurement Plan and Supporting Testimony. This declaration is based on my personal knowledge of PG&E's nuclear fuels procurement and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning fuels management of an investor-owned utility.

2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for PG&E's Bundled Procurement Plan and Supporting Testimony submitted to the California Public Utilities Commission on March 25, 2011.

3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the limitations specified in the IOU Matrix for that type of data or information; (2) the information is

not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on March 25, 2011 at San Francisco, California.



A handwritten signature in black ink, appearing to read "Christopher R. Groff". The signature is written in a cursive, somewhat stylized font. The first name "Christopher" is written in a larger, more prominent script, and "R. Groff" is written in a smaller, more compact script to the right. The signature is positioned above a horizontal line.

CHRISTOPHER R. GROFF

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF VINCENT K. LOH IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF APPENDIX F
OF PG&E'S BUNDLED PROCUREMENT PLAN AND
SUPPORTING TESTIMONY**

I, Vincent K. Loh, declare:

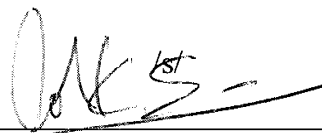
1. I am the manager of the Short Term Portfolio Management group at Pacific Gas and Electric Company (PG&E). I am responsible for managing PG&E's short-term electric procurement, including Congestion Revenue Rights (CRR) procurement, which PG&E is required to submit in Appendix F as part of its Bundled Procurement Plan and Supporting Testimony. This declaration is based on my personal knowledge of managing PG&E's short-term electric portfolio and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning electric procurement of an investor-owned utility.

2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for PG&E's Bundled Procurement Plan and Supporting Testimony submitted to the California Public Utilities Commission on March 25, 2011.

3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the

limitations specified in the IOU Matrix for that type of data or information; (2) the information is not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on March 25, 2011 at San Francisco, California.

A handwritten signature in black ink, appearing to read "VK Loh", is written over a horizontal line.

VINCENT K. LOH

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
BUNDLED PROCUREMENT PLAN
March 25, 2011**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Bundled Procurement Plan, Appendix A: Capacity and Energy Tables							
Table PGE-1, row 20	Y	Item IV.B: Forecast of Qualifying Facility Generation	Y	Y	Y	Forecasts of QF energy and capacity are confidential (Item IV.B) of the D.06-06-066 Matrix. The data shown in PGE-1 Line 20 include QF capacity amounts.	3 years
Table PGE-1, row 23	Y	Item VI.A: Utility Net Open Position for Capacity	Y	Y	Y	Front 3 year of the bundled portfolio's open capacity position forecast is confidential. Providing total resources would allow one to estimate the open position. In addition, providing this line for the years 2014-2020 would allow one to estimate the forecast of QF capacity so these years are also confidential.	3 years
Table PGE-1, row 24	Y	Item VI.A: Utility Net Open Position for Capacity	Y	Y	Y	Front 3 year of the bundled portfolio's open capacity position forecast is confidential. Providing total resources would allow one to estimate the open position. In addition, providing this line for the years 2014-2020 would allow one to estimate the forecast of QF capacity so these years are also confidential.	3 years
Table PG&E-2 row 12	Y	Item IV.A: Forecast of IOU Generation Resources	Y	Y	Y	Forecast of the energy generation from PG&E's-owned fossil resources is confidential.	3 years
Table PG&E-2 row 13	Y	Item IV.A: Forecast of IOU Generation Resources	Y	Y	Y	Forecast of the energy generation from PG&E's-owned nuclear resources is confidential. However, PG&E has been required to publicly disclose this forecast for years 2014-2020 at the CEC. Thus, PG&E is only claiming confidentiality for the first three years (2011-2013).	3 years
Table PG&E-2 row 17	Y	Item IV.B: Forecast of Qualifying Facility Generation	Y	Y	Y	Forecasts of QF energy and capacity are confidential (Item IV.B) of the D.06-06-066 Matrix. The data shown in PGE-1 Line 20 include QF energy amounts.	3 Years
Table PG&E-2 row 20	Y	Item IV.J: Forecast of Wholesale Market Purchases	Y	Y	Y	Forecasts of the first three years of wholesale market purchases are confidential.	3 years
Table PG&E-2 row 21	Y	Item IV.K: Forecast of Wholesale Market Sales	Y	Y	Y	Forecasts of the first three years of wholesale market sales are confidential.	3 years

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
BUNDLED PROCUREMENT PLAN
March 25, 2011**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Supporting Testimony, Section V: Evaluation Of Commission-mandated Case							
Table V-2	Y	Item XII – Monthly Portfolio Risk Assessment	Y	Y	Y	Table contains TeVaR portfolio risk assessment for the period 2011-2020.	3 years
Document: Bundled Procurement Plan, Appendix B: Electric Portfolio Hedging Plan							
Entire document	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans. Electric portfolio hedging plan should be confidential.	Y	Y	Y	Appendix B describes PG&E's electric and gas hedging strategies, the electric portion should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. Disclosure of this information would reveal to market participants PG&E's strategy to manage its electricity and gas hedging positions, which would harm ratepayers because suppliers could adjust either the availability or pricing of supply available to PG&E. This material is also protected as confidential under General Order ("G.O") 66-C, Section 2.	3 years
Document: Supporting Testimony, Appendix B: Electric Portfolio Hedging Plan							
Redacted Portions	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans. Electric portfolio hedging plan should be confidential.	Y	Y	Y	The redacted portions of Appendix B of PG&E's Supporting Testimony describe PG&E's electric and gas hedging strategies, the electric portion should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. Disclosure of the redacted information would reveal to market participants PG&E's strategy to manage its electricity and gas hedging positions, which would harm ratepayers because suppliers could adjust either the availability or pricing of supply available to PG&E. This material is also protected as confidential under G.O 66-C, Section 2.	3 years

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
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March 25, 2011**

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Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Bundled Procurement Plan, Appendix C: Nuclear Fuel Procurement Plan							
Entire document	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans. Nuclear fuel procurement plan should be confidential.	Y	Y	Y	Appendix C describes PG&E's plans for long-term buying and hedging plans for nuclear fuel, which should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. Disclosure of this information would reveal to market participants PG&E's strategy to manage its nuclear fuel position, which would harm ratepayers because suppliers could adjust either the availability or pricing of supply available to PG&E. This material is also protected as confidential under G.O 66-C, Section 2.	3 years
Document: Supporting Testimony, Appendix C: Nuclear Fuel Procurement Plan							
Redacted portions	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans. Nuclear fuel procurement plan should be confidential.	Y	Y	Y	The redacted portions of Appendix C in PG&E's Supporting Testimony describe PG&E's plans for long-term buying and hedging plans for nuclear fuel, which should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. Disclosure of the redacted information would reveal to market participants PG&E's strategy to manage its nuclear fuel position, which would harm ratepayers because suppliers could adjust either the availability or pricing of supply available to PG&E. This material is also protected as confidential under G.O. 66-C, Section 2.	3 years

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
BUNDLED PROCUREMENT PLAN
March 25, 2011**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Bundled Procurement Plan, Appendix D: Electric Portfolio Gas Supply Plan							
Entire document	Y	Items I.A.3 – Utility gas demand forecasts – consumption and I.A.4 – Long-term fuel (gas) buying and hedging plans	Y	Y	Y	Appendix D describes PG&E's Electric Portfolio Gas Supply Plan for the procurement of natural gas supply, pipeline capacity, and storage in order to meet the needs of PG&E's Electric Portfolio. This information is confidential under Items I.A.3 and I.A.4 of the D.06-06-066 Matrix. This material is also protected as confidential under G.O 66-C, Section 2.	3 years
Document: Supporting Testimony, Appendix D: Electric Portfolio Gas Supply Plan							
Redacted portions	Y	Items I.A.3 – Utility gas demand forecasts – consumption and I.A.4 – Long-term fuel (gas) buying and hedging plans	Y	Y	Y	The redacted portions of Appendix D of PG&E's Supporting Testimony describe PG&E's Electric Portfolio Gas Supply Plan and specifies the upfront achievable standards and criteria for the procurement of natural gas supply, pipeline capacity, and storage in order to meet the needs of PG&E's Electric Portfolio. This information is confidential under Items I.A.3 and I.A.4 of the D.06-06-066 Matrix. This material is also protected as confidential under G.O 66-C, Section 2.	3 years

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
BUNDLED PROCUREMENT PLAN
March 25, 2011**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Bundled Procurement Plan, Appendix F: Congestion Revenue Rights							
Redacted portions	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans.	Y	Y	Y	The redacted information in this document describes PG&E's strategy related to its hedging of congestion risk and participation in the CRR allocation and procurement processes, which should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. This redacted information pertains to specific hedging strategies and parameters. Disclosure of the redacted information would reveal to market participants PG&E's strategy to manage its congestion risk, which would harm ratepayers because suppliers could adjust either the availability or pricing of supply (CRRs) available to PG&E. In addition, this information is confidential under Items I.A.3 and I.A.4 of the D.06-06-066 Matrix.	3 years
Document: Supporting Testimony, Appendix F: Congestion Revenue Rights							
Redacted portions	Y	Item I.A.4 – Long-term fuel (gas) buying and hedging plans.	Y	Y	Y	The redacted information in this document describes PG&E's strategy related to its participation in the CRR allocation and procurement processes, which should be confidential by analogy to the protections for gas hedging plans (Item I.A.4) of the D.06-06-066 Matrix. This redacted information pertains to specific hedging techniques. Disclosure of the redacted information would reveal to market participants PG&E's strategy to manage its congestion risk, because suppliers could adjust either the availability or pricing of supply (CRRs) available to PG&E. In addition, this information is confidential under Items I.A.3 and I.A.4 of the D.06-06-066 Matrix.	3 years

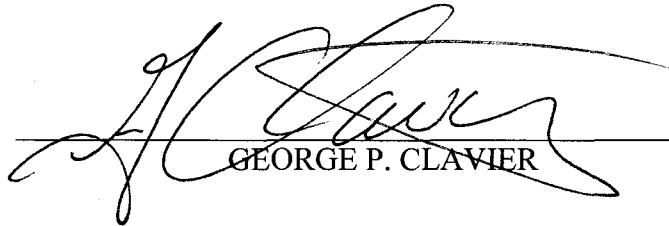
**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF GEORGE P. CLAVIER IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF PG&E'S CONFORMED BUNDLED
PROCUREMENT PLAN ADVICE LETTER FILING**

I, George P. Clavier, declare:

1. I am a principal analyst of the Long-Term Procurement Department at Pacific Gas and Electric Company (PG&E). This declaration is based on my personal knowledge of PG&E's electric energy procurement cost forecast function and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning electric procurement of an investor-owned utility.
2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for certain information contained in Appendices A and E of PG&E's Conformed Bundled Procurement Plan ("BPP").
3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the limitations specified in the IOU Matrix for that type of data or information; (2) the information is not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on April 11, 2012 at San Francisco, California.



GEORGE P. CLAVIER

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
BUNDLED PROCUREMENT PLAN
April 11, 2012**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix 1 to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix 1:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Appendices A and E							
Table PGE-3	Y	Item VI.A – Utility Bundled Net Open (Long or Short) for Capacity	Y	Y	Y	Table contains electrical capacity position limit and ratable rates of procurement through the 2020 delivery year. Disclosure of this commercial information would reveal PG&E's limits on procuring forward capacity and would harm ratepayers as market participants could adjust supply or price based on this knowledge.	3 years
Table PGE-4	Y	II.A.1 – Utility Electric Price Forecasts	Y	Y	Y	Table contains Implied Market Heat Rate market condition measure that, if disclosed, would harm ratepayers as market participants could adjust supply or price based on this knowledge.	3 years
Table E-1	Y	Item XII – Monthly Portfolio Risk Assessment	Y	Y	Y	Table contains TeVaR portfolio risk assessment for the period 2011-2020.	3 years

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**DECLARATION OF XANTHA BRUSO IN SUPPORT OF
THE CONFIDENTIAL TREATMENT OF PG&E'S GHG PROCUREMENT PLAN
APPENDIX L IN ADVICE LETTER 4026-E-A**

I, Xantha Bruso, declare:

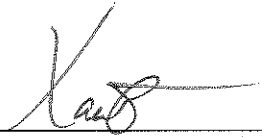
1. I am a Principal in the Portfolio Management section of the Energy Procurement Department at Pacific Gas and Electric Company ("PG&E"). I am responsible for managing the preparation of PG&E's greenhouse gas ("GHG") procurement plan, which is contained in Appendix L which PG&E is submitting in Supplemental Advice Letter 4026-E-A. This declaration is based on my personal knowledge of PG&E's electric energy procurement practices and my understanding of the Commission's decisions protecting the confidentiality of market-sensitive information concerning energy procurement of an investor-owned utility.

2. Based on my knowledge and experience, and in accordance with the "Administrative Law Judge's Ruling Clarifying Interim Procedures For Complying With Decision 06-06-066," issued in Rulemaking 05-06-040 on August 22, 2006, I make this declaration seeking confidential treatment for certain information contained in PG&E's supplemental Advice Letter 4026-E-A conforming its Bundled Procurement Plan to the modifications listed in D.12-04-046.

3. Attached to this declaration is a matrix identifying the data and information for which PG&E is seeking confidential treatment. The matrix specifies that the material PG&E is seeking to protect constitutes the particular type of data and information listed in Appendix 1 (the "IOU Matrix") of Decision 06-06-066; if applicable GO 66-C, Section 2.2b, which would place PG&E in an unfair business advantage; and Public Utilities Code Section 454.4(g), which would reveal market sensitive information. The matrix also specifies the category or categories in the IOU Matrix to which the data and information corresponds, and why confidential protection is justified. Finally, the matrix specifies that: (1) PG&E is complying with the

limitations specified in the IOU Matrix for that type of data or information; (2) the information is not already public; and (3) the data cannot be aggregated, redacted, summarized or otherwise protected in a way that allows partial disclosure. By this reference, I am incorporating into this declaration all of the explanatory text that is pertinent to my testimony in the attached matrix.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct. Executed on May 21, 2012 in San Francisco, California.

A handwritten signature in black ink, appearing to read 'Xantha Bruso', is written over a horizontal line.

Xantha Bruso

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
PG&E'S ADVICE LETTER 4026-E-A
May 21, 2012**

IDENTIFICATION OF CONFIDENTIAL INFORMATION

Redaction Reference	1) Constitutes data listed in Appendix I to D.06-06-066 (Y/N)	2) Data correspond to category in Appendix I:	3) Complies with limitations of D.06-06-066 (Y/N)	4) Data not already public (Y/N)	5) Lead to partial disclosure (Y/N)	PG&E's Justification for Confidential Treatment	Length of Time
Document: Appendix L							
Section B – “PG&E’s Allowance Consignment Proposal”	Y	General Order 66-C, Section 2.2; Public Utilities Code (“PUC”) Section 454(g); D.06-06-066, Section Item XIII	Y	Y	Y	This information discloses PG&E’s greenhouse gas (“GHG”) allowance consignment strategy. The release of this commercially sensitive information could cause harm to PG&E’s customers and put PG&E at an unfair business advantage by the disclosure of a consignment strategy which could then be used by other market participants to gain a commercial advantage. In addition, this information regarding PG&E’s confidential consignment strategy is similar to the general type of procurement information that is confidential and provided in response to Energy Division’s Monthly Data Request.	No quantification in GO66-C and PUC Section 454(g)
Redacted Portions of Section C – “GHG Obligations”	Y	General Order 66-C, Section 2.2; Public Utilities Code (“PUC”) Section 454(g); D.06-06-066, Section Item VII.B	Y	Y	Y	This information discloses PG&E’s GHG obligations and the terms and conditions in power purchase agreements (“PPA”) with non-affiliated third parties. The release of this commercially sensitive information could cause harm to PG&E’s customers and put PG&E at an unfair business advantage by the disclosure of PPA terms and conditions which could then be used by other market participants to gain a commercial advantage in contract negotiations. In addition, this information may reveal the net open for GHG compliance.	No quantification in GO66-C and PUC Section 454(g)
Redacted Portions of Section D – “GHG Procurement Strategy”	Y	General Order 66-C, Section 2.2; Public Utilities Code (“PUC”) Section 454(g); D.06-06-066, Section Item VI and XIII	Y	Y	Y	This information reveals PG&E’s procurement activities and position in the GHG Products market by revealing our bid, price, and volume strategies. The release of this commercially sensitive information could cause harm to PG&E’s customers and put PG&E at an unfair business advantage by the disclosure of a GHG procurement strategy which could then be used by other market participants to gain a commercial advantage. In addition, this information regarding PG&E’s confidential GHG procurement strategy is similar to the general type of procurement information that is confidential and provided in response to Energy Division’s Monthly Data Request.	No quantification in GO66-C and PUC Section 454(g)



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No.
Pacific Gas and Electric Company
Bundled Procurement Plan

PACIFIC GAS AND ELECTRIC COMPANY
CONFORMED 2010 LONG-TERM PROCUREMENT PLAN

ATTACHMENT A
REDLINED PUBLIC VERSION



I. Introduction

In accordance with Decision (“D.”) 12-01-033, Pacific Gas and Electric Company (“PG&E”) is filing its conformed Bundled Procurement Plan (“BPP”) covering the period from January 12, 2012 to December 31, 2020 ~~in Track II of Rulemaking (“R.”) 10-05-006 as directed by the Assigned Commissioner’s and Administrative Law Judge’s Scoping Memo for Track II Bundled Procurement Plans issued January 13, 2011.~~ PG&E’s BPP ~~will be~~ became effective on January 12, 2012, the date upon which the California Public Utilities Commission (“CPUC” or “Commission”) issued D.12-01-033 approving the BPP approval and will remain in effect until December 31, 2020 or the BPP is superseded by a subsequent Commission-approved BPP, whichever is earlier. ~~and will remain in effect until a subsequent BPP is proposed by PG&E, approved by the Commission, and expressly supersedes the BPP~~ After the BPP is approved by the Commission, a All updates to the BPP proposed before the next BPP filing, including a request for an extension of procurement authority, will be made via advice letter (“AL”).

PG&E’s BPP establishes the upfront achievable standards and criteria for PG&E’s procurement activities and the recovery of procurement costs without an after-the-fact reasonableness review, consistent with California Public Utilities Code Section 454.5.

A. Overview of PG&E’s Procurement Activities Consistent With the State’s Energy Action Plan and Environmental Policies

The state of California has been, and continues to be, a leader in the area of energy and environmental policy. For decades, the California Legislature and the Commission have pioneered laws, regulations, and policies that have addressed critical energy and environmental issues and concerns. On May 8, 2003, the Commission, California Energy



Commission (“CEC”) and the California Consumer Power and Conservation Financing Authority (~~“CPA”~~) jointly issued an Energy Action Plan (“EAP”) for the state of California, outlining state energy and environmental policies and strategies. The EAP was updated in October 2005. The EAP includes a preferred resource order to achieve California’s energy and environmental policy goals: Energy Efficiency (“EE”), Demand Response (“DR”), renewable resources, Distributed Generation (“DG”) and clean, efficient conventional facilities. In 2006, the California Legislature enacted legislation intended to reduce California greenhouse gas (“GHG”) emissions commonly referred to as “Assembly Bill 32” or “AB 32.” A significant portion of the targeted GHG emissions reductions will likely come from the energy sector of the California economy.

As one of California’s largest investor-owned utilities (“IOU”), PG&E has also been a leader in energy and environmental policies. In 1976, PG&E became one of the first utilities in the nation to offer EE programs to customers. Since that time, PG&E’s EE programs have kept more than 155 million tons of carbon dioxide (“CO₂”) out of the atmosphere. PG&E has also pioneered DR and renewable energy programs that are environmentally-friendly and have resulted in the significant growth of the DR and renewable energy sectors both in California and nationally. PG&E’s 2012-2014 DR program proposal will produce over 1,000 megawatts (“MW”) of DR resources. Since the beginning of California’s Renewable Portfolio Standard (“RPS”) Program, PG&E has signed contracts with RPS-eligible resources totaling over 8,800 MW of capacity, capable of delivering more than 20% of PG&E’s future energy needs. PG&E also has a long-standing commitment to DG and efficient Combined Heat and Power (“CHP”) programs.



In addition to these programs, PG&E is now working actively with stakeholders, the Commission, and the California Air Resources Board (“CARB”) on the implementation of AB 32, which can significantly reduce California’s GHG emissions.

In addition to its environmental and energy policy leadership, PG&E is also committed to providing reliable, cost-effective service for its customers. Throughout northern and central California, PG&E’s customers depend on a reliable energy supply. California’s economy is powered in large part by electrical energy, and as Electric Vehicles (“EV”) and other energy-using devices become more commonplace over the next decade, the need for a reliable energy supply will only grow. Moreover, to help California’s economy recover from the crippling recession that has gripped the state in recent years, it is also essential that PG&E procure the most cost-effective electric and gas supplies.

Balancing environmental considerations, reliability, and customer cost is not an easy task. PG&E’s BPP is designed to continue PG&E’s environmental leadership through the implementation of the EAP loading order and other procurement policies, while ensuring that PG&E’s customers receive reliable and cost-effective service. In particular, the BPP describes PG&E’s ongoing and significant efforts to spur continued investment in EE, develop DR programs that reduce usage when needed and are consistent with the California Independent System Operator’s (“CAISO”) proxy DR program, and encourage the continued development of new renewable resources. PG&E’s BPP also incorporates the provisions of the Qualifying Facility and Combined Heat and Power Settlement (“QF/CHP Settlement”) approved by the Commission in



~~Decision (“D.”)~~10-12-035, which is designed to develop a CHP program that increases reliability and decreases GHG emissions. The BPP describes the numerous programs developed by PG&E which are designed to fully implement the EAP loading order.

In addition to strongly encouraging the development of preferred resources, PG&E’s BPP also supports reliable service for PG&E’s customers. PG&E has included approved products and processes which are intended to enable PG&E to maintain a reliable supply of electricity over the short-, medium- and long-term. PG&E describes in detail its planning, procurement, and dispatch processes, all of which are designed to enable PG&E to provide reliable, cost-effective service for its customers. PG&E has also included a nuclear fuel supply plan and a gas supply plan to assure these fuels are available to allow for the continued, efficient operation of facilities owned or dispatched by PG&E that provide electricity to PG&E’s customers.

Finally, the BPP addresses the critical issue of customer costs. In addition to procurement processes developed to get the best available market prices, PG&E ~~is~~ also ~~proposing~~ adopts an electricity and gas hedging plan and To-expiration Value-at-Risk (“TeVaR”) methodology intended to effectively manage customer price risks. PG&E has also included in the BPP plans for the use of Congestion Revenue Rights (“CRR”) and convergence bidding, which will allow PG&E to manage customer costs. The BPP includes procurement processes and rules, many of which have been previously approved by the Commission, as a means of ensuring cost-effective procurement for customers. In summary, PG&E’s BPP is designed to help meet California’s energy and environmental policies, while providing reliable and cost-effective service to PG&E’s customers.



B. Overview of PG&E's Bundled Procurement Plan

1. Section II – Implementation of PG&E's Bundled Procurement Plan

Section II describes PG&E's procurement processes including planning, procurement, and economic dispatch. PG&E identifies the resource needs of its customers and describes how it satisfies these needs consistent with the EAP loading order and other Commission and legislative directives. PG&E identifies specific products to meet its customers' needs. These power products include energy products (baseload, shaping, and peaking), capacity products to meet Resource Adequacy ("RA") requirements, and various Ancillary Services ("A/S") products, including regulation, load following (i.e., balancing services), spinning, non-spinning, and black-start capability.

Section II also describes how PG&E implements the BPP through various processes, including competitive solicitations, bilateral negotiations, development of utility-ownership projects, and participation in various markets. PG&E enters into short-term (one year or less in duration), medium-term (greater than one year but less than five years in duration) and long-term (five years or greater in duration) contracts that result from the procurement process. PG&E also contracts with third-party generators for units that utilize once-through cooling ("OTC") technology. Consistent with D.12-04-046, this section outlines the various procedural steps required for contracting with such units. In addition, included in this section are tables and descriptions of how PG&E established its position limits on capacity procurement and maximum rates of transactions.



PG&E is required to meet its electric load obligations consistent with the Commission's "Least-Cost Dispatch" ("LCD") requirements. PG&E economically dispatches its resources, subject to regulatory, legal, operational, contractual and financial requirements. Regulatory requirements include the Commission's direction regarding preferred resources, such as RPS-eligible resources, and the Commission's and statutory requirements to meet California's RPS.

Section II defines a variety of physical and financial electric products to meet PG&E's electric procurement needs. PG&E purchases these products through exchanges, inter-dealer or voice brokers, spot markets, electronic solicitations, energy product solicitations and Request for Offers ("RFO"), bilaterally negotiated contracts, QF/CHP standard form contracts, inter-utility swaps, and convergence bidding. In planning and procurement decisions, PG&E applies a consistent evaluation methodology to both supply-side and demand-side resources. By applying least-cost, best-fit ("LCBF") principles to supply-side and demand-side alternatives, PG&E obtains the lowest cost for customers for a given set of portfolio needs. PG&E's procurement evaluation methodology considers both the market value and the portfolio fit of alternative resources that are available.

2. Section III – Description of Commission-mandated Case

Section III describes the Commission-mandated case standardized assumptions and inputs directed in the *Assigned Commissioner's and Administrative Law Judge's Scoping Memo for Track II Bundled Procurement Plans* dated January 13, 2011, as well as directives from D.12-01-033.



3. Section IV – Procurement Plan Strategies for Implementing the Loading Order

Section IV describes PG&E's resource acquisition strategies for EE, DR, RPS-eligible resources, DG, conventional generation, and other generation including imports.

4. Section V – Evaluation of Commission-mandated Case

Section V summarizes the evaluation of the Commission-mandated case in terms of cost, risk, and GHG emissions.

5. Section VI – Commission Review of Implementation of Procurement Plan

Section VI describes PG&E's compliance with AB 57 (Public Utilities Code Section 454.5), compliance with the Commission's Procurement Standards of Conduct, and describes the various monthly, quarterly, and annual filings made to demonstrate compliance with its approved plan and Commission policy. Section VI also describes cost recovery under the BPP and Commission pre-approval, approval and filing requirements.

6. Appendix A – Capacity and Energy Tables and Procurement Limits

The capacity and energy tables included in Appendix A cover a 10-year period of time and reflect both demand forecasts and the resources currently owned or under contract to PG&E. The capacity and energy tables also identify the "net short" (i.e., the difference between demand and resources) and resources expected to satisfy the net short, consistent with the EAP loading order. In addition, capacity procurement limits and ratable rates tables are included covering the same 10-year period.



7. Appendix B – Electric Portfolio Hedging Plan

PG&E's Electric Portfolio Hedging Plan ~~proposes~~ adopts electric and gas hedging strategies to mitigate electric portfolio price risk, including product mix, operating targets, time horizon, and liquidity management strategy and reporting considerations.

8. Appendix C – Nuclear Fuel Procurement Plan

PG&E's Nuclear Fuel Procurement Plan provides forward contracting authority for uranium, conversion and enrichment services and inventory management procurement strategies to ensure that the Diablo Canyon Power Plant ("DCPP") reload requirements are adequately met in the future and to mitigate long-term risks associated with security of supply.

9. Appendix D – Electric Portfolio Gas Supply Plan

PG&E's Gas Supply Plan ("GSP") includes upfront and achievable standards for the procurement of natural gas transportation, storage, and physical supply in order to meet the needs of PG&E's Electric Portfolio. The GSP is designed to provide a reliable supply of natural gas at the lowest cost and cost volatility for PG&E's Electric Portfolio, including utility-owned generation ("UOG") and tolling agreements with third-party generators tolling agreements. The GSP includes targets for gas supply, pipeline capacity, and storage. In addition, the GSP includes preferences for biomethane and diverse suppliers. Finally, PG&E's GSP includes certain provisions regarding regulatory filings, ~~and Commission confirmation that biomethane transactions can be used to satisfy PG&E's RPS requirements.~~



10. Appendix E – PG&E’s To-expiration Value-at-Risk Methodology

PG&E’s TeVaR methodology describes the methodology for calculating unexpected changes in PG&E’s variable electric portfolio procurement costs, net of electric portfolio revenues from sales of cumulative long positions over some specific time period, typically 12 months. TeVaR measures how high the net portfolio cost for the projection period may become if certain market changes occur.

11. Appendix F – Congestion Revenue Rights

Appendix F describes PG&E’s participation in the CRR allocation and procurement processes and provides the upfront and achievable standards and criteria for the procurement of CRRs and Long-Term CRRs (“LT-CRR”).

12. Appendix G – Convergence Bidding

Appendix G includes PG&E’s convergence bidding authority consistent with D.10-12-034 granting interim authority to participate in the CAISO’s convergence bidding market under three strategies. Appendix G also includes Commission-approved stop loss limits and reporting requirements.

13. Appendix H – Brokerages and Exchanges

Appendix H includes a list of current authorized brokerages, exchanges and futures commission merchants.

14. Appendix I – Procurement Review Group, Independent Evaluators and Request for Offer Requirements

Appendix I describes the current Commission procurement requirements for the Procurement Review Group (“PRG”), Independent Evaluators (“IE”) and RFOs.



15. Appendices J and K – Glossary and Acronym Lists

These appendices provide a summary of electric and gas industry terms and acronyms used within PG&E's BPP.

16. Appendix L – Greenhouse Gas Procurement Plan

Appendix L includes PG&E's approved authority for GHG-related products, processes, and procurement strategies.

II. Implementation of PG&E's Bundled Procurement Plan

A. Procurement Processes

1. PG&E's Energy Procurement Organization

PG&E's Energy Procurement ("EP") organization plans for and acquires resources to ensure an adequate and reliable energy supply. EP has a number of procurement objectives, including assembling a portfolio of reliable and operationally flexible resources, supporting the development of environmentally preferred resources, and managing customer costs. The organization is responsible for both front-office functions associated with planning, procuring, scheduling, and dispatching resources, and back office functions associated with ensuring accurate payments to the CAISO and other power suppliers. EP is comprised of the following departments:

- Energy Policy, Planning & Analysis ("EPPA")
- Energy Supply Management ("ESM")
- Renewable Energy
- Energy Contract Management & Settlements ("ECMS")
- Energy Compliance and Reporting



The following section discusses the primary goals and responsibilities of each of the departments listed above. In addition, PG&E describes how its EP organization complies with Commission Standard of Conduct No. 2.¹

a. Energy Policy, Planning & Analysis

The EPPA department strives to meet the EP organization objectives through electric and gas resource planning that integrates demand-side and supply-side resource alternatives, and transmission and generation alternatives. EPPA analyzes regional supply-demand balances, the composition of potential PG&E portfolios, and the value of incremental resources to PG&E customers and regional supply. EPPA performs these analyses using financial, economic, and engineering methodologies and tools. EPPA analyzes current and potential market structures and policy initiatives, such as the EAP Loading Order, cap-and-trade for GHG emission reductions, and considers how these developments impact PG&E's procurement.

b. Energy Supply Management

The ESM department is responsible for all commercial transaction activities through competitive solicitations, bilateral negotiations and energy markets, including the development and execution of electric and fuels procurement strategies for short-term, medium-term, and long-term transactions, which will meet PG&E's customers' forecasted energy needs. ESM's responsibilities also include: (1) the management,

¹ The Commission originally adopted Standards of Conduct for procurement in D.02-10-062. These standards have subsequently been modified. See D.02-12-074, Ordering Paragraph ("OP") 24 (modifying standards); D.03-06-067, OP 3 (modifying standards and eliminating Standard Nos. 6-7); and D.03-06-076, OP 6 (clarifying that "Standard of Conduct 1 does not preclude anonymous transactions conducted through the ISO or through brokers and exchanges."). PG&E also received a waiver from Standard of Conduct 1 for certain gas transportation transactions in D.04-06-003.



optimization, and scheduling of PG&E's resources and contracts; (2) PG&E's trading in the energy markets; and (3) the natural gas procurement and hedging activities for PG&E's resources, power purchase agreements and assigned California Department of Water Resources ("CDWR") contracts.

ESM purchases natural gas supplies and transportation capacity to meet PG&E's bundled core gas customer demands. The gas procurement function relates generally to the process of acquiring gas supplies (e.g., the gas commodity) and managing transmission and storage capacity for core gas customers.

c. Renewable Energy

The Renewable Energy department is responsible for ensuring compliance with California's and the Commission's RPS requirements. This includes both oversight of all PG&E's renewable contracting and procurement portfolio, as well as the commercial transaction activities, including conducting RFOs and negotiating Power Purchase Agreements ("PPA"), to obtain renewable supplies to meet PG&E's RPS requirements. In addition, the Renewable Energy department provides direction on renewable energy policy issues at the Commission, the CEC, and the California Legislature; and participates in other renewable energy forums. The Renewable Energy department also focuses on renewable technology development, both emerging and market-ready, and utility renewable ownership efforts, including joint ownership agreements, strategic investments, project acquisitions, and greenfield project development.



d. Energy Contract Management & Settlements

The ECMS department is responsible for the preparation of regulatory filings, and implementation of standard reporting and documentation related to energy procurement and settlements activities. ECMS performs contract management and settlements related to energy procurement, including bilateral purchases and sales, fuel, Qualifying Facility (“QF”), Irrigation District (“ID”), Reliability Must-Run (“RMR”), and CDWR contracts, as well as CAISO market settlements. This work includes contract monitoring, validating calculations and data, preparing invoices, processing payments, and duties related to PG&E’s role as transmission owner and CAISO scheduling coordinator for both retail and existing transmission contract customers.

e. Energy Compliance and Reporting

The Energy Compliance and Reporting department oversees cost recovery and regulatory compliance policies, with a focus on Commission, Federal Energy Regulatory Commission (“FERC”) and North American Electric Reliability-~~(“NERC”)~~ standards and obligations affecting PG&E’s procurement activities. In addition, this group is responsible for ensuring compliance with Securities and Exchange Commission-~~(“SEC”)~~ reporting requirements, Section 404 of the Sarbanes-Oxley-~~(“SOX”)~~ Law, and all internal audit recommendations.

f. Compliance With Commission Standard of Conduct No. 2

The employees in PG&E’s EP organization manage a substantial portfolio of resources to ensure PG&E acquires a reliable, environmentally preferred, and cost-effective portfolio of supply-side and demand-side resources for its customers.

The EP employees, as well as the employees throughout PG&E, comply with the



Commission's Standard of Conduct No. 2, to the extent it is applicable. Standard of Conduct No. 2 provides:

Each utility must adopt, actively monitor, and enforce compliance with a comprehensive code of conduct for all employees engaged in the procurement process that:

- 1) Identifies trade secrets and other confidential information.
- 2) Specifies procedures for ensuring that such information retains its trade secret and/or confidential status (e.g., limiting access to such information to individuals with a need to know, limiting locations at which such information may be accessed, etc.).
- 3) Discusses employee actions that may inadvertently waive or jeopardize trade secret and other privileges.
- 4) Discusses employee or former employee activities that may involve misappropriation of trade secrets or other confidential information, unlawful solicitation of former clients or customers of the utility, or otherwise constitute unlawful conduct.
- 5) Requires or encourages negotiation of covenants not to compete to the extent such covenants are lawful under the circumstances (e.g., where a business acquires business interests of individuals who subsequently work for the acquiring business, the individuals disposing of their business interests may enter covenants not to compete with their new employer). All employees with knowledge of its procurement strategies should be required to sign and abide by an agreement to comply with the comprehensive code of conduct and to refrain from disclosing, misappropriating, or utilizing the utility's trade secrets and other confidential information during or subsequent to their employment by the utility.

To ensure compliance, each employee is required to certify that they are aware of PG&E's Employee Code of Conduct. A certification is electronically signed by each employee. In addition, PG&E employees are required to complete a Compliance and



Ethics training course on an annual basis, a description of which can be found at the following link: http://www.pge-corp.com/aboutus/ethics_compliance. The annual Compliance and Ethics training includes a review of various parts of the Code of Conduct for Employees handbook.

2. Overview of PG&E's Procurement Process

PG&E's procurement process involves three phases: planning, procurement, and dispatch.

a. Planning

In the planning phase, PG&E identifies the resource needs of its bundled customers and plans to satisfy these needs consistent with the State Loading Order, EAP and other Commission and legislative directives.² PG&E identifies specific products to meet its customers' needs. These power products include energy products (baseload, shaping, and peaking), capacity products to meet RA requirements, and various A/S products, including regulation, load following (i.e., balancing services), spinning, non-spinning, and black-start capability.

b. Procurement

PG&E implements its Commission-approved BPP through various procurement methods and practices, including competitive solicitations, bilateral negotiations, development of utility-ownership projects, and participation in various markets. PG&E's procurement methods and practices are described in detail in Section II.A.5, below. PG&E enters into short-term, medium-term and long-term contracts that result from the

² PG&E also looks at the reliability and operational flexibility needs for its entire service area.



procurement process. PG&E defines short-term contracts as contracts with a term of one year or less; medium-term contracts as contracts with a term greater than one year but less than five years; and long-term contracts are contracts with a term five years or greater. Renewable contracts are an exception to this rule, with anything under 10 years in duration being short-term for this contract category.

For pre-approval purposes, the contract duration begins: (1) at the time the contracted resource begins delivery if delivery begins within ~~two years~~one year of contract execution; or (2) at the time of contract execution if delivery does not begin within ~~two years~~one year of contract execution. The length of the contract duration includes any extension options provided for in the contract. Pre-approval, approval and filing requirements are described in more detail in Section VI.E.

c. Dispatch

PG&E is required to meet its electric load obligations consistent with the Commission's LCD requirements. Implementation of LCD is performed in the spot market, which is currently defined as "day-ahead, hour-ahead, and real-time" markets. In Energy Resource Recovery Account ("ERRA") Compliance Filings, the CPUC has reviewed PG&E's decisions to dispatch the resources under its control in the day-ahead, hour-ahead, and real-time markets.

PG&E economically dispatches its resources, subject to regulatory, legal, operational, contractual and financial requirements. In implementing LCD, PG&E dispatches resources or purchases energy with the lowest incremental cost of providing energy. Incremental cost includes the variable operating costs of resources owned or



controlled by PG&E, opportunity costs associated with such resources, and market prices for electricity, subject to regulatory, legal, operational, contractual and financial requirements. PG&E uses incremental cost dispatch for resources in its portfolio, including utility retained generation, third-party contracts, novated CDWR contracts, and spot market transactions. When deciding whether to dispatch and/or curtail renewable resources and other preferred resources, PG&E will consider factors in addition to incremental cost, such as the statutory requirement to meet California's RPS. This is an example of a regulatory requirement affecting PG&E's economic dispatch.

To implement LCD, PG&E has adopted the following principles:

- PG&E aims to minimize its total cost of energy required to meet load and ancillary service requirements, subject to regulatory, legal, operational, contractual and financial requirements.
- PG&E's procurement process considers all regulatory, legal, operational, contractual and financial requirements.
- PG&E minimizes energy costs by explicitly considering the incremental costs of all resources available to it in dispatch decisions.
- PG&E integrates any local area reliability, day-ahead scheduling requirements, and deliverability requirements into its dispatch decisions.

Although the CAISO's Market Redesign and Technology Upgrade ("MRTU") has increased the complexity of processes for participating in day-ahead, hour-ahead, and real-time markets, the principles described above remain essential for achieving LCD and meeting all regulatory, legal, operational, contractual and financial requirements.



3. Description of Procurement Products

a. Electric Products

PG&E uses a variety of physical and financial electric products to meet its electric procurement needs. Table II-1 below provides product names, descriptions and citations to the initial regulatory authority approving procurement of these products.



TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Ancillary Services	Products that are utilized by the control area operator to ensure electric system reliability for example, those that are listed in control area operator tariffs, such as the CAISO.	D.02-10-062
2	Capacity (Demand Side)	The amount of power consumed by a customer, measured in ~~megawatts~~ (“MW”), that can be reduced upon request.	D.02-10-062
3	Capacity (Purchase or Sale)	The amount of power capable of being generated, measured in MW, that can be converted to energy upon request.	D.02-10-062
4	Contingent Forward	A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.	AL 2615-E
5	Electric Product Exchange	The buyer has an obligation to receive electric products and an obligation to return electric products as part of the same transaction. The transaction may also include an exchange of payments, in fixed or variable terms. Electric products include energy, capacity, and A/S.	AL 2615-E
6	Electricity Transmission Products	Purchase, sale, or allocation of transmission rights, products (e.g., Long-Term Firm Transmission Rights (“LT FTR”), CRR, losses), or the use of locational spreads <u>for CAISO and non-CAISO transmission</u> .	D.02-10-062 D.07-12-052 <u>D.12-01-033</u>
7	Financial Call (or Put) Option or Swaption	The right, but not the obligation, to buy (call) a forward electric contract on a specific date (expiration) at a fixed or indexed price (strike). The right to sell is a put option. Additional examples include locational spread options, time spread options, cross-commodity options, and exotic (combination) options. A Swaption is an option on a Financial Swap.	D.02-10-062 AL 3482-E
8	Financial Swap	An agreement to exchange one type of pricing for another. Examples include fixed-for-floating swaps, locational spread (basis) swaps, time spread swaps, cross-commodity swaps and payment obligation swaps (e.g., CAISO Integrated Forward Market (“IFM”) Uplift Load Obligations). Swaps are financially settled directly with a counterparty or may be financially cleared through a financial clearing house. Margin-free swaps require just one counterparty or neither counterparty to post collateral.	D.02-10-062 AL 2615-E D.07-12-052 AL 3482-E



TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)

Line No.	Product	Description	Initial Authorization
9	Forward Energy (Demand-Side)	Electric energy planned to be consumed by a customer, measured in megawatt-hour ("MWh") that is agreed to be reduced for a specific period for a specified time in the future.	D.02-10-062
10	Proxy Demand Response ("PDR"), Reliability Demand Response Product ("RDRP"), and Participating Load ("PL")	<i>PDR:</i> Virtual generator that is paid for response to dispatches and market awards with performance based on a baseline method. <i>RDRP:</i> Virtual generator that is paid for response to dispatch in near emergency conditions with performance based on a baseline method. <i>PL:</i> Load acting as a resource with individual scheduling of load and generation for the PL.	D.10-06-002 D.10-12-036 AL 3635-E-A AL 3689-E-A
11	Forward Energy (Purchase or Sale)	Electric energy purchased or sold by a counterparty, measured in MWh that is agreed to be supplied or received for a specific period at a specific location for a specified time in the future.	D.02-10-062
12	Forward Spot (Day-Ahead and Hour-Ahead) Purchase, Sale, or Exchange	Electric energy, capacity, A/S or transmission purchased or sold by a counterparty, or exchanged between counterparties measured in MW or MWh that is agreed to be supplied, received or exchanged for a specific period at a specific location in the Day-Ahead or Hour-Ahead markets.	D.02-10-062
13	New York Mercantile Exchange ("NYMEX") Electricity Futures (Purchase or Sale)	Standardized forward energy contract traded on NYMEX. Futures may be physically or financially settled.	AL 2615-E
14	On-Site Energy or Capacity (Self-Generation on Customer Side of the Meter)	The amount of power measured in MW or MWh that can be generated downstream of the customer's electric meter that can be used to offset the customer's load served by the electric service provider.	D.02-10-062
15	Peak for Off-Peak Exchange	Electric energy, capacity, or A/S or transmission exchanged between counterparties measured in MW or MWh that is agreed to be supplied in an on-peak period in exchange for receiving an amount in an off-peak period. These transactions may also include an exchange of dollars.	D.02-10-062



**TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)**

Line No.	Product	Description	Initial Authorization
16	Physical Call (or Put) Option	The right, but not the obligation, to buy (call) physical electricity for delivery on a specific date at a fixed or indexed price (strike). The right to sell is a put option.	D.02-10-062
17	Real-Time (Purchase or Sale)	The amount of energy, measured in MWh supplied or received by the control area operator to balance an entity's load and supply.	D.02-10-062
18	Resource Adequacy Product	A capacity product intended to meet RA obligations.	AL 2615-E AL 2897-E
19	Seasonal Exchange	Electric energy, capacity, or A/S or transmission exchanged between counterparties measured in MW or MWh that is agreed to be supplied during one season or set of months in exchange for receiving an amount in another season or set of months. These transactions may also include an exchange of dollars.	D.02-10-062
20	Tolling Agreement	An agreement to provide (receive) gas in exchange for receiving (providing) electricity.	D.02-10-062 D.04-12-048
21	Emissions Credits Futures or Forwards	Credits or allowances for emissions that can be bought or sold in order to comply with emissions limits.	D.03-12-062
22	Forecast Insurance	A method for managing load forecast (volume and shape) risk.	D.03-12-062
23	Firm Transmission Rights ("FTR") Locational Swaps	Over-the-counter basis swaps associated with Firm Transmission Rights. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.	D.03-12-062
24	Non-FTR Locational Swaps	Over-the-counter basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.	D.03-12-062
25	Weather Triggered Options	A method for managing temperature and other weather forecast risks.	D.03-12-062
26	Resource Adequacy Import Capacity Counting Right	The right to count import energy or import RA product at an intertie toward satisfying RA requirements.	AL 2897-E
27	Long-Term Congestion Revenue Rights	Financial instruments to hedge Locational Marginal Price ("LMP") congestion in MRTU for 10 years.	AL 3095-E



**TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)**

Line No.	Product	Description	Initial Authorization
28	Congestion Revenue Rights	Financial instruments to hedge LMP congestion in MRTU, including, for example, monthly CRRs and seasonal CRRs.	D.02-10-062 D.07-12-052 AL 3106-E
29	Path 26 Resource Adequacy Capacity Counting Rights	The right to count south of Path 26 RA product toward satisfying RA requirements.	D.07-06-029
30	Convergence Bids	Virtual supply or virtual demand bids submitted in the CAISO day-ahead IFMs that, if cleared, would automatically liquidate with an opposite buy or sell in the CAISO Hour-Ahead Scheduling Process/Real-Time Market ("HASP/RTM").	D.10-12-034 <u>D.11-06-004</u>
31	Tradable Renewable Energy Credits ("TREC")	Tradable Renewable Energy Credits that can be used for compliance with California's RPS Program.	D.10-03-021 D.11-01-025
<u>32</u>	<u>QF Fixed for Short Run Avoided Cost ("SRAC") Floating Swap (purchase)</u>	<u>A fixed-for-floating SRAC swap settled directly with the QF counterparty.</u>	<u>D.12-01-033</u>
<u>33</u>	<u>GHG Allowance</u>	<u>A compliance instrument accepted by CARB providing the right to emit one mtCO₂e to satisfy obligations under the Cap-and-Trade regulation.</u>	<u>D.12-04-046</u>
<u>34</u>	<u>GHG Offset</u>	<u>A compliance instrument representing a verified emission reduction that is accepted by CARB in lieu of a GHG Allowance to satisfy obligations under the Cap-and-Trade regulation.</u>	<u>D.12.04-046</u>

b. Gas Products

PG&E uses a variety of physical and financial gas products to support electric procurement. Physical gas products are used to support LCD and reliability. Table II-2 below provides physical gas product names, descriptions and information about the initial regulatory authority approving procurement of these products.



TABLE II-2
PACIFIC GAS AND ELECTRIC COMPANY
NATURAL GAS PHYSICAL PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Natural Gas Purchases (Physical Supply)	Purchases/sales/exchanges of physical natural gas for terms of one month or longer.	D.02-10-062
2	Spot Natural Gas (Physical Supply)	Purchases/sales/exchanges of physical natural gas for terms less than one month.	D.02-10-062
3	Physical Options on Natural Gas Supply (Purchase or Sale)	The right, but not the obligation, to buy (call) physical gas for delivery on a particular date at a fixed or index price (strike). The right to sell is a put option.	D.02-10-062
4	Biomethane (Purchase or Sale)	Pipeline quality natural gas produced from renewable (non-fossil based) resources ~~that is eligible to be used for RPS compliance.~~	D.07-12-052
5	Contingent Forward (Purchase or Sale)	A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.	AL 2615-E
6	Gas Storage (Purchase or Sale)	Includes firm and as-available storage inventory, injection and withdrawal. Also includes parking and borrowing services.	D.02-10-062
7	Gas Transportation (Purchase or Sale)	Interstate, intrastate, and distribution gas transportation services. Includes firm, as-available and interruptible services.	D.02-10-062

Financial products are used to support gas hedging. Table II-3 below provides financial gas product names, descriptions and information about the initial regulatory authority approving procurement of these products.



TABLE II-3
PACIFIC GAS AND ELECTRIC COMPANY
NATURAL GAS FINANCIAL PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Natural Gas Financial Swaps (Purchase or Sale)	Over-the-counter gas forward products including fixed-for-floating swaps, locational spread (basis) swaps, time spread swaps, cross-commodity swaps and swing-swaps (fixed-price or monthly index for daily index). Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse. Margin-free swaps require just one counterparty or neither counterparty to post collateral.	AL 2615-E D.02-10-062 AL 3482-E
2	Natural Gas Futures (Purchase or Sale)	Standardized forward contracts for gas that trade on an exchange. Futures may be physically or financially settled. Physically settled futures may be unwound by an offsetting trade, exchanged for a physical position, or held to physical delivery.	AL 2615-E
3	Financial Options (Call or Put) or Swaptions (Purchase or Sale)	The right, but not the obligation, to buy (call) a forward gas contract on gas on a particular date (expiration) at a particular price (strike). The right to sell is a put option. Over-the-Counter ("O-T-C")-traded options settle in cash, whereas exchange traded (NYMEX) options are exercised, which causes delivery of a futures position to the option holder. Additional examples include locational spread options, time spread options, cross-commodity options, and exotic (combination) options. A Swaption is an option on a Financial Swap.	D.02-10-062 AL 3482-E

c. Credit Products

Credit products are used to support electric and gas hedging. Table II-4 below provides credit product names, descriptions and information about the initial regulatory authority approving procurement of these products.



**TABLE II-4
PACIFIC GAS AND ELECTRIC COMPANY
CREDIT PRODUCTS**

Line No.	Product	Description	Initial Authorization
1	Counterparty Credit Insurance	A method for managing payment or performance risk for a fee. Applies to physical and financial electric and gas products.	D.02-10-062 AL 3482-E
2	Counterparty Sleeves	Facilitating a transaction with an un-contracted or non-creditworthy counterparty through a contracted, creditworthy counterparty. Applies to physical and financial electric and gas products.	<u>D.02-10-062</u> D.03-12-062 AL 3482-E
3	Credit Intermediation Arrangement	Eliminates the need to post collateral on specific, identified, existing hedge positions. Under this arrangement, PG&E would novate existing positions from one counterparty to a financial institution. The financial institution becomes PG&E's counterparty to the positions. The financial institution does not require PG&E to post collateral in exchange for a negotiated fee. The financial institution may or may not post collateral to PG&E, depending on the arrangement.	AL 3482-E

The products presented in Section II.A.3 include those products PG&E is currently authorized to transact. Authorized GHG products ~~will be separately filed in the 2010 LTPP proceeding (i.e., R.10-05-006).~~ are further described in Appendix L, along with PG&E's GHG procurement framework which was approved in D.12-04-046. PG&E will request approval through advice letter filings of new products that arise from changed policies or market developments that are not covered by the above lists. Such products may be necessary to satisfy procurement needs arising from, for example, CAISO market initiatives, new legislation, regulatory requirements, or financial and administrative requirements.



4. Overview of Energy Product Markets

This section provides an overview of the markets available to PG&E to purchase the products described in Section II.A.3, above. PG&E's specific procurement practices are described in detail in Section II.A.5, which follows this section.

a. Exchanges

For electric and gas markets there are several types of transparent exchanges: O-T-C electronic trading platforms such as the Intercontinental Exchange ("ICE"), NYMEX Clearport, NYMEX Globex, and the Natural Gas Exchange ("NGX"); and open outcry exchanges such as the NYMEX. A list of authorized exchanges that PG&E is authorized to use is included in Appendix H.

The electronic platforms allow market participants to post bids and offers for specific gas and electric products. To complete a trade, a buyer must lift an offer or a seller must hit a bid. Once completed, the exchange confirms the transactions to both parties. NYMEX hosts open outcry trading for its natural gas futures contracts and natural gas options. Buyers and sellers transmit bids and offers to the trading pits through a Futures Commission Merchant ("FCM"). The trade is executed by the trader in the trading pit. The results of the trade are communicated back to the buyer or seller through the FCM.

For the electronic exchanges, buyers post bids to the system. If a seller hits the bid, the trade is completed. If a seller does not hit the bid, the buyer can adjust its bid until it is hit by a seller. Alternatively, if the buyer likes an offer already posted on the exchange, the buyer can lift that offer to complete the trade.



For open outcry trading, the buyers work through their FCM to trade on the exchange. Buyers can submit two types of orders with their FCM, a limit order (a bid at a specific price) or a market order (which will buy the current offer in the trading pit). FCMs will work a limit order until it is executed in the pit or until the floor trader indicates that the order is unlikely to trade. At this point, the buyer can cancel the order or raise its bid. In this manner, the buyer can adjust its bid until the trade is executed.

Since the transparent exchanges trade standard products and trading is anonymous, selection is made on product availability, credit availability, and price.

b. Voice Brokers

Voice brokers facilitate trades in the wholesale market for electricity and gas. Brokers communicate bids and offers to market participants through squawk boxes³ and telephone calls. Brokers work with buyers and sellers to facilitate trades. Once completed, brokers confirm the transactions with both parties and may initiate financial clearing with both NYMEX and the ICE. Brokers facilitate the trading of physical and financial gas and electric products. Brokers, as part of their price discovery role, provide price reporting services to subscribing clients.

Buyers communicate bids to the broker. If a seller hits the bid the trade is completed. If a seller does not hit the bid, the buyer can ask the broker to work its bid in the market. The broker will provide the buyer feedback if its bid is not hit by a seller. The buyer can adjust its bid until it is hit by a seller. Alternatively, if the buyer likes an

³ A squawk box is an intercom speaker used for communication between brokers and traders. The box allows brokers to broadcast market information to traders and to have one-on-one conversations with traders. PG&E records all communication on its squawk boxes as part of its trading process controls.



offer communicated by the broker, the buyer can lift that offer to complete the trade. Since brokers facilitate trades of standard products and trading is anonymous, selection is made by product availability, credit availability and price. A list of authorized brokers that PG&E is authorized to use is included in Appendix H.

c. Spot Markets

The spot market for electricity and gas is the wholesale market for day-ahead, hour-ahead, and real-time for electric energy and day-ahead for natural gas. Day-ahead for electricity normally includes two, two-day strips for weekends (Friday-Saturday and Sunday-Monday) and other combinations of days to accommodate holidays. Hour-ahead for electricity is the market as traded intra-day. Real time is the CAISO real-time market. Day-ahead for gas normally includes a 3-day strip for weekends (Saturday-Monday) or a longer combination of days to accommodate holidays.

The bilateral spot market consists of buyers and sellers communicating bids and offers to counterparties through telephone calls and Instant Messaging (“IM”). Traders negotiate until a trade is completed. Spot trades are normally executed and then confirmed over the phone by schedulers and not with paper confirmation documents. Spot market trades are also executed through voice brokers, ICE and NGX.

Buyers communicate bids to potential sellers. If a seller hits the bid the trade is completed. If a seller does not hit the bid, the buyer adjusts the bid to entice the seller or the buyer can call another potential seller. The process continues until the buyer finds a willing seller at the buyer’s price. Alternatively, sellers communicate offers to potential buyers, negotiate prices, and keep searching until they find a willing buyer. It is common



for buyers and sellers to trade through brokers, exchanges and the bilateral spot market simultaneously. Selection is made by product availability, credit terms, credit availability, and price.

d. Electronic Solicitations

Electronic solicitations facilitate the competitive purchase or sale of commodity products with approved counterparties and are defined as any competitive process where products are requested from the market. PG&E may participate in or administer as either a buyer or seller in an electronic solicitation that does not involve utility-owned resources. In an electronic solicitation, the buyer or seller may post a product for purchase or sale through a variety of electronic platforms. These platforms include but are not limited to: a secure internet site, an instant message communication, email, or via a voice solicitation to participants. Participants compete in a competitive process to provide the buyer or seller with the most advantageous price. Both sealed bid and live, open outcry solicitations are considered a competitive process. Bidders are required to meet the buyer or organizer's credit qualifications in order to participate. Selection is made by product availability and price. The current IE rules and requirements apply to PG&E's participation in an electronic solicitation.

e. Renewable Portfolio Standard Procurement

PG&E pursues renewable procurement through a number of different procurement methods. Each of these processes is described below.

- **RPS RFO** – Consistent with its Commission-approved RPS Procurement Plan, PG&E issues an RFO for all RPS-eligible resources.⁴ As a result of

⁴ See e.g., D.09-06-018 (approving 2009 RPS Procurement Plans).



D.11-01-025 regarding Renewable Energy Credits (“REC”), PG&E’s 2011 RPS RFO will also allow offers for REC-only products, as well as more traditional bundled RPS products. Once offers are received, PG&E then reviews all offers received, short-lists offers, and then negotiates with the short-listed bidders to execute an RPS agreement.

- **Photovoltaic (“PV”) Program** – Pursuant to the authority granted in D.10-04-052, PG&E also conducts two separate RFOs to implement its PV Program: one for utility-ownership bids and the second for PPAs.
- **Renewables Auction Mechanism (“RAM”)** – In D.10-12-048, the Commission directed the utilities to conduct RFOs for renewable resources under 20 MW as a part of the RAM Program.
- **REC-Only RFO** – In the future, PG&E may issue a separate RFO for RECs.
- **Feed-In Tariffs (“FIT”)** – The Commission has directed PG&E to provide tariffs and standard form contracts (i.e., a FIT) for small renewable resources that are 1.5 MW and less. In D.07-07-027, and subsequent advice letters and Commission Resolutions implementing that decision, the Commission has approved PG&E’s Electric Schedules E-PWF and E-SRG, which include standard form contracts for eligible renewable resources. The Commission is also currently considering the implementation of Senate Bill (“SB”) 32, which would increase the MW size of small renewables eligible for the FIT tariff from 1.5 MW to 3 MW.⁵
- **Bilateral Negotiations** – PG&E also procures RPS-eligible resources through bilateral negotiations.

f. Solicitations and Request for Offers

PG&E can also purchase or sell electric and gas products through solicitations.

PG&E defines the products it is seeking in its RFO or requests for bids and then reviews bids and offers received. PG&E can conduct RFOs for long-term resources or for shorter-term products, such as capacity to satisfy Local or System RA requirements.

PG&E may also participate in solicitations or RFOs held by generation owners, Load

⁵ See R.08-08-009 (addressing implementation of SB 32).



Serving Entities (“LSE”), or other market participants. Proposals for non-RPS eligible UOG cannot be bid into utility-run RFOs for new generation resources. New UOG resources shall be procured only after a corresponding utility RFO has “failed,” as that term is described in D.12-04-046 or subsequent Commission decisions addressing the definition of RFO failure in the context of a UOG proposal. As provided in OP 7 of D.12-04-046, applications for new UOG resources “shall be evaluated using criteria comparable to those used to evaluate independently-owned generation.” These criteria are described in more detail in D.12-04-046.

g. Bilaterally Negotiated Contracts

Bilateral negotiations ~~are~~ can be used for the purchase and sale of electric and gas products. The phrase “bilateral negotiations” is generally used in the context where negotiations take place in a one-on-one setting rather than as a part of a competitive solicitation. ~~When PG&E enters into a bilaterally negotiated contract, the following conditions apply:~~

- ~~1) — **Standard Commodity Products** — PG&E may enter into bilateral contracts for standard products to include those products with terms, conditions, or characteristics commonly traded in commodity or financial markets provided the duration of the contract is three months or less. PG&E will benchmark the transaction against available and relevant market data.~~
- ~~2) — **Non-Standard Commodity Products** — PG&E may enter into bilateral contracts for non-standard products to include those products with terms, conditions, or characteristics not commonly traded in commodity or financial markets but could be replicated by multiple counterparties. For contract durations of three months or less, PG&E will benchmark the transaction against available and relevant market data. For contract durations greater than three months, PG&E will demonstrate the need and process for each transaction and that the terms and conditions are~~



benchmarked against the best available market information for similar products recently offered or at a published index price.

- 3) **Limited Products**—PG&E may enter into bilateral contracts for limited commodity, financial, or capacity products to include those products offered by five or fewer counterparties offering products with terms, conditions, or characteristics that cannot be replicated by other counterparties. PG&E will demonstrate the need and process for each transaction and demonstrate that the terms and conditions are benchmarked against the best available market information for similar products recently offered.

TABLE H-5
PACIFIC GAS AND ELECTRIC COMPANY
BILATERAL NEGOTIATED DURATIONS

Authorized Term	Duration Less Than or Equal To Three Calendar Months	Duration Greater Than Three Calendar Months But Less Than Five Years
Standard Products	Yes	No
Non-Standard Products	Yes	Yes
Limited Products	Yes	Yes

The BPP does not modify the current Commission standards for review and approval of RPS-eligible bilateral energy and capacity transactions.⁶ The calculation of contract duration is described in Section H.A.2.b.

h. Qualifying Facility/Combined Heat and Power Standard Form Contracts

PG&E is required to offer three standard offer contracts as a result of Commission decisions issued in Rulemaking ("R.") 08-06-024 implementing AB 1613. These contracts are for new, eligible CHP facilities under 20 MW. Two of these contracts—one for units with a power rating under 20 MW and one for units which export no more than

⁶ See D.03-06-071 at p. 59 (authorizing bilateral RPS-eligible contracts); D.06-10-019 at pp. 31-32 (same); D.09-06-050 at pp. 28-29 (establishing standards for review of RPS-eligible bilateral transactions).



5 MW—have been ~~submitted to~~approved by the Commission and a simplified contract for units with a capacity under 500 kilowatt (“kW”) ~~is being developed~~has been submitted to the Commission.

In addition, PG&E ~~will~~is offering ing five standard form contracts ~~when it implements~~as part of its implementation of the QF/CHP Settlement, which was approved by the Commission in D.10-12-035 and became effective November 23, 2011. ~~PG&E will implement the QF/CHP Settlement once the settlement becomes effective.~~

i. Inter-Utility Swaps

Inter-utility swaps can be used for the purchase and sale of electric and gas products. Inter-utility swaps historically have been used for transactions that offer some form of operational and reliability benefits to both utilities. The process consists of direct one-on-one negotiations, with negotiated terms and conditions constantly weighed against best available market price benchmarks to justify the transactions. The decision to proceed is based on LCBF principles. Evaluation criteria and methodologies are very similar, if not the same used to evaluate transactions in recent and comparable product RFOs. PG&E uses the best available market price benchmarks in the evaluation process.

j. Convergence Bidding

The CAISO markets were expanded to include convergence bidding products starting January 31, 2011, effective for the February 1, 2011 trade day. Convergence bids are financial transactions (i.e., virtual bids for energy that will not be consumed or produced), that can only be submitted in the day-ahead market, and are recognized by the CASIO as not being physical. Convergence bids represent a financial commitment to sell



(or buy) energy in the day-ahead IFM at the individual pricing node location where the convergence bid is submitted. If these bids are cleared in the day-ahead market, they are automatically liquidated by the CAISO with an opposite buy-back by seller or sell-back by buyer of the same quantity of energy in the 5-minute RTM for locations inside the CAISO, and in the HASP for Interties. In D.10-12-034, the Commission authorized, but did not require, PG&E to submit convergence bids specifically to manage generator performance risks, load forecast uncertainty risks, renewable resource scheduling and hedging, and also to provide defensive bids against market dynamics.

5. PG&E's Procurement Methods and Practices

In this section, PG&E describes its electric procurement methods and practices for short-term, medium-term and long-term contracts. Table II-~~6~~⁵ below reflects the procurement methods and practices that PG&E is authorized to use.



TABLE II-~~65~~
PACIFIC GAS AND ELECTRIC COMPANY
PROCUREMENT METHODS AND PRACTICES

Item #	Transaction Process	Description	Initial Authorization
1	Competitive Solicitations ("RFO")	Widely distributed request for offers or proposals. Required items include among other things: Description of product requirements, term, minimum and maximum bid quantities, scheduling and delivery attributes, credit requirements, and pricing attributes. Additional requirements for the RFO process are specified in D.07-12-052, pages 142-152. See Appendix I for other specific information on administering the RFO process.	D.02-10-062 D.04-12-048 AL 2615-E
2	~~Direct bilateral contracting with counterparties for short-term products (e.g., three months or less)~~ ~~Bilateral Contracting With Counterparties for Standard Products With a Contract Duration of Three Months or Less~~	~~Bilateral process for products procured with a term transactions for standard commodity products that have a contract duration~~ three months or less. ~~IOUs demonstrate that such transactions are reasonable based on in duration: PG&E will benchmark the transaction against~~ available and relevant market data ~~supporting the transaction. The demonstration may include showing competing price offers, result of market surveys, broker and online quotes, and/or other source of price information such as published indices, historical price information for similar time blocks, and comparison to RFOs completed within one month of the transaction.~~	D.02-10-062 D.04-12-048 AL 2615-E
~~3~~	~~Negotiated bilateral contracts for non-standard products which terms exceed three months provided that the IOUs include a product justification in quarterly compliance filings.~~	~~Process to purchase products provided they are included in quarterly compliance filings to justify the need and process in each case. Terms and conditions are benchmarked against the best available market information for similar products recently offered.~~	~~D.03-12-062 D.04-12-048 AL 2615-E~~
~~3~~	~~Bilateral Contracting With Counterparties for Non-Standard Products~~	~~Bilateral transactions for non-standard commodity products: For contract duration of three months or less, PG&E will benchmark the transaction against available and relevant market data. For contract duration greater than three months, PG&E will demonstrate the need and process for each transaction and that the terms and conditions are benchmarked against the best available market information for similar products recently offered or at a published index price.~~	~~D.02-10-062 D.04-12-048 AL 2615-E~~
4	Bilateral Contracting With Counterparties for Products With Contract Durations That Exceed	Process to purchase long-term products outside of the RFO process. Terms and conditions are benchmarked against the best available market information for similar products recently offered and submitted to the	D.03-12-062 D.04-12-048 AL 2615-E



	<u>Five Years</u>	<u>Commission for approval in an application.</u>	
<u>5</u>	<u>Bilateral Contracting With Counterparties for Limited Products</u>	<u>Bilateral transactions for limited products. PG&E will demonstrate the need and process for each transaction and demonstrate that the terms and conditions are benchmarked against the best available market information for similar products recently offered.</u>	<u>D.03-12-062 (for natural gas pipeline and storage capacity)</u>
<u>64</u>	Inter-Utility Exchanges	Exchange with other regulated utilities and other load-serving entities negotiated through private negotiation crafted to best fit the resources and needs of both parties.	D.02-10-062 D.04-12-048 AL 2615-E
<u>75</u>	ISO Markets: Imbalance Energy, Hour-Ahead, Day-Ahead and Convergence Bids	Spot market transactions are authorized to meet short-term needs. Convergence Bids are authorized to manage specific areas of portfolio risks and renewable scheduling limitations.	D.02-10-062 D.04-12-048 AL 2615-E D.10-12-034

TABLE II-65
PACIFIC GAS AND ELECTRIC COMPANY
PROCUREMENT METHODS AND PRACTICES
(CONTINUED)

Item #	Transaction Process	Description	Initial Authorization
<u>86</u>	Transparent Exchanges, such as Bloomberg and Intercontinental Exchange, Voice and On-Line Brokers	Electronic trading exchanges for transparent prices.	D.02-10-062 D.03-12-062 D.04-12-048 AL 2615-E
<u>97</u>	<u>RPS-Eligible</u> Utility Ownership of Generation	Utility ownership of generation can be pursued through an RFO under certain conditions (see D.07-12-052 at 198-205; D.08-11-008 at 18-20) or outside of the RFO process under certain conditions (see D.07-12-052 at 209-213; D.08-11-008 at 20-23).	D.07-12-052 D.08-11-008
<u>8</u>	<u>Non-RPS-eligible Utility Ownership of Generation</u>	<u>Utility ownership of generation can be pursued outside of an RFO process under certain conditions (see D.07-12-052 at 209-213; D.08-11-008 at 20-23 and D.12-04-046 at pp. 28-39).</u>	<u>D.07-12-052</u> <u>D.08-11-008</u> <u>D.12-04-046</u>
<u>109</u>	Open Access Same-Time Information Systems (<u>"OASIS"</u>)	Procure standard electric transmission products from transmission providers throughout the Western Electric Coordinating Council ("WECC") region at FERC tariffed rates and voice and on-line brokers.	D.03-12-062 D.04-12-048 AL 2615-E
<u>110</u>	Electronic Solicitations	IOUs are authorized to conduct purchase or sale through an electronic solicitation format for <u>non-utility-owned</u> products requested from the market.	D.03-12-062 D.04-12-048 AL 2615-E <u>D.12-01-033</u>



~~12~~ <u>11</u>	Market Requests for Proposals ("RFP")	IOUs can bid in open season or RFPs held by generator owners, LSEs and other market participants.	D.04-01-050 AL 2615-E <u>D.12-01-033</u>
~~13~~ <u>12</u>	CAISO Allocations and Auctions	CAISO allocation and auctions for LT-CRRs and CRRs and allocation of RA counting rights.	AL 3095-E AL 3106-E D.06-07-029 AL 2897-E
<u>13</u>	<u>CARB Auction</u>	<u>Authorization to procure GHG Allowances through any CARB Auction in accordance with the Cap-and-Trade regulation.</u>	<u>D.12-04-046</u>
<u>14</u>	<u>Allowance Price Containment Reserve</u>	<u>Authorization to procure GHG Allowances through CARB's Allowance Price Containment Reserve.</u>	<u>D.12-04-046</u>

In the remainder of this section, PG&E describes its procurement methods and practices for: (a) short- and medium-term procurement transactions; (b) long-term transactions; and (c) RPS transactions.

a. Procurement Methods and Practices for Short-Term and Medium-Term Transactions

This section describes PG&E's methods and practices for short- and medium-term procurement transactions. PG&E utilizes various Commission-approved transaction methods that are set forth in Table II-~~6~~5 for short- and medium-term transactions.

PG&E's electric procurement process is not a one-time event. Rather, it is comprised of a series of ongoing analyses and activities that focus on different time frames and decisions. This process ensures that resources are available to meet energy, capacity and A/S requirements and allows PG&E to minimize the cost of generation and risks by participating in a variety of transactions over time.

The electric procurement process for all time frames, from multi-year to hour ahead, is conceptually identical. Only the input assumptions and the granularity of those assumptions differ. The remainder of this discussion summarizes the short- and



medium-term procurement process and describes some of the Commission-approved transaction methods that PG&E has undertaken in each timeframe.

(1) Multi-Year

PG&E initially determines its need for short- and medium-term transactions. Multi-year transactions typically involve competitive solicitations that are reviewed in consultation with the PRG. PG&E begins by determining total load requirements, including bundled customer demand, wholesale sales, transmission and distribution losses, A/S, and any and all operating constraints. PG&E then determines the quantity of generation from “must-run” resources such as the DCP, QFs, and some CDWR novated contracts. Finally, PG&E assesses market conditions in order to optimize production from dispatchable resources and market transactions. PG&E’s objectives are to meet any remaining load requirements as well as extract value from resources when it is economic to sell into the market. Required electric procurement or sales are spread over the short- and medium-term time frames to minimize market impacts and to allow for changing load requirements.

(2) Annual, Quarterly and Monthly

PG&E performs and updates assessments of its net open position for a 12-month forward period on a regular basis to determine whether additional resources are required or it has excess resources for potential surplus sales. This process ensures that PG&E has resources to meet requirements, and determines by the close of the month prior to an operating month that it will control resources within 5% of expected requirements, as recommended by the Commission in D.02-10-062. However, consistent with



D.04-01-050 at page 33, PG&E may exceed the 5% of expected energy requirements if it has satisfied the monthly RA requirements.

The analysis is the same as that employed for the multi-year time frame, with the primary difference being the assumptions used—forecasted loads, resource availability, gas prices, hydro availability and market prices are further refined as PG&E moves closer to the operating period and resource requirements and market opportunities become clearer.

Forward Energy Products (e.g., term, balance-of-month and balance of week purchases and sales) are transacted to diversify the portfolio and reduce reliance on spot markets. Transactions with delivery terms greater than three months' in duration are reviewed by the PRG. Typically, bilateral contracts are benchmarked against pricing information obtained from recent competitive solicitations for a similar product, forward price curves or the best available market information for similar products recently offered or at a published index price. In addition, brokers play a critical role in almost all of these transactions. Voice brokers and electronic exchanges are used for the purpose of price discovery and matching buyers with sellers in an anonymous fashion.

(3) Intra-Month and Weekly

As part of an integrated process, results from the actions described in the previous section determine the amount of the residual open position (long or short) that is carried into the prompt month. Inside the month time horizon, PG&E reviews the availability of resources, hydro conditions, and makes an assessment of market prices and conditions to



further assess how best to manage the open position. If market transactions are needed, the transaction methods listed in Section II.A.5 are generally used.

(4) Daily

On a daily basis, generally between 5:30 a.m. and 7:00 a.m., PG&E conducts a least-cost analysis to determine unit dispatch and market transactions to meet energy and A/S requirements. This analysis incorporates weather-adjusted load forecasts, resource availability, dispatch costs, current electric market prices, and PG&E's prices forecast of the CAISO's IFM. The results of this analysis will determine the bidding or dispatch of CDWR contracts that were novated to PG&E, PG&E-owned or controlled thermal and hydro generation, QFs, demand-side options, existing bilateral contracts, as well as purchases or sales in the CAISO markets. In addition, PG&E bids separately for its load in the IFM, bidding to purchase up to 100% of its load in each hour based on forecast prices.

PG&E must anticipate and plan for potential schedule changes that occur after the IFM closes. Between the day-ahead and real-time market timeframes, changes in system conditions, such as weather, transmission, resource availability, and energy prices are inevitable. In anticipation of these changes, PG&E incorporates flexible resources with the capability to increase and decrease generation in response to load and operating requirements into its day-ahead schedules.

Generation and load bids are created for individual hours at individual hourly prices and submitted to the IFM. A/S are also bid for in the IFM and not normally self-scheduled in by PG&E. Through the bidding of generation, load and A/S, the IFM



simultaneously determines schedules and prices for energy and A/S while also solving for congestion.

(5) Hour-Ahead Planning and CAISO's Real-Time Market

"Hour-ahead" planning is something of a misnomer since it effectively begins at the conclusion of day-ahead trading. As day-ahead analysis and trading occurs early in the morning prior to the operating day, there can be substantial changes to operating requirements. PG&E prepares weather-adjusted load forecasts throughout the day to determine if changes in generation or system operation are required. Further, unit outages, transmission outages, and other constraints may also affect resource requirements prior to real-time. In order to address its portfolio during this time frame, PG&E's hour-ahead staff has several resources at its disposal, such as generation, including PG&E-owned thermal and hydro; demand-side options; the Helms pumped storage unit; certain novated CDWR contracts that may be adjusted at unique dispatch prices; and facilities under contract. Hour-ahead personnel optimize the portfolio based on operating requirements and market opportunity costs, and decide whether any generating resources should be adjusted to minimize system costs and whether market transactions are required or beneficial.

The bilateral hourly market, while active, is far less transparent than the day-ahead market or the RTM. As there are few brokers operating in the hourly market and limited electronic exchange opportunities, the majority of transactions are bilateral in nature, making it difficult to broadly characterize the hour-ahead market. PG&E evaluates



participation in the hour-ahead bilateral markets as a potential hedge against CAISO RTM costs.

b. Procurement Methods and Practices for Long-Term Transactions

Long-term transactions (e.g., contracts with a duration of five years or greater), including ~~utility-owned generation~~ (“UOG”) proposals, are approved by the Commission either through an application or advice letter process. PG&E uses the following method for long-term transaction procurement.

(1) Solicitations

PG&E typically conducts RFO solicitations for long-term transactions. PG&E has conducted two Long-Term RFOs (“LTRFO”) for non-RPS, new generation resources since it resumed procurement responsibilities in 2004 and 2008. The results of the LTRFOs have been addressed in Commission decisions. Specific information related to conducting RFOs is included in Appendix I.

(2) Bilateral Contracts

PG&E also conducts bilateral negotiations when appropriate and beneficial for its customers. For example, PG&E’s acquisition through a bilateral transaction of the Gateway facility stemmed from a settlement of PG&E’s claims against Mirant. The Commission approved PG&E’s acquisition of Gateway in D.06-06-035.



c. Procurement Methods and Practices for Renewable Portfolio Standard-Eligible Resources

PG&E procures RPS resources through competitive solicitations, bilateral negotiations, and Commission-approved FITs. These procurement methods are described in more detail in Section II.A.4.e, above.

d. Procurement Methods for Qualifying Facility and Combined Heat and Power Resources

PG&E procures CHP and QF resources through competitive solicitations, bilateral negotiations, and Commission-approved form contracts. These procurement methods are described in more detail in Section II.A.4.h, above.

6. Electrical Capacity Procurement Limits and Ratable Rates

Electrical capacity procurement limits and ratable rates apply to electric capacity transactions with deliveries beyond the prompt calendar year (e.g., for electrical capacity transactions occurring in 2012, procurement limits and ratable rate shall apply to contract deliveries in 2014 and beyond).⁷ The procurement limits and ratable rates reflect a limit on net capacity procurement, which is purchases less sales of capacity in a given year. No limits or ratable rates apply to PG&E meeting its RA capacity requirements for the current calendar year and prompt calendar year (i.e., the calendar delivery year immediately following the current year).

Delivery years two through ten have maximum annual electrical capacity procurement limits equal to the difference between: (1) PG&E's forecast electrical capacity requirement to meet its RA requirement (i.e., peak annual hour load using a

⁷ No formal limits or ratable rates are set beyond the term of the BPP. Approval for any capacity procurement in this timeframe will be sought through an application.



1-in-2 year load forecast multiplied by 117%); and (2) the forecast Net Qualifying Capacity (“NQC”) of PG&E’s committed resources⁸ and planned preferred resources.⁹

Ratable rates equal to the annual electrical capacity procurement limits divided by the number of years between the delivery year and transaction year apply for delivery years two through ten and reflect the maximum capacity procurement of non-preferred electrical capacity allowed under the BPP in that year. For example, the ratable rate for delivery Year 4 is one-third the annual electrical capacity procurement limit for Year 4 (i.e., the Year 4 electrical capacity procurement limits divided by the annual time difference between Year 4 and Year 1). The unused portion of each year’s ratable rate accumulate year-to-year, producing cumulative ratable rate for each delivery year. The electrical capacity procurement limits and ratable rates are shown in Appendix A. Procurement at two-times the ratable rate, subject to the electrical capacity procurement limits, for delivery years 2 through 5 is allowed if the prompt 12-month forward on-peak implied market heat rate at the time of execution is less than the two standard deviation historical high value as shown in Appendix A. Otherwise, procurement at one-times the ratable rate is used.

⁸ Assuming no re-contracting of resources that are not preferred.

⁹ For purposes of calculating PG&E’s annual electrical capacity procurement limits and compliance with such limits, preferred resources are EE programs, DR programs, Renewable Sources (including energy imports associated with approved RECs), and Distributed Generation including CHP resources (or those resources qualified to count toward the Commission’s CHP goals) including procurement of preferred resources above the Commission’s targets or goals.



A transaction counts against the annual electrical capacity procurement limits and ratable rates in the year the contract is effective.¹⁰ A transaction is compliant with PG&E's authorized procurement limits and ratable rates if, at the time the contract becomes effective, the transaction does not cause PG&E to exceed its procurement limit or ratable rate for the applicable year. A transition from a two-times ratable rate to a one-times ratable rate within a given year will not cause any transaction activity that occurred prior to the transition date to be non-compliant with PG&E's ratable rates, provided that such transactions complied with the applicable ratable rate when executed.

On occasion, whether due to the lumpiness of procurement, Commission mandated procurement (such as non-renewable, non-CHP QFs), or unique and fleeting opportunities, transactions in a given year may exceed the electrical capacity procurement limits and/or ratable rates for that year. For these transactions, PG&E will request from the Commission an exemption from the annual electrical capacity procurement limits and/or ratable rates as necessary when seeking approval for the transaction.

PG&E will file an annual (or more frequent, if necessary) update to its electrical capacity procurement limits and ratable rates in a Tier 1 advice letter during years in which PG&E does not file an updated conformed bundled procurement plan.¹¹ This update will provide PG&E with the opportunity to adjust its procurement limits and ratable rates to reflect changes in PG&E's portfolio and updated forecast assumptions.

¹⁰ Procurement at two-times the ratable rate is allowed only when the contract is effective upon execution since the ability to procure at this level is determined at the time of execution.

¹¹ The updated limits calculations shall be consistent with the methodology employed in Appendix A.



7. Contracting Rules for Once-Through Cooling Units

PG&E may procure authorized products from OTC facilities through the authorized processes identified in this BPP subject to the conditions approved by the Commission in D.12-04-046. PG&E is not required to file by separate advice letter or application agreements with OTC facilities with a contract duration of two years or less and which terminate more than one year prior to the applicable State Water Resources Control Board ("SWRCB") compliance deadline. Agreements with OTC facilities with a contract duration greater than two years but less than five years or that terminate one year or less prior to the applicable SWRCB compliance deadline must be submitted to the Commission for approval in a Tier 3 advice letter. Agreements with OTC units with a contract duration five year or greater must be submitted to the Commission for approval via an application consistent with normal procurement rules.

For agreements with OTC facilities with a contract duration greater than two years but less than five years, PG&E will show in its advice letter: (1) how the contract helps facilitate compliance with the SWRCB OTC policy, or at a minimum why it does not delay compliance; (2) the expected operation of the OTC facility under normal load (1-in-2) and high load (1-in-10) conditions, including the number of starts and the run time after each start; (3) the local capacity requirement net position with and without the OTC facility over the contract duration and two years beyond the contract duration; and (4) how any other available generation resources compare under these criteria.

For agreements with OTC facilities that terminate one year or less prior to the applicable SWRCB compliance deadline, PG&E will show in its advice letter how the agreement helps facilitate compliance with the SWRCB OTC policy.



PG&E may procure from OTC facilities beyond the applicable SWRCB OTC compliance deadline provided that the contracts: (1) allow for utility purchase or receipt of power generated by a unit using non-compliant OTC only up to the SWRCB OTC policy compliance deadline in effect on the date the contract is signed (the contract shall not allow the utility to continue to purchase or receive power generated using non-compliant OTC beyond that date even if SWRCB extends the compliance deadline); (2) protect utility ratepayers against stranded costs; (3) protect ratepayers against the risk of future unspecified cost increases resulting from increases in the cost of the generation unit compliance with the SWRCB OTC policy (for PG&E to recover such cost increases from ratepayers, it must obtain the necessary approval from the Commission); (4) are consistent with a need authorization from the System Track of the Long-Term Procurement Plan (“LTPP”) proceeding; and (5) are consistent with other procurement rules, including the D.12-05-046 requirement to file either a Tier 3 Advice Letter (for contracts with a duration of less than five years) or an application (for contracts with a duration of more than five years).

Any OTC-related advice letter or application must show compliance with all relevant SWRCB policies and regulations, and also must show how the contract provides or facilitates cost-effective and reliable service.

PG&E will consider a resource’s use of OTC in its evaluation of offers in RFOs or solicitations.



6.8. The Application of Least-Cost, Best-Fit and the Loading Order in PG&E's Procurement Planning and Transactions

LCBF provides for resource alternatives to be selected based on their relative cost effectiveness and their ability to meet the specific needs of the portfolio. A resource's cost effectiveness is determined relative to common market benchmarks or "market value," as explained below. A resource's portfolio fit can be a qualitative assessment or quantitative measure that represents how well its energy profile, location, and other operating characteristics meet the needs of the portfolio for a particular product in a given location.

In planning and procurement decisions, PG&E applies a consistent evaluation methodology to both supply-side and demand-side resources. By applying LCBF principles to supply-side and demand-side alternatives, PG&E obtains the lowest cost for customers for a given set of portfolio needs. PG&E's procurement evaluation methodology considers both the market value and the portfolio fit of alternative resources that are available.

a. Market Valuation

Market value represents a resource's net market value from a market perspective, based on its costs and benefits, regardless of its fit with the rest of PG&E's portfolio. The costs that PG&E uses in calculating a resource's net market value include the cost associated with GHG emissions. In some circumstances, PG&E adjusts market value to include the costs of transmission system upgrades, since part of those costs are borne by PG&E's bundled customers.



b. Portfolio Fit

Portfolio fit assesses how well a resource alternative matches PG&E's portfolio needs. For example, a resource that produces energy during time periods in which PG&E's portfolio is expected to be long (i.e., periods in which PG&E expects to make spot market energy sales) has a poorer portfolio fit than a resource that produces energy during time periods in which PG&E's portfolio is expected to be short (i.e., periods in which PG&E expects to make spot market energy purchases). As a result, the portfolio fit of a resource is different from, but complementary to, the net market value of that resource.

In the planning phase, PG&E considers portfolio fit based on how well a particular resource provides the power products that need to be added to the portfolio. Not all resources provide the same products. For example, PV distributed generation and energy efficiency do not provide dispatchable peaking energy.

In the planning phase, PG&E first identifies the types and amounts of power products that it needs to fill its open position over the planning horizon. Those power products include energy products (e.g., baseload, peaking and shaping), capacity or RA products, and A/S products (e.g., spinning, non-spinning, regulation, and black-start capacity). Then, PG&E identifies the energy products that each alternative resource can provide (e.g., baseload energy and dispatchable shaping or peaking energy). Most resources can provide a capacity product, or have an RA value that PG&E can estimate by using the Commission-adopted RA counting rules. However, some resources are more likely to provide energy in the hours when the system's peak demand is most likely to occur, and which as a result may have a higher RA value (per unit of installed capacity).



In the procurement phase, when evaluating transactions, portfolio fit can be a qualitative assessment or quantitative measure that represents how well a resource fits the portfolio's need. In addition to the market valuation, resources are compared based on their ability to meet the particular need being met, or their ability to provide additional features that are complementary to the portfolio. For example, if the proposed resource is not dispatchable by the utility, the offer with a generation profile that best matches the hourly profile of the open position will score more highly on PG&E's portfolio fit measure. Other portfolio fit considerations can include location and the volatility of the remaining portfolio open position.

c. Loading Order

According to the EAP, cost-effective EE and DR are preferred to meet the State's growing energy needs, followed by cost-effective renewable and distributed generation, and finally clean and efficient fossil-fired generation. Pursuant to D.12-01-033, PG&E shall procure additional EE and DR resources to the extent they are feasibly available and cost effective. This approach continues for each step down the loading order, including renewable and distributed generation. The EAP also requires improvements to transmission and distribution ("T&D") system to support demand growth and enable the interconnection of new generation.

7.9. PG&E's Use of the Procurement Review Group Process

PG&E consults with the PRG on a wide range of transactions generally on a monthly basis, and sometimes more often as necessary. The Commission initially directed PG&E to consult with the PRG for specific types of transactions including:



(1) overall interim procurement strategy; (2) proposed procurement contracts before the contracts are submitted to the Commission for expedited review; and (3) proposed procurement processes including but not limited to RFOs which result in contracts being entered into in compliance with the terms of the RFO.¹² Since 2002, the Commission has expanded the role of the PRG, including reporting requirements such as congestion bidding activities and CRRs. Although the PRG acts in an advisory capacity only, PG&E actively solicits feedback from PRG members and incorporates that feedback into its procurement processes regularly. Consistent with Commission directives, PG&E confers with the PRG on:

- **Bundled Procurement Plan and Customer Risk Tolerance (D.03-12-062, D.07-12-052, D.12-01-033)** – PG&E provides the PRG monthly updates of its portfolio position and risk. If the Customer Risk Tolerance (“CRT”) is expected to be hit or exceeded within the next quarter, When the portfolio risk (TeVaR measured at the 95th percentile) exceeds 125% of the Customer Risk Tolerance (“CRT”), PG&E informs and confers with the PRG to discuss the underlying risk drivers and factors affecting the change in portfolio risk and to decide whether specific hedging strategies and/or plan modifications are needed to reduce portfolio risk to within the CRT threshold.
- **Capacity Position Limits (D.12-01-033)** – PG&E provides the PRG quarterly updates of its current position relative to the Commission-approved capacity limit on a rolling 24-month forward basis compared to the previous quarter.
- **Procurement Transactions That Are More Than Three Months in Length With Delivery Periods Greater Than Three Months (D.02-10-062, D.03-12-062, D.04-12-048, D.07-12-052)** – PG&E consults with the PRG at least once, and sometimes several times, on transactions that are more than three months in length have delivery periods greater than three months. PG&E discusses how transactions meet portfolio needs, solicitation or other procurement processes, evaluation methods, negotiation processes and contract selection.

¹² See D.02-08-071 at p. 24.



- **LTRFO Design and Administration (D.04-12-048 and D.07-12-052)** – PG&E discusses both all-source and renewable RFOs with the PRG. Consultation with the PRG may encompass RFO design, the evaluation processes, short-list selection, negotiation strategy, and bid selection.
- **Electric Portfolio Hedging and Gas Supply Plans** – PG&E provides the PRG any updates to its hedging plan strategies and other aspects of its hedging plan such as changes or exceedance of liquidity limits. PG&E also informs the PRG of any hedging strategy changes that are presented to the Commission for approval.
- **Participation in a Generator Request for Bids (D.04-01-050)** – PG&E consults with the PRG prior to making an offer in other LSE solicitations or generator requests for bids.
- **Annual and Monthly LT-CRRs and CRRs (Resolutions E-4122 and E-4135, Appendix F)** – PG&E consults with its PRG prior to annual nominations for allocations and auctions. PG&E provides the PRG participants with information regarding the CRR it is buying or selling, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). PG&E will notify the PRG of all CRRs awarded in the monthly process after submission. The notification will include information about every CRR awarded in the monthly process, including the source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). The notification will be provided within three business days of the posting of the results of the final market process of a month's CRR process (currently the auction). ~~PG&E discusses LT-CRR and CRR nominations and transactions with the PRG as required by Resolutions E-4122 and E-4135.~~
- **LT-CRRs (Resolutions E-4122 and E-4135, Appendix F)** – For any LT-CRR transaction, PG&E must provide the PRG participants with information regarding the LT-CRR, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description the underlying arrangement that the LT-CRR will hedge (or, in the case of a sale of a LT-CRR, no longer hedge). In addition, PG&E will report to the PRG the performance of its LT-CRRs on a quarterly basis



- including source, sink, MW quantity and performance using average congestion prices as published by CAISO.
- **Convergence Bidding (BPP, Appendix G)** – PG&E provides quarterly presentations to the PRG regarding its convergence bidding strategies, performance and market analysis.
 - **Other Products and Processes Resulting From Commission Decisions** – PG&E has presented new proposed products and processes to its PRG. Such products include convergence bidding and other future products to support the CAISO system current market or new federal energy policy as approved by the Commission. In addition, PG&E has presented new technologies that PG&E may engage for its procurement activities or products.
 - **GHG Procurement (D.12-04-046)** - The PRG is consulted on various aspects of procurement of GHG Products including the resale of GHG Products, PG&E's adopted CARB auction bidding strategy (including discussion of the total volume of GHG allowances that PG&E might acquire and its GHG position); transacting for any GHG Product in the Secondary Market with a vintage year¹³ more than three years in the future beyond the current calendar year, and any forecast updates and corresponding revision to the GHG purchase limits as a part of PG&E's quarterly position update. Appendix L includes a more detailed discussion of PRG consultation with regard to GHG Products.

Although PG&E is required to discuss only a specified set of procurement matters with the PRG, PG&E and the PRG discuss a wider range of topics related to procurement. PG&E provides educational sessions to the PRG on topics including credit, market valuation and portfolio fit, risk management and TeVaR, and the principles and processes of electric portfolio gas hedging. Appendix I includes specific information on the administration of the PRG.

¹³ A "vintage year" is an attribute of each allowance that refers to the compliance year that CARB associates with the allowance at issuance. The vintage year designation restricts the allowance's eligibility for use to certain compliance periods. In the case of offsets, the vintage year refers to the year in which the offset is created.



8.10. PG&E's Use of the Independent Evaluator

PG&E uses an IE in competitive solicitations for electric supply-side resources that seek products with a contract term of two years or more. ~~An IE is not required for solicitations for other types of resources or products such as EE, DR, natural gas physical or financial products, and other non-electric supply products.~~ PG&E also uses an IE in all solicitations that involve an IOU-affiliate or utility bidder. In addition, consistent with D.09-06-050, PG&E uses an IE for bilateral negotiations for RPS-eligible resources. Appendix I includes specific information on IE qualifications, evaluation, entrance into the IE pool and other administrative items. Consistent with D.12-04-046, PG&E will make the public version of an IE report identical to the corresponding confidential version, except for the visible redaction of confidential material.

B. Risk Management Policy and Strategy

1. Portfolio Risk Assessment and Customer Risk Tolerance

PG&E manages the net open positions of the bundled electric portfolio in accordance with Commission guidelines. The portfolio, and PG&E's ability to manage the portfolio, are affected by numerous risks, including: price, market liquidity, model, counterparty credit exposure, and credit liquidity.

First, with regard to price risk, increases in electricity and gas commodity prices increase the costs of the portfolio and increase the risk of even higher costs of the portfolio. Increases in price volatility also increase the risk of higher costs of the portfolio. The portfolio's exposure to price risk is included in the TeVaR measure. Changes in how electricity and gas commodity fluctuate, including changes in price volatility, make managing the portfolio more difficult. Among the challenges in



managing the portfolio's exposure to price risk are balancing how much to hedge, when to hedge and what products to use to hedge.

Second, the portfolio and PG&E face market liquidity risk. Depending on the size of the portfolio's net open positions, prices may move adversely when transactions are executed to reduce those net open positions. Depending on market conditions, this adverse price movement could be significant. In formulating a plan to execute transactions, and in actual transaction execution, PG&E considers the potential effects of market liquidity risk.

Third, the portfolio and PG&E can be affected by model risk. Model risk relates to the risks involved in using models to estimate portfolio risk and manage the portfolio's net open positions. Often, PG&E's portfolio positions are not directly traded in any marketplace. In this situation, models are used to estimate net open position exposure, measure portfolio risk, and guide in managing the portfolio. Model risk includes the risk of estimating, extrapolating, or forecasting inputs needed for portfolio evaluation, such as energy demand, hydro supply, forward prices, volatilities, and correlations. PG&E's risk management policies and procedures include provisions and activities to assess and manage model risk.

Fourth, the portfolio and PG&E can be affected by counterparty credit risk. The portfolio and PG&E hold contracts with counterparties, and there is a risk that counterparties may not pay or perform on their contractual obligations. PG&E's credit department manages this risk. Since returning to procurement in 2003, PG&E's credit department has employed a credit policy whereby all transactions with counterparties are



subject to term and dollar limits. Generally, these limits are based on collateral thresholds, credit ratings, and contractual conditions that both PG&E and counterparties have agreed to for managing collateral obligation of each party to more effectively manage counterparty credit risk.

Additionally, the portfolio and PG&E face credit liquidity risk. PG&E is obligated to post collateral with counterparties as well as exchanges. The collateral posting by PG&E results from the combination of accruals for delivered physical energy and mark to market of obligations above and beyond the negotiated credit threshold with counterparties. In addition, most of the portfolio's contractual agreements require PG&E to post collateral if PG&E's credit rating by external rating agencies were to fall below investment grade. For exchanges and cleared transactions, PG&E is required to post initial margin as well as mark to market and the portfolio does not benefit from any unsecured credit limits.

PG&E reports its electric portfolio TeVaR to the Commission's Energy Division ("ED") on a monthly basis. Consistent with D.07-12-052, PG&E measures TeVaR as the potential change in portfolio costs under a low probability (5%) outcome or a 95% confidence level. The TeVaR measure assumes that no further forward hedging is performed, and that all existing positions are taken to delivery. In addition, D.~~03-12-062~~ 07-12-052 and D.12-01-033 requires PG&E to notify and meet and confer with the PRG if ~~between quarterly PRG consultations,~~ PG&E's ~~estimated portfolio risk~~ CRT level is expected to be hit or exceeded within the next quarter ~~125% of the CRT level~~. In ~~2003~~ D.12-01-033, the CRT level was set by the Commission at ~~one cent per kilowatt-~~



~~hour (“kWh”) impact to retail rates~~ 10% of PG&E’s system average rate. The calculation of the CRT value is derived by multiplying 10% of the adopted bundled system average rate by the bundled forecasted sales for the rolling 12-month period. Pursuant to D.12-01-033, this CRT calculation will be updated every two years in each LTPP filing. If the LTPP filing is delayed or not made, the CRT will be updated two years from the filing of the previous LTPP via a Tier 1 advice letter. A description of PG&E’s TeVaR methodology is included in Appendix E.

2. PG&E’s Current Risk Management Practices

PG&E hedges to keep the portfolio’s risk within the CRT level established by the Commission. PG&E uses the electric TeVaR measure to assess portfolio risk. While hedging reduces the risk of adverse price movements and leads to more stable portfolio costs, hedging does not reduce the expected (that is, average or mean) portfolio cost.

PG&E hedges the price risk of its portfolio in accordance with its Commission-approved electricity and gas hedging plan. Under the hedging plan, PG&E is authorized to utilize financial instruments in addition to physical contracts to hedge its price risk. This hedging plan provides PG&E with an approved guideline for volume, term and tenor, and permitted product type. The hedging plan also establishes the credit liquidity amount that can be allocated to the hedging of PG&E’s electric portfolio as outlined in the credit and collateral requirement section.

PG&E hedges using swaps and options, as well as fixed-price contracts. These hedges complement other portfolio positions. A significant fraction of portfolio price risk is currently “hedged” through PG&E’s ownership of physical assets or the rights to



output from physical assets (power plants, long-term power contracts, gas pipelines, and gas in storage). Along with existing physical positions, PG&E uses financial swaps and options to further hedge commodity price risk.

In selecting financial hedge instruments, PG&E considers risk reduction, liquidity impacts, and costs to transact and execute. An option requires a known up-front payment, and results in a later cash inflow that is unknown until expiration and settlement. On the other hand, a financial swap has no up-front payment and results in a later cash inflow or outflow that is unknown until expiration and settlement. Swaps are also subject to collateral posting requirements and do not allow the buyer to take advantage of lower prices if commodity prices drop in the future.

Typically, PG&E is the buyer of the hedge instruments. On rare occasions, PG&E anticipates, in advance, having more commodity than needed to serve customer demand. On such occasions, the sale of hedge instruments would serve as a hedge reducing the portfolio's exposure to commodity price risk.

3. PG&E's Credit and Collateral Requirements

The Commission has not established specific rules for counterparty or customer risk that apply to credit exposure. PG&E's credit and collateral requirements evolved from accepted energy industry practices, including concepts that can be found in Edison Electric Institute ("EEI"), North American Energy Standards Board ("NAESB"), and International Swaps and Derivatives Association, Inc. ("ISDA") master agreements. The primary elements of PG&E's credit and collateral requirements include: collateral thresholds (unsecured credit lines), collateral posting for purchases and sales of physical



or financial gas and power, and mark to market posting to cover the change in value of a contract relative to the market. The general goal is to protect the customer against the risk of default by parties with whom PG&E enters into wholesale commodity transactions or hedging transactions. PG&E's credit risk management process includes: creditworthiness evaluations, collateral requirements for various types of transactions, and the level of collateral authority. Each of these aspects of credit risk management is described below.

PG&E manages the credit risk regarding each counterparty by assigning unsecured credit limits or unsecured credit thresholds to each counterparty. In establishing unsecured credit lines for counterparties, PG&E performs evaluations of counterparty creditworthiness. PG&E assesses each counterparty's financial strength, transaction risk and duration, credit standing, and other credit criteria, as deemed appropriate. PG&E periodically reviews the unsecured credit lines assigned to a counterparty to ensure the unsecured credit lines are appropriate for the then-current credit quality of the counterparty.

If a counterparty is a rated entity (e.g., the debt of the entity is rated by Standard and Poor's ("S&P"), Moody's or Fitch) assigned a credit rating below investment grade (for example investment grade is considered BBB- or above by S&P or Baa3 by Moody's) or is a "non-rated entity" not considered creditworthy by PG&E, then PG&E generally will require the counterparty to provide acceptable credit support. Such credit support can be in the form of a cash deposit, guaranty from an investment grade entity, or a letter of credit from an acceptable credit support provider, in form and substance



satisfactory to PG&E. For creditworthy counterparties, PG&E establishes a specified unsecured credit limit beyond which posting of acceptable credit support is required. Some of the specific collateral requirements that apply to various categories of transactions are described below.

- **Standard Physical Contracts** – Physical power contracts are generally executed under standard agreements such as the Western System Power Pool (“[WSPP](#)”), or EEI form master agreements. These master agreements generally have a credit annex where parties can specify unsecured credit limits and conditions that apply for parties to honor the levels. For natural gas physical contracts, either NAESB or Gas Industries Standards Board (“[GISB](#)”) are commonly used. Credit terms of the master agreements for natural gas have similar clause and treatment as power. For the most part power and gas contract exposure cannot be netted without a bridging agreement. Bridging agreements are difficult to establish as the executed contracts may be with various subsidiary or affiliate of a credit support provider.
- **Standard Financial Contracts** – Financial transactions are executed directly through the exchanges or executed bilaterally with a counterparty in the O-T-C market. When executed with exchanges, PG&E must post appropriate collateral based on the exchange’s requirements for initial margin and ongoing margin maintenance associated with mark to market value of the transactions on a daily basis. O-T-C transactions can be submitted for clearing with a clearing entity such as the ICE, or remain with the counterparty. Similar to exchanges, cleared contracts will require collateral posting based on the mark to market value of the contracts. Bilateral financial transactions are generally executed under the negotiated terms of the ISDA. Similar to standard physical agreement, an ISDA master agreement has a credit annex for specifying conditions and level of unsecured credit limit among the parties to the agreement.
- **Renewable Contracts** – Renewable counterparties are required to post a bid deposit of \$3 per kW; a development and construction period deposit of up to \$100 per kW multiplied by the greater of: (1) the capacity factor; or (2) 0.5 for intermittent technologies; and a delivery term security of up to 12 months of the average revenue depending on contract term once commercial operations begin.



- **Resource Adequacy** – RA counterparties (rated as non-investment grade) are generally required to post 16% to 33% of annual capacity payments depending on term of the contract, particularly when RA is a clearly identified component.
- **Intermediate Term Tolling, Forward or Option Contracts** – Intermediate term tolling counterparties are subject to mark to market posting in accordance to the Market Intrinsic Value (“MIV”) methodology.
- **Long-Term Tolling Contracts** – Long-term tolling counterparties are required to post a bid deposit of \$5 per kW; post an additional \$10 per kW when an executed contract is submitted to the Commission (for a total of \$15 per kW); an additional developmental and construction period deposit of \$85 per kW at the time the Commission approves the contract (for a total of \$100 per kW); and once commercial operations begin the counterparty is subject to mark to market posting (this amount is capped and the cap depends on the technology).
- **Procurement Activities Through the CAISO** – PG&E schedules all its energy procurement through CAISO system. It also procures a portion of its physical needs daily and hourly through the CAISO or may resell any excess energy it may have. In addition, PG&E manages transmission congestion risks through procurement of financial contracts for CRRs through the CAISO auction and term allocation process. PG&E is also responsible for various CAISO charges related to T&D, Losses, and administrative. The combined exposure to a market participant is referred to as Estimated Aggregate Liability (“EAL”) by CAISO and is used for monitoring and collecting appropriate level of security to mitigate counterparty risk. CAISO allocates a maximum of \$50 million of unsecured credit to the most creditworthy market participants. PG&E currently qualifies for this unsecured credit limit, but must post additional collateral above and beyond the \$50 million limit within three business day of receiving the request from CAISO. In addition, during the period of bidding for CRR or during convergence bidding, PG&E may need to maintain additional amount of collateral above and beyond the projected daily EAL to ensure its bids are not rejected because of lack of credit support.
- **Short-Term Transactions** – Short-term transactions include hour-ahead, day ahead, balance of the month, multi-month, and swing deals. Exposures from purchases and sales of power and gas are tracked daily. Collateral



requirements are governed by the master agreements under which these transactions are executed.

D.09-05-002 grants PG&E, among other things, authority to issue up to \$4.0 billion of short-term debt, subject to the restriction that \$500 million of that authority may only be used for the following purposes:

- Procuring natural gas for PG&E’s customers during price spikes.¹⁴
- Procuring electricity for PG&E’s customers during price spikes.
- Responding to major natural disasters, large scale terrorist attacks, or other cataclysms.
- Providing liquidity during a major disruption of PG&E’s ability to bill, collect, and/or process utility customer bills.

Given these restrictions, PG&E effectively has \$3.5 billion of general short-term debt authority, with the additional \$500 million of authorization reserved for the foregoing specified contingencies. Short-term debt is used to meet the liquidity requirements of the electric portfolio and finance other operations at PG&E. The liquidity management structure specified in Appendix B deploys short-term debt to the electric portfolio.

III. Description of Commission-mandated Case

This section summarizes the load and resource assumptions as required by the *Assigned Commissioner’s and Administrative Law Judge’s Scoping Memo for Track II Bundled Procurement Plans* issued January 13, 2011 (“Track II Scoping Memo”) and further modifications from D.12-01-033. PG&E prepared a case based on the standardized planning assumptions that were established in Appendix B of the

¹⁴ D.04-10-037 defines the commencement of a “price spike” as an increase in the price of gas or electricity of at least 50% over the average of the preceding 12 months.



Administrative Law Judge's Ruling Requesting Post-Workshop Comments, Updating Standardized Planning Assumptions, and Providing Lawrence Berkeley Report on Modeling Issues issued December 23, 2010 ("Standardized Assumptions") and further modifications from D.12-01-033. PG&E neither explicitly nor implicitly adopts these planning assumptions as its own and is submitting this Commission-mandated case and its results in Section V to meet the requirement of the Track II Scoping Memo and further modifications from D.12-01-033. Appendix A includes the capacity (PGE-1) and energy (PGE-2) tables. The assumptions used and described below correspond to both the energy and capacity tables in Appendix A.

A. Load Forecast (Appendix A, Table PGE-1, Lines 1-8)

The load forecast in Table PGE-1, line 1, is the 2009 1-in-2 Integrated Energy Policy Report ("IEPR") base case load forecast including CEC-updated assumptions for Community Choice Aggregation¹⁵ ("CCA") (Table PGE-1, line 2) and Direct Access ("DA") (Table PGE-1, line 7) based on Public Utilities Code Section 365.1(b), D.10-03-022 and D.12-01-033. Line 1 also includes the demand-side resources and the impacts of EVs.

EE savings (Table PGE-1, line 3) included in the Commission-mandated case through 2020 are based on the 2009 IEPR demand forecast and include mid-case values from the CEC's final Committee Report on Incremental Uncommitted Energy

¹⁵ PG&E's load calculation in Tables PGE-1 and PGE-2 does not include the Marin Energy Authority's ("MEA") Phase 2B implementation plan rollout which would begin in 2013. While MEA has recently met the binding notice requirements under PG&E's Electric Tariff Rule 23.2 in which MEA would assume responsibility for the planning and purchase of its customers' electrical power requirements, PG&E plans to reflect MEA's load for Phase 2B in its next annual update to the electrical capacity procurement limits.



Efficiency,¹⁶ except for Big Bold Energy Efficiency Strategies (“BBEES”), for which the CEC’s low case was mandated. Savings decay makeup and adjusted line loss savings are included to arrive at generation-level MW savings.

DR values (Table PGE-1, line 4) include those DR programs reported in the April 1, 2010 load impact filings (as updated in June 2010) and “AMI-enabled DR, such as price-responsive programs adopted or directed by the Commission, but yet to be implemented, and any default and optional dynamic rates expected in the forecast period. In addition, the forecasts include the Peak Time Rebate (“PTR”) program and the Programmable and Communicating Thermostat (“PCT”) program underling the AMI related DR benefit assumptions in the Commission AMI decisions.”¹⁷ The Time-of-Use (“TOU”) figures reported in the load impact filings include PG&E’s large Commercial and Industrial (“C&I”) customers. PG&E’s largest C&I customers (greater than 500 kW) have been on mandatory TOU rates since the late 1970s. The remaining largest C&I customers greater than 200 kW have been on mandatory TOU rates since 2001, therefore, the TOU affect on C&I usage is embedded in the load forecast. Given that the large C&I TOU impact is embedded in the load forecast, including the impact as a load modifier as well results in double-counting. Therefore, PG&E has excluded the large C&I TOU impacts from the DR load modifier in the Commission-mandated case, per a February 27, 2011 conference call with Energy Division.

¹⁶ *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 integrated Energy Policy Report Adopted Demand Forecast*, May 2010 and *Attachment A: Technical Report*, January 2010.

¹⁷ Attachment 1: Standardized Planning Assumptions (Part 1) for System Resources, December 23, 2010, p. 11.



Self-generation values (Table PGE-1, line 5) represent on-site generators excluding the California Solar Initiative (“CSI”). The CHP component of this amount includes the additional new CHP of 401 MW by 2020 which includes losses. CSI values are shown on Table PGE-1, line 6. The CSI generation levels are from the 2009 IEPR base case-load forecast. In the preparation of the analysis, for demand-side CHP, a coincidence factor of 0.922 and an on-peak availability of 1.0 were used.

B. Existing and Planned Resources (Table PGE-1, Lines 15-23)

PG&E-owned fossil resources (Table PGE-1, line 15) include two combined cycle (“CC”) plants (Gateway and Colusa) and a series of 10 gas-fired reciprocating engines that replaced the Humboldt Bay Power Plant. The combined fossil capacity is currently 1,384 MW. In addition, ~~in December 2010, the CPUC approved~~ PG&E’s request to own and operate the Oakley Generating Station, a 586 MW CC that will be operational in 2016, is included in line 15.

PG&E owns and operates two nuclear power units at DCPD with a combined peak capacity of 2,240 MW (Table PGE-1, line 16). The plant is expected to have an availability of over 98% annually, excluding refueling outages.

PG&E owns and operates 68 hydroelectric facilities (Table PGE-1, line 17), including run-of-river and dispatchable hydroelectric facilities as well as the Helms Pumped Storage Facility. Forty-two of these facilities are RPS-eligible resources.

Existing and planned resources also include CDWR contracts. At the beginning of 2011, eight unexpired CDWR contracts were still allocated to PG&E (Table PGE-1, line 19). The counterparties include CalPeak, Shell, Kings River Conservation District,



Iberdrola, Fresno Cogeneration Partners and Wellhead. These contracts total 1,168 MW of generation. However, half of these MWs expired ~~d by~~ at the end of 2011 and all but 96 MW expire by the end of ~~September~~ June 2012. Kings River, the last contract, runs through September 2015. The contracts are forecast to generate approximately 2,800 gigawatt-hours (“GWh”) in 2011 and half that amount in 2012. *De minimus* quantities are expected to be generated in 2013-2015. In particular, PG&E has the following CDWR contracts:

TABLE III-1
PACIFIC GAS AND ELECTRIC COMPANY
CDWR CONTRACTS

DWR Counterparty	End Date	MW
CalPeak Power—Panoche	12/27/2011	52.6
CalPeak Power—Vaca Dixon	12/31/2011	51.9
Shell	6/30/2012	550
Kings River Conservation District	9/18/2015	96
Iberdrola Renewables	6/30/2011	300
Fresno Cogeneration Partners	10/31/2011	21.5
Wellhead Power Gates	10/31/2011	46.4
Wellhead Power Panoche	10/31/2011	49.9

PG&E has PPAs with approximately 230 operating QFs (Table PGE-1, line 20). The QF contracts cover a wide range of technologies including RPS-eligible resources and large-scale CHP. The Standardized Assumptions provided limited guidance on CHP contracting assumptions for the Bundled Plan and directed the IOUs to the guidance provided in the Joint Scoping Memo. In *Standardized Planning Assumptions (Part 1) for System Resource Plans*, the CHP assumptions for the PG&E planning area are:

- Maintenance of 1,888 MW of existing CHP ~~Net Qualifying Capacity~~ (“NQC”).
- Addition of 409 MW of new CHP NQC serving the system planning area load.



- Addition of 373 MW of new demand side CHP serving behind the meter load (401 MW impact to the system planning table).

In accordance with D.12-01-033, supply-CHP MWs included in the bundled portfolio are as follows:

- 100 percent renewal of existing contracts. All CHP Transition Contracts expiring on June 30, 2015 renewed for four months at 55 percent (427 MW of 776 MW expiring). CHP Transition Contracts achieve 100 percent renewal on November 1, 2015.
- New CHP capacity exporting to grid: 8.4 MW per year through 2015 plus 204.8 MW in November 2015 and then approximately 40 MW per year thereafter; a total of 409 MW (nameplate) by 2020.

~~Under the Commission-mandated case all expiring non-RPS QF contracts are assumed to be recontracted through the end of the forecast horizon at 100% of the original contract volume, including all existing QF CHP contracts. In addition, 409 MW of incremental (new) supply-side CHP resources are assumed to be available to the bundled portfolio.~~ Consistent with the recontracting assumptions used for the RPS PPA portfolio, expiring RPS-eligible QF contracts are assumed to be recontracted at 70% of the original contract volumes.

In addition to QFs, PG&E also has contracts with RPS-eligible resources (Table PGE-1, line 21). PG&E developed RPS assumptions for the Commission-mandated case consistent with the Commission direction for the Track I Trajectory Scenario. Using the RPS projects and generation volumes from PG&E's March 1, 2011 RPS Compliance Report as a foundation, the RPS portfolio reflected in the Commission-mandated case:



- Meets the RPS targets outlined in the CARB 33% Renewable Electricity Standard (~~“RES”~~) regulation, specifically: 20% renewables in 2011-2014; 24% renewables in 2015-2017; 28% renewables in 2018-2019; and 33% renewables in 2020. RPS targets for the Commission-mandated case were calculated based on the PG&E Bundled Sales forecast included in the E3 RPS Calculator.
- Includes all executed contracts at 100% of negotiated energy deliveries.¹⁸ Online dates reflect the best available information on the development status of projects under contract to PG&E.
- Assumes PG&E will re-contract with resources whose contracts expire before 2020 at a rate of 70% of their current volumes. PG&E elected to include all expiring contracts at a discounted volume in the years following expiration rather than hand-picking projects with which it would not renew purchase agreements.
- Assumes that the CPUC-mandated TREC cap of 25% of Annual Procurement Target (“APT”) volumes is extended in perpetuity beyond the current sunset date of December 31, 2013. Results for the Commission-mandated case project that PG&E does not exceed the REC cap in any year except 2011, where REC-only deliveries represent 28% of APT volumes. PG&E assumes that it will bank the 3% of REC-only overages and save for use in later years when it is comfortably under the REC cap but may need additional generation volumes due to unforeseen project failure.
- Fills PG&E’s RPS-specific net short position in 2020 with generic RPS resources using the following technology mix: 30% in-state wind; 30% out-of-state wind; 30% solar PV; 5% biomass; and 5% geothermal. This technology mix ~~is was~~ PG&E’s ~~current~~ best estimate of its desired blend of technologies for long-term RPS procurement purposes when the BPP was filed in March 2011.¹⁹

PG&E’s Bilateral Contractual Resources (Table PGE-1, Line 22) consist of bilateral contracts including: (1) incremental supply-side CHP; (2) CDWR contract

¹⁸ RPS contracts that have been terminated or expired are not included in PGE-1 or PGE-2.

¹⁹ Commercial negotiations and market factors will ultimately determine the technology makeup of PG&E’s renewable portfolio in 2020, so the numbers presented here may change over time.



novations; (3) contracts resulting from the 2004 and 2008 LTRFOs; (4) intermediate-term contracts; and (5) RA contracts.

With regard to incremental supply-side CHP, PG&E used the following assumptions:

- 409 MW of contracts with new CHP by the end of 2020
- Capacity factor of 0.922 and on-peak availability of 1.0

With regard to CDWR novations, on October 1, 2010, three former CDWR contracts: Calpine 3, Calpine 4 and GWF (Tracy, Henrietta and Hanford) were novated by PG&E for a combined contracted capacity of 1,051 MW. All of the contracts expire prior to 2013 with the exception of Calpine 3 which extends through 2021.

The 2004 LTRFO resulted in PPAs for CalPeak Firebaugh, Panoche Energy and Russell City for a combined contracted capacity of 1,067 MW. The 2008 LTRFO and CDWR novations resulted in PPAs for Mariposa, Marsh Landing, Midway-Sunset, GWF Tracy Expansion and Calpine 2 Los Esteros Expansion for a combined contracted capacity of 1,648 MW. Finally, intermediate length contracts (five years or less) were entered into for Moss Landing 6 and 7 and Delta Energy Center for a combined capacity of 2,312 MW. These contracts expire by the end of 2013.

IV. Procurement Plan Strategies for Implementing the Loading Order

A. Introduction to Resource Procurement Strategy

PG&E's BPP is designed to implement California's EAP loading order and Legislative and Commission directives regarding procurement. The BPP balances three primary objectives: (1) assembling a portfolio of reliable and operationally flexible



resources; (2) supporting development of environmentally preferred resources; and (3) managing customer price and price volatility. In this section, PG&E describes its resource acquisition strategies for EE, DR, RPS-eligible resources, DG, clean-efficient conventional generation, and other generation including imports. Section IV.G briefly addresses electric and gas hedging and fuel strategies. Specific strategies are described in more detail in the appendices.

B. Energy Efficiency

1. PG&E's Long-Term Commitment to Energy Efficiency

PG&E has been, and will continue to be, supportive of California's efforts to promote EE. In 1976, PG&E became one of the first utilities in the nation to offer EE programs to its customers. Since then, PG&E has received numerous awards and recognition for its leadership by industry leaders such as Energy Star and the American Council for an Energy Efficient Economy (~~"ACEEE"~~). Since 1976, PG&E and its customers have kept more than 155 million tons of CO₂ out of the atmosphere.²⁰ PG&E has been and continues to be supportive of the EAP "loading order" for energy needs in California, which places EE at the top of the list, followed by other demand-side resources and renewable resources. The 2008 EAP Update lays out specific action areas, including EE, and acknowledges the need for coordination and integration, broadening perspectives and the focus on action, and the leveraging of partnerships. As described below, this coordination is a key part of PG&E's current and future EE programs.

²⁰ See <http://www.pge.com/about/environment/pge/energyefficiency/index.shtml>.



2. PG&E's 2010-2012 Programs

PG&E's 2010-2012 EE portfolio is described in D.09-09-047. After this decision, PG&E filed Compliance AL 3065-G-A/3562-E-A conforming PG&E's EE portfolio to D.09-09-047. PG&E's 2010-2012 EE portfolio builds upon successes of prior EE programs and realigns program delivery to offer an Integrated Demand-Side Management ("IDS~~M~~") portfolio to better meet the needs of PG&E's customers and deliver energy savings to the state of California in line with the California Energy Efficiency Long Term Strategic Plan ("Strategic Plan"). This integrated portfolio has been streamlined to a limited number of statewide programs with coordinated marketing and outreach, smaller targeted programs to meet unique conditions in PG&E's service area, and contains pilots for new and innovative EE approaches, in addition to 57 third-party programs.

As directed by the Commission,²¹ the Joint IOUs, in collaboration with ED staff, developed the following Statewide and Local Programs to align with California's Strategic Plan:

Core Statewide Programs

- 1) Residential
- 2) Commercial
- 3) Industrial
- 4) Agriculture
- 5) New Construction
- 6) Lighting Market Transformation
- 7) Heating, Ventilating and Air Conditioning (~~HVAC~~)

²¹ For background on the 2010-2012 EE portfolio, see D.09-09-047, at p. 16.



- 8) Codes and Standards-~~(“C&S”)~~
- 9) Emerging Technologies-~~(“ET”)~~
- 10) Workforce Education and Training-~~(“WE&T”)~~
- 11) Marketing, Education and Outreach-~~(“ME&O”)~~
- 12) Statewide Demand-Side Management (“DSM”) Coordination and Integration

Government Partnerships

- 1) Government Partnerships
- 2) Innovator Pilot Program
- 3) Green Communities

Third Party Programs

Other Local Programs

- 1) Local DSM Coordination and Integration
- 2) ZNE Pilots
- 3) On-Bill Financing Program
- 4) On-Bill Financing Revolving Loan Pool

D.09-09-047 included utility specific goals for the program cycle. The goals established for PG&E can be found in Table IV-1 below.

TABLE IV-1
PACIFIC GAS AND ELECTRIC COMPANY
PG&E GOALS FOR 2010 – 2012

Metric (‘10-‘12 Program Cycle)	Commission Goal (D.09-09-047)
Electricity Savings (GWh)	3,110
Peak Savings (MW)	703



3. Post-2012 Programs

In recent years, it has become clear that EE programs can no longer rely on inexpensive, easy to obtain EE. Rather, California must pursue more challenging and costly implementation efforts to achieve its energy savings goals. As a result, PG&E expects funding requirements for future EE programs to increase as less cost effective measures are pursued to address remaining market potential. Despite the challenges of increasing efficiency beyond easy and inexpensive measures, PG&E is committed to helping California achieve deep and lasting improvements, while maintaining California's role as the nation's most energy efficient state. PG&E will continue to work closely with the Commission, the other IOUs, and interested parties to develop future EE portfolios which continue California's national leadership in EE achievement. PG&E anticipates the current 2010-2012 portfolio cycle will be extended by one or more years; however, the exact timing, goals, and budget have not yet been determined. PG&E will continue to actively propose innovative programs to the Commission in line with the historical EE leadership of PG&E and California.

C. Demand Response

DR is second in the EAP Loading Order after EE. DR is a valuable resource for meeting PG&E's peak demand, improving system reliability through RA, avoiding costly capital investments, advancing SmartGrid goals, facilitating integration of intermittent renewable resources, and furthering the objectives of California's EAP. As such, PG&E has developed a portfolio of DR resources that are capable of furthering these goals. PG&E is committed to further developing its DR portfolio, in terms of efficiency, flexibility and size.



1. PG&E's 2009-2011 Demand Response Program

PG&E's 2009-2011 DR Program, which was approved in D.09-08-027, includes a variety of programs designed to elicit DR from all customer classes to meet systemwide and PG&E specific needs. PG&E's DR portfolio can be broadly divided into two categories: non-event based DR resources and event based DR resources.

Non-event based resources are those resources that provide an ongoing financial incentive for customers to shift usage outside of peak hours. PG&E's non-event based programs include the Permanent Load Shifting (~~"PLS"~~) program and TOU rates.

Event based programs provide financial incentives for customers to shift their usage outside of peak hours on days when system usage is critically high or when there is a critical local condition. These event based programs include the Base Interruptible Program (~~"BIP"~~), Capacity Bidding Program (~~"CBP"~~), Demand Bidding Program (~~"DBP"~~), Dynamic Pricing Programs (Peak Day Pricing (~~"PDP"~~) & SmartRate™), PeakChoice™, SmartAC™, and the Aggregator Managed Portfolio Program (~~"AMP"~~), each of which qualifies for credit towards PG&E's RA requirement.

Both event based and non-event based programs have established histories of predictable and verifiable performance and are evaluated annually according to the Load Impact Protocols mandated by the Commission in D.08-04-050, Attachment A.

2. PG&E's ~~Proposed~~ Adopted 2012-2014 Demand Response Program

DR opportunities are expanding both in terms of diversity and load impact potential as the deployment of SmartMeters is opening DR to a large number of PG&E customers. PG&E's 2012-2014 DR Application (~~"A."~~) 11-03-001, filed on March 1,



2011, seeks to leverage these opportunities through expansion of highly effective programs to new customers and improvements in DR for existing participants.

PG&E's ~~proposed~~adopted 2012-2014 DR Program also ~~proposes to~~incorporates changes to allow PG&E's DR programs to bid into the CAISO market as a supply resource via the RDRP or the PDR product. In D.10-12-036, the Commission approved PG&E authority to bid PDR into the CAISO's market. The Commission ~~is expected to~~approved AL 3635-E-A and 3689-E-A ~~in on June 7,~~on June 7, 2011 to further implement bidding PDR. Consistent with this authority, PG&E is adding PDR and RDRP as products that it can bid into the CAISO markets.

D. Renewable Portfolio Standard-Eligible Resource Procurement

PG&E strongly supports the development of renewable resources consistent with the EAP Loading Order. ~~Since the beginning of the RPS Program~~As of March 2011 ~~when the BPP was filed,~~ PG&E ~~had~~s signed 109 contracts with RPS-eligible resources totaling over 8,800 MW of capacity, capable of delivering more than 20% of PG&E's future energy needs. PG&E is continuing to procure RPS-eligible resources to achieve the 33% by 2020 goal established by ~~Executive Order S-21-09~~SB 2 in the First Extraordinary Session ("SB 2 1X").

PG&E's renewable procurement strategy is described in detail in its RPS Procurement Plan ("Plan" or "RPS Plan") filed in R.08-08-009. Although PG&E has executed contracts that represent over 20% of its future energy needs, PG&E's ability to meet the RPS targets is dependent upon timely completion of renewable energy projects, which are subject to uncertainties and risks. Chief among the uncertainties facing



renewable projects under development are permitting challenges ~~resulting from proximity to sensitive wildlife habitats,~~ related to time-intensive and potentially high-cost transmission planning and development, and access to financing.

In light of these issues, PG&E plans to continue to hold regular RPS RFOs to account for continued uncertainty in project development and expand its portfolio of RPS-eligible resources to meet the 33% RPS requirement. Section II.A.4.e. contains a detailed description of several RPS procurement methods that PG&E may use to meet its RPS requirements.

E. Distributed Generation

PG&E has supported DG before the California Legislature, the Commission, and through a variety of internal process improvements. PG&E's customers continue to play an important role in developing DG by adding generation to the electrical grid. In addition to RPS programs which can include DG, such as the AB 1969 FIT, PG&E also administers several programs that support DG: the CSI, the Self-Generation Incentive Program ("SGIP"), the Fuel Cell Program, and several Net Energy Metering ("NEM") Programs. The following sections describe PG&E's DG strategies.

1. California Solar Initiative

PG&E is committed to retaining its role as a leader in the solar market. In recent years, PG&E has supported regulation and legislation that created or extended programs providing assistance to customers who choose to install solar generation. PG&E supported the CSI established by the Commission in 2005 and supported SB 1, which



codified CSI and increased the cap on the net metering program from 0.5% to 2.5% of PG&E's peak load.

In terms of solar interconnections, PG&E is the leading solar utility in the United States and is committed to continuing and expanding that leadership role. Thousands of additional photovoltaic solar systems are interconnected to PG&E's system every year by customers seeking to address environmental concerns or to fulfill a desire for energy independence. CSI will provide approximately \$1 billion in rebates for customers in PG&E's service territory over a 10-year period; to date, the program has resulted in installations of 278 MW of solar generation by PG&E's customers. Customers installing these systems have received or will receive \$486 million in incentives.

CSI has four major sub-programs. First, CSI provides incentives for residential and non-residential customers choosing to install solar. Systems over 30 kW earn the rebate as a per-kilowatt-hour ("kWh") incentive based on actual generation from their solar installation. This incentive has contributed to increased performance of solar for our customers. Systems up to 30 kW may receive a one-time rebate based on an estimate of the power the system will produce. This estimate models the effects of orientation, geographic location, shading, etc.

Second, there are two low income CSI programs: the Single-Family Affordable Solar Housing Program ("SASH") and the Multi-Family Affordable Solar Housing Program ("MASH"). PG&E has led a cooperative effort with representatives of the low income housing development community to better understand how to bring solar benefits to low income customers. The SASH program, administered by Grid Alternatives for



PG&E's customers, is closely aligned with the low income EE program. PG&E has integrated the MASH program with the low income EE program as well.

Finally, the fourth solar program is the New Solar Homes Partnership ("NSHP") – which was established by the same legislation as the CSI and low income programs. Responsibility for the NSHP resides with the CEC, which has hired PG&E to administer the program. This allows the NSHP to be closely integrated with the other three CSI programs, including taking advantage of economies of scale, cross-training, and integration with PG&E's Residential New Construction EE program.

2. Self-Generation Incentive Program

The second incentive program available for our customers who choose to install DG to help meet customer need is the SGIP. PG&E has administered the SGIP since 2001. For the first six years of the program, incentives were available for installations up to 1 MW of solar, wind, fuel cell, and efficient combustion engines. In 2007, the solar incentives were subsumed into the CSI. Starting in 2008, the SGIP was only available for wind and fuel cells, with storage technologies added in 2010 when used in conjunction with qualifying wind or fuel cells. Passage of SB 412 in 2009 expanded the program to include efficient CHP and renewable technologies. As of December 2010, 678 customers had taken advantage of the SGIP program to install 163 MW of generation to meet their energy needs, receiving \$346 million in incentives.

For clean and renewable customer generation, the SGIP can improve a customer's project economics by providing a rebate to offset the capital cost. As the Commission implements SB 412, PG&E anticipates that some systems will instead receive some



portion of their compensation through a performance based incentive, similar to that established in the CSI program. Whether or not a customer takes advantage of the SGIP program, any customer installing at-site generation will benefit from both interconnection process improvements and savings on energy bills.

3. Fuel Cell Program

On February 2, 2009, PG&E filed an application with the Commission requesting authority to develop, own and operate three fuel cell electric generating facilities at two California State Universities: San Francisco State University (“SF State”) and California State University East Bay (“CSU East Bay”). PG&E filed supplemental testimony on August 10, 2009, revising the total MW capacity from 2.9 MW to 3.0 MW and increasing the capital cost request from \$21.3 million to \$21.5 million, along with recovery of actual Operations and Maintenance (“O&M”) costs. While the electric generation will be exported to PG&E’s distribution grid, the universities will benefit by utilizing the fuel cell waste heat to serve thermal load at both campuses and by utilizing discharged water for landscape irrigation. In addition, both universities plan to incorporate the fuel cell facilities into their science, technology, engineering and math curriculum. An educational kiosk will be installed at each campus as well.

On April 8, 2010, the Commission authorized capital costs of \$20.3 million for PG&E’s fuel cell demonstration project in D.10-04-028. PG&E subsequently executed lease agreements with both universities as well as engineering, procurement and construction agreements with two vendors: FuelCell Energy (“FCE”) and Bloom Energy (“Bloom”). FCE, based in Connecticut, will install two 1.4 MW molten carbonate fuel



cell facilities – one at SF State and one at CSU East Bay. Bloom, based in Sunnyvale, California, ~~will install~~ two 100 kW solid oxide fuel cell units at SF State. ~~PG&E has broken ground at both campuses and is currently scheduled to have both~~ The facilities became operational ~~by April in~~ 2011.

4. Net Metering Programs

PG&E administers four net metering programs. The first, NEM, allows customers with solar installations up to one MW and wind installations up to 50 kW to export power when their generator produces more than they need at any given time. These exports can be used to offset customer usage when solar and wind power can't meet on-site needs. On a monthly basis, any excess kWh exports are converted to a monetary credit using the customer's retail rate. These credits are available to offset charges over an annual "true-up" period. Historically, the Legislature required that at the end of the true-up period, any excess credits be forfeited. However, in 2009, the Legislature passed AB 920, which provides for payment for net excess generation over the course of the true-up period. On June 9, 2011, the Commission approved the net surplus compensation ("NSC") rate for NEM customers who produce more electricity (kWh) than they use over their true-up period, usually 12 billing months.²² The NSC rate is based on a rolling 12 month average of spot market prices. Based on current market prices, the rate would be approximately 4 cents per kWh. This compensation is for the energy only. The Commission has placed a hold on any payments for RECs until the CEC can set up a process to verify and track these attributes. Once this process is in place, PG&E should

²² D.11-06-016.



be allowed to make an additional payment for the REC value of the excess kWh. A
proposed decision implementing AB 920 is pending before the Commission.

The second and third net metering programs, Wind Energy Co-Metering (“NEMW”) and Net Energy Metering for Fuel Cell Customers-Generators (“NEMFC”), provide customers a credit for generation exports that is valued at the generation component of the customers’ energy rate and can be used to offset generation charges incurred at any point in an annual true-up period.

Finally, PG&E administers Renewable Energy Self-Generation – Bill Credit Transfer (“RES-BCT”), a net metering program that allows local governments, including school districts and the University of California/California State Universities to site renewable generation at one location and export excess electricity to PG&E’s grid. PG&E calculates a credit for those exports, based on the generation component of the energy rate of the customer’s tariff at the point where the generator is located. This credit can be used to offset generation charges at any other account for that local government customer.

F. Other Generation Supply Resources

1. California Department of Water Resources Contracts

CDWR entered into contracts during the 2000-2001 energy crisis that were subsequently allocated to the three IOUs. In D.02-09-053, the Commission allocated to PG&E the power from all CDWR contracts with a specified delivery point at North of Path-15 (“NP15”), plus the Coral contract. Since the allocation, PG&E has novated the Calpine 3, Calpine 4 and GWF contracts, and some contracts have expired. Contracts



currently delivering to PG&E provide 550 MW of must-take generation and 618 MW of dispatchable generation for a total of 1,168 MW. Most CDWR contracts will expire by 2012, except for the Kings River contract which expires in 2015. PG&E expects that the underlying resources will still be in operation and will be eligible to bid into PG&E's competitive solicitations.

2. Reliability Must-Run and Other CAISO Backstop Capacity Contracts

RMR contracts are yearly contracts procured and administered by the CAISO to meet local reliability needs. PG&E participates in the CAISO's determination of local reliability need and in the CAISO's pricing of RMR contracts, but does not directly contract for the RMR deliveries. California has transitioned from RMR to Local Capacity Requirements ("LCR"). Unlike RMR, which is procured by the CAISO, LCR capacity is procured by the LSE, and any residual local reliability need may be purchased by the CAISO through RMR and other CAISO backstop capacity procurement mechanisms. The amount of LCR and the need for RMR or other backstop capacity procurement is determined annually by the CAISO through technical studies of the electric transmission system.

LSEs contract for capacity in local areas (LCR capacity) which creates an obligation from the unit to the CAISO. The general requirements for the CAISO are that the unit will either run or bid its capacity into the CAISO market. PG&E procures LCR capacity as part of its other short-, medium- and long-term solicitations, bilateral negotiations and market purchases. If necessary, PG&E may conduct special solicitations and negotiations for LCR capacity to fully meet local reliability needs. Any needs not



met by LSEs in aggregate will likely be filled by the CAISO through RMR contracting and/or other backstop capacity procurement. RMR capacity is generally allocated to LSEs to count toward their RA requirement (both local and systemwide). Other CAISO backstop capacity procurement made on an annual basis is also allocated to LSEs for RA counting. However, most backstop capacity procurement is made on a month-to-month basis and LSEs do not receive credit for this capacity purchased by the CAISO toward their RA obligations.

3. Market Purchases

PG&E enters into market purchases through several different mechanisms:

- Transparent exchanges, such as the ICE and NYMEX
- Futures Commission Merchants
- Voice brokers
- Day-Ahead, Real-Time and spot markets
- Electronic Solicitations

Each of these markets has methods to communicate bids and offers and to complete trades. PG&E makes use of these market purchases to trade hour-ahead, day-ahead, month-ahead and term (one month to five years) electricity, and to enter into options and hedges. Market purchases are commonly used to procure power from existing resources.

4. Qualifying Facilities and Combined Heat and Power

On December 16, 2010, the Commission approved the QF/CHP Settlement in D.10-12-035. Consistent with the terms of the QF/CHP Settlement, PG&E, Southern



California Edison Company (~~“SCE”~~) and San Diego Gas & Electric Company (~~“SDG&E”~~) have filed an application at FERC to terminate their respective obligations under the Public Utility Regulatory Policy Act (“PURPA”) for QF projects that are larger than 20 MW.

The QF/CHP Settlement ~~will not become~~ became effective ~~until~~ on November 23, 2011 ~~several conditions precedent are satisfied, including a final and non-appealable Commission decision approving the settlement and a final and non-appealable FERC order approving the PURPA termination application.~~ ~~After~~ Since the QF/CHP Settlement ~~becomes~~ became effective, PG&E ~~will~~ issued new standard offer contracts and conducted its first RFOs for additional CHP generation, in addition to amending certain existing QF PPAs. New contracts included as a part of the QF/CHP Settlement include the Transition PPA (for QFs that will expire prior to July 1, 2015), an As-Available PPA, and a QF PPA for facilities under 20 MW. The QF/CHP Settlement also included a Form PPA to be used in CHP RFOs.

In addition to procurement under the QF/CHP Settlement, PG&E is also required to offer three standard offer contracts as a result of Commission decisions issued in R.08-06-024, which implements AB 1613. These contracts are for new, eligible CHP units under 20 MW and are separate agreements from those established as a part of the QF/CHP Settlement. Two of these contracts—one for units with a capacity under 20 MW and one for units which export no more than 5 MW—have been approved and a simplified contract for units with a capacity under 500 kW ~~is being developed~~ has been submitted to the Commission for approval.



5. Non-Renewable Generation and Resource Adequacy Capacity

PG&E conducts RFOs to procure energy, capacity, A/S and RA capacity from conventional resources in the long-, medium- and short-term period. These RFOs can be for either new or existing generation resources. While these resources are predominately procured through RFOs, PG&E may also procure these resources using bilateral negotiations and other approved procurement mechanisms. Since 2006, PG&E has conducted one LTRFO and has executed long-term contracts for over 2,000 MW of new conventional resource capacity. PG&E has also conducted two intermediate-term RFOs and many short-term RFOs and executed many contracts for conventional resources in these time frames.

6. Utility-Owned Generation

As of this filing, PG&E owned and operated the following generation facilities:

TABLE IV-2
PACIFIC GAS AND ELECTRIC COMPANY
PG&E'S UTILITY-OWNED GENERATION

Generation Type	Number of Units	Net Operating Capacity (MW)
<u>Nuclear</u>		
Diablo Canyon	2	2,240
<u>Hydroelectric</u>		
Conventional	107	2,684
Helms Pumped Storage	3	1,212
Hydroelectric Subtotal	110	3,896
<u>Fossil Fuel</u>		
Gateway Generating Station	1	530
Humboldt Bay Generating Station	1	163
Colusa Generating Station	1	657
Fossil Fuel Subtotal	3	1,350
Total	115	7,486



In addition, PG&E has entered into a Purchase and Sale Agreement (~~“PSA”~~) for the Oakley Project. ~~The Oakley Project was approved by the Commission in D.10-12-050.~~

7. Irrigation District and Water Agency

PG&E currently purchases approximately 700 MW of hydroelectric generation through long-term Power Sales Agreements with various IDs and Water Agencies. Originating in the 1960s, the majority of these contracts will expire in 2016. However, PG&E expects that the underlying resources will still be in operation and will be eligible to bid into PG&E’s competitive solicitations.

8. Imported Generation

The PG&E electric system is within the CAISO control area and it is electrically integrated with the western states included in the WECC electric grid. Electric power can be imported into the CAISO control area along transmission lines as far north as Canada and as far south as the Mexico/Desert Southwest regions. In PG&E’s electric portfolio, imported generation consists of market purchases, existing contracts and future contracts as described below. Historically, PG&E has obtained most of its imported power from the Pacific Northwest.

Market purchases occur when the net open position is short and when it is economic (including transmission costs and constraints), compared to other alternatives, to purchase power outside the CAISO control area and import the power to meet demand. When the net open position is long, PG&E may sell and export the power when economic.



Currently, in PG&E's electric portfolio there are two conventional contracts for generation located in the Northwest and a number of contracts for renewable generation located both in the Northwest and Southwest. The Puget Sound Energy ("PSE") Exchange contract and CDWR Iberdrola contract import from the Northwest. PSE is an exchange of 413 GWh on a calendar year energy basis between PSE and PG&E. PG&E can take up to 300 MW hourly between June-September and in return PSE can take up 300 MW on an hourly basis between January-February and November-December. This contract is an ever-green contract with a 5-year termination notice. The CDWR Iberdrola contract has a dispatchable contract capacity of 300 MW. This contract expires ~~ds~~ in June 2011.

PG&E manages the risk of transmission congestion on the various import paths by procuring CRRs according to its CRR procurement strategy discussed in Appendix F. PG&E also considers the need, availability and economics of procuring firm transmission to support the deliver of import power to its interconnection point with the CAISO.

PG&E's imported generation will change ~~as~~ with the CDWR Iberdrola contract expires ~~ds~~ in 2011 and ~~as~~ more renewable contracts outside of the CAISO area are added to PG&E's electric portfolio. In its future contracting for imported power, PG&E will consider the "preferred loading order" and the GHG effects in evaluating the use of imported resources.

G. Fuel, Congestion Revenue Rights and Hedging Procurement Strategies

In addition to PG&E's Resource Procurement Strategy described above, PG&E's BPP also includes the following procurement strategies:



- Electric Portfolio Hedging Plan (Appendix B)
- Nuclear Fuel Procurement Plan (Appendix C)
- Electric Portfolio Gas Supply Plan (Appendix D)
- Congestion Revenue Rights (Appendix F)
- Convergence Bidding (Appendix G)

The duration, timing, quantity, and implementation of each of these elements of PG&E's BPP are described in detail in the respective appendices identified above.

V. Evaluation of Commission-mandated Case

As required by the Track II Scoping Memo, PG&E prepared and evaluated the Commission-mandated case based on the Standardized Assumptions and further modifications from D.12-01-033. PG&E neither explicitly nor implicitly adopts these assumptions as its own and is submitting the Commission-mandated case, and its evaluation of this case, as required by the Track II Scoping Memo and further modifications from D.12-01-033. This section summarizes PG&E's evaluation of the Commission-mandated case in terms of cost, risk, and GHG emissions and is included primarily for illustrative purposes.

A. Cost Evaluation

The revenue requirement and rate projections are presented in Table V-1 below, which also presents the Present Value of Revenue Requirement ("PVRR"). The revenue requirements are discounted at the Weighted Average Cost of Capital ("WACC") rate for this calculation. The average rate is calculated as prescribed by the Standardized Assumptions, and is the division of PVRR with the discounted bundled sales also using



the WACC rate. This calculation represents the levelized rate that is referred to as the average rate by the Commission.

TABLE V-1
PACIFIC GAS AND ELECTRIC COMPANY
BUNDLED REVENUE REQUIREMENTS AND RATES

	Forecast Period	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bundled Revenue Require- ment (\$ Million)	\$108,597(a)	\$11,579	\$12,733	\$13,481	\$14,329	\$15,109	\$15,868	\$16,554	\$16,877	\$17,365	\$18,032
Bundled Rate (¢/kWh)	18.2(b)	15.1	15.6	16.5	17.5	18.4	19.3	20.2	20.6	21.1	21.9
(a) — Net Present Value (“NPV”) Revenue Requirement (\$ Million) 2011. (b) — Levelized Rate (¢/kWh).											
	Forecast Period	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bundled Revenue Require- ment (\$ Million)	\$103,373(a)	\$11,579	\$12,191	\$12,867	\$13,567	\$14,275	\$14,998	\$15,640	\$15,919	\$16,365	\$16,805
Bundled Rate (¢/kWh)	18.2(b)	15.1	15.7	16.5	17.6	18.5	19.4	20.3	20.7	21.2	21.7
(a) — Net Present Value (“NPV”) Revenue Requirement (\$ Million) 2011. (b) — Levelized Rate (¢/kWh).											

B. Risk Evaluation

As prescribed by the Standardized Assumptions, PG&E is providing risk metrics that include TeVaR calculations in Appendix E together with sensitivity analysis results in its accompanying testimony as shown below.

The sensitivity analyses presented in Tables V-2 and V-3 are as prescribed by the Standardized Assumptions. Table V-2 presents the impact of drivers on revenue requirements and Table V-3 shows the impacts of the same on bundled rates.



TABLE V-2
PACIFIC GAS AND ELECTRIC COMPANY
REVENUE REQUIREMENTS: SENSITIVITY

		Bundled Revenue Requirement (\$ Million)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	\$108,597	\$11,579	\$12,733	\$13,481	\$14,329	\$15,109	\$15,868	\$16,554	\$16,877	\$17,365	\$18,032
High Load	\$112,545	\$11,579	\$13,204	\$13,995	\$14,902	\$15,722	\$16,519	\$17,241	\$17,593	\$18,120	\$18,819
Low Load	\$104,691	\$11,579	\$12,298	\$12,998	\$13,749	\$14,491	\$15,215	\$15,868	\$16,158	\$16,605	\$17,242
High CO ₂ Prices	\$108,491	\$11,579	\$12,735	\$13,480	\$14,315	\$15,089	\$15,838	\$16,529	\$16,856	\$17,344	\$17,994
Low CO ₂ Prices	\$108,631	\$11,579	\$12,732	\$13,470	\$14,327	\$15,119	\$15,870	\$16,565	\$16,888	\$17,368	\$18,074
High Gas Prices	\$117,009	\$11,579	\$13,633	\$14,752	\$15,895	\$16,681	\$17,316	\$17,957	\$18,228	\$18,717	\$19,150
Low Gas Prices	\$98,742	\$11,579	\$11,695	\$12,120	\$12,825	\$13,585	\$14,280	\$14,890	\$15,025	\$15,348	\$16,165

(a) — NPV Revenue Requirement (\$ Million 2011).

		Bundled Revenue Requirement (\$ Million)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	\$103,373	\$11,579	\$12,191	\$12,867	\$13,567	\$14,275	\$14,998	\$15,640	\$15,919	\$16,365	\$16,805
High Load	\$107,132	\$11,579	\$12,652	\$13,355	\$14,117	\$14,853	\$15,587	\$16,249	\$16,559	\$17,033	\$17,738
Low Load	\$99,541	\$11,579	\$11,745	\$12,390	\$12,998	\$13,669	\$14,359	\$14,977	\$15,232	\$15,646	\$16,003
High CO ₂ Prices	\$103,221	\$11,579	\$12,181	\$12,847	\$13,536	\$14,249	\$14,972	\$15,619	\$15,898	\$16,348	\$16,752
Low CO ₂ Prices	\$103,550	\$11,579	\$12,190	\$12,876	\$13,578	\$14,303	\$15,035	\$15,682	\$15,964	\$16,412	\$16,874
High Gas Prices	\$110,481	\$11,579	\$12,938	\$13,955	\$14,923	\$15,643	\$16,229	\$16,775	\$17,033	\$17,437	\$17,802
Low Gas Prices	\$94,950	\$11,579	\$11,294	\$11,675	\$12,263	\$12,975	\$13,679	\$14,257	\$14,373	\$14,678	\$15,120

(a) — NPV Revenue Requirement (\$ Million 2011).



TABLE V-3
PACIFIC GAS AND ELECTRIC COMPANY
BUNDLED RATES: SENSITIVITY

		Bundled Rate (¢/kWh)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	18.2	15.1	15.6	16.5	17.5	18.4	19.3	20.2	20.6	21.1	21.9
High Load	17.3	15.1	14.7	15.5	16.5	17.4	18.3	19.1	19.5	20.0	20.8
Low Load	19.2	15.1	16.7	17.6	18.6	19.6	20.6	21.5	21.9	22.5	23.2
High CO ₂ Prices	18.1	15.1	15.6	16.4	17.4	18.4	19.3	20.1	20.5	21.1	21.8
Low CO ₂ Prices	18.2	15.1	15.6	16.4	17.5	18.4	19.3	20.2	20.6	21.1	21.9
High Gas Prices	19.6	15.1	16.7	18.0	19.4	20.3	21.1	21.9	22.2	22.8	23.2
Low Gas Prices	16.5	15.1	14.3	14.8	15.6	16.5	17.4	18.1	18.3	18.7	19.6
(a) — Levelized Rate (¢/kWh).											
		Bundled Rate (¢/kWh)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	18.2	15.1	15.7	16.5	17.6	18.5	19.4	20.3	20.7	21.2	21.7
High Load	17.4	15.1	14.8	15.6	16.7	17.5	18.4	19.1	19.5	20.1	20.8
Low Load	19.2	15.1	16.8	17.7	18.7	19.7	20.7	21.6	22.0	22.5	23.0
High CO ₂ Prices	18.2	15.1	15.7	16.5	17.6	18.5	19.4	20.2	20.6	21.2	21.6
Low CO ₂ Prices	18.2	15.1	15.7	16.6	17.6	18.5	19.5	20.3	20.7	21.3	21.8
High Gas Prices	19.4	15.1	16.6	17.9	19.4	20.3	21.0	21.7	22.1	22.6	23.0
Low Gas Prices	16.7	15.1	14.5	15.0	15.9	16.8	17.7	18.5	18.6	19.0	19.5
(a) — Levelized Rate (¢/kWh).											

C. Greenhouse Gas Emissions Evaluation

Table V-4 presents emission forecasts for the Commission-mandated case. PG&E reports both physical emissions (metric tons per year) and financial exposure (also expressed in metric tons per year).



**TABLE V-4
PACIFIC GAS AND ELECTRIC COMPANY
GHG EMISSIONS**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Financial (MMT CO ₂ e)	46.9	49.0	49.1	47.6	47.4	47.1	47.2	47.1	47.5	45.7
Physical (MMT CO ₂ e)	45.1	47.3	46.4	46.5	46.3	45.4	45.2	45.8	46.2	44.8
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Financial (MMT CO ₂ e)	14.1	15.7	15.8	13.9	15	14.7	14.9	14.8	15.2	14.8
Physical (MMT CO ₂ e)	15.2	16.4	16.5	14.6	13.7	13.8	14.0	14.7	15.2	15.0

VI. Commission Review of Implementation of Procurement Plan

A. Compliance With AB 57

AB 57 includes detailed requirements for an IOU's procurement plan. PG&E's BPP fully complies with these requirements, as the table below demonstrates:

**TABLE VI-1
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH AB 57**

PUC Section 454.5(b) Requirements	Citation To PG&E's BPP
1. An assessment of price risk associated with PG&E's portfolio.	Sections II.B, ~~and~~ V.B, and <u>Appendix E</u>
2. Definition of electricity products, electricity-related products and procurement-related financial products, including justification and the amount to be procured.	Section II.A.2 –A.5
3. The plan duration.	Section I
4. The duration, timing and range of quantities of each product to be procured.	Sections II.A.5 and IV, and Appendix A
5. A description of PG&E's competitive procurement process.	Sections II.A.4–II.A.6 <u>5</u> , and IV, and Appendix I
6. Any proposed incentive mechanism.	Not applicable
7. The upfront standards and criteria for the acceptability and eligibility for rate recovery, and any expedited approval process.	Sections II.A, II.B, IV, VI, and Appendices B, C, D, F, G, ~~and~~ H <u>and L</u>



8. Procedures for updating the plan.	Sections I and VI.E
9. A showing that the plan achieves: (a) the 20% RPS standard and 1% incremental RPS procurement standard; (b) a diversified portfolio; and (c) meeting resource needs through energy efficiency and demand reduction when it is cost effective, reliable and feasible.	Sections III, IV, V and Appendix A
10. PG&E's risk management policies.	Section II.B and Appendices B, E, F and G

TABLE VI-1
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH AB 57
(CONTINUED)

11. A diversity of ownership and fuel supply.	Section III and Appendices A, C and D
12. A mechanism for recovery of reasonable administrative costs related to procurement in the generation component of rates.	Section VI

B. Compliance With the Commission's Procurement Standards of Conduct

In D.02-10-062, the Commission adopted seven Standards of Conduct for utility procurement.²³ These standards have subsequently been modified, and two of them have been eliminated.²⁴ PG&E's BPP is in full compliance with Commission's Standards of Conduct. The following table includes each standards of conduct, a summary of PG&E's compliance with the standard and the portion of the BPP that addresses PG&E's compliance.

²³ D.02-10-062 at pp. 51-52.

²⁴ See D.02-12-074, OP 24 (modifying standards); D.03-06-067, OP 3 (modifying standards and eliminating Standard Nos. 6-7); and D.03-06-076, OP 6 (clarifying that "Standard of Conduct 1 does not preclude anonymous transactions conducted through the ISO or through brokers and exchanges."). PG&E also received a waiver from Standard of Conduct 1 for certain gas transportation transactions in D.04-06-003.



TABLE VI-2
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH THE COMMISSION'S PROCUREMENT STANDARDS OF CONDUCT

Standard of Conduct	Summary of Compliance And Citation To PG&E's BPP
1. Each utility must conduct all procurement through a competitive process with only arms-length transactions. Transactions involving any self-dealing to the benefit of the utility or an affiliate, directly or indirectly, including transactions involving an unaffiliated third party, are prohibited.	PG&E's procurement practices and competitive, arms-length solicitations are described in Sections II.A.4 ~~A.5, IV~~ , and Appendix I. To the extent PG&E conducts any affiliate transactions, these transactions will be conducted in full compliance with the Commission's affiliate and procurement rules.
2. Each utility must adopt, actively monitor, and enforce compliance with a comprehensive code of conduct for all employees engaged in the procurement process that: (1) identifies trade secrets and other confidential information; (2) specifies procedures for ensuring that such information retains its trade secret and/or confidential status [e.g., limiting access to such information to individuals with a need to know, limiting locations at which such information may be accessed, etc.]; (3) discusses employee actions that may inadvertently waive or jeopardize trade secret and other privileges; (4) discusses employee or former employee activities that may involve misappropriation of trade secrets or other confidential information, unlawful solicitation of former clients or customers of the utility, or otherwise constitute unlawful conduct; and (5) requires or encourages negotiation of covenants not to compete to the extent such covenants are lawful under the circumstances [e.g., where a business acquires business interests of individuals who subsequently work for the acquiring business, the individuals disposing of their business interests may enter covenants not to compete with their new employer]. All employees with knowledge of its procurement strategies should be required to sign and abide by an agreement to comply with the comprehensive code of conduct and to refrain from disclosing, misappropriating, or utilizing the utility's trade secrets and other confidential information during or subsequent to their employment by the utility.	PG&E's compliance practices are described in Section II.A.1.f.



TABLE VI-2
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH THE COMMISSION'S PROCUREMENT STANDARDS OF CONDUCT
(CONTINUED)

Standard of Conduct	Summary of Compliance And Citation To PG&E's BPP
3. In filing transactions for approval, the utilities shall make no misrepresentation or omission of material facts of which they are, or should be aware.	PG&E has filed procurement information in a number of different reports, which are described in more detail in Section VI.C, below. PG&E has not misrepresented any information, or made any omission of material fact in any of these reports.
4. The utilities shall prudently administer all contracts and generation resources and dispatch the energy in a least-cost manner. Our definitions of prudent contract administration and LCD is the same as our existing standard. Prudent contract administration includes administration of all contracts within the terms and conditions of those contracts, to include dispatching dispatchable contracts when it is most economical to do so. In administering contracts, the utilities have the responsibility to dispose of economic long power and to purchase economic short power in a manner that minimizes ratepayer costs. LCD refers to a situation in which the most cost-effective mix of total resources is used, thereby minimizing the cost of delivering electric services. The utility bears the burden of proving compliance with the standard set forth in its plan.	PG&E's department responsible for contract administration is described in Section II.A.1.d. Filings that address in more detail contract administration are described in Section VI.C. PG&E's dispatch of procurement contracts is described in Section II.A.2.c.
5. The utilities shall not engage in fraud, abuse, negligence, or gross incompetence in negotiating procurement transactions or administering contracts and generation resources.	PG&E procurement practices have been fair, open and transparent. PG&E has used an independent evaluator for long-term transactions and discussed short-, medium- and long-term transactions with the PRG. PG&E's procurement practices are described in detail in Sections II.A and Appendix I. The PRG and use of IEs are described in Sections II.A.79 – A.810. PG&E has also appropriately administered its procurement contracts. PG&E's ongoing administration is reviewed through the ERRA process and quarterly audits described in Section VI.C.



C. Description of PG&E Filings Made to Demonstrate Compliance

PG&E submits monthly, quarterly, and annual filings to demonstrate compliance with its approved procurement plan and Commission policy. These filings are described below.

1. Monthly Reports

a. Portfolio Risk Reduction Report

PG&E reports TeVaR on a monthly basis to both the ED and Division of Ratepayer of Advocates (“DRA”). TeVaR is reported on both a 95% and 99% Confidence Interval for the following periods:

- Monthly for the rolling 12 month period (e.g., October 2006 to October 2007);
- Quarterly for the balance of the current calendar year (e.g., 2006);
- Quarterly for the next three calendar years (e.g., 2007, 2008 and 2009); and
- Yearly for the last calendar year of reporting (e.g., 2010).

2. Monthly ERRA Report

In D.02-12-074, the Commission directed the IOUs to file with the “Energy Division each month a report showing the activity in the ERRA balancing account with copies of original source document supporting each entry over \$100.00 recorded in the account” no later than the 20th following the end of the month and be served on interested parties in the proceeding.²⁵ The stated intention of this report was to give the Commission an opportunity to anticipate when an IOU might file an expedited trigger application and to reduce the time to review such an application. D.07-04-020 directed

²⁵ D.02-12-074 at p. 43.



the IOUs to continue to file a monthly ERRA report, but reduced the amount of supporting documentation.

3. Standing Data Requests From Energy Division

PG&E responds on a monthly basis to the ED data request for electric generation procurement information. The requested procurement information relates to weekly and monthly weighted average cost of electric procurement, monthly energy and maximum capacity load forecasts for a rolling 12-month period, monthly residual net short forecast for a rolling 12-month period, and monthly electricity and gas price forecasts used to derive the residual net short forecast.

4. Quarterly Filings

D.02-10-062 ordered each IOU to file the Quarterly Procurement Compliance Reports (“QCR”). The purpose of this report is to describe all electric generation procurement transactions executed in a given quarter that are not more than five years in duration, not filed through a separate advice filing or application, and within the procurement authority authorized by the Commission in D.02-10-062, D.03-12-062, D.04-01-050, D.04-07-028, D.04-12-048, ~~and~~ D.07-12-052 and D.12-01-033. The QCRs are filed within 30 days of the end of the quarter, as specified in D.03-12-062.

As stated in D.07-12-052, QCRs are to be reviewed by the Commission within sixty (60) days. If the Commission receives no protests and the ED staff concludes that the transactions included in this report are in compliance with the IOU’s approved procurement plan, the ED Director can approve the reports. If a protest is filed, a resolution may be drafted for Commission’s final approval. The QCRs include: executed



electric and fuels transactions less than five years in delivery length, strategies implemented in a given quarter, retained investments completed in the quarter, models, transactions and documentation which qualifies under the definition of reasonable showing, briefing to the senior management, related PRG materials, and counterparty information. The purpose is for each IOU to demonstrate compliance with its Commission-approved procurement plan.

Though the CPUC Water Utilities and Water Audit Division reviews the report, the IOUs and the ED may agree upon defining the content of the report and the type of additional information required either in the QCR or through the CPUC Water Utilities and Audit Division for its review. The IOUs have the opportunity to respond to any finding before the report to the ED on the QCR is made final and before the final approval of the filing is made. Consistent with D.12-04-046, ED Staff's audits of QCRs shall be made public. A link to any PG&E's response or rebuttal on PG&E's website shall be posted on the Commission website with the audit report.

5. Semi/Annual Filings

a. ERRA Forecast and Compliance Review Filings

PG&E files two annual filings related to ERRA: an ERRA forecast revenue requirement application and an ERRA compliance review application. In D.02-10-062, the Commission established the ERRA balancing account for all three IOUs and established a semiannual update process whereby the IOUs would once a year: (1) "file applications proposing to establish annual fuel and purchased power forecasts and true up 2002 fuel and purchased costs" (i.e., ERRA Forecast Revenue Requirement proceeding);



and (2) undergo a “review of balancing accounts, contract administration, utility retained generation expenses and least-cost dispatch” (i.e., ERRA Compliance Review proceeding).²⁶ In D.02-12-074, the Commission directed PG&E to file its forecast application on February 1 and the balancing account review application on August 1, 2003.²⁷ In D.04-01-050, the Commission adopted revised schedules for the 2004 and 2005 semi-annual ERRA filings with PG&E’s ERRA compliance review application to be filed on February 15 and the ERRA forecast application to be filed on June 1.

b. ERRA Trigger

In AB 57, the California state legislature established a trigger mechanism that would ensure that any overcollection or undercollection in the appropriate electric procurement balancing account does not exceed 5% of a utility’s recorded generation revenues, excluding CDWR revenues, for the prior year.²⁸ This trigger mechanism provides the necessary assurance to PG&E that its electric procurement costs will be recovered in a timely fashion.

In D.02-10-062, the Commission adopted the AB 57 balancing account trigger mechanism for the IOUs. In that decision, the Commission directed the utilities to file an expedited “trigger” application for approval within 60 days of filing when the ERRA balance reaches or exceeds 4% of the prior year recorded generation revenues excluding CDWR revenues. This application is to include a projected account balance in 60 days or more to illustrate when the balance will reach the 5% threshold. The application is also to

²⁶ D.02-10-062 at p. 62.

²⁷ D.02-12-074 at p. 42.

²⁸ Pub. Util. Code § 454.5(d)(3).



~~propose~~adopt an amortization period of not less than 90 days to ensure timely recovery of the projected ERRA balance.²⁹ In D.04-01-050, the Commission adopted April 1 as the date when all three California utilities are to file their annual ERRA trigger advice letter, which sets the trigger amount for the following 12 months.

c. Biennial Filings

D.05-01-040 adopted the long-term procurement regulatory framework and established that the IOUs shall file long-term plans on a biennial cycle that follows the CEC's adoption of a final IEPR. D.04-12-048, which approved PG&E's 2004 ~~Long-Term Procurement Plan~~ ("LTTP"), established that starting with the 2006 LTTP proceeding, the Short-Term Plans will be eliminated and the IOUs will act in accordance with a single Commission-approved plan. The decision also determined that any updates or modifications to the plans in between the biennial review will be filed with an advice letter.

d. Additional Monthly, Quarterly, Annual Filings and Data Requests

The Commission requires RA reporting on a monthly and yearly basis. RA compliance submissions are made directly to the Commission through the advice filing process. In addition, forecasting related data is submitted to the CEC on a monthly as well as a yearly basis. The CEC submissions are not made through advice filings.

PG&E also files the following reports on a monthly, quarterly, and annual basis:

- RPS Compliance Report – This report identifies all of PG&E's transactions related to RPS compliance. This includes transactions approved and pending.

²⁹ D.02-10-062 at pp. 63-65, Conclusions of Law 15, and OP 14.



The RPS Compliance Report is submitted twice a year on March 1 and August 1.

- Convergence Bidding Monthly Compliance Report – This report describes convergence bidding activities for the preceding month. The required elements for this report are identified in D.10-12-034. After the first year of convergence bidding, the IOUs are only required to submit quarterly reports.
- Resource Adequacy Annual Report – This report identifies the RA requirements for PG&E that demonstrates compliance with the Year-Ahead System RA and Local RA obligations. This report is submitted annually in the fall and follows the guidance from the Commission Staff’s annual filing guide.
- Resource Adequacy Monthly Compliance Report – This report provides a monthly forecast and demonstrates that PG&E has acquired sufficient resources to satisfy its commitment obligation for loads plus the reserve requirements. This report is submitted at the end of each month pursuant to D.05-10-042, D.06-06-064, D.08-06-031, D.09-06-028, ~~and~~ D.10-06-036 and D.11-06-022.
- Resource Adequacy Month-Ahead Load Migration Report – This report provides load forecast adjustments to reflect anticipated load migrations. This report is submitted at the end of each month pursuant to D.05-10-042.
- Qualifying Facilities – Semi Annual Report – This report provides a list of all cogenerators, currently operational and delivering energy, as well as information related to the primary energy source, location of the generator, nameplate capacity identified in the contract, and operational start date. This report is in compliance with D.97-05-021 (as modified by Resolution E-1738), D.82-01-103, D.82-12-120, D.90-03-060, D.91-10-039, D.93-04-001, and D.96-12-028. This report is submitted annually and in subsequent quarters only if there is new information to report.
- Semi-Annual CHP Program Report – This report provides progress toward both MW targets and GHG emission reduction targets pursuant to the QF/CHP Settlement adopted in D.10-12-035. This semi-annual report is submitted twice a year in March and September.



D. Description of Costs Recovered Through ERRA

PG&E's ERRA is to record and recover power costs, excluding CDWR contract costs, associated with PG&E's authorized procurement plan, pursuant to D.02-10-062, D.02-12-074 and California Public Utilities Code § 454.5(d)(3), and any succeeding decision, which approves PG&E's procurement activities. Power costs recorded in ERRA include, but are not limited to, utility retained generation fuels, QF contracts, inter-utility contracts, CAISO charges, irrigation district contracts and other PPAs, revenues or costs related to CRRs, convergence bidding, IE costs related to authorized procurement transactions, the technical assistance costs incurred by the Commission and paid by PG&E in connection with the Commission's implementation and administration of the LTPP process, fees associated with participating in the Western Renewable Energy Generation Information System (~~“WREGIS”~~), all expenditures related to PG&E's wave energy project (“WaveConnect”), bilateral contracts, forward hedges, bilateral demand response agreements, pre-payments and collateral requirements associated with procurement (including disposition of surplus power), costs associated with GHG products, and A/S. These costs are offset by RMR revenues, PG&E's allocation of surplus sales revenues and the ERRA revenue. Revenues received from Electric Schedule Transitioning Bundled Commodity Cost will also be recorded to the ERRA. All specific and associated costs, expenses, and revenues will be identified in Electric Preliminary Statement CP – Energy Resource Recovery Account.

E. Pre-Approval, Approval and Filing Requirements

As explained in Section II.A.2.b, PG&E may execute contracts that are consistent with the BPP with a contract duration of less than five years without Commission



pre-approval. The contract duration or term begins: (1) at the time the contracted resource begins delivery if delivery begins within ~~two years~~one year of contract execution; or (2) at the time of contract execution if delivery does not begin within ~~two years~~one year of contract execution. The length of the contract duration includes any extension options provided for in the contract.

For contracts with a duration of five years or greater, PG&E will file an application for pre-approval of the contract. The only exceptions to this requirement are for: (1) RPS contracts which are filed by advice letter pursuant to D.04-07-029; (2) LT-CRRs as described in Appendix F; (3) nuclear fuel contracts pursuant to the Nuclear Fuel Procurement Plan (Appendix C); and (4) gas supply, storage and transportation contracts pursuant to the Electric Portfolio Natural Gas Supply Plan (Appendix D). In addition, the Commission may issue decisions providing that specific types of contracts or transactions that are five years or greater in duration do not require an application for pre-approval.

With regard to filing, the Commission has adopted the following requirements:

Type of Transaction	Filing Requirements
Non-RPS Transactions with a contract duration less than five years	Annual ERRA Compliance Report
Non-RPS Transactions with a contract duration five years or greater	Application
RPS-eligible Energy Transactions (including amendments to approved RPS-eligible PPAs)	Advice Letter
Gas Supply, Pipeline Capacity, ~~and~~ Storage ~~and~~ ~~Biomethane~~ Transactions pursuant to the GSP	Less than five years in contract duration – ~~Annual ERRA Compliance Report~~ <u>Quarterly Compliance Report</u> Five years ~~or~~ longer in contract duration – Advice



	Letter
Amendments to existing QF contracts	Less than five years in contract duration – Annual ERRA Compliance Report or Advice Letter Five years or longer in contract duration – Application
Nuclear Fuel Contracts pursuant to the Nuclear Fuel Procurement Plan	Annual ERRA Compliance Report
LT-CRRs and CRR	Annual ERRA Compliance Report
<u>Non-RPS-eligible UOG</u>	<u>Tier 3 Advice Letter filing demonstrating RFO failure. After the Commission issues a resolution determining that an RFO has failed, PG&E may file an application for a proposed new Non-RPS eligible UOG resource.</u>
<u>RPS-eligible UOG</u>	<u>Application</u>
<u>Contracts with OTC resources</u>	<u>Contracts that are two years or less in duration and terminated more than a year before the SWRCB compliance deadline in the Quarterly Compliance Report.</u> <u>Contracts that are more than two years but less than five years in duration or terminate a year or less before the SWRCB compliance deadline in a Tier 3 advice letter.</u> <u>Contracts that are five years or more in duration by Application.</u> <u>Contracts with duration beyond the SWRCB compliance deadline either by advice letter (for contracts that are less than five years in duration) or application (for contracts that are five years or more in duration).</u>
<u>GHG Products</u>	<u>Transactions for GHG Products with vintage years four years or less into the future, Quarterly Compliance Report and the annual ERRA Compliance proceeding.</u> <u>Transactions for GHG Products with vintage years more than four years into the future, Tier 3 Advice Letter.</u>



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-105
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX A
CAPACITY AND ENERGY TABLES
AND PROCUREMENT LIMITS

REDACTED VERSION



TABLE PG&E-1
PACIFIC GAS AND ELECTRIC COMPANY
CAPACITY BALANCE

Line	Peak PG&E Load Calculations	MW									
		2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	Forecast Total Peak-Hour 1-in-2 Demand	20,737	21,090	21,367	21,648	21,937	22,219	22,489	22,758	23,062	
2	CCA	0	0	0	0	0	0	0	0	0	
3	Uncommitted Energy Efficiency (-)	-129	-389	-619	-872	-1,180	-1,510	-1,856	-2,183	-2,496	
4	Demand Response/Interruptible Programs (-)	-1,413	-1,445	-1,488	-1,539	-1,588	-1,636	-1,681	-1,724	-1,769	
5	Self Generation (non CSI)	-80	-120	-161	-201	-241	-281	-321	-361	-401	
6	California Solar Initiative (-)	-227	-261	-296	-330	-365	-398	-432	-466	-500	
7	Direct Access Loads (-/+)	-924	-924	-924	-924	-924	-924	-924	-924	-924	
8	Subtotal: Adjustments Peak-Hour Demand (Lines 2 thru 7)	-2,774	-3,140	-3,488	-3,866	-4,297	-4,719	-5,153	-5,568	-5,969	
9	Adjusted Peak-Hour Demand for End-Use Customers Line 1+ Line 8)	17,964	17,951	17,880	17,782	17,639	17,500	17,335	17,190	17,093	
10	Coincidence Adjustment (-)	-572	-574	-573	-574	-576	-578	-579	-581	-583	
11	Net Peak-Hour Demand (Sum Line 9 + Line 10)	17,392	17,377	17,306	17,208	17,063	16,923	16,757	16,609	16,510	
12	Specified Planning Reserve Margin (Line 11*15%)	2,609	2,607	2,596	2,581	2,559	2,538	2,514	2,491	2,476	
13	Firm Sales Obligation (+)										
14	Firm PG&E Peak-Hour Requirement (Sum Lines 11 thru 13)	20,001	19,983	19,902	19,789	19,623	19,461	19,270	19,101	18,986	
	Existing and Planned Resources:										
15	PG&E-Owned Fossil Resources	1,384	1,384	1,384	1,384	1,970	1,970	1,970	1,970	1,970	
16	PG&E-Owned Nuclear Resources	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	
17	PG&E-Owned Hydroelectric Resources (1 in 5)	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582	
18	PG&E-Owned Solar Resources	292	292	292	292	292	292	292	292	292	
19	DWR Contractual Resources	96	96	96	96	0	0	0	0	0	
20	Qualifying Facility (QF) Contractual Resources										
21	Renewable Energy Contractual Resources	1,008	1,518	2,668	3,394	3,393	3,691	3,516	3,495	3,898	
22	Other Bilateral Resources	8,594	9,102	4,229	4,270	3,899	3,878	3,919	3,778	3,607	
23	Total Existing and Planned Resources (Sum lines 15 thru 22)										
24	(Resource Need) or Surplus (Line 23- Line 14)										

Delete



TABLE PGE-1
PACIFIC GAS AND ELECTRIC COMPANY
CAPACITY BALANCE

		MW									
Line	Peak PG&E Load Calculations	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Forecast Total Peak-Hour 1-in-2 Demand	20,386	20,737	21,090	21,367	21,648	21,937	22,219	22,489	22,758	23,062
2	CCA	0	0	0	0	0	0	0	0	0	0
3	Uncommitted Energy Efficiency (-)	-98	-129	-389	-619	-872	-1,180	-1,510	-1,856	-2,183	-2,496
4	Demand Response/Interruptible Programs (-)	-1,148	-1,413	-1,445	-1,488	-1,539	-1,588	-1,636	-1,681	-1,724	-1,769
5	Self Generation (non CSI)	-40	-80	-120	-161	-201	-241	-281	-321	-361	-401
6	California Solar Initiative (-)	-193	-227	-261	-296	-330	-365	-368	-372	-375	-379
7	Direct Access & CCA Loads (-/+)	-924	-1,409	-1,466	-1,598	-1,598	-1,582	-1,582	-1,582	-1,590	-1,598
8	Subtotal: Adjustments Peak-Hour Demand (Lines 2 thru 7)	-2,403	-3,258	-3,682	-4,162	-4,540	-4,955	-5,377	-5,811	-6,234	-6,643
9	Adjusted Peak-Hour Demand for End-Use Customers Line 1+ Line 8)	17,983	17,479	17,409	17,206	17,108	16,981	16,843	16,678	16,524	16,419
10	Coincidence Adjustment (-)	-573	-549	-549	-544	-546	-548	-549	-550	-552	-554
11	Net Peak-Hour Demand (Sum Line 9+ Line 10)	17,410	16,930	16,859	16,661	16,563	16,434	16,293	16,127	15,972	15,865
12	Specified Planning Reserve Margin (Line 11*15%)	2,612	2,539	2,529	2,499	2,484	2,465	2,444	2,419	2,396	2,380
13	Firm Sales Obligation (+)										
14	Firm PG&E Peak-Hour Requirement (Sum Lines 11 thru 13)	20,022	19,469	19,388	19,160	19,047	18,899	18,737	18,547	18,368	18,245
	Existing and Planned Resources:										
15	PG&E-Owned Fossil Resources	1,384	1,384	1,384	1,384	1,384	1,970	1,970	1,970	1,970	1,970
16	PG&E-Owned Nuclear Resources	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240
17	PG&E-Owned Hydroelectric Resources (1 in 5)	3,579	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582
18	PG&E-Owned Solar Resources	147	292	292	292	292	292	292	292	292	292
19	DWR Contractual Resources	868	96	96	96	96	0	0	0	0	0
20	Qualifying Facility (QF) Contractual Resources										
21	Renewable Energy Contractual Resources	1,116	1,008	1,518	2,668	3,394	3,393	3,691	3,516	3,495	3,553
22	Other Bilateral Resources	9,189	8,521	8,996	4,091	4,100	3,899	3,878	3,919	3,778	3,607
23	Total Existing and Planned Resources (Sum lines 15 thru 22)										
24	(Resource Need) or Surplus (Line 23- Line 14)										



TABLE PGE-2
PACIFIC GAS AND ELECTRIC COMPANY
ENERGY BALANCE

Line	PG&E Load Calculations	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Forecast Total energy Demand/Consumption	95,917	97,393	99,076	100,332	101,577	102,862	104,099	105,273	106,446	107,681
2	CCA	0	0	0	0	0	0	0	0	0	0
3	Uncommitted Energy Efficiency (-)	(536)		(1,590)	(2,254)	(2,865)	(3,650)	(4,569)	(5,478)	(6,215)	(6,816)
4	Demand Response/Interruptible Programs (+)	9		15	16	16	16	16	16	16	16
5	Self Generation (non CSI)	(324)		(973)	(1,297)	(1,621)	(1,946)	(2,270)	(2,594)	(2,918)	(3,243)
6	California Solar Initiative (-)	(914)		(1,238)	(1,401)	(1,564)	(1,727)	(1,744)	(1,760)	(1,777)	(1,794)
7	Direct Access Loads (-/+)	(6,084)		(6,084)	(6,084)	(6,084)	(6,084)	(6,084)	(6,084)	(6,084)	(6,084)
8	Subtotal: Adjustments to Energy Demand (Lines 2 thru 7)	(7,849)		(9,871)	(11,021)	(12,119)	(13,391)	(14,651)	(15,901)	(16,979)	(17,921)
9	Adjusted Energy Demand/Consumption Line 1+ Line 8	88,068		89,205	89,311	89,458	89,471	89,448	89,372	89,467	89,760
10	Firm Sales Obligation (+)	413		413	413	413	413	413	413	413	413
11	Firm PG&E Energy Requirement (Sum Line 9 + Line 10)	88,481		89,618	89,724	89,871	89,884	89,861	89,785	89,880	90,173
	Existing and Planned Resources:										
12	PG&E-Owned Fossil Resources										
13	PG&E-Owned Nuclear Resources										
14	PG&E-Owned Hydroelectric Resources (1 in 2)	13,230		11,323	11,186	11,105	11,073	11,101	11,041	11,038	10,876
15	PG&E-Owned Renewable Resources	39		247	350	451	517	512	508	503	503
16	DWR Contractual Resources	3,275		176	188	145	0	0	0	0	0
17	Qualifying Facility (QF) Contractual Resources										
18	Renewable Energy Contractual Resources	9,564		12,150	16,952	18,381	19,862	20,154	18,476	18,434	18,347
19	Other Bilateral Resources	13,437		14,709	10,820	10,863	10,382	9,819	10,132	10,668	10,655
20	Spot Market Purchases										
21	Spot Market Sales (-)										
22	Total Existing and Planned Resources (Sum lines 12 thru 21)	88,481		89,618	89,724	89,871	89,884	89,861	89,785	89,880	86,857
23	(Energy Need) or Surplus (Line 22 - Line 11)	0		0	0	0	0	0	0	0	(3,316)
	Generic Energy Resource Needs:										
24	Renewable Energy	0		0	0	0	0	0	0	0	3,316
25	Non-Renewable Baseload Energy	0		0	0	0	0	0	0	0	0
26	Non-Renewable Peaking Energy	0		0	0	0	0	0	0	0	0
27	Total Generic Energy Resource Needs	0		0	0	0	0	0	0	0	3,316

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TABLE PG&E-2
PACIFIC GAS AND ELECTRIC COMPANY
ENERGY BALANCE

Line	PG&E Load Calculations	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Forecast Total energy Demand/Consumption	95,917	97,393	99,076	100,332	101,577	102,862	104,099	105,273	106,446	107,681
2	CCA	(211)	(303)	(303)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)
3	Uncommitted Energy Efficiency (-)	(536)	(698)	(1,590)	(2,254)	(2,865)	(3,650)	(4,569)	(5,478)	(6,215)	(6,816)
4	Demand Response/Interruptible Programs (+)	9	12	15	16	16	16	16	16	16	16
5	Self Generation (non CSI)	(324)	(649)	(973)	(1,297)	(1,621)	(1,946)	(2,270)	(2,594)	(2,918)	(3,243)
6	California Solar Initiative (-)	(914)	(1,075)	(1,238)	(1,401)	(1,564)	(1,727)	(1,744)	(1,760)	(1,777)	(1,794)
7	Direct Access Loads (-/+)	(9,121)	(9,970)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)
8	Subtotal: Adjustments to Energy Demand (Lines 2 thru 7)	(11,097)	(12,683)	(14,428)	(16,435)	(17,533)	(18,806)	(20,065)	(21,315)	(22,393)	(23,335)
9	Adjusted Energy Demand/Consumption Line 1+ Line 8)	84,820	84,711	84,648	83,896	84,044	84,057	84,034	83,958	84,053	84,346
10	Firm Sales Obligation (+)	413	413	413	413	413	413	413	413	413	413
11	Firm PG&E Energy Requirement (Sum Line 9 + Line 10)	85,233	85,124	85,061	84,309	84,457	84,470	84,447	84,371	84,466	84,759
	Existing and Planned Resources:										
12	PG&E-Owned Fossil Resources				17,375	18,386	18,543	18,516	18,516	17,507	18,437
13	PG&E-Owned Nuclear Resources					11,186	11,073	11,101	11,041	11,038	10,876
14	PG&E-Owned Hydroelectric Resources (1 in 2)	13,230	11,850	11,323		350	517	512	508	503	503
15	PG&E-Owned Renewable Resources	39	144	247		451					
16	DWR Contractual Resources	3,279	1,403	176	188	145	0	0	0	0	0
17	Qualifying Facility (QF) Contractual Resources										
18	Renewable Energy Contractual Resources	9,564	9,581	12,150	16,952	18,381	19,862	20,154	18,476	18,434	18,347
19	Other Bilateral Resources	13,106	12,500	13,852	9,699	9,764	10,382	9,819	10,132	10,668	10,655
20	Spot Market Purchases				12,297	11,103	8,440	8,234	8,842	9,311	9,068
21	Spot Market Sales (-)				(2,673)	(3,464)	(5,593)	(6,046)	(5,433)	(5,301)	(5,449)
22	Total Existing and Planned Resources (Sum lines 12 thru 21)	85,233	85,124	85,061	84,309	84,457	84,470	84,447	84,371	84,466	84,162
23	(Energy Need) or Surplus (Line 22 - Line 11)	0	0	0	0	0	0	0	0	0	(597)
	Generic Energy Resource Needs:										
24	Renewable Energy	0	0	0	0	0	0	0	0	0	597
25	Non-Renewable Baseload Energy	0	0	0	0	0	0	0	0	0	0
26	Non-Renewable Peaking Energy	0	0	0	0	0	0	0	0	0	0
27	Total Generic Energy Resource Needs	0	0	0	0	0	0	0	0	0	597



TABLE PGE-3
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRICAL CAPACITY PROCUREMENT LIMIT AND 1 X RATABLE RATE (RR) IN MEGAWATTS (MW)

<u>Delivery Year</u>	<u>Capacity Procurement Limit (MW)</u>	<u>1 x RR in 2012</u>	<u>1 x RR in 2013</u>	<u>1 x RR in 2014</u>	<u>1 x RR in 2015</u>
<u>2014</u>			<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
<u>2015</u>				<u>n/a</u>	<u>n/a</u>
<u>2016</u>					<u>n/a</u>
<u>2017</u>					
<u>2018</u>					
<u>2019</u>					
<u>2020</u>					



TABLE PGE-4
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRICAL CAPACITY IMPLIED MARKET HEAT RATE ("IMHR") MARKET CONDITION MEASURE

<u>Measure</u>	<u>Value (MMBtu/MWh)</u>
<u>2 Standard Deviation High</u>	

The forward power curves used to calculate the 2-standard-deviation measure span periods that predate the January 2013 start-date of California's cap-and-trade program. In contrast, the forward curve used to calculate the IMHR that is to be calculated at the time of procurement and compared to the measure extends beyond December 2012.

Because implied greenhouse gas ("GHG") cost is embedded in the post December 2012 monthly forward prices, an adjustment to the relevant monthly forward prices is necessary when calculating the IMHR at the time of procurement. In calculating IMHR, forward prices for delivery months January 2013 and after will be reduced.² For the calculation of this reduction, as a conservative choice, GHG auction reserve prices (floor prices) set by California Air Resources Board ("CARB") will be used.³ After the first GHG auction, Pacific Gas and Electric Company ("PG&E") may propose to make adjustments to the IMHR calculation using market-based forward GHG and power price curves.

² Reduction in on-peak power price for months January 2013 and after will be calculated as the multiplication of: (1) the average of the historical 12-month forward on-peak IMHR for the historical period used for the calculation of the Market Condition Measure; (2) the GHG emissions from natural gas of 0.05307 metric-tons/Millions of British Thermal Units ("MMBtu"); and (3) the GHG price for that year.

³ The auction reserve price has been set by CARB at \$10/metric ton for vintage 2013 allowances, in all auctions during 2012 and 2013. [Source: Section 95911(b)(6)(A) of final regulations <http://www.arb.ca.gov/regact/2010/capandtrade10/finalrevfro.pdf>.] For 2014, PG&E will escalate this floor price by 5 percent plus rate of inflation.



Pacific Gas and Electric Company
San Francisco, California

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Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX B
ELECTRIC PORTFOLIO HEDGING PLAN

CONFIDENTIAL

REDACTED IN ITS ENTIRETY
UNDER PROTECTIONS OF D.06-06-066
AND
CALIFORNIA PUBLIC UTILITIES CODE
SECTIONS 454.5(G) AND 583



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-138
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX C
NUCLEAR FUEL PROCUREMENT PLAN

CONFIDENTIAL

REDACTED IN ITS ENTIRETY
UNDER PROTECTIONS OF D.06-06-066
AND
CALIFORNIA PUBLIC UTILITIES CODE
SECTIONS 454.5(G) AND 583



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-151
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX D
ELECTRIC PORTFOLIO GAS SUPPLY PLAN

CONFIDENTIAL

REDACTED IN ITS ENTIRETY
UNDER PROTECTIONS OF D.06-06-066
AND
CALIFORNIA PUBLIC UTILITIES CODE
SECTIONS 454.5(G) AND 583



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-158
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX E

PG&E'S TEVAR METHODOLOGY

REDACTED VERSION



Fluctuations in natural gas and electric power prices, hydroelectric generation, and electric load variations result in fluctuations in the overall cost of the Pacific Gas and Electric Company (“PG&E”) electric portfolio. The To-expiration-Value-at-Risk (“TeVAr”) metric is a measure of unexpected changes in PG&E’s variable electric portfolio procurement costs, net of electric portfolio revenues from sales of cumulative long positions over some specified time period, typically twelve months. TeVaR measures how high the net portfolio cost for the projection period may become if certain market changes occur.

Revenues and costs which accrue to PG&E’s electric portfolio, and thus to PG&E customers, depend on prices for natural gas and power at specific locations. Currently, PG&E’s TeVaR model includes forward and spot natural gas daily prices, and forward and day-ahead electricity prices. Day-ahead electricity prices are based on time of use, such as super-peak hours (hour ending 13 through 20 Monday through Friday), on-peak but not super-peak hours (hour ending 7 through 22 Monday through Saturday except Super-peak hours), “Sunday and holiday” hours, off-peak hours (all other remaining hours).

The TeVaR metric is computed using a Monte Carlo simulation. In this simulation, for each Monte Carlo “trial,” daily spot prices are randomly generated for each of the specified locations and for each day of the projection period, and hydro generation and electric load are simulated at hourly level for the projection period. Daily electricity spot prices are further shaped into time-of-use prices. Forward prices for natural gas and electricity are also simulated to compute pay-off from the financial hedge



positions (swaps and options). The prices used in the simulation are consistent with current market forward prices, volatility term-structures implied by market data, and with historical correlations of market data. For each day of the projection period, the net cost at delivery is computed for every position in the portfolio. Net costs over the projection period then produce a single (aggregated) net cost for each such trial. The variation of net costs over trials produces a probability distribution of net costs. Costs are represented as negative numbers, so the 1st percentile in the distribution of net cost represents more cost to customers than the 10th percentile in the same distribution of net cost. The difference between the mean net cost and the 5th percentile of net cost is identified as TeVaR at the 95th percentile, or “TeVaR95.”

TeVaR95 represents the largest additional unexpected variable procurement cost for PG&E’s electric portfolio, with probability 0.95. There is a 0.05 probability that unexpected costs can be even greater than TeVaR95. Using TeVaR95 to measure portfolio risk enables close monitoring of potential unexpected costs to PG&E’s customers.

As discussed in Section V.B., Table E-1 is the risk metric based on the Standardized Assumptions prescribed by the California Public Utilities Commission.

TABLE E-1
PACIFIC GAS AND ELECTRIC COMPANY
TIME TO EXPIRATION VALUE AT RISK

<u>TeVaR (\$ Million)</u>									
<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-161
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX F

CONGESTION REVENUE RIGHTS

REDACTED VERSION



A. Introduction

Pacific Gas and Electric Company (“PG&E”) is authorized to procure Congestion Revenue Rights (“CRR”) under two California Public Utilities Commission (“CPUC” or “Commission”) resolutions. CRRs are financial instruments issued by the California Independent System Operator (“CAISO”). Resolution E-4135 authorized PG&E to procure CRRs in the CAISO’s monthly and annual processes. Resolution E-4122 authorized PG&E to procure Long-Term Congestion Revenue Rights (“LT-CRR”) in the CAISO’s long-term process. Both resolutions authorized PG&E to purchase and sell CRRs in the secondary markets.

The monthly and annual CRR processes consist of up to three allocation tiers and an auction. In the allocation tiers, only Load Serving Entities (“LSE”) such as PG&E can nominate CRRs that they wish to obtain at no ~~additional~~ direct cost. In the auctions, which are open to all market participants, PG&E can purchase or sell CRRs at market based prices determined through the competitive auction. The Annual CRR process releases CRRs with calendar quarter delivery periods that occur over the next year. The monthly CRR process releases CRRs with monthly delivery periods for the next month. The LT-CRR process consists of one allocation tier each year and is performed as part of the annual CRR process. In this Long Term Tier, quarterly-term CRRs previously acquired from the annual Tier 1 allocation can be nominated for conversion to LT-CRRs with same quarter deliveries ~~over~~ for the subsequent nine years. Under the CAISO Tariff, only LSEs are eligible to participate in allocation tiers and can procure CRRs up to an



amount determined by their historical or forecasted load. LSEs and non-LSEs are eligible to participate in monthly and annual CRR auctions.

B. Congestion Revenue Rights and Long-Term Congestion Revenue Rights Procurement Objectives

As the Commission determined in Resolutions E-4135 and E-4122, PG&E uses CRRs and LT-CRRs to hedge against congestion costs (expected and anticipated). PG&E does not use CRRs and LT-CRRs for financial speculation.

C. Congestion Revenue Rights Procurement

1. Congestion Revenue Rights Source-Sink Pairs and Paths

PG&E is authorized to acquire CRRs for any path (represented by a source-sink pair) connecting existing generation sources to existing loads (retail loads, Helms pumping load and wholesale load obligations) or for any path that PG&E reasonably anticipates that it might need to flow energy in the future due to the addition of new contracts, resources or load obligations. Additionally, there may be CRRs which are positively correlated in value with CRRs for paths that have limited availability. PG&E is authorized to acquire CRRs for such positively correlated paths as well. Therefore, PG&E will obtain any CRRs that are determined to be valuable as hedges against congestion costs at the time they are offered, subject to risk assessment regarding the specific source/sink combinations as described in Section F of this appendix.

2. Procurement Review Group Consultation

PG&E will consult with its Procurement Review Group ("PRG") prior to annual nominations for allocations and auctions and include the transactions in its Quarterly Compliance Report. Due to the very tight schedule and short lead time with the



associated with the CAISO monthly CRR process, PG&E cannot provide the PRG with its nominations prior to submission or hold PRG consultations. PG&E provides the PRG participants with information regarding the CRR it is buying or selling, including but not limited to source, sink, megawatt (“MW”) quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). ~~PG&E currently provides the PRG with its nominations within two (2) business days after submission. However, in the Bundled Procurement Plan (“BPP”), PG&E proposes instead to~~will notify the PRG of all CRRs awarded in the monthly process ~~instead of nominations~~ after submission. The notification will include information about every CRR awarded in the monthly allocation or auction, including the source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). The notification will be provided within three business days of the posting of the results of the *final* market process of a month’s CRR process (currently the auction).

D. Long-Term Congestion Revenue Rights Procurement

1. Long-Term Congestion Revenue Rights Source-Sink Pairs and Paths

PG&E is authorized to acquire LT-CRRs for any path (represented by a source-sink pair) connecting existing generation sources to existing loads (either retail loads or wholesale load obligations) or for any path that PG&E reasonably anticipates that it might need to flow energy in the future due to the addition of new contracts, resources or load



obligations. Additionally, there may be LT-CRRs which are positively correlated in value with LT-CRRs for paths that have limited availability. PG&E is authorized to acquire LT-CRRs for such positively correlated paths as well. Therefore, PG&E will obtain any LT-CRRs that are determined to be valuable as hedges against congestion costs at the time they are entered into, subject to risk assessment regarding the specific source/sink combinations as described in Section F of this appendix.

2. Procurement Review Group Consultation

PG&E will consult with its PRG prior to ~~annual~~ LT-CRR nominations and include the transactions in its Quarterly Compliance Report. For any LT-CRR transaction, PG&E must provide the PRG participants with information regarding the LT-CRR, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the LT-CRR will hedge (or, in the case of a sale of a LT-CRR, no longer hedge).

PG&E will also report the performance of its awarded LT-CRRs to the PRG on a quarterly basis including source, sink, a description of the underlying arrangement that the LT-CRR hedges and the performance of the LT-CRRs using average congestion prices as published by CAISO.

3. Application for Long-Term Congestion Revenue Rights Not Required

PG&E is not required to file an application with the Commission for approval of the acquisition of LT-CRRs with a duration of more than five years.



E. Volume Limits

PG&E's CRR and LT-CRR procurement is subject to source-specific volume limits. That is, PG&E will limit the "net" volume¹ that it could procure at each source node to the maximum non-coincident capacity of the sources (existing, potential, planned, or "positively correlated") at that node for that delivery period. There are separate source-specific volume limits for the on-peak and off-peak hours in the delivery period.

Overall or total CRR volume limits are unnecessary because PG&E is already limited by CAISO rules, and to hedging no more than its total expected or anticipated grid use.

[REDACTED]

¹ "Net" volume refers to the result of netting CRRs in one direction with CRRs in the counter-flow direction.



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K. Cost Recovery

PG&E will record the revenues and costs related to LT-CRR and CRR transactions in its Energy Resource Recovery Account (“ERRA”) balancing account. LT-CRR and CRR entries will be examined in the Commission’s Quarterly Compliance Reports and annually in the Commission’s ERRA compliance review.



Pacific Gas and Electric Company
San Francisco, California

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APPENDIX G

CONVERGENCE BIDDING



A. Background

The California Independent System Operator's ("CAISO") Market Redesign and Technology Upgrade initiative, launched in April 2009, re-introduced a Day-Ahead Market, also known as the Integrated Forward Market and provided for Locational Marginal Pricing ("LMP"). Through its market processes, the CAISO produces LMPs for the Day-Ahead Market (i.e., one day prior to the flow of power) and the Real-Time Markets ("RTM") (i.e., up to two hours prior to the flow of power).

Convergence bidding is intended to reduce the price differences between the day-ahead and RTMs and to provide additional benefits. Convergence bids are financial transactions (i.e., virtual bids for energy that will not be consumed or produced), that can only be submitted in the Day-Ahead Market, and are recognized by system operators as not being physical. Convergence bids represent a financial commitment to sell (or buy) energy in the Day-Ahead Market at the individual pricing node location where the convergence bid is submitted. If these bids are cleared in the Day-Ahead Market, they are automatically liquidated by the CAISO with an opposite buy-back by seller or sell-back by buyer of the same quantity of energy in the 5-minute RTM for locations inside the CAISO, and in the Hour-Ahead Scheduling Process ("HASP") for Interties.

The CAISO initiated convergence bidding on February 1, 2011.

B. CPUC Authorization

On December 21, 2010, the California Public Utilities Commission ("CPUC" or "Commission") issued Decision 10-12-034 authorizing the investor owned utilities ("IOU") to participate in convergence bidding under three separate strategies. The



decision provides interim authority until a subsequent decision supersedes or modifies this authority, or a stop-loss limit¹ is reached. The decision further establishes that the IOUs are not required to use any or all of the three bidding strategies and may apply them flexibly to meet their own circumstances. Decision 10-12-034 was subsequently modified by Decision 11-06-004.

C. PG&E's Convergence Bidding Participation

Pacific Gas and Electric Company ("PG&E") may use one or more of the following convergence bidding strategies authorized by the Commission:

- **Strategy 1** – Generation performance risk and load forecast uncertainty hedging. PG&E is authorized to participate in convergence bidding to manage Real-Time price exposure resulting from unanticipated forced outages, derating of generating units, derating of transmission, or uncertain generation performance for resources scheduled by PG&E in the CAISO's Day-Ahead Market. This strategy also authorized submission of bids related to long-start generation units.²
- **Strategy 2** – Intermittent resource schedule and hedging. PG&E is authorized to submit virtual supply bids in the CAISO's Day-Ahead Market up to, but not exceeding, the amount of the Day-Ahead forecast of intermittent generation in the Day-Ahead Market, followed by buying it back through the convergence sale in the CAISO RTM.
- **Strategy 3** – Defensive bidding against market dynamics. PG&E is authorized to participate in defensive convergence bidding in the CAISO's Day-Ahead and Real-Time energy markets to mitigate real harms from market manipulation or other unintended market dynamics. Any IOU using defensive convergence bidding must report such use on a case-by-case basis with actual market and settlement data, and not just hypothetical scenarios showing how engaging in convergence bidding by the IOUs protected ratepayers. Each IOU

¹ A 365-day rolling stop net-loss limit of \$20 million for PG&E and Southern California Edison Company, and \$5 million for San Diego Gas & Electric Company, that requires suspension of convergence bidding pending IOU explanation and CPUC re-authorization.

² D.11-06-004, OP 1.



must report if and how it employed convergence bidding strategies intended to protect the IOU's ratepayers from avoidable risks at identified locations. This information will be used for future review of convergence bidding authority and not for post-hoc reasonableness reviews of utility bidding activities.

PG&E's convergence bidding under all strategies will be restricted to the nodes or locations where PG&E-owned or contracted resources or loads are physically located³, at interties where utility resources or loads are located, as well as at the previously authorized nodes or locations.³

D. Utility Convergence Bidding Reporting

PG&E will provide convergence bidding reports to the CPUC's Energy Division ("ED") and periodically confer with PG&E's Procurement Review Group ("PRG").

During the first year after the initiation of convergence bidding within the CAISO, PG&E will provide ED with a monthly report⁴ on its convergence bidding activities.

The reports will include:

- 1) For that month, a list of each cleared convergence bid, containing the hour, location, volume, and justification for the transaction.
- 2) A list of the Day-Ahead and relevant HASP or Real-Time prices corresponding with each convergence bid during the month.
- 3) For each day during the month, the gains or losses, in dollars, as a result of convergence bidding.
- 4) For that month, and any past months during the calendar year in which convergence bids were transacted, a monthly total of volume, gains or losses (in dollars), the number of times (by hourly bid) each strategy was employed, and the number of bids conducted outside of PG&E's service territory.

³ Id.

⁴ Monthly reports will be provided within two weeks from the end of each month.



- 5) The approved convergence bidding strategies utilized during that time period.
- 6) Qualitative analysis of convergence bidding impacts upon other related products, such as Congestion Revenue Rights during the period.
- 7) A list of any PG&E affiliates who have or are registered with the CAISO to participate in convergence bidding.

After one year of CAISO convergence bidding, PG&E will replace the monthly reporting with quarterly reporting that will be included as part of the Quarterly Compliance Report filings beginning with the First Quarter 2012 filing. PG&E will also consult quarterly with the PRG to provide a review of PG&E's convergence bidding strategies, performance and market analysis.

E. Stop Net-Loss

PG&E will monitor the net profit and losses associated with submittal of convergence bids. In the event that the 365-day rolling net-loss exceeds or is expected to exceed \$20 million, PG&E will cease implementation of all convergence bidding strategies and confer with the PRG. To the extent that PG&E determines that continuation of convergence bidding is warranted, it will file a Tier 3 Advice Letter ("AL") with the Commission. The AL must contain, at a minimum: (1) an explanation for why PG&E exceeded the stop-loss limit; (2) an explanation of what actions or changes to its bidding activity PG&E will implement to ensure that future convergence bidding will not continue to lose ratepayer funds; and (3) an explanation for why PG&E's authority to engage in convergence bidding should be reinstated, in light of the specific facts of PG&E's convergence bidding history and remedial activities to protect ratepayer funds. Unless and until the Commission approves the AL with or without conditions,



PG&E shall have no authority to engage in convergence bidding regardless of how long the Commission takes to issue a ruling on the AL.

F. California Independent System Operator Notification Requirements

PG&E shall, within one (1) business day of its receipt of notice, provide written notice to the CPUC's Executive Director, the Director of Energy Division and the General Counsel of: (1) notice from the CAISO or its Department of Market Monitoring that PG&E or its scheduling coordinator is the subject of an investigation pursuant to the CAISO Tariff, including Section 37.8.4; (2) notice from the CAISO that the conduct of PG&E or its scheduling coordinator's conduct has been referred to the Federal Energy Regulatory Commission by the CAISO pursuant to the CAISO Tariff, including Section 37.8.2; or (3) notice from the CAISO that PG&E or its scheduling coordinator's convergence bidding trading has been suspended or limited by the CAISO.

G. Future Convergence Bidding Strategies

PG&E may seek authority through a Tier 3 AL filing to participate in additional convergence bidding areas and/or propose additional convergence bidding strategies.



Pacific Gas and Electric Company
San Francisco, California

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APPENDIX H

BROKERAGES AND EXCHANGES



Brokerages

- Tullett Liberty (acquired Natsource)
- ICAP Energy LLC (acquired APB)
- Prebon
- TFS
- Amerex (recently acquired by GFI Group, Inc.)
- Landmark
- Saddleback
- Anahau Energy LLC (a Women, Minority and Disabled Veteran Business Enterprise (“WMDVBE”))
- Evolution Markets Inc
- Bluesource Energy, LLC (WMDVBE)
- Energy Trade Management GP, LLC
- Equus Energy Group, LLC
- Spectron Energy Inc.
- Karbone Inc.
- BGC Environmental Brokerage Services, L.P.
- Edge Energy, LLC

Exchanges and Futures Commission Merchants

- Intercontinental Exchange (“ICE”) – Exchange and Cleared (Clear Europe) trades
- New York Mercantile Exchange (“NYMEX”) – Exchange and Cleared trades
- Green Exchange, LLC (GreenX) – Exchange and Cleared (CME Clearing) trades
- Natural Gas Exchange (“NGX”) – Physical and Financially Cleared Gas Products
- Barclays Capital (allows accessibility to NYMEX, NYMEX Clearing, and ICE Clear Europe)
- J.P. Morgan ~~Futures Securities, LLC Inc.~~, (allows accessibility to NYMEX, NYMEX Clearing, ~~and~~ ICE Clear Europe, and GreenX/CME Clearing)
- Mizuho Securities, USA, (allows accessibility to NYMEX, NYMEX Clearing, ~~and~~ ICE Clear Europe, and GreenX/CME Clearing)
- Wells Fargo Advisors, LLC., (allows accessibility to NYMEX, NYMEX Clearing, and ICE Clear Europe)
- BNP Paribas Prime Brokerage Inc. (allows accessibility to ICE Clear Europe and GreenX/CME Clearing)
- Parity Energy, Inc. – the Parity Energy Platform (online energy derivative trading)
- ICAP Energy, LLC – the ICAPture Electronic Trading Platform (online energy derivative trading)



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APPENDIX I

PRG, IE AND RFO REQUIREMENTS



A. Procurement Review Group

1. Membership

Procurement Review Group (“PRG”) membership includes both organizations and individuals. Energy Division (“ED”) employees are ex-officio participants of the PRG. All PRG members must be nominated and then evaluated for participation in the PRG by Pacific Gas and Electric Company (“PG&E”) and then PG&E may recommend the individual to ED for approval. PRG members must be non-market participants and are required to execute a non-disclosure agreement.

When procuring or potentially procuring Cost Allocation Mechanism (“CAM”) resources pursuant to California Public Utilities Commission (“CPUC” or “Commission”) Decisions (“D.”) 06-07-029 and 07-09-044 or Combined Heat and Power resources under D.10-12-035 where the costs are allocated to all benefitting customers, PG&E will utilize an advisory CAM Group consistent with the proposal as presented in D.07-12-052, Attachment D.

2. Scope of Procurement Review Group Review

Topics presented to the PRG shall include (but are not limited to):

- Transactions with delivery terms greater than three months’ in duration
- Request for Offers (“RFO”)/Request for Bids development (including protocols, bid evaluation and ranking, shortlist, and resulting executed transactions)
- Gas supply plans
- Electric supply plans
- Electric procurement portfolio position and transactions (quarterly)



- Electric portfolio hedging plan and strategy modifications
- Consumer Risk Tolerance triggers (e.g., liquidity and To-expiration Value-at-Risk (“TeVaR”) notifications for exceedance)
- Nuclear fuel plans
- California Independent System Operator related procurement (e.g., Congestion Revenue Rights, Convergence bidding)
- New technologies and products
- Procurement portfolio position and transactions (on a quarterly basis, as noted)
- Independent Evaluator (“IE”) (evaluation and re-evaluation of organization and individuals or other selection processes)
- ~~Electric transactions greater than three months in delivery~~
- All Renewable Portfolio Standard (“RPS”)-related transactions
- Electric-related transactions resulting from any settlements
- Greenhouse Gas (“GHG”) Product procurement consistent with the PRG consultation requirements in PG&E’s GHG Procurement Plan (Appendix L)

3. Meeting and Notification Requirements

Agendas: PG&E will provide PRG members with meeting agendas and materials at a minimum of 48 hours in advance of the PRG meeting, unless there are unusual, extenuating circumstances that PG&E communicates to PRG members in an e-mail announcing a meeting or distributing meeting materials on a tighter timeframe.

MinutesSummaries: PG&E will provide confidential meeting summaries to PRG members that include a list of attending PRG members (including the organizations represented), a summary of topics presented and discussed, and a list of information requested or offered to be supplied after the meeting (and identify the requesting party).



PG&E will distribute meeting summaries on the earlier of (a) 14 days after the PRG meeting, or (b) 48 hours before the next regularly scheduled PRG meeting. If, due to unusual circumstances, 14 days will be inadequate time to prepare a meeting summary, PG&E may distribute the summary 21 days after the PRG meeting, but may do so only if PG&E sends an email to the PRG members informing them of the delay in distribution.

Web-Based Calendar: PG&E maintains a web-based PRG calendar. PG&E will provide the following information to the public through a web-based forum: date, meeting time and duration of the meeting; the individuals participating in the meeting and organization represented by the individual; and a list of non-confidential items discussed or a summary of general topics discussed.

Notifications to the PRG: In addition to the agenda, presentations, and meeting summaries, PG&E may provide notification to the PRG in between scheduled meetings. Periodic notifications may include notification of transactions to be executed. Monthly notifications include status of monthly TeVaR. However, upon exceedance of either TeVaR or liquidity, notification may be provided upon the initial potential execution of a transaction, upon initial hedging strategy changes (already approved) and upon the initial exceedance for liquidity and TeVaR. Additional notifications to the PRG will be provided upon request by the PRG.



B. Independent Evaluators

1. Independent Evaluator Pool

PG&E, in conjunction with its respective PRG, shall develop a pool of at least three, but preferably more, IEs. PG&E will develop and periodically add to its IE pool as follows:

1. PG&E shall develop a list of prospective IEs via industry contacts, literature searches, PRG recommendations, and similar methods, solicit information from the prospective IEs and circulate the list of candidates and their “resumes” to the PRG and ED for feedback. All individuals who perform the specific IE responsibilities and duties are covered under the IE organization or company.
2. PG&E shall rely on the guidance regarding IE expertise and qualifications provided in D.04-12-048 and D.07-12-052. However, these qualifications should represent the minimum necessary for an IE to be effective, and PG&E and the PRG will include any additional relevant information that it has gained through its experiences implementing the IE requirements.
3. PG&E and its PRG shall interview a subset of prospective candidates that PG&E, PRG and ED staff deem most suitable for the role.
4. PG&E shall coordinate the development and submittal to the PRG of its recommendations on each prospective candidate (including the general consensus and any opposition to the consensus). PG&E shall submit a written list of qualified IEs to ED to add to the contracting pool. The list will contain the recommendations of the PRG that were submitted to the PRG. ED will evaluate the proposed IE’s competencies based on the guidelines in D.04-12-048 as well as evaluating the IE’s independence including any conflicts of interest. ED shall give final approval for inclusion of an IE in the IE pool by letter to PG&E. ED will also have the right to final approval of the use of a particular IE for each RFO.
5. Beyond the development of the initial IE pool, additional IEs may be added to the pool by following the same procedures listed above.
6. An IE may remain in the IE pool for two consecutive years, within which he/she must go through a reevaluation process based upon the inclusion criteria to assure continued compliance. The re-evaluation process will



involve additional reviews of the IE candidate by the PG&E, PRG, and ED staff including additional interviews, or other evaluation tools, if necessary. The re-evaluation of an IE is based on both the organization and the individuals who have participated as an IE within that organization. The conclusions may include the inclusion of an organization and specific IEs in that organization. The resulting conclusions may also identify the specific IEs that will not continue in the pool for the next succeeding two years.

7. PG&E has developed a pro forma master contract to be used each time it contracts with an IE. If deviations from the pro forma contract are necessary, the modifications must be approved by the ED.

PG&E will provide to the PRG the name of the IE to be used in a specific procurement solicitation and the estimated and actual IE costs before and after the solicitation takes place.

2. Independent Evaluator Requirements

PG&E uses an IE in competitive solicitations for electric supply-side resources that seek products with a contract term of two years or more. ~~An IE is not required for solicitations for other types of resources or products such as energy efficiency, demand response, natural gas physical or financial products, and other non-electric supply products.~~ PG&E also uses an IE in all solicitations that involve an investor-owned utility-affiliate or utility bidder. In addition, consistent with D.09-06-050, PG&E uses an IE for bilateral negotiations for RPS-eligible resources.

3. Independent Evaluator Reports

For solicitations of less than five years and not filed separately through an advice filing, the IE report shall be filed with the Quarterly Compliance Report ("QCR"). For solicitations greater than five years, the IE report shall be filed with the application. If an IE report was prepared for a stand-alone bilateral of less than five years and not filed



separately through an advice filing, the IE report shall also be filed with the QCR. If an IE report was prepared for a stand-alone bilateral those term is greater than five years, the IE report shall be filed with the application. IEs shall use the template approved by the ED. The template(s) may be modified by ED or the Commission as appropriate. Public versions of IE reports shall be identical to the corresponding confidential versions, except for the visible redaction of confidential material.

4. Independent Evaluator Disclosure Requirements

PG&E ~~has begun discussions with its PRG and ED to develop~~ed a comprehensive conflict of interest disclosure requirement for the IE. An IE may be disqualified from participating in an RFO process if there are particular egregious conflicts of interest that arise during the contract. The IE pro forma contract currently (see Attachment 1 of Appendix I: "General Conditions: Consulting Services") includes a conflict of interest section (Section 17.2). In addition, PG&E requires that all IEs sign a Non-Disclosure Agreement (see Attachment 2 of Appendix I: "Specification for Independent Evaluator Services") which addresses potential conflicts of interest, including establishing business relationships between the IE and the parties with respect to the transaction (of which he or she is evaluating).

C. Request for Offers Process

PG&E shall hold a meeting with the IE, PRG and ED to outline its plans and solicit feedback prior to drafting RFO bid documents. Draft RFO bid documents are to be developed under the oversight of an IE, vetted through the PRG and any differences resolved by ED staff in advance of the public issuance of the bid documents. Any RFO



~~that seeks any form of utility ownership options must include a code of conduct in the RFO bid documents when the bid documents are issued.~~ PG&E shall present and consult with its PRG on its RFO protocols, bid evaluation, bids, and shortlist list.

If PG&E needs new fossil resources not formally authorized in a Commission decision, PG&E shall make a showing through an advice letter that unusual or extreme circumstances warrant such an action.

PG&E shall recognize the effects of debt equivalence when comparing Power Purchase Agreements (“PPA”) against PPAs in their bid evaluations, ~~but not when a utility owned generation project is being considered.~~

PG&E shall consider the use of brownfield sites first before building new generation on Greenfield sites, subject to the parameters set forth in D.07-12-052.

PG&E shall publicly reveal the names of winning bidders after key commercial terms have been finalized, within 30 days of filing an application, or withdraw the application until the bidder’s identity and other required information can be released. The actual contract will not be revealed. This activity would be addressed and made consistent as part of any Commission confidentiality decision and currently under D.06-06-066 and as with D.07-12-052.

PG&E shall use the project application template developed by ED when developing an application for approval of winning bid projects in an RFO.



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APPENDIX I
ATTACHMENT 1
GENERAL CONDITIONS: CONSULTING SERVICES

CONFIDENTIAL

Consulting Services
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General Conditions

GENERAL CONDITIONS: CONSULTING SERVICES

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1.0 DEFINITIONS

- 1.1 "Change Order": A revision or modification to the Contract reflected on a PG&E Field Order form or a PG&E Change Order form.
- 1.2 "Consultant" or "Contractor": The entity or entities entering into this Contract with PG&E to perform the Work.
- 1.3 "Contract": This agreement between PG&E and Consultant, including the Specification and appendices, together with any other material specifically incorporated therein.
- 1.4 "Party" or "Parties": In the singular, PG&E or Consultant, and in the plural, both PG&E and Consultant.
- 1.5 "PG&E": Pacific Gas and Electric Company, a California corporation.
- 1.6 "Specification": PG&E's specification which includes the specific conditions, these general conditions, and any addenda to these.
- 1.7 "Subcontract": An agreement between Consultant and Subcontractor or between Subcontractors at any level for a portion of the Work under this Contract.
- 1.8 "Subcontractor": Party or parties entering into a Subcontract with Consultant or another Subcontractor to perform a portion of the Work covered by the Contract.
- 1.9 "Work": All services (including but not limited to professional, engineering, analytical and other consulting services), labor, supervision, materials, equipment, actions and other requirements to be performed and furnished by Consultant under this Contract.

2.0 INDEPENDENT CONTRACTOR: In assuming and performing the obligations of this Contract, Consultant is an independent contractor and shall not be eligible for any benefits which PG&E may provide its employees, except as expressly provided for in this Contract. All persons, if any, hired by Consultant shall be employees or Subcontractors of Consultant and shall not be construed as employees or agents of PG&E in any respect.

3.0 AMENDMENTS, SUBCONTRACTS AND ASSIGNMENTS

- 3.1 AMENDMENT: No provision of the Contract will be deemed amended or waived by PG&E without prior written approval in the form of a signed Contract Change Order. No oral statement will modify or otherwise affect the terms and conditions set forth herein.
- 3.2 SUBCONTRACTS: Consultant shall not enter into Subcontracts and no Subcontractor shall be permitted to perform Work without the prior written approval of PG&E. PG&E's approval of any Subcontract shall not relieve Consultant of its obligations to PG&E under this Contract. Consultant's obligations under this Contract shall apply to any Subcontract, and Consultant shall be responsible to PG&E for any damages to PG&E arising out of Subcontracts not in accordance with this Contract. Nothing in the Contract or any subcontract shall create any direct contractual relations between a Subcontractor and PG&E.
- 3.3 ASSIGNMENT: PG&E may assign all or any part of this Contract, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise, without the Consultant's prior approval or written consent, provided PG&E remains obligated to pay for services rendered up to the effective date of such assignment. Consultant may not assign all or any part of this Contract or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise without PG&E's prior written consent, except that Consultant

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may assign to Consultant's corporate affiliate in which Consultant holds a majority interest, provided that the Consultant and the affiliate remain obligated under this Contract. Subject to the foregoing, this Contract shall be binding upon and inure to the benefit of the successors and assigns of the Parties hereto.

4.0 BILLING AND PAYMENT

4.1 LUMP SUM WORK: The following provisions shall apply to all Work performed on a lump sum basis.

4.1.1 INVOICE SUBMITTAL INSTRUCTIONS: Consultant shall submit a monthly invoice to PG&E for compensation earned in the preceding calendar month. Consultant shall submit invoices to PG&E in accordance with the requirements of this Section and with the instructions printed in the Contract or Contract Change Order. The Consultant shall include the Contract number, and if applicable the Contract Work Authorization number, on the invoice.

4.1.2 INVOICE DEFICIENCIES: Should PG&E determine that Consultant's invoice does not meet the invoicing requirements of this Contract, PG&E will notify Consultant of the deficiencies or return the invoice to Consultant with noted deficiencies. Consultant shall provide to PG&E such documents or information correcting such deficiencies, or for invoices returned to Consultant, Consultant shall resubmit a corrected invoice.

4.1.3 PG&E PAYMENT: Payment by PG&E to Consultant for Work performed on a lump sum basis will be monthly, in the full amount of the cost of the Work performed less any negotiated percentage withholding, computed in accordance with the terms of the Contract, and satisfactorily completed during each month. PG&E reserves the right to discount payment(s) to Consultant by Two (2) percent of the invoice total amount for payment(s) made to Consultant within Fifteen (15) days; or payable to Consultant within Forty-Five (45) days. All payments will be made, subject to PG&E approval after receipt of a correct invoice. Payment of the balance of the amount will occur at the end of the Contract after all Work is satisfactorily completed.

4.1.4 FINAL INVOICE: The final invoice shall be marked "FINAL" and must be received by PG&E within Sixty (60) calendar days after completion of the Work. PG&E will not be liable for payment of any late invoices that are received by PG&E beyond the Sixty (60) day period.

4.1.5 BILLING RATES AND CONFLICTS: Consultant's lump sum price(s) stated in the Contract fee schedule shall not change during the term of this Contract without prior written approval by PG&E. The lump sum price(s) shall be inclusive of all Consultant's overhead costs, administrative and general fees, and profit. To the extent such lump sum price(s), or any invoice or other billing instrument as provided for in this Article 4, "Billing and Payment", contains terms and conditions which are in addition to or in conflict with the terms and conditions in this Contract, whether Specific or General, those terms and conditions in the fee schedule, invoice, or other billing instrument shall be null and void.

4.2 TIME AND MATERIALS AND UNIT PRICE WORK: The following provisions shall apply to all Work performed on a time and materials or unit price basis.

4.2.1 INVOICE SUBMITTAL INSTRUCTIONS: Consultant shall submit invoices to PG&E in accordance with the requirements of this Section and with the instructions printed in the Contract or Contract Change Order. The Consultant

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shall include the Contract number, and if applicable the Contract Work Authorization number, on the invoice.

4.2.2 MONTHLY INVOICE: Consultant shall submit a monthly invoice to PG&E for review and approval of compensation earned and reimbursable expenses incurred in the preceding calendar month. Each invoice shall be broken down by Contract tasks; for each task the invoice shall include the following information:

- a. STATUS: Task description, estimated cost to complete, total cost incurred to date, percentage of Work completed and date completed.
- b. LABOR: Employee name, employee labor classification, employee salary rate, number of hours spent, and billing rate.
- c. REIMBURSABLE EXPENSES: Unit cost and quantity of each item of expense.

4.2.3 BILLING RATES AND CONFLICTS: Consultant's billing rates or fees stated in the Contract fee schedule shall not change during the term of this Contract without prior written approval by PG&E. These billing rates and fees shall be inclusive of all Consultant's overhead costs, administrative and general fees, and profit. To the extent such fee schedule, or any invoice or other billing instrument as provided for in this Article 4, "Billing and Payment", contains terms and conditions which are in addition to or in conflict with the terms and conditions in this Contract, whether Specific or General, those terms and conditions in the fee schedule, invoice, or other billing instrument shall be null and void.

- a. Overtime hours shall be billed at straight-time rates, unless otherwise approved by PG&E prior to the use of overtime, and limited to those hours for which Consultant's employee is actually compensated. If applicable, Consultant's overhead cost shall not be applied to the premium portion of the overtime cost.
- b. Individuals other than employees of Consultant (nonemployees) retained by Consultant, such as Subcontractors, outside consultants, or agency personnel, shall not be billed as Consultant's employees and shall be shown separately on the invoice. Such nonemployees working in Consultant's established office under Consultant's direct supervision shall be billed to PG&E at the cost charged to Consultant times 1.05. All other nonemployees shall be billed at Consultant's direct costs.

4.2.4 EXPENSES: All reimbursable expenses shall be reasonable, ordinary, and necessary and shall be billed at cost. All reimbursable expenses other than those listed in this Article shall be authorized in writing by PG&E's authorized representative prior to expenditure by the Consultant. PG&E will not reimburse Consultant for any expenses not so approved.

- a. Overhead costs are Consultant's responsibility and will not be reimbursed as expenses. The following types of costs are all considered to be overhead: Miscellaneous costs, such as routine telephone communications, routine copying, electronic mail, facsimile transmissions, computer time and use of in-house technical software.

4.2.5 TRAVEL TIME AND COSTS: All air travel costs within or outside of the United States will be reimbursed only on a coach fare basis and all rental car costs will be

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reimbursed only on a subcompact rate basis. Travel time to and from the Work site shall be at Consultant's expense.

- 4.2.6 MILEAGE AND USE OF PERSONAL CAR: in the event Consultant uses its personal car in the performance of Work under the Contract and such use is included as a reimbursable expense, normal commuting such as trips from home to first business stop and from the last business stop to home represents personal use of car and shall not be reimbursed. All other reimbursable mileage shall be at the current IRS rate.
- 4.2.7 SUPPORTING DOCUMENTATION: For each expense item over \$100, supporting data and documentation shall be furnished with the invoice. Copies of detailed expense reports to support travel costs shall be attached to the invoice. Although travel receipts need not be attached, Consultant shall retain them for the term of the audit period.
 - a. Each invoice shall be assembled such that attached supporting documentation shall be placed in the order listed in the invoice, and each item of expense chargeable to PG&E shall be highlighted or clearly delineated.
- 4.2.8 INVOICE DEFICIENCIES: Should PG&E determine that Consultant's invoice does not meet the invoicing requirements of this Contract, PG&E will notify Consultant of the deficiencies or return the invoice to Consultant with noted deficiencies. Consultant shall provide to PG&E such documents or information correcting such deficiencies, or for invoices returned to Consultant, Consultant shall resubmit a corrected invoice.
- 4.2.9 FINAL INVOICE: The final invoice shall be marked "FINAL" and must be received by PG&E within Sixty (60) calendar days after completion of the Work. PG&E will not be liable for payment of any late invoices that are received by PG&E beyond the Sixty (60) day period.
- 4.2.10 UNIT PRICE BASIS: When invoices include Work performed on a unit price basis, Consultant shall attach to the invoice a list stating the unit price item numbers, unit prices, quantities, dollar amounts and other information as required to identify the Work.
- 4.2.11 PG&E PAYMENT: Payment by PG&E to Consultant for Work performed on a time and materials or unit price basis will be monthly, in the full amount due for Work performed less any negotiated percentage withholding, computed in accordance with the terms of the Contract, and satisfactorily completed during each month including reimbursable expenses, if any. After receipt and approval of the Consultant's itemized invoice, PG&E reserves the right to discount payment(s) to Consultant by Two (2) percent of the invoice total amount for payment(s) made to Consultant within Fifteen (15) days; or payable to Consultant within Forty-Five (45) days. Payment of any remaining balance of the amount due will occur at the end of the Contract after all Work is satisfactorily completed.

- 5.0 PRIOR WORK: Services performed by Consultant pursuant to PG&E's authorization, but before the execution of this Contract, shall be considered as having been performed subject to the provisions of this Contract.

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- 6.0 NO GUARANTEE OF WORK: THIS IS NOT AN EXCLUSIVE CONTRACT. THIS CONTRACT DOES NOT GUARANTEE THE CONSULTANT ANY WORK NOR IS THERE ANY GUARANTEE AS TO ANY VOLUME OR DURATION OF WORK.
- 7.0 ADDITIONAL WORK OR CHANGES IN WORK
- 7.1 PROCEDURE FOR ADDITIONAL WORK: BEFORE PROCEEDING WITH ANY WORK INVOLVING POSSIBLE CLAIMS FOR EXTRA COMPENSATION NOT SPECIFIED IN THE CONTRACT, CONSULTANT SHALL SUBMIT IN WRITING TO PG&E A DETAILED ESTIMATE OF THE COST FOR SUCH WORK. Consultant shall provide PG&E with a detailed breakdown and estimated cost of such anticipated contract work, including extensions and Change Orders, as follows:
- 7.1.1 Description of work to be performed including detailed breakdown by identifiable tasks.
- 7.1.2 Estimated cost of each task.
- 7.1.3 Expected date of completion of each task.
- 7.2 APPROVAL NEEDED FOR ADDITIONAL WORK: Consultant shall not proceed with any such additional work prior to receiving written authorization or a Change Order issued to Consultant by PG&E. CONSULTANT AGREES THAT ALL COSTS FOR ANY SUCH MODIFICATION OR CHANGE THAT IS PERFORMED BY CONSULTANT WITHOUT PG&E'S PRIOR WRITTEN APPROVAL SHALL BE AT CONSULTANT'S SOLE RISK AND EXPENSE.
- 7.3 PG&E CHANGES TO WORK: PG&E reserves the right to make such changes in Work, specifications, or level of effort, as may be necessary or desirable and any difference in Contract price resulting from such changes shall be approved in writing by PG&E before the Work is begun.
- 8.0 REPLACEMENT OF PERSONNEL
- 8.1 BY CONSULTANT: Consultant acknowledges that in the event that the individuals who are initially assigned by Consultant to perform services under this Contract are removed, replaced or reassigned by Consultant, such removal, replacement, or reassignment may result in serious harm and costs to PG&E. Consultant agrees not to remove, replace or reassign such individuals without the approval of PG&E. Such approval shall not be unreasonably withheld or delayed. Consultant will make reasonable efforts to maintain continuity in its staffing and will provide PG&E with ample notification if any such changes are made. Consultant agrees not to charge PG&E for the time spent in familiarizing replacement personnel with the Work.
- 8.2 BY PG&E: Consultant shall employ personnel qualified to perform the Work. If PG&E finds Consultant's employee to be unsatisfactory, Consultant shall replace that employee within Twenty Four (24) hours of notification. For the avoidance of doubt, this provision addresses only the assignment of personnel to PG&E jobs; it does not require the Consultant to terminate the employment of any employee replaced hereunder, nor does PG&E endorse or approve, either expressly or impliedly, Consultant's termination of any such employee.
- 9.0 SAFETY PRECAUTIONS AND PROTECTION OF PROPERTY: Consultant shall plan and conduct its Work to safeguard persons and property from injury. Consultant shall direct performance of Work in compliance with reasonable safety and work practices and applicable federal, state and local laws, rules and regulations, including but not limited to, "Occupational

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Safety and Health Standards" promulgated by the U.S. Secretary of Labor and the California Division of Occupational Safety and Health. PG&E may designate safety precautions in addition to those in use or proposed by Consultant. PG&E reserves the right to inspect the Work and to halt Work to ensure compliance with reasonable and safe work practices and with applicable federal, state, and local laws, rules and regulations. Neither the requirement that Consultant follow said practices and applicable laws, rules and regulations, and any special instructions given by PG&E nor the adherence thereto by Consultant shall relieve Consultant of the sole responsibility to maintain safe and efficient working conditions.

10.0 **LAWFUL DISPOSAL OF SAMPLED AND OTHER WASTE:** If the scope of Work under this Contract requires Consultant to perform hazardous waste site investigations, the following provisions shall apply:

10.1 PG&E will be responsible for disposal of onsite samples. Charges for disposal of samples taken offsite for testing are included in the Consultant's proposed rates.

10.2 Consultant shall lawfully dispose of all test samples after completion of the required tests, along with any residue or byproducts of the testing process. Consultant shall comply with all of the existing federal, state and local laws, rules, regulations, and/or ordinances applicable to the services to be performed, including but not limited to, to the extent applicable, the Code of Federal Regulations, Title 40, Part 260 et seq. and the California Health and Safety Code, Section 25, 100 et seq., and the Title 22, California Code of Regulations, Section 66,000 et seq.

11.0 **INTELLECTUAL PROPERTY**

11.1 **OWNERSHIP OF DELIVERABLES:** PG&E shall own all data, reports, information, manuals, computer programs or other written, recorded, photographic or visual materials, or other deliverables produced in the performance of this Contract. Consultant shall retain no ownership, interest, or title in them except as may otherwise be provided in the Contract.

11.2 **PROPRIETARY RIGHTS :** PG&E shall own all proprietary rights, including, but not limited to, exclusive patent and copyright rights, in and to any and all inventions, software, works of authorship, designs or improvements of equipment, tools or processes, including the items referenced in the Section titled "Ownership of Deliverables" (collectively, the "Developments"), conceived, developed, implemented, or produced by Consultant in the performance of this Contract, and Consultant shall retain no ownership, interest or title in or to them except as otherwise provided in this Contract. Consultant agrees to assign and hereby assigns all its right, title and interest in and to the patents, copyrights and other intellectual property rights in the Developments and hereby agrees to fully cooperate and to do all things reasonably necessary to allow PG&E to claim sole ownership, including the execution of documents deemed necessary by PG&E.

11.3 **USE AND REPRODUCTION RIGHTS:** If and to the extent that Consultant retains any preexisting rights in any materials furnished hereunder, including Developments, Consultant hereby grants to PG&E the irrevocable, perpetual, non-exclusive, worldwide, royalty free right and license to (i) make, use, execute, reproduce, display, perform, distribute copies of, and prepare derivative works based upon such preexisting rights and derivative works thereof in connection with PG&E's business and (ii) authorize others to do any or all of the foregoing in connection with PG&E's business. Any claims of Consultant to proprietary rights in materials furnished hereunder must be expressly set forth in this Contract or shall have been previously disclosed to PG&E in writing.

11.4 **INFRINGEMENT PROTECTION:** Consultant represents to PG&E that the material to be prepared under this Contract will not infringe upon the copyright, patent or license, or otherwise violate the proprietary rights, including trade secret rights, of any person or entity.

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Consultant agrees to indemnify and hold PG&E, its parent company, subsidiaries and/or affiliates, harmless from and against any and all liabilities, costs and damages arising out of any such infringement, and from any suit, demand or claim made against PG&E, its parent company, subsidiaries and/or affiliates, alleging any such infringement or violation. In addition to the foregoing, if there is such a suit, demand or claim, Consultant agrees, as soon as possible, to either procure for PG&E the right to continue using the material, replace the material with non-infringing material or modify it so it becomes non-infringing; provided, however that the replaced or modified material shall be equal to that contracted for hereunder and satisfactory to PG&E. Consultant further agrees to pay any judgment or reasonable settlement offer resulting from a suit, demand or claim, and pay any reasonable attorney's fees incurred by PG&E in defense against such suit.

- 11.5 COPYRIGHT REGISTRATION: Notice of PG&E copyright ownership shall be placed by Consultant on all reports, information or instructional manuals, computer programs or other written, recorded, photographic or visual materials or other deliverables to which PG&E has the right of such ownership as provided in this Contract. Such notice shall be placed on the materials in a manner and location as to give reasonable notice of the claim of copyright, and shall consist of the copyright symbol or the word "Copyright" followed by the year in which the material is produced and the words "Pacific Gas and Electric Company". Application for copyright registration shall be the responsibility of PG&E.
- 11.6 ROYALTIES AND LICENSE FEES: Royalties, license fees or other charges for patents, copyrights and other intellectual property for designs, processes, technology, published or unpublished data, information or technical materials including, but not limited to, manuals, computer programs, or other deliverables furnished by Consultant, or for processes or methods employed by Consultant in performing the services, shall be included in the Contract price.
- 11.7 DELIVERY AND RETENTION OF RECORDS: To the extent PG&E does not otherwise specifically request delivery of records or results, Consultant agrees to retain all records and results of Work performed under this Contract for a period of not less than two years from the date the Work is accepted by PG&E. At PG&E's request Consultant will deliver a copy of any or all original field notes, investigative notes, tests, photographs, records, calculations, summaries, reports, and records produced and collected in the course of the Work performed under this Contract.
- 11.8 PUBLIC RELEASE OF RESULTS: Consultant agrees not to release any results of the Work without first providing PG&E with the material sought to be released and a description of the publication for PG&E's prior approval. Consultant further agrees that no release shall present any material findings not reasonably inferable from the data. Any public release shall acknowledge PG&E's sponsorship of the Work.
- 11.9 CONSULTANT'S USE OF PG&E PROPERTY: All records, reports, computer programs, written procedures and similar materials, documents or data, in whatever form, provided by PG&E for Consultant's use in the performance of services under this Contract shall remain the confidential property of PG&E and shall be returned to PG&E immediately upon completion of Consultant's use for the performance of the Work or earlier upon the request of PG&E.
- 11.10 CONFIDENTIALITY: In the course of performing the services under this Contract, Consultant may have access to confidential commercial or personal information concerning, but not limited to, California residents, technological, ratemaking, legislative and personnel matters and practices of PG&E, its parent company, subsidiaries, affiliates, or members of the public. Consultant agrees not to disclose any such confidential information or otherwise make it available to any other person, including any affiliate of PG&E that produces energy or energy-related products or services, without the prior written approval of PG&E.

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Consultant shall implement and maintain reasonable security procedures and practices appropriate to the nature of the information, to protect any personal or confidential information from unauthorized access, destruction, use, modification, or disclosure.

11.11 PUBLIC TESTIMONY: It is further agreed between the Parties that, if requested by PG&E, Consultant shall provide testimony before any federal, state or local court, regulatory body or any other public agency to substantiate any Work performed or data, reports, or materials supplied to PG&E. Reasonable fees for such testimony will be negotiated at that time.

12.0 WARRANTY: Consultant warrants to PG&E that the Work under this Contract shall be performed with the degree of skill and care that is required by current, good and sound professional procedures and practices, and in conformance with generally accepted professional standards prevailing at the time the Work is performed so as to ensure that the services performed are correct and appropriate for the purposes contemplated in this Contract and related specifications.

13.0 INDEMNIFICATION, WITHHOLDING AND LIMITATION OF LIABILITY

13.1 INDEMNIFICATION

13.1.1 Consultant shall indemnify, hold harmless and defend PG&E, its affiliates, subsidiaries, parent company, officers, managers, directors, agents, and employees, from and against all claims, demands, losses, damages, costs, expenses, and liability (legal, contractual, or otherwise), which arise from or are in any way connected with any: i) injury to or death of persons, including but not limited to employees of PG&E or Consultant; (ii) injury to property or other interests of PG&E, Consultant, or any third party; (iii) violation of local, state, or federal common law, statute or regulation, including but not limited to environmental laws or regulations; or (iv) strict liability imposed by any law or regulation; so long as such injury, violation, or strict liability (as set forth in (i) - (iv) above) arises from or is in any way connected with Consultant's performance of, or failure to perform, this Contract, however caused, regardless of any strict liability or negligence of PG&E, whether active or passive, excepting only such loss, damage, cost, expense, liability, strict liability, or violation of law or regulation that is caused by the sole negligence or willful misconduct of PG&E, its officers, managers, or employees.

13.1.2 Consultant acknowledges that any claims, demands, losses, damages, costs, expenses, and liability that arise from or are in any way connected with the release or spill of any legally designated hazardous material or waste and arise from or is in any way connected with the Work performed under this Contract, are expressly within the scope of this indemnity. Likewise, the costs, expenses, and legal liability for environmental investigations, monitoring, containment, abatement, removal, repair, cleanup, restoration, remedial work, penalties, and fines arising from strict liability or the violation of any local, state, or federal law or regulation, attorney's fees, disbursements, and other response costs incurred as a result of such releases or spills are expressly within the scope of this indemnity.

13.1.4 TAX WITHHOLDING: Consultant represents and warrants that it will withhold all taxes, if any, which are required to be withheld under applicable law with respect to payments to persons hired by Consultant who perform services for PG&E. Consultant shall indemnify and hold PG&E harmless, on an after-tax basis, for any liability incurred by PG&E as a result of Consultant's failure to institute any such required withholding.

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13.1.5 Consultant shall, on PG&E's request, defend any action, claim, or suit asserting a claim which might be covered by this indemnity, using counsel acceptable to PG&E. Consultant shall pay all costs and expenses that may be incurred by PG&E in enforcing this indemnity, including reasonable attorney's fees. To the extent necessary, each Party was represented by counsel in the negotiation and execution of this Contract.

13.2 LIMITATION OF LIABILITY: TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, PG&E SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES, WHETHER IN CONTRACT, TORT, EQUITY, OR OTHERWISE, FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE, OR EXEMPLARY DAMAGES, EVEN IF SUCH DAMAGES ARE FORESEEABLE, AND REGARDLESS OF WHETHER OR NOT PG&E HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR UNRECOVERED OVERHEAD AND, UNLESS EXPRESSLY AUTHORIZED IN ADVANCE IN WRITING AND SPECIFICALLY ASSUMED BY PG&E, COMMITMENTS TO THIRD PARTIES, SUCH AS SUBCONTRACTS, RENTAL OR LEASE AGREEMENT(S), AND PERSONAL SERVICES CONTRACTS.

14.0 INSURANCE REQUIREMENTS

Consultant shall maintain the following insurance coverage. Consultant is also responsible for its Subcontractors maintaining sufficient limits of the appropriate insurance coverage.

14.1 Workers' Compensation and Employers' Liability

14.1.1 Workers' Compensation insurance or self-insurance indicating compliance with any applicable labor codes, acts, laws or statutes, state or federal, where Consultant performs Work.

14.1.2 Employers' Liability insurance shall not be less than \$1,000,000 for injury or death each accident.

14.2 Commercial General Liability

14.2.1 Coverage shall be at least as broad as the Insurance Services Office (ISO) Commercial General Liability Coverage "occurrence" form, with no coverage deletions.

14.2.2 The limit shall not be less than \$1,000,000 each occurrence/\$2,000,000 aggregate for bodily injury, property damage and personal injury.

14.2.3 Coverage shall: a) By "Additional Insured" endorsement add as insureds PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of or connected with the Work performed by or for the Consultant. (ISO Form CG2010 or equivalent is preferred). In the event the Commercial General Liability policy includes a "blanket endorsement by contract," the following language added to the certificate of insurance will satisfy PG&E's additional insured requirement: "PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of the work performed by or for the Consultant are additional insureds under a blanket endorsement."; b) Be endorsed to specify that the Consultant's insurance is primary and that any insurance or self-insurance maintained by PG&E shall not contribute with it.

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14.3 Business Auto

14.3.1 Coverage shall be at least as broad as the Insurance Services Office (ISO) Business Auto Coverage form covering Automobile Liability, code 1 "any auto."

14.3.2 The limit shall not be less than \$1,000,000 each accident for bodily injury and property damage.

14.4 Professional Liability Insurance

14.4.1 Errors and Omissions Liability insurance appropriate to the Consultant's profession. Coverage shall be for a professional error, act or omission arising out of the scope of services shown in the Contract.

14.4.2 The limit shall not be less than \$1,000,000 each claim/\$2,000,000 aggregate.

14.5 Additional Insurance Provisions

14.5.1 Before commencing performance of Work, Consultant shall furnish PG&E with certificates of insurance and endorsements of all required insurance for Consultant.

14.5.2 Should any of the above described policies be cancelled before the expiration date thereof, the insurer shall deliver notification to PG&E in accordance with the policy provisions.

14.5.3 PG&E uses a third party vendor, Exigis, to confirm and collect insurance documents. Certificates of insurance and endorsements shall be signed and submitted by a person authorized by Consultant's insurer to bind coverage on insurer's behalf, and submitted through the website at:
<https://prod1.exigis.com/pgc> and by telephone at (1) (888) 280-0178.

Certificate Holder:
PG&E Corporation
c/o EXIGIS, LLC
589 8th Ave., 8th floor
New York, NY 10018

A copy of all such insurance documents shall be sent to PG&E's Contract negotiator and/or Contract administrator.

14.5.4 PG&E may inspect the original policies or require complete certified copies at any time.

14.5.5 Upon request, Consultant shall furnish PG&E the same evidence of insurance for its Subcontractors as PG&E requires of Consultant.

15.0 FORCE MAJEURE: Neither PG&E nor Consultant shall be considered in default in the performance of its obligations under this Contract, except obligations to make payments hereunder for Work previously performed, to the extent that the performance of any such obligation is prevented or delayed by any cause, existing or future, which is beyond the reasonable control, and without the fault or negligence, of the affected Party. If either Party claims that performance of its obligations was prevented or delayed by any such cause, that Party shall promptly notify the other Party of that fact, and of the circumstances preventing or delaying

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performance. Such Party so claiming a cause-delayed performance shall endeavor, to the extent reasonable, to remove the obstacles which preclude performance.

16.0 CANCELLATION AND TERMINATION OF CONTRACT

16.1 CANCELLATION FOR CAUSE:

16.1.1 PG&E may, at its option, cancel or suspend this Contract for cause including, but not limited to, the following situations: (1) the failure, refusal or inability of the Consultant to perform the Work in accordance with this Contract for any reason (except as specified in the section titled "Force Majeure"); or (2) Consultant has become insolvent, has failed to pay its bills, or has had checks for payment of its bills returned from suppliers and Subcontractors due to insufficient funds; or (3) a legal action is placed against Consultant which, in PG&E's opinion, may interfere with the performance of the Work; or (4) in PG&E's opinion, the Work will not be completed in the specified time and PG&E has requested Consultant to take steps necessary to accomplish the required progress and completion, and Consultant has failed to do so.

16.1.2 PG&E will be the sole judge whether Consultant is substantially performing Work and services in accordance with this Specification. Consultant shall be liable for additional costs to PG&E arising from cancellation.

16.1.3 In the event of such cancellation, PG&E shall pay Consultant for services satisfactorily performed prior to the date of cancellation. In no event shall PG&E be liable for lost or anticipated profits or overhead on uncompleted portions of the Work. Before PG&E will release final payment, Consultant shall deliver to PG&E any reports, drawings or other documents prepared for PG&E prior to the effective date of such cancellation. Consultant shall not enter into any agreements, commitments or Subcontracts which would incur significant cancellation costs without prior written approval of PG&E. Such written approval is a condition precedent to the payment of any cancellation charges by PG&E.

16.1.4 LABOR DISPUTE: In the event of a labor dispute or strike by Consultant's or its Subcontractors' employees which threatens the progress or cost of Work, or PG&E's labor relations, or which disrupts PG&E's operations, or results in a secondary boycott at PG&E's facilities, PG&E reserves the right to restrict and/or require the additional hiring of Consultant's employees, to suspend or discontinue the Work of the Consultant or any Subcontractor, or cancel the Contract for cause. This paragraph shall be applicable whether or not any Consultant or Subcontractor is directly involved in a labor dispute.

16.2 TERMINATION FOR PG&E'S REASONS: PG&E may suspend or terminate the Contract, without cause and upon written notice to Consultant. Consultant thereupon shall take whatever action with respect to performance of the Work as will tend to minimize its claim against PG&E, if any. In the event of termination, PG&E shall be liable to Consultant only for the compensation earned on the Work performed to the date of termination, plus costs reasonably incurred by Consultant in terminating its operation. Consultant shall not be entitled to any payment for lost or anticipated profits or overhead on uncompleted portions of the Work. Any reports, drawings or other documents prepared for PG&E prior to the effective date of such termination shall be delivered to PG&E by Consultant prior to PG&E's release of its final payment to Consultant.

16.3 COOPERATION: To the extent the work hereunder is to be transitioned to a third party or to PG&E, Consultant shall cooperate to ensure a smooth and effective transition.

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17.0 CODE OF CONDUCT, BUSINESS ETHICS, AND AVAILABILITY OF INFORMATION

- 17.1 CODE OF CONDUCT: CONTRACTOR AND CONTRACTOR'S SUBCONTRACTORS AND THEIR SUPPLIERS AT ALL TIERS SHALL COMPLY WITH PG&E'S CONTRACTOR, CONSULTANT AND SUPPLIER CODE OF CONDUCT IN THE AWARD OF ALL CONTACTS AND SUBCONTRACTS This policy requires that Contractor and Contractor's Subcontractors and suppliers demonstrate a strong commitment to compliance and ethics as a foundation to successful business. Any Work done for PG&E must be completed in full compliance with PG&E's Contractor, Consultant and Supplier Code of Conduct ("Code of Conduct"). Consultant shall access, read and comply with PG&E's Code of Conduct and shall make it available to its Subcontractors and suppliers. The Code of Conduct is available at PG&E's website, www.pge.com, at the following link:

http://www.pge.com/includes/docs/pdfs/b2b/purchasing/contractor_consultant_and_supplier_code.pdf

17.2 CONFLICT OF INTEREST AND BUSINESS ETHICS

- 17.2.1 REASONABLE CARE: Consultant, in its dealings with PG&E under or in connection with the Contract, will act reasonably and in good faith. Consultant shall exercise reasonable care and diligence to prevent any actions or conditions which could result in a conflict with PG&E's interest.
- 17.2.2 OTHER EMPLOYMENT: During the term of this Contract, Consultant or its employees will not accept any employment or engage in any work which creates a conflict of interest with PG&E or in any way compromises the performance and completion of Work to be performed under this Contract.
- 17.2.3 GIFTS: Consultant or its employees shall not offer or cause to be offered gifts, entertainment, payments, loans and/or other services, benefits or considerations of more than a nominal value to PG&E's employees, their families, vendors, Subcontractors and other third parties.
- 17.2.4 ACCURATE DOCUMENTATION: All financial statements, reports, billings, and other documents rendered shall properly reflect the facts about all activities and transactions handled for the account of PG&E.
- 17.2.5 NOTIFICATION: The Consultant shall notify PG&E of any and all violations of this clause within three (3) business days after such violation is brought to Consultant's attention.

17.3 AVAILABILITY OF INFORMATION

- 17.3.1 ACCESS: PG&E's duly authorized representatives shall have, during the term of the Contract and for Three (3) years thereafter, access at all reasonable times to all of the Consultant's and its Subcontractors' personnel, accounts and records of all description, including but not limited to computer files, pertaining to the Contract to verify or review the quantity, quality, work program and progress of the Work, reimbursable costs, amounts claimed by the Consultant, estimates of cost for fixed rates including those applicable to proposed changes, and for any other reasonable purposes including any and all records of the Consultant for the purpose of verifying compliance with the section concerning CONFLICT OF INTEREST AND BUSINESS ETHICS.

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- 17.3.2 **APPLICABILITY:** This AVAILABILITY OF INFORMATION provision shall apply to all PG&E contracts but shall not apply to pricing for contracts performed solely on a lump-sum basis. However, where lump-sum and time and materials work (including unit price, reimbursable cost, fixed rates, etc.) are performed together, either as a part of this Contract or as separate contracts, then the above audit right shall also extend to PG&E's access to all Consultant's records pertaining to all PG&E contracts, including the lump-sum, for assurance that the portions of the Work performed on a time and materials basis are not being charged with time, material or other units or cost which are intended to be covered by lump-sum or fixed rates, etc., provided under this Contract, including Change Orders, or other agreements.
- 17.3.3 **ACCOUNTING:** The Consultant's and its Subcontractors' accounts shall be kept in accordance with generally accepted accounting principles in the particular industry and shall be kept in such a manner and in sufficient detail to clearly disclose the nature and amounts of the different items of service and cost pertaining to the Contract and the basis for charges or allocations to the Contract.
- 17.3.4 **ADJUSTMENTS:** Consultant shall promptly adjust any inaccuracy in the billings. Adjustments shall accrue interest, compounded monthly, at a rate equal to the prime rate charged by the Bank of America, NT&SA, San Francisco, California, at the beginning of each month, from the date of payment of the invoice being adjusted to the date that the adjustment is paid.
- 17.3.5 **TIME PERIOD:** The Consultant and its Subcontractors shall preserve all such accounts and records for a period of three years after the term of the Contract. PG&E's duly authorized representatives shall have the right to reproduce any such accounts and records
- 17.3.6 **SUBCONTRACTORS:** The Consultant shall include the necessary provisions in its Subcontracts to ensure that its Subcontractors comply with this Article.

18.0 SUPPLIER DIVERSITY AND EQUAL OPPORTUNITY

- 18.1 **PG&E'S SUPPLIER POLICY:** It is PG&E's policy that Women, Minority, and Disabled Veteran Business Enterprises (WMDVBES) shall have the maximum practicable opportunity to participate in providing the products and services it purchases.
- 18.1.1 For all Contracts, the Consultant agrees to comply, and to require all Subcontractors and sub-subcontractors to comply, with PG&E's Supplier Diversity Policy, as set forth in Exhibit 1 hereto. The Consultant shall provide to each prospective Subcontractor a copy of Exhibit 1.
- 18.1.2 In addition, for Contracts exceeding \$500,000 (or \$1 million for construction contracts), the Consultant must comply with the Policy Regarding Utilization of Small Business Concerns and Small Disadvantaged Business concerns, as described in Exhibit 2 hereto. The Subcontracting Plan for these contracts must include provisions for implementing the terms prescribed in Exhibit 2.
- a. Small Business, and Small Disadvantaged Business Subcontracting Plans are not required for small business contractors, personal service contracts, contracts that will be performed entirely outside of the United States and its territories, or modifications to existing contracts which do not contain subcontracting potential.

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- 18.1.3 For all Contracts, the Consultant shall act in accordance with the Subcontracting Plan in the performance of the Work and in the award of all Subcontracts.
- 18.1.4 All Bidders must describe with their submission how they will comply with the mandatory requirements of Exhibit 1. The requirements of Exhibit 1 and the successful Bidder's response will be incorporated into the Contract.
- 18.1.5 Each proposal will be evaluated using a formula of weighted and defined criteria including the strength of its proposed compliance with PG&E's Supplier Diversity Policy.
- 18.2 FEDERAL EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION REGULATIONS POLICY: During the performance of this Contract and to the extent they may be applicable, Consultant agrees to comply with all laws, orders, and regulations included by summary or reference in the following paragraphs:
 - 18.2.1 Executive Order 11246, 41 CFR Part 60-1.4: Equal Opportunity Clause.
 - 18.2.2 Executive Order 11246, 41 CFR Part 60-1.8: Nonsegregated Facilities.
 - 18.2.3 Vietnam Era Veterans' Readjustment Assistance Act of 1974, 41 CFR Part 60-250.5.a: Equal Opportunity Clause.
 - 18.2.4 Vietnam Era Veterans' Readjustment Assistance Act of 1974, 41 CFR Part 60-300.5.a: Equal Opportunity Clause.
 - 18.2.5 Section 503 of the Rehabilitation Act of 1973, 41 CFR Part 60-741.5.a: Equal Opportunity Clause.
- 19.0 INJURY AND ILLNESS PREVENTION PROGRAM: In the performance of the Work under this Contract, Consultant acknowledges that it has an effective Injury and Illness Prevention Program which meets the requirements of all applicable laws and regulations, including but not limited to Section 6401.7 of the California Labor Code. Consultant shall ensure that any Subcontractor hired by Consultant to perform any portion of the Work under this Contract shall also have an effective Injury and Illness Prevention Program. If the Consultant has any employees in California, even if those employees do not perform Work under this Contract, the attached Compliance Certificate (Exhibit 3) shall be executed by the person with the authority and responsibility for implementing and administering such Injury and Illness and Prevention Program.
- 20.0 PG&E DRUG AND ALCOHOL ABUSE POLICY: PG&E is committed to maintain and promote job safety and health for all workers at its facilities. In addition, PG&E is determined to protect its employees, customers, and the general public while they are on PG&E property from any harm caused by illegal drug and alcohol use by non-PG&E personnel. To accomplish these objectives, PG&E has established a drug and alcohol policy for access to PG&E facilities by its Consultant and Subcontractor personnel. If any personnel of Consultant or its approved Subcontractors perform any Work or services at PG&E offices and/or other PG&E facilities, then Consultant shall comply with PG&E's Drug and Alcohol Abuse and Testing Policies, attached as Exhibit 4 to these General Conditions.
- 21.0 GENERAL PROVISIONS
 - 21.1 COMPLIANCE WITH LAWS: Consultant shall comply with all applicable federal, state and local laws, rules and regulations, and shall obtain all applicable licenses and permits for the conduct of its business and the performance of the Work called for in this Contract. Consultant shall comply with all environmental and endangered species requirements and shall conduct its operations in a manner that complies with applicable programs and permits. To the extent Consultant's work is subject to PG&E-specific environmental permits or programs, PG&E will provide Consultant with such permit or program requirements. Unless prohibited by law, Consultant shall hold PG&E harmless

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from any liability, fine or penalty incurred as a result of Consultant's failure to comply with applicable legal and regulatory requirements.

- 21.2 REPORTING: In accordance with Section 7912 of the California Public Utilities Code, Consultant agrees to report annually to PG&E the number of California residents employed by Consultant, calculated on a full-time or full-time equivalent basis, who are personally providing services to PG&E.
- 21.3 CHOICE OF LAWS: This Contract shall be construed and interpreted in accordance with the laws of the State of California, excluding any choice of law rules which may direct the application of the laws of another jurisdiction. Any controversy or claim arising out of or in any way relating to this Contract which cannot be amicably settled without court action shall be litigated in a California State Court of competent jurisdiction; or if jurisdiction over the action cannot be obtained in a California State Court, in a Federal Court of competent jurisdiction situated in the State of California.
- 21.4 DISPUTE RESOLUTION
- 21.4.1 PROCEDURE: The Parties shall attempt in good faith to resolve any dispute arising out of or relating to this Contract promptly by negotiations between a vice president of PG&E or his or her designated representative and an executive of similar authority of Consultant. Either Party may give the other Party written notice of any dispute. Within twenty (20) days after delivery of said notice, the executives shall meet at a mutually acceptable time and place, and thereafter as often as they reasonably deem necessary to exchange information and to attempt to resolve the dispute. If the matter has not been resolved within thirty (30) days of the first meeting, either Party may initiate a mediation of the controversy.
- 21.4.2 CONFIDENTIALITY: All negotiations and any mediation conducted pursuant to this clause are confidential and shall be treated as compromise and settlement negotiations, to which Section 1119 of the California Evidence Code shall apply, and Section 1119 is incorporated herein by reference.
- 21.4.3 PRELIMINARY INJUNCTION: Notwithstanding the foregoing provisions, a Party may seek a preliminary injunction or other provisional judicial remedy if in its judgment such action is necessary to avoid irreparable damage or to preserve the status quo.
- 21.4.4 CONTINUATION OF WORK: Each Party shall continue to perform its obligations under this Contract pending final resolution of any dispute arising out of or relating to this Contract.
- 21.5 HAZARDOUS MATERIALS: The California Health and Safety Code requires businesses to provide warnings prior to exposing individuals to materials listed by the Governor as chemicals "known to the State of California to cause cancer, birth defects or reproductive harm." PG&E uses chemicals on the Governor's list at many of its facilities. In addition, many of these chemicals are present at non-PG&E-owned facilities and locations. Accordingly, in performing the Work or services contemplated under this Contract, Consultant, its employee, agents, and Subcontractors may be exposed to chemicals on the Governor's list. Consultant is responsible for notifying its employees, agents, and Subcontractors that Work performed hereunder may result in exposures to chemicals on the Governor's list.
- 21.6 NON-WAIVER: The waiver by either Party of any breach of any term, covenant or condition contained in this Contract, or any default in the performance of any obligations under this Contract, shall not be deemed to be a waiver of any other breach or default of

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the same or any other term, covenant, condition or obligation. Nor shall any waiver of any incident of breach or default constitute a continuing waiver of the same.

- 21.7 ENFORCEABILITY: In the event that any of the provisions, or application of any of the provisions, of this Contract are held to be illegal or invalid by a court of competent jurisdiction or arbitrator/mediator, PG&E and Consultant shall negotiate an equitable adjustment in the provisions of this Contract with a view toward effectuating the purpose of this Contract. The illegality or invalidity of any of the provisions, or application of any of the provisions, of this Contract will not affect the legality or enforceability of the remaining provisions or application of any of the provisions of the Contract.
- 21.8 INTEGRATION: This Contract constitutes the entire agreement and understanding between the Parties as to the subject matter of the Contract. It supersedes all prior or contemporaneous agreements, commitments, representations, writings, and discussions between Consultant and PG&E, whether oral or written, and has been induced by no representations, statements or agreements other than those expressed herein. Neither Consultant nor PG&E shall be bound by any prior or contemporaneous obligations, conditions, warranties or representations with respect to the subject matter of this Contract.
- 21.9 SURVIVAL: The provisions of this Contract which by their nature should survive expiration, cancellation or other termination of this Contract, including but not limited to provisions regarding warranty, indemnity, insurance, confidentiality and availability of information, shall survive such expiration, cancellation or other termination.

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EXHIBIT 1

EXHIBIT 1

PG&E'S SUPPLIER DIVERSITY PURCHASING POLICY

CONTRACTOR AND SUBCONTRACTORS OF ALL TIERS MUST COMPLY WITH PG&E'S SUPPLIER DIVERSITY PURCHASING POLICY IN THE AWARD OF ALL SUBCONTRACTS. This policy requires that Small, Women, Minority, and Disabled Veteran Business Enterprises (WMDVBEs) shall have the maximum practicable opportunity to participate in the performance of Work.¹

1. Contractor shall provide to each prospective Subcontractor a copy of this Exhibit.
2. Contractor shall provide a separate, signed Prime Supplier Plan consisting of a specific list of Subcontractors that will participate in the performance of the Work and a statement setting forth the Contractor's goals for WMDVBE subcontracting of all tiers and setting forth such additional good faith efforts Contractor and Subcontractors will employ to increase the participation of WMDVBE in the performance of the Work.
3. No later than the 10th of each month, Contractor shall submit its subcontracting spend with women, minority, and service disabled veteran owned suppliers direct payments to their diverse subcontractors using PG&E's electronic reporting system located at:
<https://www.pgesupplierdiversity.com/pge/login.asp>
 - a. To establish a user ID, Contractor shall submit a request via email to the following address: supplierdiversityteam@pge.com
4. In addition, for contracts exceeding \$500,000 (or \$1 million for construction contracts), the Contractor must comply with the Policy Regarding Utilization of Small Business Concerns and Small Disadvantaged Business Concerns, as described in Exhibit 1A. The Prime Supplier Plan for these contracts must include provisions for implementing the terms prescribed in Exhibit 1A.
 - a. Small Business and Small Disadvantaged Business Prime Supplier Plans are not required for small business contractors, personal service contracts, contracts that will be performed entirely outside of the United States and its territories, or modifications to existing contracts which do not contain subcontracting potential.
 - b. For all PG&E contracts, the Contractor shall act in accordance with the Prime Supplier Plan in the performance of the Work and in the award of all Subcontracts.
5. Contractor's **supplier diversity subcontracting goal** for this Contract is ____%. Contractor shall report its supplier diversity goal as Contractor's spend with verified WMDVBE Subcontractors on PG&E Work under this Contract.

¹ WMDVBEs must be verified pursuant to the procedures prescribed in Section 2 of CPUC General Order 156.

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**Pacific Gas and
Electric
Company**

List of Subcontractors and Disbursement Record

01-5873 (Rev 11/08)
Sourcing
Page 1 of 2

EXHIBIT 1-A

Prime Contractor/Supplier:	Name of Preparer:
PG&E Contract Number (if any):	Telephone: ()
PG&E Project/Product:	E-Mail:
Contract Duration (Year):	Total Bid Value:
From:	To:

Name of Subcontractor (1)	WMDVBE Status Code*	V** (3)	NV*** (4)	Address (5)	Description of Work (6)	Estimated Amount to be Paid to Subcontractors (7)
* Refer to Instructions/Codes/Definitions on back. ** V = Subcontractor is a verified WMDVBE.				(8) Estimated Total Amount to be Paid to All Verified WMDVBE Subcontractor(s):		
*** NV = Subcontractor is <u>not</u> a verified a verified WMDVBE				(9) Total Bid Value:		
				(10) Estimated Percentage to be Paid to All Verified WMDVBE Subcontractor(s) (a+b):		

Signature: _____

/ Date

I hereby verify that the listed information is true and accurate to the best of my knowledge.

The successful bidder(s) will be expected to register and report all monthly subcontracting spending with verified WMDVBE subcontractors at www.pgsupplierdiversity.com for the duration of the contract.

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Page 2 of 2

STEP-BY-STEP INSTRUCTIONS

Complete column numbers 1-10 and return this form with your bid proposal (Please attach copies of diverse Subcontractors certifications with your bid proposal).

- (1) Include the complete name of the subcontractor.
- (2) Indicate the supplier's minority code (see definitions and codes below).
- (3) Place a "V" in the box if the subcontractor is a **verified** WBE or MBE supplier by the CPUC Clearinghouse or a **verified** DVBE certified by the Department of General Services.
- (4) Place a "NV" in the box if the subcontractor is **not verified**.
- (5) Include the address, city, state and zip of the subcontractor.
- (6) Describe the work that the subcontractor will be performing.
- (7) Indicated the estimated amount to be paid to each subcontractor for the duration of the contract.
- (8) Indicate the estimated total amount to be paid to all **verified** subcontractors for the duration of the contract.
- (9) Indicate the proposed bid value.
- (10) Indicate the percentage of the bid value to be paid to all verified subcontractors. Divide the estimated dollars to be paid to all **verified** WMDVBE subcontractors by the total bid value.

DEFINITIONS AND CODES

WBE	Women Business Enterprise: A business enterprise that is at least 51 percent owned by a woman or women, or, in the case of any publicly-owned business, at least 51 percent of the stock of which is owned by one or more women, and whose management and daily business operations are controlled by one or more of those individuals												
MBE	Minority Business Enterprise: A business enterprise that is at least 51 percent owned by a minority group or groups, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more minority-group individuals, and whose management and daily business operations are controlled by one or more of those individuals.												
	Minority Status:	001	African American Male	008	Hispanic American Female	009	Caucasian Male	010	Caucasian Female	011	Multi- Status	012	Other Groups
		002	African American Female							013	Small Business Enterprise	014	Service Disabled Veteran Business Enterprise
		003	Asian Pacific American Male										
		004	Asian Pacific American Female										
		005	Native American Male										
		006	Native American Female										
		007	Hispanic American Male										
African Americans	Persons having origins in any black racial groups of Africa.												
Asian Pacific Americans	Persons having origins in Asia or the Indian Subcontinent, including, but not limited to, persons from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, Taiwan, India, Pakistan, and Bangladesh.												
Native Americans	Persons having origin in any of the original peoples of North America or the Hawaiian Islands, in particular, American Indians, Eskimos, Aleuts, and Native Hawaiians.												
Hispanic Americans	All persons of Mexican, Puerto Rican, Cuban, South or Central American, Caribbean, or other Spanish culture or origin.												
Caucasian	Includes all people of European and North African descent.												
Multi-Status	An enterprise that is wholly owned and controlled by a combination of minorities or women but whose majority ownership (at least 51%) is not vested with any one of these individuals.												
Other Groups	Groups whose members are found to be socially and economically disadvantaged by the Small Business Administration pursuant to Section 8 (d) of the Small Business Act as amended (15 U.S.C. 637 (d)), or by the Secretary of Commerce pursuant to Section 5 of Executive Order 11625.												
Small Business Enterprise (SBE)	A business defined pursuant to Section 3 of the Small Business Act (SBA) and relevant regulations pursuant thereto. If unsure, please contact your local Small Business Administration office for clarification.												
Service Disabled Veterans Business Enterprise (DVBE)	Has the same meaning as defined in subdivision (g) of the Military and Veterans Code and must meet the "Control" and "Operate" criteria. An enterprise which is 51 percent owned, or the stock is 51 percent owned, by one or more disabled veterans.												

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EXHIBIT 2

**POLICY REGARDING UTILIZATION OF SMALL BUSINESS CONCERNS AND
SMALL DISADVANTAGED BUSINESS CONCERNS**

The following policy of the United States shall be adhered to in the performance of this Contract:

- a) It is the policy of the United States that small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals shall have the maximum practicable opportunity to participate in performing contracts let by any Federal Agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals.
- b) Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of Contractor's compliance with this clause.
- c) As used in this Contract, the term "small business concern" shall mean a small business as defined in Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals" shall mean a small business concern (1) which is at least 51 percent unconditionally owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 percent of the stock of which is unconditionally owned by one or more socially and economically disadvantaged individuals; and (2) whose management and daily business operations are controlled by one or more of such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one of these entities which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirement of 13 CFR Part 124. Contractor shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, and other minorities, or any other individual found to be disadvantaged by the Administration pursuant to Section 8(a) of the Small Business Act. Contractor shall presume that socially and economically disadvantaged entities also include Indian Tribes and Native Hawaiian Organizations.
- d) Contractor acting in good faith may rely on written representations by its subcontractors regarding their status as either a small business concern or a small business concern owned and controlled by socially and economically disadvantaged individuals.²

EXHIBIT 3

**INJURY AND ILLNESS PREVENTION PROGRAM
Compliance Certificate**

The undersigned, the _____ of
(title/position)

_____, (Consultant), hereby certifies to PG&E as follows:
(name of Consultant)

1. That Consultant has an effective Injury and Illness Prevention Program which meets the requirements of all applicable laws and regulations, including but not limited to Section 6401.7 of the California Labor Code and that any Subcontractor hired by Consultant to perform any portion of the Work under this Contract has an effective Injury and Illness Prevention Program; and
2. That he or she is the person with the authority and responsibility for implementing and administering Consultant's 's Injury and Illness Prevention Program.

IN WITNESS WHEREOF, the undersigned has executed this Compliance
Certificate on _____

Signature

Print Name

EXHIBIT 4

**PG&E DRUG AND ALCOHOL
ABUSE AND TESTING POLICIES**

- 1.0 PREFACE: PG&E is committed to maintain and promote job safety and health for all workers at its facilities. In addition, PG&E is determined to protect its employees, customers, and the general public while they are on PG&E property from any harm caused by illegal drug and alcohol use by non-PG&E personnel. To accomplish these objectives, PG&E has established the following drug and alcohol policy for access to PG&E facilities by its Contractor and Subcontractor personnel.
- 2.0 COVERAGE: This policy applies to the personnel of all PG&E Contractors and Subcontractors performing any work or services at PG&E offices and/or any other PG&E facilities.
- 3.0 POLICY: PG&E may deny access to, or remove from, its facilities the personnel of any Contractor or Subcontractor, who PG&E has reasonable grounds to believe has:
 - 3.1 Engaged in alcohol abuse or illegal drug activity which in any way impairs PG&E's ability to maintain safe work facilities, to protect the health and well-being of PG&E employees, customers, and the general public, and to promote the public's confidence in PG&E's service and operations; or
 - 3.2 Been found guilty, pled guilty, or pled nolo contendere to a charge of sale or distribution of any illegal drug or controlled substance as defined under Federal or California law within the past five years, unless the criminal record was later expunged or sealed by a court order.
- 4.0 PROHIBITED ACTIVITIES: The following activities are prohibited at all facilities owned or leased by PG&E:
 - 4.1 Possessing, furnishing, selling, offering, purchasing, using or being under the influence of illegal drugs or other controlled substances as defined under Federal or California law;
 - 4.2 Possessing, furnishing, selling, offering, or using alcoholic beverage, or being under the influence of alcohol.
- 5.0 ACTIONS: Where reasonable cause exists that paragraph 18.4 of this policy has been violated, the Contractor or Subcontractor must inform the PG&E representative responsible for the Contract. The Contractor or Subcontractor is also expected to take any or all of the following actions to the fullest extent they are permitted under governing collective bargaining agreements and/or its applicable security and human resources policies.
 - 5.1 Search the individual, his or her vehicle, locker, storage area, and personal effects;
 - 5.2 Require the individual to undergo a medical examination to determine their fitness for duty. Such examination shall include obtaining a urine and/or blood specimen for drug or alcohol analysis unless the examining physician deems such tests to be inappropriate;
 - 5.3 Take any other appropriate action to determine if there has been a violation of paragraph 18.4. Refusal to comply with a request made under this paragraph shall be grounds for denying access to, or immediate removal from, any PG&E facility.
- 6.0 PERMISSION TO RE-ENTER: Any individual who has been denied access to, or removed from, PG&E facilities or violating this policy may obtain permission to enter or reenter provided the individual establishes, to the satisfaction of his or her employer and PG&E, that the previous activity which formed the basis for denying access or removal has been corrected and his or her future conduct will conform with this policy. PG&E retains the right of final approval for the entry or reentry of any individual previously denied access to or removed from PG&E facilities.



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-212
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX I
ATTACHMENT 2
SPECIFICATION FOR INDEPENDENT EVALUATOR SERVICES

CONFIDENTIAL

Attachment No. 1 Specific Conditions



**PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA**

SPECIFICATION

for

Independent Evaluator Services

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Attachment 1: SPECIFIC CONDITIONS

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Attachment 2: CONSULTING SERVICES GENERAL CONDITIONS

SPECIFIC CONDITIONS

(hereinafter referred to as "Consultant") located at _____ and
PACIFIC GAS AND ELECTRIC COMPANY (hereinafter referred to as "PG&E"), a California
corporation, whose corporate offices are located at 77 Beale Street, San Francisco, CA 94105,
agree as follows:

1.0 GENERAL AND PURPOSE

This Contract is to establish the terms and conditions for Consultant to
and as described in Section 4.0, Scope of Work, of the Specific Conditions (hereinafter referred to
as "Work") on as needed basis. Work shall comply with the requirements of this Specification. In
the event that PG&E shall desire the performance of Work by Consultant, the Work will be
described in detail in the form of a Contract Work Authorization ("CWA") and in accordance with
Section 3.0, Contract Work Authorization Process, of these Specific Conditions. Consultant agrees
that all Work shall be performed as outlined in the Specific Conditions and the General Conditions,
attached and made part of the Contract, and each specific CWA that PG&E issues hereunder.

- 1.1 Consultant shall coordinate Work with PG&E Work Supervisor during project bid solicitation
to ensure that PG&E's competitive bid process is transparent to Consultant. This Contract is
effective for the period of time specified in Section 7.0, Term of Contract, of the Specific
Conditions. Any amendment related to the services provided in this Contract must be
authorized by the issuance and execution of a Contract Change Order by both Consultant
and PG&E prior to performance of the amended services defined in this Contract.
- 1.2 It is mutually agreed that no funds have been committed or will be paid by PG&E upon
execution of the Contract.
- 1.3 **NON-EXCLUSIVITY: THE PARTIES AGREE THAT THIS CONTRACT DOES NOT
ESTABLISH AN EXCLUSIVE CONTRACT BETWEEN PG&E AND CONSULTANT NOR
CONSTITUTE A COMMITMENT BY PG&E, WHETHER EXPRESSED OR IMPLIED, TO
CONTRACT WITH CONSULTANT TO PERFORM OR SUPPLY ANY WORK; NOR IS
THERE ANY GUARANTEE AS TO VOLUME OF WORK OR THE DURATION OF THIS
CONTRACT. PG&E EXPRESSLY RESERVES ALL ITS RIGHTS, INCLUDING BUT NOT
LIMITED TO THE FOLLOWING: THE RIGHT TO UTILIZE OTHERS TO PERFORM OR
SUPPLY WORK OF THE TYPE CONTEMPLATED BY THE CONTRACT; THE RIGHT TO
REQUEST PROPOSALS FROM OTHERS WITH OR WITHOUT REQUESTING
PROPOSAL(S) FROM CONSULTANT FOR WORK OF THE TYPE CONTEMPLATED BY
THE CONTRACT AND THE UNRESTRICTED RIGHT BY PG&E TO BID OR PERFORM
ANY SUCH WORK.**

2.0 DEFINITIONS

The definitions in Section 1.0, Definitions, of the General Conditions are supplemented with the
following:

- 2.1 **Bidder:** Participant in a competitive solicitation for power contracts pursuant to CPUC
Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 conducted by PG&E.
- 2.2 **PG&E Work Supervisor:** PG&E's employee or agent representing PG&E's interest in
connection with the Work described in this Contract to be issued under this Contract and who
has ultimate oversight and approval over Work pertaining to the Contract, monitoring
Contract expenditures and authorizing invoice payments.
- 2.3 **PRG:** PG&E's Procurement Review Group, established by the CPUC to oversee PG&E's
procurement strategy, processes, and contracts.

2.4 **Supplier:** Vendor of services and/or products to PG&E.

3.0 CONTRACT WORK AUTHORIZATION PROCESS

Consultant agrees to perform the Work in accordance with the terms and conditions set forth in the Contract. Any CWA that PG&E may issue under this Contract will provide more detailed information for Consultant. The process that Consultant shall follow in performing Work is outlined below. A sample CWA form is incorporated herein as Exhibit A.

3.1 When PG&E has identified a potential need for Consultant's services under the Contract, the PG&E Work Supervisor will first submit to the Consultant a written or verbal request for proposal soliciting Consultant's estimates for performing the proposed Work. PG&E's request for proposal will include but is not limited to the following:

- description of Work,
- location of Work,
- start date, timeline, end date, deliverables and associated deliverable due dates,
- acceptance criteria
- performance criteria or guarantees
- Consultant responsibilities
- PG&E's responsibilities
- industry standard to be followed
- special qualification for the Consultant employee(s) performing the Work
- special conditions to be considered
- special equipment or software required to perform Work
- maximum not-to-exceed amount on Time and Material basis or fixed price amount on Lump Sum basis for Work to be performed
- and other requirements as appropriate for the Work.

3.1.1 Consultant acknowledges that PG&E may elect to solicit proposals from other sources for the same proposed Work.

3.2 Within the timeframe specified in PG&E's request for proposal, Consultant shall provide PG&E Work Supervisor with a copy of Consultant's proposal for the performance of the Work. The proposal shall include a detailed breakdown as follow:

3.2.1 Consultant's estimated costs including labor, materials, and other direct project expenses.

3.2.2 Consultant's work schedule shall include work completion dates. Consultant shall note any proposed changes to, or problems meeting, PG&E's proposed schedule, and explain in writing why the changes are being proposed.

3.2.3 Consultant shall list all pre-existing rights to any materials to be utilized for specific CWA.

3.3 PG&E will review Consultant's proposal. If necessary, PG&E Work Supervisor will discuss with the Consultant any modifications or changes to the proposal. If PG&E Work Supervisor recommends authorizing Consultant to perform the services and tasks, then PG&E Work Supervisor will order the services in writing using a CWA, authorizing Consultant to commence with the Work.

3.4 Each CWA issued will include the detailed description of the Work to be performed by Consultant; specific Work location(s); required start and completion date, deliverables and other requirements as appropriate for the Work.

3.4.1 Each CWA will state:

- A maximum not-to-be exceeded amount for Work to be performed on a Time and Material basis, or
- A fixed price amount for work to be performed on a Lump Sum basis, or
- A combination of both

3.4.2 Each CWA will state all of Consultant's pre-existing rights to any materials furnished thereunder.

- 3.5 Consultant shall not commence Work until a CWA has been fully executed by both parties. Consultant's acceptance will be noted by signing a copy of the CWA and returning it to PG&E by electronic or facsimile transmission. Work shall be completed in accordance with the terms specified in the CWA. Time is of the essence in Consultant's performance of the Work.
- 3.6 Any Work performed by Consultant prior to approval by PG&E Work Supervisor and the signing by both parties of a CWA shall be at Consultant's risk.
- 3.7 Changes to an executed CWA shall be prepared and approved in the same manner as an original CWA, with both parties signing the amended CWA.
- 3.8 CWAs which are executed pursuant to this Contract and which have completion dates beyond the completion date of the Contract shall continue to be governed by the terms of the Contract until the expiration of such CWAs.
- 3.9 THE TERMS AND CONDITIONS OF THIS CONTRACT SHALL APPLY INDEPENDENTLY TO EACH CWA ISSUED UNDER THIS CONTRACT.
- 3.10 THE TERMS AND CONDITIONS OF THIS CONTRACT SHALL NOT BE MODIFIED IN WHOLE OR IN PART, NOR SHALL ANY SUCH PURPORTED MODIFICATION OR CHANGE BE BINDING OR EFFECTIVE, BY THE USE OF ANY CWA.

4.0 SCOPE OF WORK

5.0 CONSULTANT RESPONSIBILITIES

- 5.1 When providing Work as described in this Contract for PG&E, Consultant shall not perform any activity other than those listed above without the express prior written consent of PG&E.
- 5.2 In performing Work described in this Contract, Consultant will be provided access to any and all of PG&E's data and evaluation models used in the solicitation, and all communications between PG&E, Suppliers and Bidders. Consultant shall treat such information as confidential and in accordance with Section 11, Confidentiality, of the Specific Conditions.
- 5.3 In performing Work as described in this Contract, if Consultant perceives he is the target of any attempt to improperly influence, pressure, or otherwise affect is finding – whether by PG&E, any Bidder, any market participant, any individual member of the PRG, or any other party whatsoever, Consultant shall immediately notify the PRG of such attempt.
- 5.4 SUBCONTRACTOR: Assignment of part or parts of the Work pursuant to this Contract to Subcontractor(s) shall be in accordance with Section 3.0, Subcontract, of the General Conditions. Consultant shall obtain approval of assignment from PG&E Work Supervisor. The assigning or subcontracting of any such Work shall not relieve the Consultant of any of its liabilities under this Contract.
- 5.4.1 Consultant shall submit a list of all proposed Subcontractor(s) in the performance of Work prior to the beginning of Work. PG&E reserves the right to refuse any person, organization or subcontractor to participate in the performance of Work. PG&E shall not honor any claims arising from PG&E exercising this right of refusal.

5.4.2 Consultant shall ensure that Subcontractor(s) shall comply with this Contract and shall perform the Work in accordance therewith. Without limiting the foregoing, Subcontractors shall, for example, have the required credentials to perform Work (e.g. capability of performing independent market valuation of renewable energy contracts, substantial prior experience with electric procurement, power generation technologies, and the economics of generation and power markets); shall provide insurance of the same type and limits as required of Consultant (See Section 30.0, Insurance, of the General Conditions), unless otherwise authorized in writing by PG&E; and shall abide by provision of Section 11.0, Confidentiality, of the Specific Conditions.

5.4.3 Subcontractor(s) shall be responsible to the Consultant, and Work performance by the Subcontractor(s) shall be the sole responsibility of the Consultant; however, PG&E Work Supervisor, and/or PG&E personnel authorized by PG&E Work Supervisor shall have the privilege and rights provided under the Contract governing the Work of the Consultant. Nothing in this Contract shall create any contractual relationship between a Subcontractor and PG&E.

5.5 CONSULTANT VALUES: PG&E places high value on our Customers, employees and shareholders; the environment; safety; continuous improvement; and conducting business in an ethical manner, as stated in Exhibit B, Contractor Values and Section 4.0 of the General Conditions. We expect Consultant and its Subcontractor working for PG&E to do the same.

6.0 PG&E'S RESPONSIBILITIES

6.1 PG&E Work Supervisor identified in each CWA will be the point of contact for Consultant.

6.2 PG&E Work Supervisor will confirm Consultant invoices and approve payments.

7.0 TERM OF CONTRACT

7.1 The effective date of this Contract is the execution of Contract by both parties and shall expire

7.2 MODIFICATION TO A CONTRACT: As set forth in Section 10, Amendments, of the General Conditions and reiterated here to reinforce the point, changes to an executed Contract shall be in the form of a Contract Change Order with both parties signing the Contract Change Order.

8.0 PAYMENT TERMS

8.1 COMPENSATION: Work performed by Consultant under the Contract shall be compensated on Time and Materials as set forth in Consultant Hourly Rate Schedule, Exhibit C, of the Specific Conditions, and in accordance with Section 6.0, Billing and Payment, of the General Conditions.

8.1.1 RATE ADJUSTMENT: At PG&E's discretion, Consultant Hourly Rate Schedule (Exhibit C) may be adjusted annually based on the percentage change in US Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U).

8.1.2 Any substitution or additions to Subcontractor(s) listed in Exhibit C of the Specific Conditions shall be provided in accordance with Section 5.4 of the Specific Conditions.

8.1.3 REIMBURSABLE EXPENSE: PG&E will reimburse Consultant for expenses incurred in the performance of Work in accordance with Sections 6.2.4, Expenses; 6.2.6, Mileage and Use of Personal Car; and 6.2.7, Supporting

Documentation, of the General Conditions. Consultant shall not charge a markup on reimbursable expenses.

- 8.2 **INVOICE PAYMENT:** For Consultant's satisfactory performance of the Work and any associated deliverables and upon acceptance of Work and any associated deliverables by PG&E Work Supervisor, Consultant shall invoice PG&E in accordance with the Section 6.0, Billing and Payment, of the General Conditions. All payments will be made, subject to PG&E approval, within forty five days (45) days after receipt of a correct invoice.

- 8.2.1 Should Consultant elect for an earlier payment schedule, PG&E offers payment within fifteen (15) days after receipt of correct invoice subject to an early payment discount of one and one half percent (2.0%) of the invoiced amount.

9.0 NOTICES

- 9.1 Any notices required or permitted to be given under this Contract shall be in writing and shall be sent by U.S. Mail, telecopy, facsimile or delivered personally, addressed to the parties listed below or such other address as either party may from time to time designate by written notice in the manner set forth below. Any such notice shall be deemed given, if mailed, on the date of receipt, or if telecopied or hand-delivered, on the date of such delivery. All notices of breach shall be sent by Certified Mail, Return Receipt Requested to:

Consultant Representative:

Contract Issues:

PG&E Work Supervisor: To be provided in each CWA

10.0 CONFLICTS BETWEEN TERMS

- 10.1 Where there is any conflict in the Specific Conditions stated herein and the General Conditions, the Specific Conditions shall control. Should a conflict exist between the Specific Conditions and General Conditions and applicable Federal, State or local law, rule regulation, order or code, the law, rule, regulation, order or code shall control. Varying degrees of stringency between the General Conditions, Specific Conditions, drawings, laws, rules, regulation, order, or codes are not deemed conflicts; and the most stringent requirement shall control.

11.0 CONFIDENTIALITY

- 11.1 In addition to the requirements found at Section 25.0 of the General Conditions, Consultant shall abide by the following additional terms of this Section 11.0, Confidentiality, regarding the handling of confidential or proprietary information from PG&E.
- 11.2 Consultant agrees that all confidential or proprietary information:
- shall be used solely for the purpose of performing services and Work for PG&E and as mandated by CPUC Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050; and
 - shall not be reproduced, copied, in whole or in part, except as specifically, authorized by PG&E and necessary to the purpose set forth in (a) above; and
 - shall, together with any copies, reproductions and other records, thereof, in any form, and all information and materials developed by Consultant therefrom, be returned to PG&E when no longer needed for the performance of Consultant's services and Work for PG&E.
- 11.3 In the event that Consultant is in doubt whether certain information is confidential and/or Proprietary Information, Consultant shall treat the information as confidential and/or Proprietary Information.
- 11.4 Consultant hereby agrees that it will require all of its employees, Subcontractors, and Subcontractor employees who will perform Work or services under this Contract to sign a

non-disclosure agreement in the form attached hereto as Exhibit D, Non-Disclosure and Use of Information Agreement. Prior to starting said Work or services, Consultant shall promptly furnish the original signed non-disclosure agreements to PG&E

12.0 SUPPLIER DIVERSITY PROGRAM POLICY

The Consultant must read and comply with the requirements of PG&E's Supplier Diversity Program Policy contained in Section 32.2, PG&E's Policy, of the General Conditions and Exhibit 1 to the General Conditions.

12.1 CPUC General Order 156 promotes purchasing goods and services from women, minority and disabled veteran-owned and controlled business enterprises (WMDVBES).

12.2 There are no specific WMDVBE goals that have been established for Consultant to meet in this Contract. However, PG&E expects Consultant to assist PG&E in working with WMDVBES. As part of Consultant's proposal, Consultant set forth WMDVBE spending which it deems to be appropriate for this Contract.

12.3 Consultant shall submit to PG&E, in writing, a subcontracting and/or supplier plan in accordance with the requirements of Exhibit 1 to the General Conditions.

12.4 In addition to the subcontracting plan, Consultant shall provide to PG&E a list of verified WMDVBE's that it expects to do business with during the term of this Contract and shall submit this information on Exhibit 1-A.

12.5 Primary verification of WMDVBES shall be the CPUC WMDVBE Clearinghouse.

12.6 **REPORTING COMMITMENT:** Consultant shall provide timely and accurate reporting of Consultant's detailed spent information with diverse suppliers on PG&E's Supplier Diversity Management System (SDMS) as described in Exhibit 1 of the General Conditions.

Contract Work Authorization



Exhibit A

Contract Work Authorization (CWA)

This Contract Work Authorization ("CWA") No. [enter #] is issued under and pursuant to the Blanket Agreement or Master Service Agreement No. [enter #] dated [enter Date] (the "MSA") between the below-named Contractor ("Contractor"), [enter Legal Title], and Pacific Gas and Electric Company ("PG&E"), a California corporation with its headquarters located at 77 Beale Street, San Francisco, California 94105. Contractor shall perform all Work under this CWA pursuant to and in accordance with the terms and conditions of the MSA.

Contractor's
Legal Name: [enter Name]

Total Number of Pages: [enter #]

Contractor's
Address: [Street Address]
[PO Box]
[City, State Zip Code]

Project Name: [enter Name]

Job Location: [enter Location]

WORK: Contractor shall, at its own risk and expense, perform the Work described in this Contract Work Authorization and furnish all labor, equipment, and materials necessary to complete the Work as summarized below and as more fully described in Attachment 1, Scope of Work.

[enter Work Summary here]

ATTACHMENTS: Each of the following documents are attached to this CWA and are incorporated herein by this reference:

Attachment 1: Scope of Work, [enter Pages # through #]

[enter Attachment # (Use for additional attachments or Delete)]

CWA TERM: This CWA is effective upon signature by both parties and expires on [enter Date]. Time is of the essence.

CWA COMPLETION: Contractor shall commence performance hereof when directed to do so by PG&E and Work shall be completed by the completion date of [enter Date].

CONSIDERATION: As full consideration for satisfactory performance of the Work under this CWA by Contractor, PG&E's total obligation to Contractor shall not exceed the following amount. This amount is inclusive of all taxes incurred in the performance of the Work. Any change to this amount shall only be authorized in writing by a PG&E CWA Change Order, fully executed by both PG&E and Contractor.

TOTAL: [enter total dollar amount and appropriate language based on pricing method for Work]

THE PARTIES, BY SIGNATURE OF THEIR AUTHORIZED REPRESENTATIVES, HEREBY AGREE TO THE TERMS OF THIS CONTRACT WORK AUTHORIZATION.

PACIFIC GAS AND ELECTRIC COMPANY		CONTRACTOR: [enter FIRM NAME HERE]	
Signature		Signature	
Name	[enter Name]	Name	
Title	[enter Title]	Title	
Date		Date	

62 1220 CWA (12-1-08)

Decision No. 12-01-033

Sourcing

Issued by
Brian K Cherry
Vice President
Regulation and Rates

Date Filed April 11, 2012
Effective
Resolution No.

CWA No. [enter #]
Page 2 of [enter #]

ADMINISTRATION			
PG&E Negotiator	[enter Name]	Contractor Represent	
Phone	[enter #]	Phone	
Email	[enter Address]	Email	
Accounting Reference	[enter Account # if known or Delete]		
PG&E Work Supervisor:	[enter Name]	Phone:	[enter #]
INVOICE INSTRUCTIONS: Contractor shall send invoices for each payment when due, showing the CWA number, to: PACIFIC GAS AND ELECTRIC COMPANY	Send ORIGINAL Invoice to:	PG&E Accounts Payable* PO Box 7760 San Francisco, CA 94120-7760	
	Send COPY of Invoice to:	[Name] [Street Address/Mail Code] [City, State Zip Code]	
	For information regarding invoice status, call PG&E's Paid Help Line at (800) 756-PAID (7243) or go to AP Web Reporting site at www.pge.com/actpay .		
	*Note: Contractors using the XIGN System do not need to mail a copy of the invoice to PG&E.		

INTERNAL PG&E USE ONLY		
Distribution Date		
Distribution of Copies:	☐ Document Services (Signed Original Copy) Mail Code N5D 245 MARKET ST., SAN FRANCISCO	☐ Contractor (Signed Original Copy)
	☐ Work Supervisor	☐ Manager
	☐ Invoice Approver	☐ Supervisor
	☐ V.P.	☐ Sourcing/ Purchasing
	☐ Director	☐ Law



Pacific Gas and Electric Company
Contractor Values

Exhibit B

PG&E places high value on our customers, employees, and shareholders, the environment, safety, continuous improvement; and conducting our business in an ethical manner. We expect contractors working for PG&E to do the same. We will judge their performance, in part, on how these values are met in the course of working for us.

CUSTOMER RELATIONS: PG&E is committed to understanding the services that are of value to our customers in an increasingly diverse society and providing those services safely, dependably, courteously, and at fair prices. Actions of our contractor affect our customers' and the general public's perception of PG&E; therefore, we expect our contractors to conduct their work in this same safe, dependable, and courteous manner.

ENVIRONMENT: PG&E is dedicated to being a leader in the energy industry with respect to environmental issues. Environmental protection and enhancement is a fundamental corporate direction as PG&E recognizes that a sound environmental policy and sound business practices go hand in hand. PG&E expects its contractors to contribute to the success of maintaining our leadership in the environmental arena by conducting all aspects of work performed for PG&E in an environmentally sensitive manner which maintains and, when feasible, improves the quality of the environment.

SAFETY: PG&E is committed to maintain and promote job safety and health for our employees, customers and the general public, and we expect contractors performing work for PG&E to do the same. We are committed to working with contractors who conduct their work safely by providing adequate training and a safe work environment.

CONTINUOUS IMPROVEMENT: PG&E includes among its corporate goals providing its employees with fair compensation and the opportunity for fulfilling careers and individual growth. One way of accomplishing this objective is by continually improving our work processes in all aspects of our business. A major element of continuous improvement is employee involvement. We expect our contractors to be a part of this process by joining with PG&E in creating a work environment that encourages all employees to become involved by sharing experiences, viewing other employees as a resource, recognizing and reinforcing behaviors that lead to work process improvements and participating in collaborative efforts with PG&E to improve the work process.

BUSINESS ETHICS: Integrity, honesty, professionalism, and ethical business conduct are expected of all our contractors.

Exhibit C

2010 CONSULTANT HOURLY RATE SCHEDULE

Company	Name	Labor Classification	Billing Rates (\$/Hr)

Other Reimbursable Expenses

Reference Contract's General Conditions Sections 6.2.4, Expenses; 6.2.5, Travel Time and Costs; 6.2.6, Mileage and Use of Personal Car; 6.2.7, Supporting Documentation; and 6.2.8, Invoice Deficiencies

Exhibit D

**PACIFIC GAS AND ELECTRIC COMPANY
NONDISCLOSURE AGREEMENT**

THIS NON-DISCLOSURE AGREEMENT (this "Agreement") is made as of _____, 200_ ("Effective Date") and entered into between Pacific Gas and Electric Company ("PG&E"), and _____ ("Consultant").

In consideration of the mutual covenants set forth below, the parties hereby agree as follows:

1. "Confidential Information" shall mean, collectively, all agreements and associated documents (regardless of whether such agreement(s) and associated documents are executed or in draft form), technical, financial and business information of any kind whatsoever including, where appropriate and without limitation, all data, specifications, technology, ideas, know-how, improvements, maps, technical drawings, inventions (whether or not patentable or copyrightable), trade secrets, that is provided by or on behalf of PG&E, and without limiting the foregoing, any other information as well as any and all tangible and intangible embodiments thereof of any kind whatsoever that would reasonably be considered the confidential or proprietary information of PG&E, its parent company, its subsidiaries or affiliates and/or third parties who have licensed or provided such information to PG&E given the nature of the information or manner of disclosure, in each case disclosed by or on behalf of PG&E to Consultant or obtained by Consultant through observation or examination of the foregoing, regardless of whether such information or embodiment has been marked as confidential or proprietary. Confidential Information shall not include information that Consultant can establish by written documentation:

- (a) has been publicly known prior to disclosure by PG&E of such information to Consultant;
- (b) has become publicly known, without fault on the part of Consultant or its Representatives, subsequent to disclosure by PG&E of such information to Consultant;
- (c) has been or is received by Consultant at any time on a non-confidential basis from a source, other than PG&E, lawfully having possession of and the right to disclose such information; or
- (d) has been independently developed by Consultant, as demonstrated by the written records of Consultant, without use of Confidential Information.

2. In the course of reviewing and evaluating information in connection with Work as California Public Utility Commission Independent Evaluator pursuant to California Public Utility Commission ("CPUC" or "Commission") Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 (the "Transaction"), PG&E may disclose certain Confidential Information to Consultant, with each such disclosure being subject on the terms and conditions of this Agreement. Consultant agrees to be bound by the terms and conditions in this Agreement in exchange for PG&E's disclosure of its Confidential Information.

3. Consultant hereby acknowledges that PG&E is the owner or licensee or rightfully has possession of the Confidential Information. Consultant shall not use any of the Confidential Information at any time except for the Transaction. Consultant shall hold the Confidential Information in strict confidence and shall not, directly or indirectly, disclose the Confidential Information to any third party without the prior written consent of PG&E. Consultant shall keep the Confidential Information in a safe and secure location. Consultant agrees to only disclose the Confidential Information to Consultant's employees on a need-to-know basis, as reasonably necessary, who are bound by written agreements with Consultant to maintain the Confidential Information of PG&E in confidence on terms that are materially similar to those set forth herein (collectively, the "Representatives").

4. Notwithstanding the foregoing, in the event that Consultant becomes legally compelled by deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar process to disclose any of the Confidential Information, Consultant shall give PG&E prompt prior written notice of such requirement so that PG&E may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Agreement and if such protective order or other remedy is not obtained, or PG&E waives compliance with the terms hereof, Consultant agrees to provide only that limited portion of the Confidential Information that it is required by the Commission pursuant to CPUC Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 and to ensure that all Confidential Information that is so disclosed will be accorded confidential treatment. PG&E may request that Consultant disclose certain information to the CPUC pursuant to the decisions referred to above. In that case, prior to such disclosure, Consultant shall work with PG&E to determine whether or not such information shall be marked confidential before being provided to the CPUC.

5. Upon the written request of PG&E, Consultant shall immediately return all tangible items relating to Confidential Information, including all written material, photographs, models, compounds, compositions and the like made available or supplied by PG&E to Consultant, and all copies and derivatives thereof. Without limiting the foregoing, Consultant that all confidential or proprietary information shall, together with any copies, reproductions and other records, thereof, in any form, and all information and materials developed by Consultant therefrom, be returned to PG&E or destroyed by Consultant, as PG&E shall instruct upon Consultant's completion of the Transaction. Consultant shall provide PG&E with a written certification of return or destruction signed by an officer or other individuals authorized to bind Consultant.

6. As between PG&E and Consultant, PG&E's Confidential Information will remain the property of PG&E. Nothing contained in this Agreement will be construed as obligating PG&E to disclose Confidential Information to Consultant, or as granting to or conferring on Consultant, expressly or by implication, any rights or license to the Confidential Information.

7. Consultant is aware, and will advise its Representatives who are informed of the matters that are the subject of this Agreement, of the restrictions imposed by the United States securities laws on the purchase or sale of securities by any person who has received material, non-public information from the issuer of such securities and on the communication of such information to any other person when it is reasonably foreseeable that such other person is likely to purchase or sell such securities in reliance upon such information.

8. Consultant will not disclose any information or make any news release, advertisement, public communication, response to media inquiry or other public statement regarding this Agreement, the Confidential Information, the Transaction and/or the potential commercial relationship between the parties or Consultant's performance hereunder without the prior written consent of PG&E. Consultant shall immediately refer all media inquiries concerning PG&E to PG&E. Consultant will not make any reference to PG&E or to the existence of this Agreement in any advertising or other publication (except for confidential, internal company publications), without PG&E's prior written consent and Consultant will not associate or in any way connect its name, trademark or any other intellectual property right to any name, trademark or any other intellectual property right of PG&E without PG&E's prior written consent. The fact that PG&E and Consultant have entered into this Agreement does not constitute, nor does it imply in any way, endorsement by PG&E of Consultant, and Consultant will not indicate or imply that PG&E endorses, recommends, or vouches for Consultant in any form of written, verbal, or electronic advertisement, communication, or any other business development effort, without PG&E's prior written consent.

9. PG&E and its agents, auditors (internal and external), and other representatives as PG&E may designate will have the right to inspect, examine and audit the systems, records, data, practices and procedures of Consultant with respect to Consultant's performance hereunder.

10. This Agreement shall last until and cover Confidential Information received by the Consultant for five (5) years following the Effective Date. Notwithstanding the foregoing, all of the Consultant's duties of confidentiality and non-use shall, with respect to Confidential Information, continue until such time that Confidential Information is no longer deemed confidential by PG&E or falls within one of the exceptions set forth in Section 1.

11. Consultant may not transfer or assign all or part of this Agreement, whether by operation of law or otherwise, without the prior written consent of PG&E.

12. PG&E makes no express or implied warranty or representation relating to the Confidential Information (including as to completeness) or its use, and hereby disclaims all warranties, including without limitation, the implied warranties of merchantability, fitness of a particular purpose and non-infringement. PG&E provides the Confidential Information on an "as is" basis and Consultant's use of the Confidential Information shall be at its own risk.

13. This Agreement represents the entire agreement between the parties regarding the subject matter hereof and shall supersede all previous communications, representations, understandings, acknowledgements and agreements, whether oral or written, by or between the parties with respect to Confidential Information, whether heretofore or hereafter disclosed between the parties.

14. No change, modification, extension, termination or waiver of this Agreement, or any of the provisions herein contained, shall be valid unless made in writing and signed by duly authorized representatives of the parties hereto. Regardless of PG&E's review, audit or inspection of Consultant, or other act or omission, Consultant will remain responsible for complying with all the terms and conditions of this Agreement and such acts or omissions of PG&E will not constitute a waiver.

15. This Agreement shall in no way be construed to (i) preclude in any way either party from pursuing any business opportunities; (ii) establish any relationship between the parties with respect to such business opportunities; or (iii) establish any relationship between the parties with respect to the Transaction.

16. Consultant shall be responsible for any breach of the provisions of this Agreement by it and its Representatives. In the event that Consultant learns of any unauthorized use or disclosure of Confidential Information or any other breach of this Agreement by the Consultant or its Representatives or reasonably believes such use, disclosure or breach to have occurred, Consultant shall immediately notify PG&E in writing, and shall cooperate with PG&E in every reasonable way to help PG&E regain possession of such Confidential Information and to prevent its further unauthorized use.

17. This Agreement shall be construed and interpreted in accordance with the laws of the State of California, excluding any choice of law rules which may direct the application of the laws of another jurisdiction. Any controversy or claim arising out of or in any way relating to this Agreement which cannot be amicably settled without court action shall be litigated in a California State Court of competent jurisdiction; or if jurisdiction over the action cannot be obtained in a California State Court, in a Federal Court of competent jurisdiction situated in the State of California..

18. Consultant understands and agrees that, because of the unique nature of the Confidential Information, PG&E will suffer irreparable harm if Consultant fails to comply with any of its obligations under this Agreement, and monetary damages inadequate to compensate PG&E for such breach. Accordingly, Consultant agrees that PG&E shall, in addition to any other remedies available to PG&E at law or in equity, be entitled to injunctive relief to enforce the terms of this Agreement without posting will be a bond or other undertaking. It is further understood and agreed that no failure or delay by PG&E in exercising any right, power or privilege hereunder shall cooperate as a waiver thereof, nor shall any single or partial exercise thereof preclude any other or further exercise thereof or the exercise of any right, power or privilege hereunder.

19. The covenants and agreements set forth in this Agreement are each deemed separate and independent, and if any such covenant or agreement is determined by any court of competent jurisdiction to be invalid or unenforceable for any reason, including without limitation by reason of such covenant or agreement extending for too great a period of time or over too great a geographical area, or by reason of its being too extensive in any other respect, such covenant or agreement, to the specific extent that it is unenforceable, shall be deemed automatically deleted from this Agreement and shall be interpreted to extend only over the maximum period of time and geographical area, and to the maximum extent in all other respects, as to which it is valid and enforceable, in order to effectuate the parties' intent to the greatest extent possible. Any such deletion or interpretation shall have no effect on the validity or enforceability of any remaining provision of this Agreement.

20. This Agreement has been negotiated by both parties and shall not be strictly construed against either party.

21. This Agreement may be executed in one or more original or faxed counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same instrument.

Intending to be legally bound, each of the undersigned Parties has caused its duly authorized representative to execute the Agreement as of the Effective Date.

Pacific Gas and Electric Company
By: _____
Printed: _____
Title: _____
Date: _____

By: _____
Printed: _____
Title: _____
Date: _____



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-229
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX J

GLOSSARY



A

ABOVE-MARKET COST - The cost of a service in excess of the price of comparable services in the market.

ABNORMAL PEAK DAY (APD) - An abnormal peak day is the coldest day which could reasonably be expected to occur within the Pacific Gas and Electric Company system for planning purposes and is based on the coldest day of record for the Pacific Gas and Electric Company territory.

ACCESS CHARGE - A charge paid by all market participants withdrawing energy from the ISO controlled grid. The access charge will recover the portion of a utility's transmission revenue requirement not recovered through the variable usage charge.

AFFILIATE – A company that is controlled by another or that has the same owner as another company.

AFFILIATED POWER PRODUCER - A generating company that is affiliated with a utility.

AGGREGATION - The process of organizing small groups, businesses or residential customer into a larger, more effective bargaining unit that strengthens their purchasing power with utilities.

AGGREGATOR - An entity that puts together customers into a buying group for the purchase of a commodity service. The vertically integrated investor owned utility, municipal utilities and rural electric cooperatives perform this function in today's power market. Other entities such as buyer cooperatives or brokers could perform this function in a restructured power market.

ALTERNATIVE ENERGY SOURCES – (See RENEWABLE ENERGY)

ANCILLARY SERVICES – Capacity, measured in MW, that is utilized by the control area operator to ensure electric system reliability.

ANIMAL WASTE CONVERSION - Process of obtaining energy from animal wastes. This is a type of biomass energy.

ANNUAL MAXIMUM DEMAND - The greatest of all demands of the electrical load which occurred during a prescribed interval in a calendar year.



AREA LOAD - The electrical load in given geographic area irrespective of what LSEs are providing generation services to end-users within the area.

Service Area Load is generally used to mean the load in an IOU distribution service area including loads served by IOUs through bundled service tariffs, loads served by ESPs under direct access, and loads served by CCAs through the provisions of AB 117. In addition, for the SCE service area the generation and loads of MWD Metropolitan Water district included.

Planning Area Load is generally used to mean Service Area Load plus the loads of publicly-owned utilities embedded within an IOU distribution service area or adjacent to the IOU distribution service area which collectively received transmission service from the PTO unit of an IOU.

PG&E and SCE provide transmission services to, and plan such services for, an extensive list of publicly-owned utilities in common with their own distribution service area customers. In contrast, SDG&E provides no such transmission services to publicly-owned utilities.

ASSOCIATED GAS - Natural gas that can be developed for commercial use, and which is found in contact with oil in naturally occurring underground formations.

ATTRIBUTES - The outcomes by which the relative “goodness” of a particular expansion plan is measured, e.g., fuel usage.

AUXILIARY ENERGY SUBSYSTEM - Equipment using conventional fuel to supplement the energy output of a solar system. This might be, for example, an oil-fueled generator that adds to the electrical output of substitutes for the solar system during long overcast periods when there is not enough sunlight.

AUXILIARY EQUIPMENT - Extra machinery needed to support the operation of a power plant or other large facility.

AVAILABLE BUT NOT NEEDED CAPABILITY - Capability of generating units that are operable but not necessary to carry load.

AVERAGE COST - The revenue requirement of a utility divided by the utility’s sales. Average cost typically includes the costs of existing power plants, transmission, and distribution lines, and other facilities used by a utility to serve its customers. It also included operating and maintenance, tax, and fuel expenses.



AVERAGE DEMAND - The energy demand in a given geographical area over a period of time. For example, the number of kilowatt-hours used in a 24-hour period, divided by 24, tells the average demand for that period.

AVERAGE HYDRO - Rain, snow and runoff conditions that provide water for hydroelectric generation equal to the most commonly occurring levels. Average hydro usually is a mean indicating the levels experienced most often in a 104-year period.

AVOIDED COST (Regulatory) - The amount of money that an electric utility would need to spend for the next increment of electric generation to produce or purchase elsewhere the power that it instead buys from a cogenerator or small-power producer.

B

BALANCED SCHEDULE - A Scheduling Coordinator's schedule is balanced when generation, adjusted for transmission losses, equals demand.

BALANCING - Making receipts and deliveries of gas into or withdrawals from a pipeline equal. Balancing may be accomplished daily, monthly or seasonally, with non-compliance charges generally assessed for excessive imbalance.

BASE LOAD - The lowest level of power production needs during a season or year.

BASE LOAD (For Gas) - As applied to gas, a given consumption of gas remaining fairly constant over a period of time, usually not temperature-sensitive.

BASE LOAD UNIT - A power generating facility that is economic to run in all hours at full or near full capacity levels.

BASELINE FORECAST - A prediction of future energy needs which does not take into account the likely effects of new conservation programs that have not yet been started.

BASELOAD CAPACITY - Generating equipment operated to serve loads 24-hours per day.

BASE RATE - That portion of the total electric or gas rate covering the general costs of doing business unrelated to fuel expenses.

BILATERAL CONTRACT - A two-party agreement for the purchase and the sale of energy and/or capacity products and services or financially settled products.

BIO-GAS - Methane produced by the decomposition or processing of organic matter.



BIOMASS - Energy resources derived from organic matter. These include wood, agricultural waste and other living-cell material that can be burned to produce heat energy. They also include algae, sewage and other organic substances that may be used to make energy through chemical processes.

BIOMETHANE (Purchase or Sale) - Pipeline quality natural gas produced from renewable (non-fossil based) resources. May include renewable or environmental attributes.

BLACK START – Critical generating units to ensure “black start” capability for purposes of system restoration.

BLACKOUT - A power loss affecting many electricity consumers over a large geographical area for a significant period of time.

BRITISH THERMAL UNIT (Btu) - The quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit from 58.5 to 59.5 degrees Fahrenheit under standard pressure of 30 inches of mercury at or near its point of maximum density. One Btu equals 252 calories, (gram), 778 foot-pounds, 1,055 joules or 0.293 watt hours.

BULK POWER MARKET - Wholesale purchases and sales of electricity.

BULK POWER SUPPLY - Often this term is used interchangeably with wholesale power supply. In broader terms, it refers to the aggregate of electric generating plants, transmission lines, and related-equipment. The term may refer to those facilities within one electric utility, or within a group of utilities in which the transmission lines are interconnected.

BUNDLED CUSTOMERS - Bundled customers are those customers of the IOU for whom the IOU provides a suite of “bundled” services, including procuring and supplying electricity, as well as providing transmission, distribution and customer services.

BUNDLED SERVICE - Electric power, transmission, distribution, billing, metering and related service provided by the IOU.

BURNER TIP - A generic term that refers to the ultimate point of consumption for natural gas.

BUSBAR - In electric utility operations, a busbar is a conductor that serves as a common connection for two or more circuits. It may be in the form of metal bars or high-tension cables.



BUY THROUGH - An agreement between utility and customer to import power when the customer's service would otherwise be interrupted.

BUYER - An entity that purchases electrical energy or services from the Power Exchange (PX) or through a bilateral contract on behalf of end-use customers.

C

CALIFORNIA ENERGY COMMISSION - The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000, *et seq.*) responsible for energy policy. The Energy Commission's five major areas of responsibilities are:

1. Forecasting future statewide energy needs;
2. Licensing power plants sufficient to meet those needs;
3. Promoting energy conservation and efficiency measures;
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels; and
5. Planning for and directing state response to energy emergencies.

Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account and other sources.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA - pronounced See' quah) - Enacted in 1970 and amended through 1983, established state policy to maintain a high-quality environment in California and set up regulations to inhibit degradation of the environment.

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) - A state agency created by constitutional amendment in 1911 to regulate the rates and services of more than 1,500 privately owned utilities and 20,000 transportation companies. The CPUC is an administrative agency that exercises both legislative and judicial powers; its decisions and orders may be appealed only to the California Supreme Court.

The major duties of the CPUC are to regulate privately owned utilities, securing adequate service to the public at rates that are just and reasonable both to customers and shareholders of the utilities; including rates, electricity transmission lines and natural gas



pipelines. The CPUC also provides electricity and natural gas forecasting, and analysis and planning of energy supply and resources. Its main headquarters are in San Francisco.

CALL-BACK - A provision included in some power sale contracts that lets the supplier stop delivery when the power is needed to meet certain other obligations.

CAPABILITY - Maximum load that a generating unit can carry without exceeding approved limits.

CAPACITY (Demand side) – The amount of power consumed by a customer, measured in MWs, that can be produced upon request.

CAPACITY (Purchase or Sale) - The amount of power capable of being generated, measured in MWs, that can be reduced upon request.

There are various types of electricity capacity:

Dependable Capacity: The system's ability to carry the electric power for the time interval and period specific, when related to the characteristics of the load to be supplied. Dependable capacity is determined by such factors as capability, operating power factor, weather, and portion of the load the station is to supply.

Installed (or Nameplate) Capacity: The total manufacturer-rated capacities of equipment such as turbines, generators, condensers, transformers, and other system components.

Peaking Capacity: The capacity of generating equipment intended for operation during the hours of highest daily, weekly or seasonal loads.

Purchased Capacity: The amount of energy and capacity available for purchase from outside the system.

Reserve Capacity: Extra generating capacity available to meet peak or abnormally high demands for power and to generate power during scheduled or unscheduled outages. Units available for service, but not maintained at operating temperature, are termed "cold." Those units ready and available for service, though not in actual operation, are termed "hot."

CAPACITY CHARGE - An assessment on the amount of capacity being purchased.

CAPACITY FACTOR - A percentage that tells how much of a power plant's capacity is used over time. For example, typical plant capacity factors range as high as 80 percent for geothermal and 70 percent for cogeneration.



CAPACITY RELEASE - A secondary market for capacity that is contracted by a customer which is not using all of its capacity.

CARBON DIOXIDE - A colorless, odorless, non-poisonous gas that is a normal part of the air. Carbon dioxide, also called CO₂, is exhaled by humans and animals and is absorbed by green growing things and by the sea.

CARBON MONOXIDE (CO) - A colorless, odorless, highly poisonous gas made up of carbon and oxygen molecules formed by the incomplete combustion of carbon or carbonaceous material, including gasoline. It is a major air pollutant on the basis of weight.

CIRCUIT - One complete run of a set of electric conductors from a power source to various electrical devices (appliances, lights, etc.) and back to the same power source.

CITYGATE, PG&E - On the PG&E gas system, the Citygate is any point at which the backbone transmission system connects to the local transmission and distribution system.

CLEAN FUEL VEHICLE - Is frequently incorrectly used interchangeably with "alternative fuel vehicle." Generally, refers to vehicles that use low-emission, clean-burning fuels. Public Resources Code Section 25326 defines clean fuels, for purposes of the section only, as fuels designated by ARB for use in LEVs, ULEVs or ZEVs and include, but are not limited to, electricity, ethanol, hydrogen, liquefied petroleum gas, methanol, natural gas, and reformulated gasoline.

COGENERATION - Cogeneration means the sequential use of energy for the production of electrical and useful thermal energy. The sequence can be thermal use followed by power production or the reverse, subject to the following standards:

- (a) At least 5 percent of the cogeneration project's total annual energy output shall be in the form of useful thermal energy.
- (b) Where useful thermal energy follows power production, the useful annual power output plus one-half the useful annual thermal energy output equals not less than 42.5 percent of any natural gas and oil energy input.

COGENERATOR - Cogenerators use the waste heat created by one process, for example during manufacturing, to produce steam which is used, in turn, to spin a turbine and generate electricity. Cogenerators may also be QFs.

COINCIDENCE FACTOR - The ratio of the coincident maximum demand of two or more loads to the sum of their noncoincident maximum demands for a given period. The



coincidence factor is the reciprocal of the diversity factor and is always less than or equal to one.

COMBINED CYCLE PLANT - An electric generating station that uses waste heat from its gas turbines to produce steam for conventional steam turbines.

COMBUSTION - Rapid oxidation, with the release of energy in the form of heat and light.

COMBUSTION TURBINE - A fossil-fuel-fired power plant that uses the conversion process known as the Brayton cycle. The fuel, oil, or gas is combusted and drives a turbine-generator.

COMMERCIAL OPERATION - Occurs when control of the generator is turned over to the system dispatcher.

COMMODITY CHARGE - A charge per unit volume or heat content (i.e., therm) of gas delivered to the buyer. Compare **DEMAND CHARGE**.

COMPETITIVE TRANSMISSION CHARGE (CTC) - A non-bypassable charge that customers pay to a utility for the recovery of its stranded costs.

COMMUNITY CHOICE AGGREGATION SERVICE (CCA SERVICE) - Allows customers to purchase electric power and, at the customer's election, participate in additional energy efficiency or conservation programs from non-utility entities known as Community Choice Aggregators (CCAs). It is a form of direct access.

COMMUNITY CHOICE AGGREGATOR - Any city, county, or city and county, or group of cities, counties, or cities and counties, whose governing board or boards elect to combine the loads of their residents, businesses, and municipal facilities in a community wide electricity buyers' program. (see PU Code § 331.5.) A CCA may also provide certain energy efficiency and conservation programs to its CCA customers.

COMPETITIVE BIDDING - This is a procedure that utilities use to select suppliers of new electric capacity and energy. Under competitive bidding, an electric utility solicits bids from prospective power generators to meet current or future power demands.

CONDENSER - A heat exchanger in which the refrigerant, compressed to a hot gas, is condensed to liquid by rejecting heat.

CONGESTION - A condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules simultaneously.



CONGESTION MANAGEMENT - Alleviation of congestion by the ISO.

CONSERVATION - Steps taken to cause less energy to be used than would otherwise be the case. These steps may involve improved efficiency, avoidance of waste, reduced consumption, etc. They may involve installing equipment (such as a computer to ensure efficient energy use), modifying equipment (such as making a boiler more efficient), adding insulation, changing behavior patterns, etc.

CONTINGENT FORWARD (Purchase or Sale) - A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.

CONTRACT PATH - The most direct physical transmission tie between two interconnected entities. When utility systems interchange power, the transfer is presumed to take place across the "contract path," notwithstanding the electric fact that power flow in the network will distribute in accordance with network flow conditions. This term can also mean to arrange for power transfer between systems.

CONTRACTS FOR DIFFERENCES - A type of bilateral contract where the electric generation seller is paid a fixed amount over time which is a combination of the short-term market price and an adjustment with the purchaser for the difference.

CONTROL AREA - An electric power system, or a combination of electric power systems, to which a common automatic generation control (AGC) is applied to match the power output of generating units within the area to demand. The control area of the ISO is the state of California.

CORE CUSTOMERS - Residential and small commercial customers who must rely on the traditional distributor bundled service of sales and transportation. Compare NON-CORE CUSTOMERS.

COUNTERPARTY SLEEVES (For Electric Products) - An agreement by a counterparty to buy (sell) electricity from one counterparty and sell it to (buy it from) another counterparty.

COUNTERPARTY SLEEVES (For Natural Gas Physical Products) - Facilitating a transaction with an un-contracted or non-creditworthy through a contracted, creditworthy counterparty.

CRUDE OIL - Petroleum as found in the earth, before it is refined into oil products.



CUSTOMER CLASS - Refers to, in general, a group of customers with similar service requirements. Typical customer classes include residential, industrial, commercial and agricultural.

D

DAILY PEAK - The maximum amount of energy or service demanded in one day from a company or utility service.

DAY-AHEAD MARKET - The forward market for energy and ancillary services to be supplied during the settlement period of a particular trading day that is conducted by the ISO, the PX, and other Scheduling Coordinators. This market closes with the ISO's acceptance of the final day-ahead schedule.

DAY-AHEAD SCHEDULE – Day-ahead Schedule A schedule prepared by a Scheduling Coordinator or the ISO before the beginning of a trading day. This schedule indicates the levels of generation and demand scheduled for each settlement period of that trading day.

DAYLIGHTING - The use of sunlight to supplement or replace electric lighting.

DEKATHERM - A unit of heating value equivalent to 10 therms or 1,000,000 Btus.

DELIVERY POINT - Point at which gas leaves a transporter's system completing a sale or transportation service transaction between the pipeline company and a sale or transportation service customer.

DEMAND (Utility) - The level at which electricity or natural gas is delivered to users at a given point in time. Electric demand is expressed in kilowatts.

DEMAND CHARGE - The sum to be paid by a large electricity consumer for its peak usage level.

DEMAND CHARGE - The portion of a rate for gas service which is billed to the customer whether they use the service or not. Depending on the rate design this charge is based on actual or estimated peak usage (1 or 3 days), annual needs or a combination of the two. Compare **COMMODITY CHARGE**.

DEMAND RESPONSE PROGRAMS - "Demand response" refers to actions taken by end-users to reduce power demand during critical peak times or to shift demand to off-peak times. A demand response program provides customers with incentives for reducing load in response to an event signal. These incentives can take the form of a financial credit or their bill, a dynamic rate or exemption from rolling blackouts. Events can be called for economic or reliability reasons. Because demand response programs are



designed to operate only a few hours per event, they typically reduce capacity (kW) but not energy (kWh).

DEMAND SIDE MANAGEMENT (DSM) - The methods used to manage energy demand including energy efficiency, load management, fuel substitution and load building. (See **LOAD MANAGEMENT**)

DEMONSTRATION - The application and integration of a new product or service into an existing or new system. Most commonly, demonstration involves the construction and operation of a new electric technology interconnected with the electric utility system to demonstrate how it interacts with the system. This includes the impacts the technology may have on the system and the impacts that the larger utility system might have on the functioning of the technology.

DEPENDABLE CAPACITY - The system's ability to carry the electric power for the time interval and period specified. Dependable capacity is determined by such factors as capability, operating power factor and portion of the load the station is to supply.

DEREGULATION - The elimination of regulation from a previously regulated industry or sector of an industry.

DERIVATIVES - A specialized security or contract that has no intrinsic overall value, but whose value is based on an underlying security or factor as an index. A generic term that, in the energy field, may include options, futures, forwards, etc.

DIRECT ACCESS - The ability of end-use customers located in the service territory of an IOU to purchase electricity from retail sellers other than their local utility. (See also **RETAIL COMPETITION**)

DIRECT ACCESS CUSTOMERS - Customers located within the service territory of an IOU who purchase electricity from sellers other than their local utility. DA customers continue to receive and pay for delivery services from their local utility.

DIRECT ACCESS-ELIGIBLE CUSTOMER – A customer located within the service territory of an IOU who is eligible for Direct Access.

DISPATCH - The operating control of an integrated electric system to: Assign generation to specific generating plants and other sources of supply to effect the most reliable and economical supply as the total of the significant area loads rises or falls. Control operations and maintenance of high-voltage lines, substations and equipment, including administration of safety procedures. Operate the interconnection. Schedule energy transactions with other interconnected electric utilities.



DISPATCHABILITY - This is the ability of a generating unit to increase or decrease generation, or to be brought on line or shut down at the request of a utility's system operator.

DISTRIBUTION - The delivery of electricity to the retail customer's home or business through low voltage distribution lines.

DISTRIBUTED GENERATION - A distributed generation system involves small amounts of generation located on a utility's distribution system for the purpose of meeting local (substation level) peak loads and/or displacing the need to build additional (or upgrade) local distribution lines.

DISTRIBUTION LINES - Overhead and underground facilities which are operated at distribution voltages, and which are designed to supply two or more customers.

DISTRIBUTION SYSTEM (Electric utility) - The substations, transformers and lines that convey electricity from high-power transmission lines to ultimate consumers, or for Electric Microutilities, the distribution lines that convey electricity from the generating units to the ultimate customer. (See GRID)

DISTRIBUTION UTILITY - The regulated electric utility entity that constructs and maintains the distribution wires connecting the transmission grid to the final customer. The distribution utility can also perform other services such as aggregating customers, purchasing power supply and transmission services for customers, billing customers and reimbursing suppliers, and offering other regulated or non-regulated energy services to retail customers. The "wires" and "customer service" functions provided by a distribution utility could be split so that two totally separate entities are used to supply these two types of distribution services.

DISTRIBUTIVE POWER - A packaged power unit located at the point of demand. While the technology is still evolving, examples include fuel cells and photovoltaic applications.

DIVESTITURE or DISAGGREGATION - The stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Most commonly associated with spinning-off generation assets so they are no longer owned by the shareholders that own the transmission and distribution assets.

DUCT - A passageway made of sheet metal or other suitable material used for conveying air or other gas at relatively low pressures.



DWR CONTRACTS - Contracts for generating resource capacity and energy deliveries executed by the California Department of Water Resources during 2001 and allocated to the investor owned utilities for contract administration purposes only.

E

ECONOMIC DISPATCH - The distribution of total generation requirements among alternative sources for optimum system economy with consideration to both incremental generating costs and incremental transmission losses.

ECONOMY ENERGY (Electricity utility) - Electricity purchased by one utility from another to take the place of electricity that would have cost more to produce on the utility's own system.

EI CONTRACT – Edison Electric Institute contract is a standard master agreement that provides the base terms and conditions for transactions executed between two parties of a particular master agreement.

EFFICIENCY - The ratio of the useful energy delivered by a dynamic system (such as a machine, engine, or motor) to the energy supplied to it over the same period or cycle of operation. The ratio is usually determined under specific test conditions.

ELECTRIC CAPACITY - This refers to the ability of a power plant to produce a given output of electric energy at an instant in time, measured in kilowatts or megawatts (1,000 kilowatts).

ELECTRIC PLANT (PHYSICAL) - A facility that contains all necessary equipment for converting energy into electricity.

ELECTRIC SERVICE PROVIDER (ESP) - An entity that is licensed by the CPUC to provide electric power service to Direct Access Customers (see PU Code §§ 218.3 and 394). An end-use customer can act as its own ESP as long as it complies with all requirements of being an ESP. Also referred to as Energy Service Providers.

ELECTRIC SYSTEM - This term refers to all of the elements needed to distribute electrical power. It includes overhead and underground lines, poles, transformers, and other equipment.

ELECTRIC UTILITY - Any person or state agency with a monopoly franchise (including any municipality), which sells electric energy to end-use customers; this term includes the Tennessee valley Authority, but does not include other Federal power marketing agency (from EPCa).



ELECTRICITY - A property of the basic particles of matter. A form of energy having magnetic, radiant and chemical effects. Electric current is created by a flow of charged particles (electrons).

ELECTRONIC QUARTERLY REPORTS (EQRs) - All FERC jurisdictional public utilities, including power marketers, must file EQRs, in which they:

- Summarize contractual terms and conditions in their agreements for all jurisdictional services, including:
 1. Market-based power sales;
 2. Cost-based power sales; and
 3. Transmission service.
- Detail transaction information for short-term and long-term market-based power sales and cost-based power sales during the most recent calendar quarter.
- Tariff holders without effective contracts and transactions must file the ID Data portion of the EQR.

ELECTRICITY TRANSMISSION PRODUCTS – The amount of electricity transportation capability of a transmission line measured in MWs.

EMISSIONS CREDITS FUTURES OR FORWARDS - Credits or allowances for emissions that can be bought or sold in order to comply with emissions limits.

END-USE - The specific purpose for which electric is consumed (i.e., heating, cooling, cooking, etc.).

ENERGY - The amount of electricity produced, flowing or supplied by generation, transmission or distribution facilities or consumed over time. Usually it is measured in units of watt-hours or standard multiples thereof, e.g., 1,000 Wh=1kWh, 1,000 kWh=1MWh, etc.

ENERGY CHARGE - The amount of money owed by an electric customer for kilowatt-hours consumed.

ENERGY CONSUMPTION - The amount of energy consumed in the form in which it is acquired by the user. The term excludes electrical generation and distribution losses.



ENERGY DELIVERIES - Energy generated by one system delivered to another system.

ENERGY EFFICIENCY - Programs and measures designed to reduce consumer energy consumption. Example of programs and measures include lighting retrofit, process redesign and appliance rebates which encourage consumers to purchase high-efficiency appliances.

ENERGY POLICY ACT OF 1992 - This act which was the first comprehensive federal energy law promulgated in more than a decade will help create a more competitive U.S. electric power marketplace by removing barriers to competition. By doing so, this act allows a broad spectrum of independent energy producers to compete in wholesale electric power markets. The act also made significant changes in the way power transmission grids are regulated. Specifically, the law gives the Federal Energy Regulatory Commission the authority to order electric utilities to provide access to their transmission facilities to other power suppliers.

ENERGY RECEIPTS - Energy generated by one utility system that is received by another through transmission lines.

ENERGY RESERVES - The portion of total energy resources that is known and can be recovered with presently available technology at an affordable cost.

ENERGY RESOURCES - Everything that could be used by society as a source of energy.

ENERGY USE - Energy consumed during a specified time period for a specific purpose (usually expressed in kWh).

ENTHALPY - The quantity of heat necessary to raise the temperature of a substance from one point to a higher temperature. The quantity of heat includes both latent and sensible.

ENTITLEMENT - Electric energy or generating capacity that a utility has a right to access under power exchange or sales agreements.

ENVIRONMENTAL ATTRIBUTES - Environmental attributes quantify the impact of various options on the environment. These attributes include particulate emissions, SO₂ or NO_x, and thermal discharge (air and water).

ENVIRONMENTAL PROTECTION AGENCY (EPA) - A federal agency created in 1970 to permit coordinated governmental action for protection of the environment by systematic abatement and control of pollution through integration or research, monitoring, standards setting and enforcement activities.



EXCHANGE (Electric utility) - Agreements between utilities providing for purchase, sale and trading of power. Usually relates to capacity (kilowatts) but sometimes energy (kilowatt-hours).

EXCHANGE TRADED CONTRACTS - Contract for electric capacity and energy executed through electronic and voice exchange markets under standard product terms and conditions. Products are generally for “standard products” (peak, on-peak or flat) and standard periods of duration (hourly, daily, balance of month, monthly, quarterly).

EXHAUST - Air removed deliberately from a space, by a fan or other means, usually to remove contaminants from a location near their source.

EXPORTS (Electric utility) - Power capacity or energy that a utility is required by contract to supply outside of its own service area and not covered by general rate schedules.

F

FACILITY - A location where electric energy is generated from energy sources.

FEDERAL ENERGY REGULATORY COMMISSION (FERC) - An independent regulatory commission within the U.S. Department of Energy that has jurisdiction over energy producers that sell or transport fuels for resale in interstate commerce; the authority to set oil and gas pipeline transportation rates and to set the value of oil and gas pipelines for ratemaking purposes; and regulates wholesale electric rates and hydroelectric plant licenses.

FEDERAL POWER ACT - An act that includes the regulation of interstate transmission of electrical energy and rates. This act is administered by the Federal Energy Regulatory Commission.

FEEDER - This is an electrical supply line, either overhead or underground, which runs from the substation, through various paths, ending with the transformers. It is a distribution circuit, usually less than 69,000 volts, which carries power from the substation.

FINANCIAL CALL (OR PUT) OPTION (For Electric Products) – The right, but not the obligation, to buy (call) a forward electric contract on a specific date (expiration) at a specific price (strike). The right to sell is a put option.

FINANCIAL CALL (OR PUT) OPTION (For Natural Gas Financial Products) - The right, but not the obligation, to buy (call) a forward gas contract on gas on a particular date (expiration) at a particular price (strike). The right to sell is a put option.



OTC-traded options settle in cash, whereas exchange traded (NYMEX) options must be exercised, which causes delivery of a futures position to the option holder. Options may be combined to hedge a wide variety of positions.

FINANCIAL SWAP – An agreement to exchange one type of pricing for another. Examples include fixed-for-floating swaps and basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through a financial clearing house.

FIRM ENERGY - Power supplies that are guaranteed to be delivered under terms defined by contract.

FIRM SERVICE - Service offered to customers (regardless of Class of Service) under schedules or contracts which anticipate no interruptions. The period of service may be for only a specified part of the year as in Off-Peak Service. Certain firm service contracts may contain clauses which permit unexpected interruption in case the supply to residential customers is threatened during an emergency. Compare **INTERRUPTIBLE SERVICE** and **OFF-PEAK SERVICE**.

FIXED COSTS - The annual costs associated with the ownership of property such as depreciation, taxes, insurance, and the cost of capital.

FORCED OUTAGE - An outage that results from emergency conditions and requires a component to be taken out of service automatically or as soon as switching operations can be performed. The forced outage can be caused by improper operation of equipment or by human error. If it is possible to defer the outage, the outage becomes a scheduled outage.

FORECAST INSURANCE - A method for managing load forecast (volume and shape) risk.

FORWARD ENERGY (Demand side) – Electric energy planned to be consumed by a customer, measured in MWhs that is agreed to be reduced for a specific period for a specified time in the future.

FORWARD ENERGY (Purchase or Sale) – Electric energy purchased or sold by a counterparty, measured in MWhs that is agreed to be supplied or received for a specific period at a specific location for a specified time in the future.

FORWARD SPOT (DAY-AHEAD & HOUR-AHEAD) PURCHASE, SALE, OR EXCHANGE – Electric energy, capacity, ancillary services or transmission purchased or sold by a counterparty, or exchanged between counterparties measured in MWs or MWhs



that is agreed to be supplied, received or exchanged for a specific period at a specific location in the Day-Ahead or Hour-Ahead markets.

FOSSIL FUEL - Oil, coal, natural gas or their by-products. Fuel that was formed in the earth in prehistoric times from remains of living-cell organisms.

FREQUENCY - The number of cycles which an alternating current moves through in each second. Standard electric utility frequency in the United States is 60 cycles per second, or 60 Hertz.

FTR LOCATIONAL SWAPS – Over-the-counter basis swaps associated with Firm Transmission Rights. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

FUEL - A substance that can be used to produce heat.

FUEL CELL - A device or an electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes, thus producing electricity.

FUEL DIVERSITY - Policy that encourages the development of energy technologies to diversify energy supply sources, thus reducing reliance on conventional (petroleum) fuels; applies to all energy sectors.

FUEL OIL - Petroleum products that are burned to produce heat or power.

FUTURES MARKET - A trade center for quoting prices on contracts for the delivery of a specified quantity of a commodity at a specified time and place in the future.

G

GAS - Gaseous fuel (usually natural gas) that is burned to produce heat energy.

GAS IMBALANCE -

- a. **Producer/Producer** - When one or more producers sell or utilize a volume of natural gas in excess of their gross working interest.
- b. **Pipeline/Pipeline** - When a pipeline receives a volume of natural gas and redelivers a larger or smaller volume of natural gas under the terms of a transportation agreement.



- c. Producer/Pipeline - When a producer delivers a volume of natural gas that is larger or smaller than the volume of natural gas that the pipeline redelivers for the producer's account to another party.

GAS, NATURAL - A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in porous geologic formations beneath the earth's surface, often in association with petroleum. The principal constituent is methane.

1. Dry. Gas whose water content has been reduced by a dehydration process. Gas containing little or no hydrocarbons commercially recoverable as liquid product. Specified small quantities of liquids are permitted by varying statutory definitions in certain states.
2. Liquefied (LNG). See LIQUEFIED NATURAL GAS.
3. Sour. Gas found in its natural state, containing such amounts of compounds of sulfur as to make it impractical to use, without purifying, because of its corrosive effect on piping and equipment.
4. Sweet. Gas found in its natural state, containing such small amounts of compounds of sulfur that it can be used without purifying, with no deleterious effect on piping and equipment.
5. Wet. Wet natural gas is unprocessed natural gas or partially processed natural gas produced from strata containing condensable hydrocarbons. The term is subject to varying legal definitions as specified by certain state statutes. (The usual maximum allowable is 7 lbs./MMcf water content and .02 gallons/Mcf of Natural Gasoline.)

GAS STORAGE (Purchase or Sale) - Includes firm and as-available storage inventory, injection and withdrawal. Also includes parking and borrowing services.

GAS TRANSPORTATION (Purchase or Sale) - Interstate, Intrastate, and distribution gas transportation services. Includes firm, as-available and interruptible services.

GAS UTILITY - Any person engaged in, or authorized to engage in, distributing or transporting natural gas, including, but not limited to, any such person who is subject to the regulation of the Public Utilities Commission.

GENERATING STATION - A station that consists of electric generators and auxiliary equipment for converting mechanical, chemical, or nuclear energy into electric energy.



GENERATING UNIT - Any combination of physically connected generators, reactors, boilers, combustion turbines, and other prime movers operated together to produce electric power.

GENERATION (Electricity) - Process of producing electric energy by transforming other forms of energy.

GENERATION COMPANY or GENERATOR - A regulated or non-regulated entity (depending upon the industry structure) that operates and maintains existing generating plants. The generation company may own the generation plants or interact with the short term market on behalf of plant owners.

GENERATION DISPATCH AND CONTROL - Aggregation and dispatching (sending off to some location) generation from various generating facilities, providing backup and reliability services.

GEOHERMAL - An electric generating station in which steam tapped from the earth drives a turbine-generator, generating electricity.

GIGAWATT (GW) - One thousand megawatts (1,000 MW) or, one million kilowatts (1,000,000 kW) or one billion watts (1,000,000,000 watts) of electricity. One gigawatt is enough to supply the electric demand of about one million average California homes.

GIGAWATT-HOUR (GWH) - One million kilowatt-hours of electric power. California's electric utilities generated a total of about 270,000 gigawatt-hours in 1988.

GLOBAL CLIMATE CHANGE - Gradual changing of global climates due to buildup of carbon dioxide and other greenhouse gases in the earth's atmosphere. Carbon dioxide produced by burning fossil fuels has reached levels greater than what can be absorbed by green plants and the seas.

GREENFIELD PLANT - Refers to a new electric power generating facility built from the ground up.

GRID - A system of interconnected power lines and generators that is managed so that the generators are dispatched as needed to meet the requirements of the customers connected to the grid at various points.

GROSS GENERATION - Amount of electric energy produced by generating units as measured at the generator terminals.



H

HEAT RATE - A number that tells how efficient a fuel-burning power plant is. Measured by Btu/kWh. The heat rate equals the Btu content of the fuel input divided by the kWh or power output. The lower the heat rate of a generating unit is, the more efficient the unit is.

HEAT STORM - Heat storms occur when temperatures exceed 100 degrees Fahrenheit over a large area for three days in a row. Normal hot temperatures cause electricity demand to increase during the peak summertime hours of 4 to 7 p.m. when air conditioners are straining to overcome the heat. If a hot spell extends to three days or more, however, nighttime temperatures do not cool down, and the thermal mass in homes and buildings retains the heat from previous days. This heat build-up causes air conditioners to turn on earlier and to stay on later in the day. As a result, available electricity supplies are challenged during a higher, wider peak electricity consumption period.

HEATING VALUE - The amount of heat produced by the complete combustion of a given amount of fuel.

HEDGING - Any method of minimizing the risk of price change. Since the movement of cash prices is usually in the same direction and about in the same degree as the movement of the present prices of futures contracts, any loss (or gain) resulting from carrying the actual merchandise is approximately offset by a corresponding gain (or loss) when the contract is liquidated.

HEDGING CONTRACTS - Contracts which establish future prices and quantities of electricity independent of the short-term market. Derivatives may be used for this purpose. (See the following: 1.) CONTRACTS FOR DIFFERENCES, 2.) FUTURES MARKET, and 3.) OPTIONS.)

HENRY HUB - A pipeline interchange, located in Vermilion Parish, Louisiana, which serves as the delivery point of natural gas futures contracts.

HIGH HEAT VALUE (HHV) - The high or gross heat content of the fuel with the heat of vaporization included; the water vapor is assumed to be in a liquid state.

HYDROELECTRIC POWER - Electricity produced by falling water that turns a turbine generator. (Also referred to as HYDRO).



I

ICE – Intercontinental Exchange (ICE) is the world’s leading electronic marketplace for energy trading and price discovery.

IMBALANCE ENERGY - The real-time change in generation output or demand requested by the ISO to maintain reliability of the ISO-controlled grid. Sources of imbalance energy include regulation, spinning and non-spinning reserves, replacement reserve, and energy from other generating units that are able to respond to the ISO’s request for more or less energy.

IMPORTS (Electric utility) - Power capacity or energy obtained by one utility from others under purchase or exchange agreement.

INDEPENDENT POWER PRODUCER (IPP) - A private entity that operates a generation facility and sells power to electric utilities for resale to retail customers. Although IPPs generate power, they are not franchised utilities, government agencies or QFs. IPPs usually do not own transmission lines to transmit the power that they generate.

INDEPENDENT SYSTEM OPERATOR (ISO) - The entity charged with reliable operation of the grid and provision of open transmission access to all market participants on a non-discriminatory basis. The ISO performs its function by controlling the dispatch of flexible plants to ensure that loads match resources available to the system.

INDEX PRICE - Tying the commodity price in a contract to other published prices, such as spot prices for gas or alternate fuels, or general indexes like the Consumer Price Index or Producer Price Index.

INFILTRATION - The uncontrolled inward leakage of air through cracks and gaps in the building envelope, especially around windows, doors and duct systems.

INFRASTRUCTURE - Generally refers to the recharging and refueling network necessary to successful development, production, commercialization and operation of alternative fuel vehicles, including fuel supply, public and private recharging and refueling facilities, standard specifications for refueling outlets, customer service, education and training, and building code regulations.

INSTALLED CAPACITY - The total generating units’ capacities in a power plant or on a total utility system. The capacity can be based on the nameplate rating or the net dependable capacity.

INSURANCE (COUNTERPARTY CREDIT INSURANCE, CROSS COMMODITY HEDGES) – A method for managing payment or performance risk for a fee.



INTEGRATED RESOURCE PLAN - A comprehensive and systematic blueprint developed by a supplier, distributor, or end-user of energy who has evaluated demand-side and supply-side resource options and economic parameters and determined which options will best help them meet their energy goals at the lowest reasonable energy, environmental, and societal cost.

INTEGRATED RESOURCE PLANNING (IRP) - A public planning process and framework within which the costs and benefits of both demand- and supply-side resources are evaluated to develop the least-total-cost mix of utility resource options. In many states, IRP includes a means for considering environmental damages caused by electricity supply/transmission and identifying cost-effective energy efficiency and renewable energy alternatives. IRP has become a formal process prescribed by law in some states and under some provisions of the Clean Air Act amendments of 1992.

INTEGRATED RESOURCE PLANNING PRINCIPLES - The underlying principles of IRP can be distinguished from the formal process of developing an approved utility resource plan for utility investments in supply- and demand-side resources. A primary principle is to provide a framework for comparing a variety of supply- and demand-side and transmission resource costs and attributes outside of the basic provision (or reduction) of electric capacity and energy. These resources may be owned or constructed by any entity and may be acquired through contracts as well as through direct investments. Another principle is the incorporation of risk and uncertainty into the planning analysis. The public participation aspects of IRP allow public and regulatory involvement in the planning rather than the siting stage of project development.

INTERCHANGE (Electric utility) - The agreement among interconnected utilities under which they buy, sell and exchange power among themselves. This can, for example, provide for economy energy and emergency power supplies.

INTERCONNECTION (Electric utility) - The linkage of transmission lines between two utilities, enabling power to be moved in either direction. Interconnections allow the utilities to help contain costs while enhancing system reliability.

INTERESTED PARTY - Any person whom the commission finds and acknowledges as having a real and direct interest in any proceeding or action carried on, under, or as a result of the operation of, this division.

INTERMEDIATE LOAD – Range from base load to a point between that and peak load.

INTERMEDIATE UNIT - A generator unit that is used for energy production as required with a capacity factor normally in the range of 15-60%.



INTERMITTENT RESOURCES - Resources whose output depends on some other factory that cannot be controlled by the utility, e.g., wind or sun. Thus, the capacity varies by day and by hour.

INTERRUPTIBLE LOADS - Loads that can be interrupted in the event of capacity or energy deficiencies on the supplying system.

INTERRUPTIBLE POWER - This refers to power whose delivery can be curtailed by the supplier, usually under some sort of agreement by the parties involved.

INTERRUPTIBLE SERVICE OR TARIFF (Electric utility) - Electricity supplied under agreements that allow the supplier to curtail or stop services at times. A service under which, upon notification from the Independent System Operator, the IOU requires the customer to reduce the demand imposed on the electrical system to firm service level (i.e., a level below which the customer's load will not be interruptible), and the customer must comply within 30 minutes.

INTERTIE - A transmission line that links two or more regional electric power systems.

INTERVAL METERING - The process by which power consumption is measured at regular intervals in order that specific load usage for a set period of time can be determined.

INVESTOR-OWNED UTILITY (IOU) - A private company owned by stockholders that provides electric utility services to a specific service area. A designation used to differentiate a utility owned and operated for the benefit of shareholders from municipally owned and operated utilities and rural electric cooperatives. A California investor-owned utility is regulated by the California Public Utilities Commission.

INVOLUNTARY DIVERSION - Involuntary Diversions are called when there is a severe supply shortage and deliveries to core customers are threatened. Emergency Flow Order provisions apply and Pacific Gas and Electric Company may divert as from non-core to core customers. Pacific Gas and Electric Company may also divert as-available off-system deliveries, but firm off-system deliveries will not be diverted.

J

No entries for the letter J.



K

KILOVOLT (kv) – One-thousand volts (1,000). Distribution lines in residential areas usually are 12 kv (12,000 volts).

KILOWATT (kW) - One thousand (1,000) watts. A unit of measure of the amount of electricity needed to operate given equipment. On a hot summer afternoon a typical home, with central air conditioning and other equipment in use, might have a demand of four kW each hour.

KILOWATT-HOUR (kWh) - The most commonly-used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour. In 1989, a typical California household consumes 534 kWh in an average month.

L

LEVELIZED - A lump sum that has been divided into equal amounts over period of time.

LINE - A system of poles, conduits, wires, cables, transformers, fixtures, and accessory equipment used for the distribution of electricity to the public.

LIQUEFIED NATURAL GAS (LNG) - Natural gas which has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure. It remains a liquid at -116 degrees Fahrenheit and 673 psig. In volume, it occupies 1/600 of that of the vapor at standard conditions.

LOAD - The amount of electric power supplied to meet end users' needs. Load is also an end-use device of an end-use customer that consumes power. Load should not be confused with demand, which is the measure of power that a load receives or requires.

LOAD CENTERS - A geographical area where large amounts of power are drawn by end-users.

LOAD DIVERSITY - The condition that exists when the peak demands of a variety of electric customers occur at different times. This is the objective of "load molding" strategies, ultimately curbing the total capacity requirements of a utility.

LOAD DURATION CURVE - A curve that displays load values on the horizontal axis in descending order of magnitude against percent of time (on the vertical axis) the load values are exceeded.



LOAD FACTOR - The ratio of the average load supplied to the peak or maximum load during a designated period. Load factor, in percent, also may be derived by multiplying the kWh in a given period by 100, and dividing by the product of the maximum demand in kW and the number of hours in the same period. The term also is used to mean the percentage of capacity of an energy facility - such as power plant or gas pipeline – that is utilized in a given period of time.

LOAD MANAGEMENT - Steps taken to reduce power demand at peak load times or to shift some of it to off-peak times. This may be with reference to peak hours, peak days or peak seasons. The main thing affecting electric peaks is air-conditioning usage, which is therefore a prime target for load management efforts. Load management may be pursued by persuading consumers to modify behavior or by using equipment that regulates some electric consumption.

LOAD-SERVING ENTITY (LSE) - An entity that provides electric power service to end-use customers. LSEs include but are not limited to IOUs, ESPs, CCAs and public-owned utilities.

LOAD SHAPE - A curve on a chart showing power (kW) supplied (on the horizontal axis) plotted against time of occurrence (on the vertical axis), and illustrating the varying magnitude of the load during the period covered.

LOAD SHIFTING - A load shape objective that involves moving loads from peak periods to off-peak periods. If a utility does not expect to meet its demand during peak periods but has excess capacity in the off-peak periods, this strategy might be considered.

LOSS OF LOAD PROBABILITY (LOLP) - A measure of the probability that system demand will exceed capacity during a given period; this period is often expressed as the expected number of days per year over a long period, frequently taken as ten consecutive years. An example of LOLP is one day in ten years.

LOSSES (Electric utility) - Electric energy or capacity that is wasted in the normal operation of a power system. Some kilowatt-hours are lost in the form of waste heat in electrical apparatus such as substation conductors. **LINE LOSSES** are kilowatts or kilowatt-hours lost in transmission and distribution lines under certain conditions.



M

MARGINAL COST - The sum that has to be paid the next increment of product of service. The marginal cost of electricity is the price to be paid for kilowatt-hours above and beyond those supplied by presently available generating capacity. In the utility context, the cost to the utility of providing the next (marginal) kilowatt-hour of electricity, irrespective of sunk costs.

MARKET-BASED PRICE - A price set by the mutual decisions of many buyers and sellers in a competitive market.

MARKET CLEARING PRICE - The price in a market at which supply equals demand. All demand prepared to pay at least this price has been satisfied and all supply prepared to operate at or below this price has been purchased.

MARKET PARTICIPANT - An entity, including a Scheduling Coordinator, who participates in the energy marketplace through the buying, selling, transmission, or distribution of energy or ancillary services into, out of, or through the ISO-controlled grid.

MARKET REDESIGN AND TECHNOLOGY UPGRADE (MRTU) - represents the largest change to the California wholesale energy market since electric restructuring began in 1998. CAISO has proposed that MRTU become effective in November 2007. Significant efforts will be required by PG&E to implement the systems and software to interface with the CAISO.

MARKETER (For Gas) - Marketers generally purchase gas supplies from producers and then resell them to end-users. Marketers add value and make a profit by saving producers and end-users the trouble of finding each other, arranging transportation and storage, and sometimes by arranging financing or assumption of price risk. Marketers also sometimes market a specific producer's gas without taking title in return for a marketing fee. Numerous marketers currently serve the California market.

MASTER FILE - A file maintained by the PX for use in bidding and bid evaluation protocol that contains information on generating units, loads, and other resources eligible to bid into the PX.

MAXIMUM DEMAND - Highest demand of the load within a specified period of time.

MCF - The quantity of natural gas occupying a volume of one thousand cubic feet at a temperature of sixty degrees Fahrenheit and at a pressure of fourteen and seventy-three hundredths pounds per square inch absolute.



MDQ - The term MDQ refers to maximum daily quantity of gas which a buyer, seller, or transporter is obligated to receive or deliver at each receipt or delivery point or in the aggregate as specified in an agreement.

MEGAWATT (MW) - One thousand kilowatts (1,000 kW) or one million (1,000,000) watts. One megawatt is enough energy to power 1,000 average California homes.

MEGAWATT HOUR (MWh) - One thousand kilowatt-hours, or an amount of electricity that would supply the monthly power needs of 1,000 typical homes in the Western U.S. (This is a rounding up to 8,760 kWh/year per home based on an average of 8,549 kWh used per household per year [U.S. DOE EIA, 1997 annual per capita electricity consumption figures]).

METER - A device for measuring levels and volumes of a customer's gas and electricity use.

METHANE (CH₄) - The first of the paraffin series of hydrocarbons. The chief constituent of natural gas. Pure methane has a heating value of 1,012 Btu per cubic foot.

MINIMUM GENERATION - Generally, the required minimum generation level of a utility system's thermal units. Specifically, the lowest level of operation of oil-fired and gas-fired units at which they can be currently available to meet peak load needs.

MMBTU - A thermal unit of energy equal to 1,000,000 Btus, that is, the equivalent of 1,000 cubic feet of gas having a heating content of 1,000 Btus per cubic foot, as provided by contract measurement terms. See DEKATHERM.

MMCF - A million cubic feet.

MUNICIPAL UTILITY - A provider of utility services owned and operated by a municipal government.

MUNICIPALIZATION - The process by which a municipal entity assumes responsibility for supplying utility service to its constituents. In supplying electricity, the municipality may generate and distribute the power or purchase wholesale power from other generators and distribute it.



MUST-TAKE GENERATION - Utilities are mandated to take electricity from specific resources identified by the CPUC. Except for Electric Microutilities, the receiver of must-take generation will pay for the electrical energy output of must-take resource even if they refuse to schedule and receive that energy. For this reason, these resources are always economic to receive and scheduled in order to minimize financial loss. Regulatory must-take generation include QF generating units under federal law, nuclear units and pre-existing power-purchase contracts that have minimum-take provisions.

N

NATURAL GAS - Hydrocarbon gas found in the earth, composed of methane, ethane, butane, propane and other gases.

NATURAL GAS FINANCIAL SWAPS (Purchase or Sale) – Over-the-counter forward products including fixed-for-floating swaps, basis swaps and swing-swaps for gas. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

NATURAL GAS FUTURES (Purchase or Sale) - Standardized forward contracts for gas that trade on an exchange. Futures may be physically or financially settled. Physically settled futures may be unwound by an offsetting trade, exchanged for a physical position, or held to physical delivery.

NATURAL GAS PURCHASES (Physical Supply) - Purchases/sales/exchanges of physical natural gas for terms of one month or longer.

NETWORK - A system of transmission and distribution lines cross-connected and operated to permit multiple power supply to any principal point on it. A network is usually installed in urban areas. It makes it possible to restore power quickly to customers by switching them to another circuit.

NEW-WORLD CONTRACTS - IOU Contracts for electric capacity and energy executed after January 1, 2003 when utilities returned to procurement.

NON-BYPASSABLE CHARGE - charge generally placed on distribution services to recover utility costs incurred as a result of restructuring (stranded costs - usually associated with generation facilities and services) and not recoverable in other ways.

NON-CORE CUSTOMERS - End-users with enough gas volume to justify consideration of transportation-only service from the distributor. Compare CORE CUSTOMERS.

NON-FIRM ENERGY - Electricity that is not required to be delivered or to be taken under the terms of an electric purchase contract.



NON-FTR LOCATIONAL SWAPS – Over-the-counter basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL (NERC) - Council formed by electric utility industry in 1968 to promote the reliability and adequacy of bulk power supply in utility systems of North America. NERC consists of ten regional reliability councils: Alaskan System Coordination Council (ASCC); East Central Area Reliability Coordination Agreement (ECAR); Electric Reliability Council of Texas (ERCOT); Mid-America Interconnected Network (MAIN); Mid-Atlantic Area Council (MAAC); Mid-Continent Area Power Pool (MAPP); Northeast Power Coordinating Council (NPCC); Southeastern Electric Reliability Council (SERC); Southwest Power Pool (SPP); Western Systems Coordinating Council (WSCC).

NOx - Oxides of nitrogen that are a chief component of air pollution that can be produced by the burning of fossil fuels. Also called nitrogen oxides.

NUCLEAR ENERGY - Power obtained by splitting heavy atoms (fission) or joining light atoms (fusion). A nuclear energy plant uses a controlled atomic chain reaction to produce heat. The heat is used to make steam run conventional turbine generators.

NUCLEAR REGULATORY COMMISSION (NRC) - An independent federal agency that ensures that strict standards of public health and safety, environmental quality and national security are adhered to by individuals and organizations possessing and using radioactive materials. The NRC is the agency that is mandated with licensing and regulating nuclear power plants in the United States. It was formally established in 1975 after its predecessor, the Atomic Energy Commission, was abolished.

NYMEX - New York Mercantile Exchange. The New York Mercantile Exchange, Inc., is the world's largest physical commodity futures exchange and the preeminent trading forum for energy and precious metals.

O

OFF-PEAK - Periods of low demands. All the time outside the on-peak period.

ON-PEAK - Periods of the highest demand.

ON-SITE ENERGY OR CAPACITY (SELF-GENERATION ON CUSTOMER SIDE OF THE METER) – The amount of power measured in MWs or MWhs that can be generated downstream of the customer's electric meter that can be used to offset the customer's load served by the electric service provider.



OPTIONS - An option is a contractual agreement that gives the holder the right to buy (call option) or sell (put option) a fixed quantity of a security or commodity (for example, a commodity or commodity futures contract), at a fixed price, within a specified period of time. May either be standardized, exchange-traded, and government regulated, or over-the-counter customized and non-regulated.

OUTAGE (Electric utility) - An interruption of electric service that is temporary (minutes or hours) and affects a relatively small area (buildings or city blocks). (See **BLACKOUT**)

OVER GENERATION - A condition that occurs when total PX participant demand is less than or equal to the sum of regulatory must-take generation, regulatory must-run generation, and reliability must-run generation.

OVERLOAD - The flow of electricity into conductors or devices when normal load exceeds capacity.

P

PARKING SERVICE – Short-term storage of a shipper’s excess gas so that shipper doesn’t have to sell it in the market.

PARTIAL LOAD - An electrical demand that uses only part of the electrical power available. [See California Code of Regulations, Title 24, Section 2-5342(e) 2]

PEAK DAY CURTAILMENT - Curtailment imposed on a day-to-day basis during periods of extremely cold weather when demands for gas exceed the maximum daily delivery capability of a pipeline or distribution system. Peak day curtailment is applied independent of seasonal curtailment and does not affect overall authorized volumes to customers under seasonal curtailment.

PEAK DEMAND OR PEAK LOAD - The electric load that corresponds to a maximum level of electric demand in a specified time period.

PEAK FOR OFF-PEAK EXCHANGE – Electric energy, capacity, or ancillary services or transmission exchanged between counterparties measured in MWs or MWhs that is agreed to be supplied in an on-peak period in exchange for receiving an amount in an off-peak period.

PEAKER - A nickname for a power generating station that is normally used to produce extra electricity during peak load times. Typically peaking resources are fully dispatchable and deliver in approximately 10% of hours.



PEAKING CAPACITY - Generating equipment normally operated only during the hours of highest daily, weekly, or seasonal loads; this equipment is usually designed to meet the portion of load that is above base load.

PG&E (PACIFIC GAS AND ELECTRIC COMPANY) - An electric and natural gas utility serving the central and northern California region.

PHOTOVOLTAICS - A technology that directly converts light into electricity. The process uses modules, which are usually made up of many cells (thin layers of semiconductors).

PHYSICAL CALL (OR PUT) OPTION - The right, but not the obligation, to buy (call) physical electricity for delivery on a specific date at a fixed or indexed price (strike). The right to sell is a put option.

PHYSICAL OPTIONS ON NATURAL GAS SUPPLY (Purchase or Sale) - The right, but not the obligation, to buy (call) physical gas for delivery on a particular date at a fixed or index price (strike). The right to sell is a put option.

PIPELINE - A line of pipe with pumping machinery and apparatus (including valves, compressor units, metering stations, regulator stations, etc.) for conveying a liquid or gas.

PIPELINE CAPACITY - The maximum quantity of gas that can be moved through a pipeline system at any given time based on existing service conditions such as available horsepower, pipeline diameter(s), maintenance schedules, regional demand for natural gas, etc.

PIPELINE FUEL - Natural gas consumed in the operation of a natural gas pipeline, primarily in compressors.

POINT(S) OF DELIVERY - Point(s) for interconnection on the Transmission Provider's System where capacity and/or energy are made available to the end user.

PORTFOLIO MANAGEMENT - The functions of resource planning and procurement under a traditional utility structure.

POWER - Electricity for use as energy.

POWER EXCHANGE - This is a commercial entity responsible for facilitating the development of transparent spot prices for energy capacity, and/or ancillary services.

POWER GRID - A network of power lines and associated equipment used to transmit and distribute electricity over a geographic area.



POWER MARKETER - An agent for generation projects who markets power on behalf of the generator. The marketer may also arrange transmission, firming or other ancillary services as needed. Though a marketer may perform many of the same functions as a broker, the difference is that a marketer represents the generator while a broker acts as a middleman.

POWER PLANT - A central station generating facility that produces energy.

POWER PURCHASE AGREEMENT - Specifies the terms and conditions under which electric power will be generated and purchased. Power purchase agreements require the Seller to supply power under specific terms and conditions for the life of the agreement. While power purchase agreements vary, their common elements include: specification of the size, pricing structure, operating flexibility, delivery point, various service and performance obligations; dispatchability options; credit/collateral terms, and conditions of termination or default.

PREFERRED SCHEDULE - The initial schedule produced by a Scheduling Coordinator that represents its preferred mix of generation to meet demand. The schedule includes the quantity of output (generators) and consumption (loads), details of any adjustment bids, and the location of each generator and load. The schedule also specifies the quantities and location of trades between the Scheduling Coordinator and all other Scheduling Coordinators, and is balanced with respect to generation, transmission losses, load, and trades.

PRICE CAP - Situation where a price has been determined and fixed.

PRICE CURVES -

- **Forward Curve (or Futures Price)** - A term structure of forward prices observed in the market. Forward contracts, like futures, are agreements to buy or sell a commodity at a future time. Forward price is the price to be paid at delivery.
- **Price Forecast** - A projection of future price levels (these could be day-ahead prices, futures prices, monthly prices etc.) expressed either in nominal or a given year's dollars, not necessarily reflective of market prices.

PRODUCTION - The act or process of generating electric energy.

PROVIDER OF LAST RESORT - A legal obligation (traditionally given to utilities) to provide service to a customer where competitors have decided they do not want that customer's business.



PUBLIC ADVISOR - An appointee of the governor who attends all meetings of the California Energy Commission and provides assistance to members of the public and intervenors in cases before the Commission.

PUBLICLY OWNED UTILITIES (POUs) - Municipal utilities (utilities owned by branches of local government) and/or co-ops (utilities owned cooperatively by customers).

PUMPED STORAGE - Facility designed to generate electric power during peak load periods with a hydroelectric plant using water pumped into a storage reservoir during off-peak periods.

PURCHASE AND SALE AGREEMENT - The written contract between buyer and seller indicating all terms and conditions of the sale.

PURPA (THE PUBLIC UTILITY REGULATORY ACT OF 1978) - Among other things, this federal legislation requires utilities to buy electric power from private “qualifying facilities,” at an avoided cost rate. This avoided cost rate is equivalent to what it would have otherwise cost the utility to generate or purchase that power themselves. Utilities must further provide customers who choose to self-generate a reasonably priced back-up supply of electricity.

PURPA is implemented by the Federal Energy Regulatory Commission and the California Public Utilities Commission (CPUC). Under PURPA each electric utility is required to offer to purchase available electric energy from cogeneration and small power production facilities.

Q

QUALIFYING FACILITY (QF) - “Qualifying facilities” (QFs) are non-utility cogeneration or other power producers that often generate electricity using renewable and alternative resources, such as hydro, wind, solar, geothermal, or biomass (solid waste). QFs must meet certain operating, efficiency, and fuel-use standards set forth by the Federal Energy Regulatory Commission (FERC) pursuant to PURPA (The Public Utility Regulatory Policies Act of 1978).

QUICK-START CAPABILITY - Refers to generating units that can be available for load within a 30-minute period.



R

R-VALUE - A unit of thermal resistance used for comparing insulating values of different material. It is basically a measure of the effectiveness of insulation in stopping heat flow. The higher the R-value number, a material, the greater its insulating properties and the slower the heat flow through it. The specific value needed to insulate a home depends on climate, type of heating system and other factors.

RAMP RATE - The rate at which you can increase load on a power plant. The ramp rate for a hydroelectric facility may be dependent on how rapidly water surface elevation on the river changes.

RAMP UP (SUPPLY SIDE) - Increasing load on a generating unit at a rate called the ramp rate.

REACTIVE POWER AND VOLTAGE CONTROL – Required to maintain adequate transmission system voltage for reliable interconnected system operation.

REAL-TIME (Purchase or Sale) - The amount of energy, measured in MWhs supplied or received by the control area operator to balance an entity's load and supply.

REAL-TIME MARKET - The competitive generation market controlled and coordinated by the ISO for arranging real-time imbalance energy.

REAL-TIME PRICING - The instantaneous pricing of electricity based on the cost of the electricity available for use at the time the electricity is demanded by the customer.

REACTOR - A device in which a controlled nuclear chain reaction can be maintained, producing heat energy.

REGULATION - The service provided by generating units equipped and operating with automatic generation controls that enables the units to respond to the ISO's direct digital control signals to match real-time demand and resources, consistent with established operating criteria.

REGULATION AND RAMPING CAPABILITY – The portion of a generating unit's unloaded capability which can be loaded, or loaded capability which can be unloaded, in response to Automatic Generation Control signals from the ISO's energy management system control computer.



RELIABILITY - Electric system reliability has two components – adequacy and security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

RELIABILITY MUST-RUN (RMR) AGREEMENTS - A Must-Run Service Agreement between the owner of an RMR Unit and the ISO within geographical areas identified via the Local Area Reliability Service (LARS) process.

RELIABILITY MUST-RUN (RMR) GENERATION - Generation that the ISO determines is required to be on line to meet applicable reliability criteria requirements. This includes:

- i) Generation constrained on line to meet NERC and WECC reliability criteria for interconnected systems operation;
- ii) Generation needed to meet load demand in constrained areas; and
- iii) Generation needed to be operated to provide voltage or security support of the ISO or a local area.

RELIABILITY MUST-RUN (RMR) UNIT - In return for payment, the ISO may call upon the owner of a generating unit under a Reliability Must-Run Agreement to run the unit when required for grid reliability.

RENEWABLE ENERGY - Resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro and wood. Although particular geothermal formations can be depleted, the natural heat in the earth is a virtually inexhaustible reserve of potential energy. Renewable resources also include some experimental or less-developed sources such as tidal power, sea currents and ocean thermal gradients.

RENEWABLE RESOURCES - Renewable energy resources are naturally replenishable, but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include: biomass, hydro, geothermal, solar and wind. In the future they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed



electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies.

REPLACEMENT RESERVE – A quantity of capacity that will ramp up within 60 minutes.

RESERVE - The extra generating capability that an electric utility needs, above and beyond the highest demand level it is required to supply to meet its users $\frac{1}{4}$ needs.

RESERVE CAPACITY - Capacity in excess of that required to carry peak load.

RESERVE MARGIN - The differences between the dependable capacity of a utility's system and the anticipated peak load for a specified period.

RESIDUAL NET LONG FOR CAPACITY (SURPLUS) – When the capacity resources under an LSE's control exceed the peak hourly demand (MW), including the required planning reserve margin, of the LSE's customers, the LSE is in a residual net long situation for capacity.

RESIDUAL NET LONG FOR ENERGY - When the energy requirement (kWh or MWh) of the LSE's customers load, for a given period of time (i.e., hour, month, year, etc.), is less than the total energy supply available to serve the LSE's customers, the LSE is in a residual net long situation for energy.

RESIDUAL NET SHORT FOR CAPACITY (DEFICIT) - When the peak hourly demand (MW), including the required planning reserve margin, of the LSE's customers exceeds the capacity resources under the LSE's control, the LSE is in a residual net short situation for capacity.

RESIDUAL NET SHORT FOR ENERGY - When the energy requirement (kWh or MWh) of an LSE's customer load, for a given time interval (i.e., hour, month, year, etc.), is greater than the total energy supply available to serve the LSE's customers, the LSE is in a residual net short situation for energy.

RESOURCE ADEQUACY - A common term used to describe sufficiency of capacity resources to meet contingencies that may be caused by unexpected energy usage (e.g., heat storm or cold spell), generation outages or transmission constraints.

RESOURCE ADEQUACY PROCEEDING - The CPUC undertook a process of addressing Resource Adequacy (RA) through the implementation of system and local RA standards. The system RA implemented in 2006 requires LSEs to meet a 15% to 17% planning reserve margin within their service territory. More recently, the CPUC implemented local RA standards for 2007, which requires LSEs to meet specific capacity



targets (or Local Capacity Requirements known as LCR) within one of the nine transmission constrained areas (or load pockets) located within the ISO's control area. Both system and local RA standards are in the process of being clarified, modified and potentially expanded through the current RA proceeding (R.05-12-013).

RESOURCE EFFICIENCY - The use of smaller amounts of physical resources to produce the same product or service. Resource efficiency involves a concern for the use of all physical resource and materials used in the production and use cycle, not just the energy input.

RETAIL COMPETITION - A system under which more than one electric provider can sell to retail customers, and retail customers are allowed to buy from more than one provider. (See also **DIRECT ACCESS**)

RETAIL MARKET - A market in which electricity and other energy services are sold directly to the end-use customer.

S

SCE (SOUTHERN CALIFORNIA EDISON COMPANY) - An electric utility serving the southern California region.

SDG&E (SAN DIEGO GAS & ELECTRIC) - An electric and natural gas utility serving the San Diego, California, region.

SCHEDULING COORDINATOR - Scheduling coordinators (SCs) submit balanced schedules and provide settlement-ready meter data to the ISO. Scheduling coordinators also:

- Settle with generators and retailers, the PX and the ISO
- Maintain a year-round, 24-hour scheduling center
- Provide non-emergency operating instructions to generators and retailers
- Transfer schedules in and out of the PX. (The PX is a marketplace. As bids are accepted, power is being bought and sold. Once a bid is accepted, the power sold is "transferred out" of the PX, since it is no longer available. Power that is available for sale is "transferred in" to the PX. These transfers may also take place directly between the buyer and seller, without involvement of the PX.)

The PX is considered a scheduling coordinator.



SEASONAL EXCHANGE - Electric energy, capacity, or ancillary services or transmission exchanged between counterparties measured in MWs or MWhs that is agreed to be supplied during one season or set of months in exchange for receiving an amount in another season or set of months. Dollars may or may not be exchanged in such a transaction.

SELF-GENERATION - A generation facility dedicated to serving a particular retail customer, usually located on the customer's premises. The facility may either be owned directly by the retail customer or owned by a third party with a contractual arrangement to provide electricity to meet some or all of the customer's load.

SERVICE, LENDING (BORROWING) – Short-term borrowing of a pipeline or storage provider's working gas by a shipper.

SERVICE AREA - The geographical territory served by a utility.

SERVICE LIFE - The length of time a piece of equipment can be expected to perform at its full capacity.

SERVICE TERRITORY - This is the state, area or region served exclusively by a single electric utility.

SETTLEMENT - The process of financial settlement for products and services purchased and sold. Each settlement involves a price and quantity. Both the ISO and PX may perform settlement functions.

SITE - Any location on which a facility is constructed or is proposed to be constructed.

SMALL POWER PRODUCER - Refers to a producer that generates at least 75% of its energy from renewable sources.

SOLAR ENERGY - Heat and light radiated from the sun.

SPARK SPREAD - The difference between the market price of electricity and its cost of production for a specific natural gas fired generating plant.

SPINNING RESERVE – The portion of unloaded synchronized generating capacity, controlled by the ISO, which is capable of being loaded in 10 minutes, and which is capable of running for at least two hours.

SPOT MARKET - A market in which transactions take place at most one day ahead of scheduled delivery.



SPOT MARKET (For Gas) - A market characterized by short-term, interruptible (or best efforts) contracts for specified volumes of gas. Participants may be any of the elements of the gas industry - producer, transporter, distributor, or end user. Brokers may also be utilized.

SPOT NATURAL GAS (Physical Supply) - Purchases/sales/exchanges of physical natural gas for terms less than one month.

SPOT PRICE - The price for spot transactions. (Also see **MARKET CLEARING PRICE**)

STORAGE, UNDERGROUND - The utilization of subsurface facilities for storing gas which has been transferred from its original location for the primary purposes of load balancing. The facilities are usually natural geological reservoirs such as depleted oil or gas fields or water-bearing sands sealed on the top by an impermeable cap rock. The facilities may be man-made or natural caverns.

STRANDED COSTS - Costs incurred by a utility which may not be recoverable under market-based retail competition. Costs incurred by a utility which may not be recoverable under market-based retail competition.

STRUCTURED TRANSACTIONS - Transactions that involve non-standard provisions for supplying electricity or electricity related products.

SUBSTATION - A facility that steps up or steps down the voltage in utility power lines. Voltage is stepped up where power is sent through long-distance transmission lines. It is stepped down where the power is to enter local distribution lines.

SUMMER - As applied to gas, the period April 1 of one year through October 31 of that same year.

SUMMER PEAK - The greatest load on an electric system during any prescribed demand interval in the summer.

SUPPLIER - A person or corporation, generator, broker, marketer, aggregator or any other entity, that sells electricity to customers, using the transmission or distribution facilities of an electric distribution company.

SUPPLY BID - A bid into the PX indicating a price at which a seller is prepared to sell energy or ancillary services.



SUPPLY-SIDE - Activities conducted on the utility's side of the customer meter. Activities designed to supply electric power to customers, rather than meeting load though energy efficiency measures or on-site generation on the customer side of the meter.

SURPLUS (Electric utility) - Excess firm energy available from a utility or region for which there is no market at the established rates.

SYSTEM - A combination of equipment and/or controls, accessories, interconnecting means and terminal elements by which energy is transformed to perform a specific function, such as climate control, service water heating, or lighting. [See California Code of Regulations, Title 24, Section 2-5302]

SYSTEM NET ENERGY FORECAST - Energy used by IOU and direct access customers, as measured at generation (includes T&D losses).

SYSTEM PEAK DEMAND - The highest demand value that has occurred during a specified period for the utility system.

T

TEMPERATURE - Degree of hotness or coldness measured on one of several arbitrary scales based on some observable phenomenon (such as the expansion).

TOLLING AGREEMENT – An agreement to provide (receive) gas in exchange for receiving (providing) electricity.

TRANSFER - To move electric energy from one utility system to another over transmission lines.

TRANSFORMER - A device, which through electromagnetic induction but without the use of moving parts, transforms alternating or intermittent electric energy in one circuit into energy of similar type in another circuit, commonly with altered values of voltage and current.

TRANSITION COSTS – Stranded costs which are charged to utility customers through some type of fee or surcharge after the assets are sold or separated from the vertically-integrated utility.

TRANSMISSION - Transporting bulk power over long distances.



TRANSMISSION AND DISTRIBUTION (T&D) LOSSES - Electric energy or capacity that is wasted in the normal operation of a power system. Some kilowatt-hours are lost in the form of waste heat in electrical apparatus such as substation transformers. Line losses are kilowatts or kilowatt-hours lost in transmission and distribution of electricity.

TRANSMISSION AND DISTRIBUTION (T&D) SYSTEM - An interconnected group of electric transmission lines and associated equipment for the movement or transfer of electric energy in bulk between points of supply and points at which it is transformed for delivery to the ultimate customers.

TRANSMISSION LINES - Heavy wires that carry large amounts of electricity over long distances from a generating station to places where electricity is needed. Transmission lines are held high above the ground on tall towers called transmission towers.

TRANSMISSION OWNER - An entity that owns transmission facilities or has firm contractual right to use transmission facilities.

TURBINE GENERATOR - A device that uses steam, heated gases, water flow or wind to cause spinning motion that activates electromagnetic forces and generates electricity.

U

UPGRADE (Electric utility) - Replacement or addition of electrical equipment resulting in increased generation or transmission capability.

U.S. DEPARTMENT OF ENERGY (DOE) - The DOE manages programs of research, development and commercialization for various energy technologies, and associated environmental, regulatory and defense programs. DOE announces energy policies and acts as a principal advisor to the President on energy matters.

UNCERTAINTIES - Uncertainties are factors over which the utility has little or no foreknowledge, and include load growth, fuel prices, or regulatory changes. Uncertainties are modeled in a probabilistic manner. However, in the Detailed Workbook, you may find it is more convenient to treat uncertainties as “unknown but bounded” variables without assuming a probabilistic structure. A specified uncertainty is a specific value taken on by an uncertainty factor (e.g., 3 percent per year for load growth). A future uncertainty is a combination of specified uncertainties (e.g., 3 percent per year load growth, 1 percent per year real coal and oil price escalation, and 2.5 percent increase in housing starts).

UNSERVED ENERGY - The average energy that will be demanded but not served during a specified period due to inadequate available generating capacity.



UPGRADE - An increase in the rating or stated measure of generation or transfer capability.

UTILITY - A regulated entity which exhibits the characteristics of a natural monopoly. For the purposes of electric industry restructuring, "utility" refers to the regulated, vertically-integrated electric company. "Transmission utility" refers to the regulated owner/operator of the transmission system only. "Distribution utility" refers to the regulated owner/operator of the distribution system which serves retail customers.

UTILITY-OWNED GENERATION - Resources owned by an investor-owned utility. Does not include resources that may be under contract or otherwise available to utilities, such as DWR contracts.

V

VARIABLE COSTS - Costs, such as fuel costs, that depend upon the amount of electric energy supplied.

W

WASTE-TO-ENERGY - This is a technology that uses refuse to generate electricity. In mass burn plants, untreated waste is burned to produce steam, which is used to drive a steam turbine generator. In refuse-derived fuel plants, refuse is pre-treated, partially to enhance its energy content prior to burning.

WEATHER SCENARIOS – 1:5, 1:10, & 1:20 - Forecasts of expected highest demand (MW) under different weather scenarios. 1:2 means average weather conditions. 1:5, 1:10, 1:20 mean probability of hot temperature (one in every five, ten or twenty years).

WEATHER TRIGGERED OPTIONS - A method for managing temperature and other weather forecast risks.

WHEELING - The transmission of electricity by an entity that does not own or directly use the power it is transmitting. Wholesale wheeling is used to indicate bulk transactions in the wholesale market, whereas retail wheeling allows power producers direct access to retail customers. This term is often used colloquially as meaning transmission.

WHOLESALE COMPETITION - A system whereby a distributor of power would have the option to buy its power from a variety of power producers, and the power producers would be able to compete to sell their power to a variety of distribution companies.



WHOLESALE POWER MARKET - The purchase and sale of electricity from generators to resellers (who sell to retail customers) along with the ancillary services needed to maintain reliability and power quality at the transmission level.

WINTER - As applied to gas, the period November 1 of one year through March 31 of the following year.

WINTER PEAK - The greatest load on an electric system during any prescribed demand interval in the winter season or months.

WIRES CHARGE - A broad term which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires.

X

X-RAY - A type of electromagnetic radiation having low energy levels.

Y

No entries for the letter Y.

Z

No entries for the letter Z.

List of Sources:

1. <http://www.energy.ca.gov/glossary/>
2. <http://www.energycentral.com/reference/glossary>
3. <http://www.eia.doe.gov/tools/glossary/>
4. CPUC Decisions (D.) 02-10-062, 03-12-062, 04-12-048, and 06-06-066
5. Advice Letter E-2615
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7. <http://www.pge.com>



Pacific Gas and Electric Company
San Francisco, California

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APPENDIX K

ACRONYM LIST



Acronym	Full Name
A.	Application
AB	Assembly Bill
ACEEE	American Council for an Energy Efficient Economy
AL	Advice Letter
AMP	Aggregator Managed Portfolio Program
APT	Annual Procurement Target
A/S	Ancillary Services
BBEES	Big Bold Energy Efficiency Strategies
BIP	Base Interruptible Program
Bloom	Bloom Energy
BPP	Bundled Procurement Plan
C&I	Commercial and Industrial
C&S	Codes and Standards
CAISO	California Independent System Operator
CARB	California Air Resources Board
CBP	Capacity Bidding Program
CC	Combined Cycle
CCA	Community Choice Aggregation
CDWR or DWR	California Department of Water Resources
CEC	California Energy Commission
CHP	Combined Heat and Power



Acronym	Full Name
CO ₂	carbon dioxide
CPA	California Consumer Power and Conservation Financing Authority
CPUC or Commission	California Public Utilities Commission
CRR	Congestion Revenue Rights
CRT	Customer Risk Tolerance
CSI	California Solar Initiative
CSU East Bay	California State University East Bay
D.	Decision
DA	Direct Access
DBP	Demand Bidding Program
DCPP	Diablo Canyon Power Plant
DG	Distributed Generation
DR	Demand Response
DRA	Division of Ratepayer Advocates
DSM	Demand-Side Management
EAL	Estimated Aggregate Liability
EAP	Energy Action Plan
ECMS	Energy Contract Management & Settlements
ED	Energy Division
EE	Energy Efficiency



Acronym	Full Name
EEI	Edison Electric Institute
enricher	enrichment services supplier
EP	PG&E's Energy Procurement organization
EPPA	Energy Policy, Planning & Analysis
ERRA	Energy Resource Recovery Account
ESM	Energy Supply Management
ET	Emerging Technologies
EUP	Enriched Uranium Product
EV	Electric Vehicle
FCE	FuelCell Energy
FCM	Futures Commission Merchant
FERC	Federal Energy Regulatory Commission
FIT	Feed-in Tariff
FNM	Full Network Model
FTR	Firm Transmission Rights
GDP-IPD	Gross Domestic Product – Implicit Price Deflator
GHG	greenhouse gas
GISB	Gas Industries Standards Board
GO 156	General Order 156
GSP	Gas Supply Plan
GWh	gigawatt-hour



Acronym	Full Name
HASP	Hour Ahead Scheduling Process
HVAC	Heating, Ventilating and Air Conditioning
ICE	Intercontinental Exchange
ID	Irrigation District
IDSMD	Integrated Demand-Side Management
IE	Independent Evaluator
IEPR	Integrated Energy Policy Report
IFM	Integrated Forward Market
IM	Instant Messaging
IOU	investor-owned utility
ISDA	International Swaps and Derivatives Association, Inc.
kgU	kilograms uranium
kW	kilowatt
kWh	kilowatt-hour
LCBF	least-cost, best-fit
LCD	least-cost dispatch
LCR	Local Capacity Requirements
LMP	Locational Marginal Price
LSE	Load Serving Entity
LT	Long-Term
LT-CRR	Long-Term Congestion Revenue Rights



Acronym	Full Name
LT-FTR	Long-Term Firm Transmission Rights
LTPP	Long-Term Procurement Plan
LTRFO	Long-Term Request for Offers
MASH	Multi-Family Affordable Solar Housing Program
ME&O	Marketing, Education and Outreach
MIV	Market Intrinsic Value
MMBtu	Millions of British Thermal Units
MRTU	Market Redesign and Technology Upgrade
MW	megawatts
MWh	megawatt-hour
NAESB	North American Energy Standards Board
NEM	Net Energy Metering
NEMFC	Net Energy Metering for Fuel Cell Customers-Generators
NEMW	Wind Energy Co-Metering
NERC	North American Electric Reliability Corporation
NGX	Natural Gas Exchange
Non-FTR	Non-Firm Transmission Rights
NP15	North of Path-15
NPV	Net Present Value
NQC	Net Qualifying Capacity
NRC	Nuclear Regulatory Commission



Acronym	Full Name
NSHP	New Solar Homes Partnership
NYMEX	New York Mercantile Exchange
O&M	Operations and Maintenance
Oakley Project	Oakley Generating Station
OASIS	Open Access Same-time Information Systems
OP	Ordering Paragraph
O-T-C	Over-The-Counter
PCT	Programmable and Communicating Thermostat
PDP	Peak Day Pricing
PDR	Proxy Demand Response
PG&E	Pacific Gas and Electric Company
PL	Participating Load
PLS	Permanent Load Shifting
PPA	Power Purchase Agreement
PRG	Procurement Review Group
PSA	Purchase and Sale Agreement
PSE	Puget Sound Energy
PTR	Peak Time Rebate
PURPA	Public Utility Regulatory Policy Act
PV	Photovoltaic
PVRR	Present Value of Revenue Requirement



Acronym	Full Name
QCR	Quarterly Compliance Report
QF	Qualifying Facility
QF/CHP Settlement	Qualifying Facility and Combined Heat and Power Settlement
R.	Rulemaking
RA	Resource Adequacy
RAM	Renewable Auction Mechanism
RDRP	Reliability Demand Response Product
REC	Renewable Energy Credit
RES	Renewable Electricity Standard
RES-BCT	Renewable Energy Self-Generation – Bill Credit Transfer
RFO	Request for Offers
RFP	Request for Proposals
RMR	Reliability Must-Run
RPS	Renewable Portfolio Standard
RTM	Real-Time Market
S&P	Standard and Poor's
S&T	Supplier's and Transporter's
SASH	Single-Family Affordable Solar Housing Program
SB	Senate Bill
SCE	Southern California Edison Company



Acronym	Full Name
SDG&E	San Diego Gas & Electric Company
SEC	Securities and Exchange Commission
SF State	San Francisco State University
SGIP	Self-Generation Incentive Program
SI	Strategic Inventory
SOX	Sarbanes-Oxley
Standardized Assumptions	Appendix B of the <i>Administrative Law Judge's Ruling Requesting Post-Workshop Comments, Updating Standardized Planning Assumptions, and Providing Lawrence Berkeley Report on Modeling Issues</i> issued December 23, 2010
Strategic Plan	California Energy Efficiency Long Term Strategic Plan
SWU	Separative Work Unit
T&D	transmission and distribution
TeVAr	To-expiration Value-at-Risk
TOU	Time-of-Use
Track II Scoping Memo	<i>Assigned Commissioner's and Administrative Law Judge's Scoping Memo for Track II Bundled Procurement Plans</i> issued January 13, 2011
TREC	Tradable Renewable Energy Credits
UOG	utility-owned generation
U.S.	United States
WACC	Weighted Average Cost of Capital



Acronym	Full Name
WaveConnect	PG&E's wave energy project
WE&T	Workforce Education and Training
WECC	Western Electric Coordinating Council
WMDVBE	Women, Minority and Disabled Veteran Business Enterprise
WREGIS	Western Renewable Energy Generation Information System
WSPP	Western System Power Pool



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APPENDIX L
GHG PROCUREMENT PLAN

CONFIDENTIAL



A. Background

1. California Air Resource Board's Cap-and-Trade Regulations

Assembly Bill ("AB 32") is California's groundbreaking greenhouse gas ("GHG") legislation that requires the reduction of statewide GHG emissions to 1990 levels by 2020. To this end, the California Air Resources Board ("CARB") proposed a statewide Cap-and-Trade regulation and other programmatic measures, including a Renewable Energy Standard, Customer Energy Efficiency, and Combined Heat and Power, to achieve these emissions reductions. The Cap-and-Trade regulation, which became effective on January 1, 2012, is intended to establish a market-based price for GHG emissions and, over time, provide market signals for efficient resource utilization and procurement activities to reduce GHG emissions. This regulation is and will likely continue to be amended; should changes to the regulation necessitate modifications to this plan, Pacific Gas and Electric Company ("PG&E") will submit an advice letter to the California Public Utilities Commission ("CPUC" or "Commission") requesting changes.

Compliance with the emissions cap established in the CARB Cap-and-Trade regulation begins in 2013 and is broken up into three compliance periods. The first compliance period—for the years 2013 through 2014—is scheduled to commence on January 1, 2013. Covered entities in the first compliance period include operators of any facility that annually emits at least 25,000 metric tons of carbon dioxide equivalent ("mtCO₂e").¹ Operators are required to obtain and surrender compliance instruments equivalent to the annual GHG emissions for each such facility. Importers of electricity into California are also responsible for obtaining and retiring compliance instruments for

¹ Units of GHG are typically measured in terms of mtCO₂e.



GHG emissions deemed to be associated with electricity imports for purposes of compliance with Cap-and-Trade.

There are two types of compliance instruments:

- i. **Allowances** are limited tradable authorizations created by CARB to emit up to one mtCO₂e. Allowances are year-specific and can be used for an annual compliance filing for the year it was issued or for any subsequent compliance filing. An allowance can be bought, sold, transferred, or “banked” for use in a particular compliance period. Allowances will be available via direct allocation² by CARB, auctions to be conducted under the auspices of CARB, and the Allowance Price Containment Reserve³ (“APCR”) to be established by CARB. CARB auctions are currently scheduled to be held quarterly.⁴ Allowances may also become available in secondary markets.
- ii. **Offset Credits** (“Offsets”) are tradable compliance instruments issued by CARB that represent verified reductions of one mtCO₂e from projects whose emissions or avoided emissions are not from a source covered under the Cap-and-Trade program. For compliance purposes, an offset and an allowance are virtually interchangeable for the year issued, however, an entity can only use offsets to meet up to 8% of its compliance obligation in any compliance period. In addition, CARB’s Cap-and-Trade regulation allows CARB to invalidate an offset for errors, regulatory violations or fraud. CARB has proposed specific rules for using offsets for Cap-and-Trade compliance, including the types of projects that qualify and the process for offset verification, issuance, and registration.

² According to the Cap-and-Trade regulation, the investor-owned utilities (“IOU”) are required to consign 100% of their directly allocated allowances to the auctions in the allocation year; any allowances unsold in the previous year will remain in the IOU’s consignment account. An IOU cannot use a directly allocated allowance to satisfy its compliance obligation.

³ The CARB APCR will be populated with a finite quantity of allowances available for purchase at fixed prices and only by entities that are required (“covered entities”) to participate in the Cap-and-Trade program.

⁴ In 2012, there will only be one auction, on November 14, 2012. For that auction, IOUs must consign one-third of 2013’s allowances allocated to them; the balance of those allowances must be consigned to the auctions in 2013. This change was noted in the March 30, 2012 proposed amendments to the cap-and-trade regulation. CARB’s Board is scheduled to consider these amendments on June 28, 2012.



Allowances and offsets may also be available from external GHG Emissions Trading System (“GHG ETS”) to which California has linked.⁵

PG&E’s actual Cap-and-Trade compliance obligation for a given year is determined by the GHG emissions reported annually to CARB per the Mandatory Reporting Rule.⁶ Annual reports are due to CARB by April 10 of the calendar year following the emission year for facility operators or suppliers, and June 1 for electric power entities. Cap-and-Trade compliance showings are made annually and at the end of each compliance period. In order to demonstrate compliance in a given year, PG&E must surrender enough compliance instruments to cover 30% of its qualifying emissions by November 1 of the following calendar year (“annual surrender date”). In addition, PG&E must surrender enough compliance instruments to cover the balance of its qualifying emissions over a multi-year compliance period by November 1 of the calendar year following the end of each compliance period (“compliance period surrender date”).

PG&E is expected to receive an allocation of free allowances directly from CARB annually; however, these free allowances cannot be used directly by PG&E to satisfy its compliance obligation. All directly-allocated allowances must be consigned by PG&E into one or more of the auctions. For the 2012 auction, allowances designated for consignment at least ten (10) days before the auction will be available for sale at that auction. Beginning in 2013, allowances consigned at least seventy-five (75) days prior to

⁵ Additional regulatory language referencing external GHG ETS to which California may be linked was added as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation. CARB’s Board is scheduled to consider these amendments on June 28, 2012.

⁶ Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Division 3, Chapter 1, Subchapter 10, Article 2, Sections 95100 to 95133, title 17, California Code of Regulations).



a quarterly auction will be offered for sale at that auction and each consigning entity agrees to accept the auction settlement price for allowances sold at auction. Only IOUs and publicly-owned utilities ("POU") can consign allowances to the auction.

2. Greenhouse Gas Compliance Instruments and California Air Resources Board Auctions

Procurement of compliance instruments may take place through any or all of the following: (1) CARB-sanctioned allowance auctions; (2) APCR; and (3) allowance or offset procurement via secondary markets.

The first CARB allowance auction is scheduled to take place on November 14, 2012, and allowance auctions will be held quarterly thereafter. To participate in an auction, PG&E must register for the auction prior to the auction date. The auction format consists of single-round bidding, with sealed bids consisting of price and quantity, and bid units of 1,000 mtCO₂e. Bidders may submit multiple bids. Each auction will clear at the auction settlement price as follows: beginning with the highest bid price, bids will be considered in declining order by price and bidders at that price will be awarded allowances until: (a) the next lower bid price is less than the auction floor price, in which case the current price is the settlement price; or (b) the total quantity of allowances bid at the next lower bid price is greater than or equal to the number of allowances available to be awarded, in which case the next lower bid price is the settlement price. If the total quantity bid at the settlement price is greater than the number of available allowances, the



regulation describes the process by which these allowances would be distributed to each entity bidding at the auction settlement price.⁷

Prior to each auction, PG&E will also be required to provide a bid guarantee, which will consist of a bond, cash, or letter of credit with a value greater than or equal to the maximum value of bids to be submitted.⁸ The Cap-and-Trade regulation also limits each participating entity's holdings of allowances in its trading or compliance accounts, with certain exemptions. This limits the total amount of allowances any participating entity can purchase and hold. In addition, the March 30, 2012 proposed amendments to the regulation stipulate that CARB shall restrict IOUs and POUs from purchasing more than 40% of the allowances offered at each auction.

Prior to a given auction, CARB will disclose the number of allowances from California and any external GHG ETS to which California has linked that will be offered in that auction. Beginning in 2013, in addition to consigned allowances, in each auction of allowances from the current and previous budget years ("current auction"), CARB will offer one-quarter of its own current year allowances designated for auction. Concurrent with the current auction, CARB will conduct an auction for allowances from future budget years ("advance auctions"). In each advance auction it will offer one-quarter of its own allowances allocated for the budget year three years subsequent to the current calendar year.⁹ Current and advance auctions will be conducted separately.

⁷ The process for resolution of tie bids was changed in March 30, 2012, proposed amendments to the cap-and-trade regulation, and has not yet been finalized.

⁸ This deadline was extended from one week as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation.

⁹ With the exception of 2012, when all of the allowances allocated for advance auction from the 2015 budget will be designated for sale at the advance auction.



The APCR will be filled with 121.8 million mtCO₂e allowances for 2013-2020.

There is no refill mechanism proposed for the APCR, and use of the APCR is restricted to entities registered into the California cap-and-trade system. Allowances purchased from the APCR go into an entity's compliance account and cannot be withdrawn or traded. To the extent allowances remain in the APCR, they will become available for purchase by complying entities on March 8, 2013. Subsequent APCR sales will be conducted on the first day six weeks after each quarterly auction. The APCR consists of three tiers with different associated prices; each tier consists of one-third of the 121.8 million mtCO₂e allowances with which the APCR is initially populated. Tier 1 allowances will be sold to entities with a compliance obligation at \$40/mtCO₂e in 2013,¹⁰ Tier 2 at \$45/mtCO₂e in 2013, and Tier 3 at \$50/mtCO₂e in 2013.

Finally, to the extent that allowances are transacted between parties outside of the auction or APCR, within three days of settlement, the seller and buyer must report each transaction to CARB.¹¹

B. PG&E's Allowance Consignment Proposal

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

¹⁰ The APCR price for each tier will rise by 5% plus the Consumer Price Index ("CPI") each year.

¹¹ The timeline for transfer of compliance instruments between accounts may change as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation.



C. PG&E's Potential Greenhouse Gas Risks

1. Greenhouse Gas Obligations

PG&E is required by CARB's Cap-and-Trade regulation to surrender compliance instruments for its qualifying utility-owned generation ("UOG"), imports, and gas compressor stations (herein collectively described as "physical" obligations). Furthermore, PG&E has contractual obligations associated with certain tolling agreements that require it to either: (1) provide the counterparty with compliance instruments for the energy under contract; or (2) reimburse the counterparty for the Cap-and-Trade compliance costs associated with its facility's operation under the contract.

2. Cap-and-Trade Penalties

PG&E could face CARB penalties for failure to surrender an adequate number of compliance instruments for UOG, imports, and gas compressor stations for which it has a compliance obligation.

CARB's Cap-and-Trade rule imposes a four-time excess emissions penalty resulting from "untimely surrender" of allowances. This penalty would be assessed by requiring that additional compliance instruments be surrendered, rather than by cash payment. In addition, if an entity fails to surrender the required compliance instruments within five (5) days of the first auction or reserve sale conducted by CARB following the



applicable surrender date, whichever is the latter, and for which the registration deadline has not passed when the untimely surrender obligation is assessed, CARB's Cap-and-Trade rule would treat each ton of GHG emissions for which a compliance instrument was not surrendered as a separate violation for each day the violation continues.

AB 32 incorporates longstanding air pollution penalty authority pursuant to Health and Safety Code ("HSC") Section 38580. In relevant part, under HSC § 42300 et seq., CARB may impose civil and criminal penalties on corporations and individuals and may also seek injunctive relief. Civil penalty authority (per day of violation) is up to \$10,000 (strict liability); \$20,000 (negligent emissions violation); \$40,000 (knowing emissions violation); \$35,000 (falsification of document with intent to deceive); and \$75,000 (intentional emissions violation). Additional penalties that are more severe can result from negligent or intentional violations causing unreasonable risk of or actual bodily injury or death. AB 32 specifies that any violation of a CARB climate regulation is considered an emissions violation.

[REDACTED]

[REDACTED]

[REDACTED]

3. Offset Credits ("Offsets")

CARB's Cap-and-Trade regulation allows CARB to invalidate an offset for errors, regulatory violations, or fraud. In the case where an offset is used to meet a compliance requirement and is later invalidated, the complying entity must replace the invalidated



offset with a valid compliance instrument within six (6) months of notification by CARB of the offset's invalidation or be subject to compliance penalties. PG&E will only purchase offsets if the purchase contract requires the seller to assume the risk of invalidation and to post appropriate collateral. PG&E will assess the risk of invalidation for each offset transaction.

D. PG&E's GHG-Related Product Procurement

This GHG Procurement Plan addresses the GHG-related procurement authority necessary for PG&E to comply with the obligations associated with emissions from sectors covered by Cap-and-Trade beginning in the first compliance period, namely facilities with GHG emissions greater than or equal to 25,000 mtCO₂e per year and imported electricity.¹³ As an entity that is required to comply with Cap-and-Trade, PG&E will need to procure compliance instruments to meet the compliance requirements associated with its own facilities and imports, as well as the GHG contractual obligations associated with Power Purchase Agreements with third parties that require PG&E to procure GHG compliance products or assume GHG compliance costs for such parties. PG&E's Energy Procurement Department will procure GHG compliance instruments for all of PG&E's emissions subject to Cap-and-Trade, and transfer requested GHG

¹³ Beginning in 2015, concurrent with the start of the second compliance period, CARB intends to expand the scope of covered sectors subject to the cap to include suppliers of natural gas, transportation fuels, and other fuels. PG&E may seek Commission approval of amended procurement authority through the advice letter process if amendments are necessary to ensure PG&E's compliance related to GHG emissions that would fall under this expanded cap.



allowances to PG&E's Gas Transmission and Distribution Department¹⁴ (i.e., for GHG emissions at gas compressor stations) at PG&E's weighted-average cost.¹⁵ Below, PG&E describes its GHG obligations and Commission-approved GHG-related products and procurement processes, as well as its GHG procurement strategy. The products, procurement processes, and GHG procurement strategy establish the upfront achievable standards for PG&E's procurement activities consistent with AB 57.

1. Greenhouse Gas Obligations

PG&E's primary need to procure GHG compliance instruments and engage in GHG transactions for the first compliance period beginning 2013 arises in connection with the following:

- Utility-Owned Facilities: Conventional generation facilities and gas compressor stations owned by PG&E that are either operating or under construction and that emit at least 25,000 mtCO₂e per year, such as the Humboldt Generating Station, Colusa Generating Station, and Gateway Generating Station, will have a compliance obligation under Cap-and-Trade.
- Selected Tolling Agreements: Contracts that allocate to PG&E or where PG&E has assumed GHG compliance instrument procurement responsibility for such counterparties.
- Electricity Imports: PG&E is responsible for GHG emissions deemed to be associated with its electricity imports for purposes of compliance with Cap-and-Trade.

¹⁴ PG&E's Energy Procurement Department will only act as the buying agent for GHG Products requested by the Gas Transmission and Distribution Department for the limited GHG obligations associated with its gas compressor stations. A forecast of GHG position will be conducted by Gas Transmission and Distribution, who will then request a quantity of compliance products from the Energy Procurement Department.

¹⁵ Weighted-average cost is the weighted-average cost of PG&E's allowances and offsets in a given compliance year.



2. Greenhouse Gas-Related Products

The following GHG-related products (“GHG Products”) have been approved by the Commission:

TABLE APPENDIX L-1
PACIFIC GAS AND ELECTRIC COMPANY
GHG PRODUCTS

<u>Product</u>	<u>Description</u>
<u>GHG Allowance</u>	<u>A compliance instrument accepted by CARB providing the right to emit one mtCO₂e to satisfy obligations under the Cap-and-Trade regulation.</u>
<u>GHG Offset</u>	<u>A compliance instrument representing a verified emission reduction that is accepted by CARB in lieu of a GHG Allowance to satisfy obligations under the Cap-and-Trade regulation.</u>

3. Greenhouse Gas-Related Processes

PG&E will procure GHG Products from the Primary and Secondary Markets¹⁶ to meet its entity-specific and contractual compliance obligations in accordance with its procurement strategy. PG&E is authorized to procure these GHG Products using the following procurement methods:

TABLE APPENDIX L-2
PACIFIC GAS AND ELECTRIC COMPANY
GHG PROCUREMENT METHODS AND PRACTICES

<u>Transaction Process</u>	<u>Description</u>
<u>CARB Auction</u>	<u>Authorization to procure GHG Allowances through any CARB Auction in accordance with the Cap-and-Trade regulation.</u>
<u>Allowance Price Containment Reserve</u>	<u>Authorization to procure GHG Allowances through CARB’s Allowance Price Containment Reserve.</u>

In addition to the new GHG Procurement Methods and Practices in Table Appendix L-2, PG&E will use approved procurement methods and practices as

¹⁶ The Primary Market consists solely of the CARB auctions and APCR for allowances. The Secondary Market consists of allowance and offset products offered for purchase outside of the Primary Market.



described in its Bundled Procurement Plan that govern procurement via competitive Requests for Offer (“RFO”) processes and transparent exchanges¹⁷ to procure GHG Products. When procuring via bilateral transactions (including brokers), PG&E will utilize a competitive RFO process, consult with its Procurement Review Group (“PRG”), apply its approved procurement credit and collateral requirements, and apply the applicable affiliate transaction rules. PG&E can also procure GHG Products on exchanges that have been previously approved by the Commission for power procurement. For exchanges not previously approved, PG&E will submit a Tier 2 advice letter detailing: (1) what exchange it is seeking to use; (2) the liquidity and transparency of the exchange, specific for GHG Products, including an explanation of how the Commission can be assured that the price of the products procured on the exchange is reasonable; and (3) the regulatory authority or authorities the exchange is subject to. Finally, PG&E has authority to resell GHG Products, but will report such sales to its PRG.

4. Greenhouse Gas Procurement Strategy

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

¹⁷ The use of exchanges includes the “clearing” of bilateral transactions authorized by the Commission.



- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

i. Maximum Volume Limits

j. Financially Hedging GHG Product Price Risk

Each of these elements is described in more detail below.

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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Cal. P.U.C. Sheet No. Redline-299
Pacific Gas and Electric Company
Bundled Procurement Plan

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Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-300
Pacific Gas and Electric Company
Bundled Procurement Plan

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Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-301
Pacific Gas and Electric Company
Bundled Procurement Plan

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Pacific Gas and Electric Company
San Francisco, California

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Bundled Procurement Plan

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i. Maximum Volume Limits

Consistent with Decision 12-04-046, specific overall volume limits for PG&E's GHG Product procurement will tie to the actual and forecasted GHG emissions for its facilities, certain tolling agreements, and electric imports. CARB's regulation also set limits on the number of allowances that can be held, and offsets that can be used for compliance. In addition, the March 30, 2012 proposed amendments to the regulation restrict PG&E from purchasing more than 40% of the allowances offered at each auction. These various limits will cap the amount of GHG Products PG&E will procure. PG&E will also transact GHG Products consistent with regulations established regarding the use of such products for compliance with Cap-and-Trade. PG&E may purchase GHG Products in excess of its annual compliance requirements and may "bank" surplus GHG Products to use in future compliance years in accordance with its procurement strategy and the procurement limits set forth below.

Generally in the current year, PG&E may purchase GHG Products to fulfill 100% of its current net remaining compliance obligation and its forecasted compliance obligation for the remainder of the current year. In addition, in the current year PG&E may purchase a portion of its forecasted compliance obligation for the following three compliance years not to exceed a set percentage in total for each year. PG&E will



not purchase GHG Products with vintages more than three years from the current year. Finally, PG&E will not purchase more than 8% of its direct compliance obligation, as defined below, in the form of offsets, provided these purchases also stay within the overall GHG Product procurement limits identified below.

The procurement limit sets the maximum amount of GHG Products PG&E may purchase in the current year to fulfill its “direct compliance obligation,” defined as the tons of emissions for which PG&E has an obligation to retire allowances on its own behalf as a regulated entity under the Cap-and-Trade program, and/or is otherwise obligated to procure GHG Products for a third party that is a regulated entity under the Cap-and-Trade program (i.e., certain contractual arrangements where PG&E is contractually responsible, or could elect to assume that responsibility, for procuring GHG Products for a third party). A “purchase” is defined as taking title of the GHG Product when it is delivered. Thus forward purchases count against the procurement limit in the year delivered, which may not be the current year.

PG&E’s Direct Compliance Obligation Purchase Limit for the current year is calculated as:

$$\text{LCY} = \text{A} + 100\% * \text{FDCY} + 60\% * \text{FDCY} + 1 + 40\% * \text{FDCY} + 2 + 20\% * \text{FDCY} + 3$$

Where:

“L” is the maximum number of GHG Products PG&E can purchase for purposes of meeting its direct compliance obligation.

“CY” is the Current Year, i.e., the year in which PG&E is transacting in the market.

“A” is PG&E’s net remaining compliance obligation to date, calculated as the sum of the actual emissions for which PG&E is responsible for



retiring allowances (or obligated to purchase for a third party) up to the Current Year, minus the total allowances or offsets PG&E has purchased up to the Current Year that could be retired against those obligations. This term in the calculation ensures PG&E is always able to buy sufficient GHG Products to cover any prior years' shortfalls, given that actual emissions may end up being less than forecast and/or prior decisions about how much procurement to do.

"FD" is PG&E's "forecasted compliance obligation", the projected amount of emissions for which PG&E is responsible for retiring GHG Products, or obligated to purchase for a third party, calculated using an implied market heat rate ("IMHR") that is two-standard deviations above the expected IMHR³².

If this equation results in a negative number in a given year, PG&E's Direct Compliance Obligation Purchase Limit for that year should be set at zero.

In addition to its Direct Compliance Obligation Purchase Limit, in the current year PG&E will not purchase GHG Products for future years greater than the percentage allowed in the Direct Compliance Obligation Purchase Limit formula. Therefore, for the prompt year (current year plus one) PG&E will not purchase in aggregate during the current year more than 60% of the prompt year's forecasted compliance obligation (as calculated above). Similarly, the percentages for current year plus two and current year plus three are 40% and 20%, respectively.

³² The IMHR two-standard deviations above the expected IMHR is calculated as follows: (1) the monthly historic IMHR is calculated by dividing monthly forward electricity prices by monthly forward gas prices for the period 2003 through 2011, yielding the forward monthly IMHR for this period; (2) monthly standard deviations of the forward monthly IMHR are then calculated separately for January through December; (3) the IMHR two-standard deviations above the expected IMHR is equal to the forward IMHR plus the standard deviation calculated in (2) multiplied by 2.0. The forward electricity prices to be used in calculating forecasted compliance obligations for the Direct Compliance Obligation Purchase Limits are then calculated by multiplying the IMHR at two-standard deviations above the expected IMHR by the forward gas price.



Consistent with Ordering Paragraph 9 of D.12-04-046, Table Appendix L-4 below details estimated forecast of the amount of greenhouse gas compliance instruments (in metric tons carbon dioxide equivalents) that correspond to the maximum procurement levels detailed in Table Appendix L-5.

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**j. Financially Hedging Greenhouse Gas Compliance
Instrument Price Risk**

Because the products and markets to financially hedge GHG compliance instrument price risk are not developed at this time, PG&E is not seeking authority financially hedge GHG compliance instrument price risk at this time. PG&E will seek to amend its BPP by advice letter to seek such authority as these markets and products develop. PG&E's purchase of financial instruments to hedge GHG Product price risk will be subject to the procurement limit set forth below.

The "financial exposure" purchase limit sets the specific limit on the amount of GHG Products PG&E can purchase to hedge its financial exposure to GHG costs under the Cap-and-Trade program. As with the Direct Compliance Obligation Purchase Limit formula above, this is a purchase limit, meaning the number that emerges from this calculation would set the maximum amount of GHG Products PG&E is allowed to purchase in the current year for purposes of hedging its financial exposure. As above, "purchase" is defined as taking title of the GHG Product when it is delivered. PG&E is not allowed to purchase allowances or offsets for hedging purposes with vintages more than three years from the current year.

PG&E's Financial Exposure Purchase Limit is calculated as:

$$\frac{\text{FLCY} = 20\% * \text{FECY} + 10\% * \text{FECY}+1 + 5\% * \text{FECY}+2 + 2.5\% * \text{FECY}+3 - \text{B}}{\text{FECY}+3 - \text{B}}$$

Where:

"FL" is the maximum number of GHG Products PG&E can purchase for purposes of hedging its financial exposure to GHG costs.

"CY" is the current year, i.e., the year in which PG&E is transacting in the market.



“FE” is an estimate of PG&E’s financial exposure to GHG costs that will, or are anticipated to be, embedded in the price of energy, calculated based on the tons of GHG emissions for which PG&E believes it will bear the costs through an embedded cost of such emissions as reflected in energy prices. This amount does not include the costs PG&E anticipates incurring as a result of its direct compliance obligation as “direct compliance obligation” is defined above. “B” is PG&E’s net purchases of GHG Products to date for hedging purposes, calculated as the total purchases of GHG Products for purposes of hedging PG&E’s financial exposure up to the current year minus those GHG Products sold up to the current year. This term helps ensure that if PG&E hedged considerably in prior years and those hedges did not pay out (i.e. the price PG&E saw in the market for GHG Products stayed below what PG&E paid for a GHG Product and so PG&E did not sell the instrument), that gets factored into the amount of additional hedging PG&E is allowed to undertake.

Should this equation result in a negative number in a given year, PG&E’s Financial Exposure Purchase Limit for that year will be set at zero.

5. Procurement Review Group Consultation

PG&E will annually review with its PRG its proposed CARB auction bidding strategy, including discussion of the total volume of GHG Products that PG&E might acquire and its GHG position. PG&E will also consult with its PRG on RFOs for GHG Products, and prior to transacting for any GHG Product in the Secondary Market with a vintage year³⁴ more than three years in the future beyond the current calendar year. PG&E will report any GHG Product sales to the PRG. Finally, PG&E will report any forecast updates, corresponding revisions to the purchase limits and GHG Product transactions to the PRG at its quarterly position update.

³⁴ A “vintage year” is an attribute of each allowance that refers to the compliance year that CARB associates with the allowance at issuance. The vintage year designation restricts the allowance’s eligibility for use to certain compliance periods. In the case of offsets, the vintage year refers to the year in which the offset is created.



6. Quarterly Compliance Reports and Energy Resource Recovery Account Recovery

Forecast updates and corresponding revision to the purchase limits along with all GHG Product transactions will be reported in PG&E's Quarterly Procurement Compliance Report ("QCR"). In addition, the QCR will provide a summary of current market conditions and all GHG Product transactions conducted by PG&E. PG&E's will record costs for GHG Products³⁵ in its Energy Resource Recovery Account ("ERRA") for recovery in rates.

PG&E's request for cost recovery of GHG Products through ERRA implicitly assumes the purchase of these products can be financed with short-term debt. However, PG&E's short-term borrowing capacity is limited, and much of that capacity is needed to meet day-to-day operational needs, other balancing account under-collections and collateral to support energy procurement. Thus, depending on the cost and tenor of these products, PG&E may need to resort to financing with long-term debt and/or equity. In that event, PG&E may seek alternative cost recovery mechanisms in order to recover its actual cost of financing of these products.

7. Approval for Contract Term Duration

For transactions of GHG Products with vintage years four years or fewer into the future, PG&E will include these transactions in its QCR and the annual ERRA Compliance proceeding. For transactions of GHG Products with vintage years more than four years into the future, PG&E will submit the transactions for review through the

³⁵ Including costs related to offset development, if authorized, in accordance with the procurement strategy.



Commission's advice letter process. PG&E will not enter into a contract whose delivery term extends beyond 2020.

8. Independent Evaluator

For contracts with delivery terms that are greater than two years, PG&E will include an Independent Evaluator ("IE") in any competitive solicitation and an IE Report in its respective QCR or advice letter filings.

9. Updates Via Advice Letter

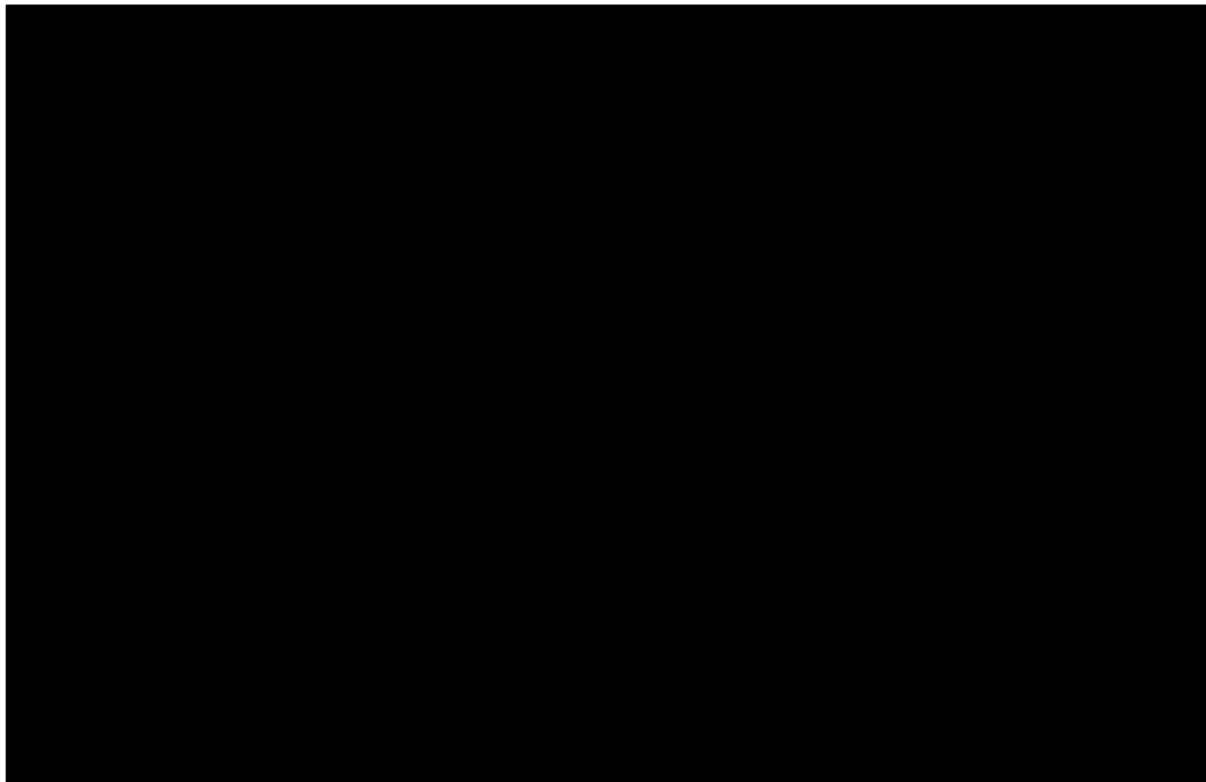
The procurement strategy for which approval is requested above is based on the final CARB Cap-and-Trade and Mandatory Reporting Rule regulations , and where noted, the March 30, 2012 proposed amendments to the Cap-and-Trade regulation. Certain changes to CARB's regulations may affect implementation of this plan for GHG-related procurement. Should market conditions, CARB's regulations, or the electric portfolio change to the point of necessitating modifications to the plan, PG&E will submit an advice letter to the Commission requesting changes.

PG&E will update its GHG compliance forecasts and corresponding purchase limits as necessary via a Tier 2 advice letter. The advice letter will include a description and workpapers detailing the calculation of the estimated purchase limits and an explanation of the key drivers of differences from the prior estimates.



Pacific Gas and Electric Company
San Francisco, California

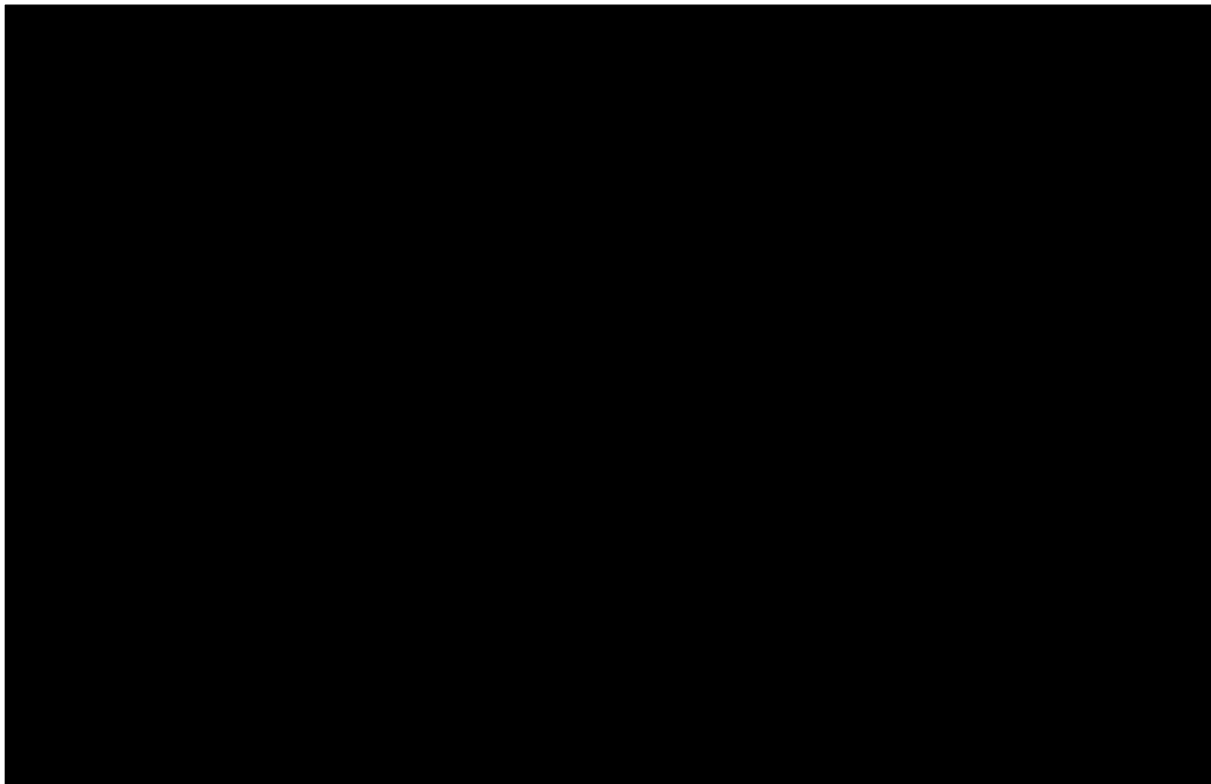
Cal. P.U.C. Sheet No. Redline-314
Pacific Gas and Electric Company
Bundled Procurement Plan





Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. Redline-315
Pacific Gas and Electric Company
Bundled Procurement Plan





Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No.
Pacific Gas and Electric Company
Bundled Procurement Plan

PACIFIC GAS AND ELECTRIC COMPANY
CONFORMED 2010 LONG-TERM PROCUREMENT PLAN

ATTACHMENT B
CLEAN PUBLIC VERSION

PACIFIC GAS AND ELECTRIC COMPANY
BUNDLED PROCUREMENT PLAN

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I. Introduction

In accordance with Decision (“D.”) 12-01-033, Pacific Gas and Electric Company (“PG&E”) is filing its conformed Bundled Procurement Plan (“BPP”) covering the period from January 12, 2012 to December 31, 2020. PG&E’s BPP became effective on January 12, 2012, the date on which the California Public Utilities Commission (“CPUC” or “Commission”) issued D.12-01-033 approving the BPP and will remain in effect until December 31, 2020 or the BPP is superseded by a subsequent Commission-approved BPP, whichever is earlier. All updates to the BPP proposed before the next BPP filing, including a request for an extension of procurement authority, will be made via advice letter (“AL”).

PG&E’s BPP establishes the upfront achievable standards and criteria for PG&E’s procurement activities and the recovery of procurement costs without an after-the-fact reasonableness review, consistent with California Public Utilities Code Section 454.5.

A. Overview of PG&E’s Procurement Activities Consistent With the State’s Energy Action Plan and Environmental Policies

The state of California has been, and continues to be, a leader in the area of energy and environmental policy. For decades, the California Legislature and the Commission have pioneered laws, regulations, and policies that have addressed critical energy and environmental issues and concerns. On May 8, 2003, the Commission, California Energy Commission (“CEC”) and the California Consumer Power and Conservation Financing Authority jointly issued an Energy Action Plan (“EAP”) for the state of California, outlining state energy and environmental policies and strategies. The EAP was updated in October 2005. The EAP includes a preferred resource order to achieve California’s



energy and environmental policy goals: Energy Efficiency (“EE”), Demand Response (“DR”), renewable resources, Distributed Generation (“DG”) and clean, efficient conventional facilities. In 2006, the California Legislature enacted legislation intended to reduce California greenhouse gas (“GHG”) emissions commonly referred to as “Assembly Bill 32” or “AB 32.” A significant portion of the targeted GHG emissions reductions will likely come from the energy sector of the California economy.

As one of California’s largest investor-owned utilities (“IOU”), PG&E has also been a leader in energy and environmental policies. In 1976, PG&E became one of the first utilities in the nation to offer EE programs to customers. Since that time, PG&E’s EE programs have kept more than 155 million tons of carbon dioxide (“CO₂”) out of the atmosphere. PG&E has also pioneered DR and renewable energy programs that are environmentally-friendly and have resulted in the significant growth of the DR and renewable energy sectors both in California and nationally. PG&E’s 2012-2014 DR program proposal will produce over 1,000 megawatts (“MW”) of DR resources. Since the beginning of California’s Renewable Portfolio Standard (“RPS”) Program, PG&E has signed contracts with RPS-eligible resources totaling over 8,800 MW of capacity, capable of delivering more than 20% of PG&E’s future energy needs. PG&E also has a long-standing commitment to DG and efficient Combined Heat and Power (“CHP”) programs. In addition to these programs, PG&E is now working actively with stakeholders, the Commission, and the California Air Resources Board (“CARB”) on the implementation of AB 32, which can significantly reduce California’s GHG emissions.



In addition to its environmental and energy policy leadership, PG&E is also committed to providing reliable, cost-effective service for its customers. Throughout northern and central California, PG&E's customers depend on a reliable energy supply. California's economy is powered in large part by electrical energy, and as Electric Vehicles ("EV") and other energy-using devices become more commonplace over the next decade, the need for a reliable energy supply will only grow. Moreover, to help California's economy recover from the crippling recession that has gripped the state in recent years, it is also essential that PG&E procure the most cost-effective electric and gas supplies.

Balancing environmental considerations, reliability, and customer cost is not an easy task. PG&E's BPP is designed to continue PG&E's environmental leadership through the implementation of the EAP loading order and other procurement policies, while ensuring that PG&E's customers receive reliable and cost-effective service. In particular, the BPP describes PG&E's ongoing and significant efforts to spur continued investment in EE, develop DR programs that reduce usage when needed and are consistent with the California Independent System Operator's ("CAISO") proxy DR program, and encourage the continued development of new renewable resources. PG&E's BPP also incorporates the provisions of the Qualifying Facility and Combined Heat and Power Settlement ("QF/CHP Settlement") approved by the Commission in D.10-12-035, which is designed to develop a CHP program that increases reliability and decreases GHG emissions. The BPP describes the numerous programs developed by PG&E which are designed to fully implement the EAP loading order.



In addition to strongly encouraging the development of preferred resources, PG&E's BPP also supports reliable service for PG&E's customers. PG&E has included approved products and processes which are intended to enable PG&E to maintain a reliable supply of electricity over the short-, medium- and long-term. PG&E describes in detail its planning, procurement, and dispatch processes, all of which are designed to enable PG&E to provide reliable, cost-effective service for its customers. PG&E has also included a nuclear fuel supply plan and a gas supply plan to assure these fuels are available to allow for the continued, efficient operation of facilities owned or dispatched by PG&E that provide electricity to PG&E's customers.

Finally, the BPP addresses the critical issue of customer costs. In addition to procurement processes developed to get the best available market prices, PG&E also adopts an electricity and gas hedging plan and To-expiration Value-at-Risk ("TeVaR") methodology intended to effectively manage customer price risks. PG&E has also included in the BPP plans for the use of Congestion Revenue Rights ("CRR") and convergence bidding, which will allow PG&E to manage customer costs. The BPP includes procurement processes and rules, many of which have been previously approved by the Commission, as a means of ensuring cost-effective procurement for customers. In summary, PG&E's BPP is designed to help meet California's energy and environmental policies, while providing reliable and cost-effective service to PG&E's customers.



B. Overview of PG&E's Bundled Procurement Plan

1. Section II – Implementation of PG&E's Bundled Procurement Plan

Section II describes PG&E's procurement processes including planning, procurement, and economic dispatch. PG&E identifies the resource needs of its customers and describes how it satisfies these needs consistent with the EAP loading order and other Commission and legislative directives. PG&E identifies specific products to meet its customers' needs. These power products include energy products (baseload, shaping, and peaking), capacity products to meet Resource Adequacy ("RA") requirements, and various Ancillary Services ("A/S") products, including regulation, load following (i.e., balancing services), spinning, non-spinning, and black-start capability.

Section II also describes how PG&E implements the BPP through various processes, including competitive solicitations, bilateral negotiations, development of utility-ownership projects, and participation in various markets. PG&E enters into short-term (one year or less in duration), medium-term (greater than one year but less than five years in duration) and long-term (five years or greater in duration) contracts that result from the procurement process. PG&E also contracts with third-party generators for units that utilize once-through cooling ("OTC") technology. Consistent with D.12-04-046, this section outlines the various procedural steps required for contracting with such units. In addition, included in this section are tables and descriptions of how PG&E established its position limits on capacity procurement and maximum rates of transactions.



PG&E is required to meet its electric load obligations consistent with the Commission's "Least-Cost Dispatch" ("LCD") requirements. PG&E economically dispatches its resources, subject to regulatory, legal, operational, contractual and financial requirements. Regulatory requirements include the Commission's direction regarding preferred resources, such as RPS-eligible resources, and the Commission's and statutory requirements to meet California's RPS.

Section II defines a variety of physical and financial electric products to meet PG&E's electric procurement needs. PG&E purchases these products through exchanges, inter-dealer or voice brokers, spot markets, electronic solicitations, energy product solicitations and Request for Offers ("RFO"), bilaterally negotiated contracts, QF/CHP standard form contracts, inter-utility swaps, and convergence bidding. In planning and procurement decisions, PG&E applies a consistent evaluation methodology to both supply-side and demand-side resources. By applying least-cost, best-fit ("LCBF") principles to supply-side and demand-side alternatives, PG&E obtains the lowest cost for customers for a given set of portfolio needs. PG&E's procurement evaluation methodology considers both the market value and the portfolio fit of alternative resources that are available.

2. Section III – Description of Commission-mandated Case

Section III describes the Commission-mandated case standardized assumptions and inputs directed in the *Assigned Commissioner's and Administrative Law Judge's Scoping Memo for Track II Bundled Procurement Plans* dated January 13, 2011, as well as directives from D.12-01-033.



3. Section IV – Procurement Plan Strategies for Implementing the Loading Order

Section IV describes PG&E's resource acquisition strategies for EE, DR, RPS-eligible resources, DG, conventional generation, and other generation including imports.

4. Section V – Evaluation of Commission-mandated Case

Section V summarizes the evaluation of the Commission-mandated case in terms of cost, risk, and GHG emissions.

5. Section VI – Commission Review of Implementation of Procurement Plan

Section VI describes PG&E's compliance with AB 57 (Public Utilities Code Section 454.5), compliance with the Commission's Procurement Standards of Conduct, and describes the various monthly, quarterly, and annual filings made to demonstrate compliance with its approved plan and Commission policy. Section VI also describes cost recovery under the BPP and Commission pre-approval, approval and filing requirements.

6. Appendix A – Capacity and Energy Tables and Procurement Limits

The capacity and energy tables included in Appendix A cover a 10-year period of time and reflect both demand forecasts and the resources currently owned or under contract to PG&E. The capacity and energy tables also identify the "net short" (i.e., the difference between demand and resources) and resources expected to satisfy the net short, consistent with the EAP loading order. In addition, capacity procurement limits and ratable rates tables are included covering the same 10-year period.



7. Appendix B – Electric Portfolio Hedging Plan

PG&E's Electric Portfolio Hedging Plan adopts electric and gas hedging strategies to mitigate electric portfolio price risk, including product mix, operating targets, time horizon, and liquidity management strategy and reporting considerations.

8. Appendix C – Nuclear Fuel Procurement Plan

PG&E's Nuclear Fuel Procurement Plan provides forward contracting authority for uranium, conversion and enrichment services and inventory management procurement strategies to ensure that the Diablo Canyon Power Plant ("DCPP") reload requirements are adequately met in the future and to mitigate long-term risks associated with security of supply.

9. Appendix D – Electric Portfolio Gas Supply Plan

PG&E's Gas Supply Plan ("GSP") includes upfront and achievable standards for the procurement of natural gas transportation, storage, and physical supply in order to meet the needs of PG&E's Electric Portfolio. The GSP is designed to provide a reliable supply of natural gas at the lowest cost and cost volatility for PG&E's Electric Portfolio, including utility-owned generation ("UOG") and tolling agreements with third-party generators tolling agreements. The GSP includes targets for gas supply, pipeline capacity, and storage. In addition, the GSP includes preferences for diverse suppliers. Finally, PG&E's GSP includes certain provisions regarding regulatory filings.

10. Appendix E – PG&E's To-expiration Value-at-Risk Methodology

PG&E's TeVaR methodology describes the methodology for calculating unexpected changes in PG&E's variable electric portfolio procurement costs, net of



electric portfolio revenues from sales of cumulative long positions over some specific time period, typically 12 months. TeVaR measures how high the net portfolio cost for the projection period may become if certain market changes occur.

11. Appendix F – Congestion Revenue Rights

Appendix F describes PG&E's participation in the CRR allocation and procurement processes and provides the upfront and achievable standards and criteria for the procurement of CRRs and Long-Term CRRs ("LT-CRR").

12. Appendix G – Convergence Bidding

Appendix G includes PG&E's convergence bidding authority consistent with D.10-12-034 granting interim authority to participate in the CAISO's convergence bidding market under three strategies. Appendix G also includes Commission-approved stop loss limits and reporting requirements.

13. Appendix H – Brokerages and Exchanges

Appendix H includes a list of current authorized brokerages, exchanges and futures commission merchants.

14. Appendix I – Procurement Review Group, Independent Evaluators and Request for Offer Requirements

Appendix I describes the current Commission procurement requirements for the Procurement Review Group ("PRG"), Independent Evaluators ("IE") and RFOs.

15. Appendices J and K – Glossary and Acronym Lists

These appendices provide a summary of electric and gas industry terms and acronyms used within PG&E's BPP.



16. Appendix L – Greenhouse Gas Procurement Plan

Appendix L includes PG&E's approved authority for GHG-related products, processes, and procurement strategies.

II. Implementation of PG&E's Bundled Procurement Plan

A. Procurement Processes

1. PG&E's Energy Procurement Organization

PG&E's Energy Procurement ("EP") organization plans for and acquires resources to ensure an adequate and reliable energy supply. EP has a number of procurement objectives, including assembling a portfolio of reliable and operationally flexible resources, supporting the development of environmentally preferred resources, and managing customer costs. The organization is responsible for both front-office functions associated with planning, procuring, scheduling, and dispatching resources, and back office functions associated with ensuring accurate payments to the CAISO and other power suppliers. EP is comprised of the following departments:

- Energy Policy, Planning & Analysis ("EPPA")
- Energy Supply Management ("ESM")
- Renewable Energy
- Energy Contract Management & Settlements ("ECMS")
- Energy Compliance and Reporting



The following section discusses the primary goals and responsibilities of each of the departments listed above. In addition, PG&E describes how its EP organization complies with Commission Standard of Conduct No. 2.¹

a. Energy Policy, Planning & Analysis

The EPPA department strives to meet the EP organization objectives through electric and gas resource planning that integrates demand-side and supply-side resource alternatives, and transmission and generation alternatives. EPPA analyzes regional supply-demand balances, the composition of potential PG&E portfolios, and the value of incremental resources to PG&E customers and regional supply. EPPA performs these analyses using financial, economic, and engineering methodologies and tools. EPPA analyzes current and potential market structures and policy initiatives, such as the EAP Loading Order, cap-and-trade for GHG emission reductions, and considers how these developments impact PG&E's procurement.

b. Energy Supply Management

The ESM department is responsible for all commercial transaction activities through competitive solicitations, bilateral negotiations and energy markets, including the development and execution of electric and fuels procurement strategies for short-term, medium-term, and long-term transactions, which will meet PG&E's customers' forecasted energy needs. ESM's responsibilities also include: (1) the management,

¹ The Commission originally adopted Standards of Conduct for procurement in D.02-10-062. These standards have subsequently been modified. See D.02-12-074, Ordering Paragraph ("OP") 24 (modifying standards); D.03-06-067, OP 3 (modifying standards and eliminating Standard Nos. 6-7); and D.03-06-076, OP 6 (clarifying that "Standard of Conduct 1 does not preclude anonymous transactions conducted through the ISO or through brokers and exchanges."). PG&E also received a waiver from Standard of Conduct 1 for certain gas transportation transactions in D.04-06-003.



optimization, and scheduling of PG&E's resources and contracts; (2) PG&E's trading in the energy markets; and (3) the natural gas procurement and hedging activities for PG&E's resources, power purchase agreements and assigned California Department of Water Resources ("CDWR") contracts.

ESM purchases natural gas supplies and transportation capacity to meet PG&E's bundled core gas customer demands. The gas procurement function relates generally to the process of acquiring gas supplies (e.g., the gas commodity) and managing transmission and storage capacity for core gas customers.

c. Renewable Energy

The Renewable Energy department is responsible for ensuring compliance with California's and the Commission's RPS requirements. This includes both oversight of all PG&E's renewable contracting and procurement portfolio, as well as the commercial transaction activities, including conducting RFOs and negotiating Power Purchase Agreements ("PPA"), to obtain renewable supplies to meet PG&E's RPS requirements. In addition, the Renewable Energy department provides direction on renewable energy policy issues at the Commission, the CEC, and the California Legislature; and participates in other renewable energy forums. The Renewable Energy department also focuses on renewable technology development, both emerging and market-ready, and utility renewable ownership efforts, including joint ownership agreements, strategic investments, project acquisitions, and greenfield project development.



d. Energy Contract Management & Settlements

The ECMS department is responsible for the preparation of regulatory filings, and implementation of standard reporting and documentation related to energy procurement and settlements activities. ECMS performs contract management and settlements related to energy procurement, including bilateral purchases and sales, fuel, Qualifying Facility (“QF”), Irrigation District (“ID”), Reliability Must-Run (“RMR”), and CDWR contracts, as well as CAISO market settlements. This work includes contract monitoring, validating calculations and data, preparing invoices, processing payments, and duties related to PG&E’s role as transmission owner and CAISO scheduling coordinator for both retail and existing transmission contract customers.

e. Energy Compliance and Reporting

The Energy Compliance and Reporting department oversees cost recovery and regulatory compliance policies, with a focus on Commission, Federal Energy Regulatory Commission (“FERC”) and North American Electric Reliability standards and obligations affecting PG&E’s procurement activities. In addition, this group is responsible for ensuring compliance with Securities and Exchange Commission reporting requirements, Section 404 of the Sarbanes-Oxley Law, and all internal audit recommendations.

f. Compliance With Commission Standard of Conduct No. 2

The employees in PG&E’s EP organization manage a substantial portfolio of resources to ensure PG&E acquires a reliable, environmentally preferred, and cost-effective portfolio of supply-side and demand-side resources for its customers.

The EP employees, as well as the employees throughout PG&E, comply with the



Commission's Standard of Conduct No. 2, to the extent it is applicable. Standard of Conduct No. 2 provides:

Each utility must adopt, actively monitor, and enforce compliance with a comprehensive code of conduct for all employees engaged in the procurement process that:

- 1) Identifies trade secrets and other confidential information.
- 2) Specifies procedures for ensuring that such information retains its trade secret and/or confidential status (e.g., limiting access to such information to individuals with a need to know, limiting locations at which such information may be accessed, etc.).
- 3) Discusses employee actions that may inadvertently waive or jeopardize trade secret and other privileges.
- 4) Discusses employee or former employee activities that may involve misappropriation of trade secrets or other confidential information, unlawful solicitation of former clients or customers of the utility, or otherwise constitute unlawful conduct.
- 5) Requires or encourages negotiation of covenants not to compete to the extent such covenants are lawful under the circumstances (e.g., where a business acquires business interests of individuals who subsequently work for the acquiring business, the individuals disposing of their business interests may enter covenants not to compete with their new employer). All employees with knowledge of its procurement strategies should be required to sign and abide by an agreement to comply with the comprehensive code of conduct and to refrain from disclosing, misappropriating, or utilizing the utility's trade secrets and other confidential information during or subsequent to their employment by the utility.

To ensure compliance, each employee is required to certify that they are aware of PG&E's Employee Code of Conduct. A certification is electronically signed by each employee. In addition, PG&E employees are required to complete a Compliance and



Ethics training course on an annual basis, a description of which can be found at the following link: http://www.pge-corp.com/aboutus/ethics_compliance. The annual Compliance and Ethics training includes a review of various parts of the Code of Conduct for Employees handbook.

2. Overview of PG&E's Procurement Process

PG&E's procurement process involves three phases: planning, procurement, and dispatch.

a. Planning

In the planning phase, PG&E identifies the resource needs of its bundled customers and plans to satisfy these needs consistent with the State Loading Order, EAP and other Commission and legislative directives.² PG&E identifies specific products to meet its customers' needs. These power products include energy products (baseload, shaping, and peaking), capacity products to meet RA requirements, and various A/S products, including regulation, load following (i.e., balancing services), spinning, non-spinning, and black-start capability.

b. Procurement

PG&E implements its Commission-approved BPP through various procurement methods and practices, including competitive solicitations, bilateral negotiations, development of utility-ownership projects, and participation in various markets. PG&E's procurement methods and practices are described in detail in Section II.A.5, below. PG&E enters into short-term, medium-term and long-term contracts that result from the

² PG&E also looks at the reliability and operational flexibility needs for its entire service area.



procurement process. PG&E defines short-term contracts as contracts with a term of one year or less; medium-term contracts as contracts with a term greater than one year but less than five years; and long-term contracts are contracts with a term five years or greater. Renewable contracts are an exception to this rule, with anything under 10 years in duration being short-term for this contract category.

For pre-approval purposes, the contract duration begins: (1) at the time the contracted resource begins delivery if delivery begins within one year of contract execution; or (2) at the time of contract execution if delivery does not begin within one year of contract execution. The length of the contract duration includes any extension options provided for in the contract. Pre-approval, approval and filing requirements are described in more detail in Section VI.E.

c. Dispatch

PG&E is required to meet its electric load obligations consistent with the Commission's LCD requirements. Implementation of LCD is performed in the spot market, which is currently defined as "day-ahead, hour-ahead, and real-time" markets. In Energy Resource Recovery Account ("ERRA") Compliance Filings, the CPUC has reviewed PG&E's decisions to dispatch the resources under its control in the day-ahead, hour-ahead, and real-time markets.

PG&E economically dispatches its resources, subject to regulatory, legal, operational, contractual and financial requirements. In implementing LCD, PG&E dispatches resources or purchases energy with the lowest incremental cost of providing energy. Incremental cost includes the variable operating costs of resources owned or



controlled by PG&E, opportunity costs associated with such resources, and market prices for electricity, subject to regulatory, legal, operational, contractual and financial requirements. PG&E uses incremental cost dispatch for resources in its portfolio, including utility retained generation, third-party contracts, novated CDWR contracts, and spot market transactions. When deciding whether to dispatch and/or curtail renewable resources and other preferred resources, PG&E will consider factors in addition to incremental cost, such as the statutory requirement to meet California's RPS. This is an example of a regulatory requirement affecting PG&E's economic dispatch.

To implement LCD, PG&E has adopted the following principles:

- PG&E aims to minimize its total cost of energy required to meet load and ancillary service requirements, subject to regulatory, legal, operational, contractual and financial requirements.
- PG&E's procurement process considers all regulatory, legal, operational, contractual and financial requirements.
- PG&E minimizes energy costs by explicitly considering the incremental costs of all resources available to it in dispatch decisions.
- PG&E integrates any local area reliability, day-ahead scheduling requirements, and deliverability requirements into its dispatch decisions.

Although the CAISO's Market Redesign and Technology Upgrade ("MRTU") has increased the complexity of processes for participating in day-ahead, hour-ahead, and real-time markets, the principles described above remain essential for achieving LCD and meeting all regulatory, legal, operational, contractual and financial requirements.



3. Description of Procurement Products

a. Electric Products

PG&E uses a variety of physical and financial electric products to meet its electric procurement needs. Table II-1 below provides product names, descriptions and citations to the initial regulatory authority approving procurement of these products.



**TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS**

Line No.	Product	Description	Initial Authorization
1	Ancillary Services	Products that are utilized by the control area operator to ensure electric system reliability for example, those that are listed in control area operator tariffs, such as the CAISO.	D.02-10-062
2	Capacity (Demand Side)	The amount of power consumed by a customer, measured in MW, that can be reduced upon request.	D.02-10-062
3	Capacity (Purchase or Sale)	The amount of power capable of being generated, measured in MW, that can be converted to energy upon request.	D.02-10-062
4	Contingent Forward	A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.	AL 2615-E
5	Electric Product Exchange	The buyer has an obligation to receive electric products and an obligation to return electric products as part of the same transaction. The transaction may also include an exchange of payments, in fixed or variable terms. Electric products include energy, capacity, and A/S.	AL 2615-E
6	Electricity Transmission Products	Purchase, sale, or allocation of transmission rights, products (e.g., Long-Term Firm Transmission Rights, CRR, losses), or the use of locational spreads for CAISO and non-CAISO transmission.	D.02-10-062 D.07-12-052 D.12-01-033
7	Financial Call (or Put) Option or Swaption	The right, but not the obligation, to buy (call) a forward electric contract on a specific date (expiration) at a fixed or indexed price (strike). The right to sell is a put option. Additional examples include locational spread options, time spread options, cross-commodity options, and exotic (combination) options. A Swaption is an option on a Financial Swap.	D.02-10-062 AL 3482-E
8	Financial Swap	An agreement to exchange one type of pricing for another. Examples include fixed-for-floating swaps, locational spread (basis) swaps, time spread swaps, cross-commodity swaps and payment obligation swaps (e.g., CAISO Integrated Forward Market ("IFM") Uplift Load Obligations). Swaps are financially settled directly with a counterparty or may be financially cleared through a financial clearing house. Margin-free swaps require just one counterparty or neither counterparty to post collateral.	D.02-10-062 AL 2615-E D.07-12-052 AL 3482-E



TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)

Line No.	Product	Description	Initial Authorization
9	Forward Energy (Demand-Side)	Electric energy planned to be consumed by a customer, measured in megawatt-hour ("MWh") that is agreed to be reduced for a specific period for a specified time in the future.	D.02-10-062
10	Proxy Demand Response ("PDR"), Reliability Demand Response Product ("RDRP"), and Participating Load ("PL")	<i>PDR</i>: Virtual generator that is paid for response to dispatches and market awards with performance based on a baseline method. <i>RDRP</i>: Virtual generator that is paid for response to dispatch in near emergency conditions with performance based on a baseline method. <i>PL</i>: Load acting as a resource with individual scheduling of load and generation for the PL.	D.10-06-002 D.10-12-036 AL 3635-E-A AL 3689-E-A
11	Forward Energy (Purchase or Sale)	Electric energy purchased or sold by a counterparty, measured in MWh that is agreed to be supplied or received for a specific period at a specific location for a specified time in the future.	D.02-10-062
12	Forward Spot (Day-Ahead and Hour-Ahead) Purchase, Sale, or Exchange	Electric energy, capacity, A/S or transmission purchased or sold by a counterparty, or exchanged between counterparties measured in MW or MWh that is agreed to be supplied, received or exchanged for a specific period at a specific location in the Day-Ahead or Hour-Ahead markets.	D.02-10-062
13	New York Mercantile Exchange ("NYMEX") Electricity Futures (Purchase or Sale)	Standardized forward energy contract traded on NYMEX. Futures may be physically or financially settled.	AL 2615-E
14	On-Site Energy or Capacity (Self-Generation on Customer Side of the Meter)	The amount of power measured in MW or MWh that can be generated downstream of the customer's electric meter that can be used to offset the customer's load served by the electric service provider.	D.02-10-062
15	Peak for Off-Peak Exchange	Electric energy, capacity, or A/S or transmission exchanged between counterparties measured in MW or MWh that is agreed to be supplied in an on-peak period in exchange for receiving an amount in an off-peak period. These transactions may also include an exchange of dollars.	D.02-10-062



**TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)**

Line No.	Product	Description	Initial Authorization
16	Physical Call (or Put) Option	The right, but not the obligation, to buy (call) physical electricity for delivery on a specific date at a fixed or indexed price (strike). The right to sell is a put option.	D.02-10-062
17	Real-Time (Purchase or Sale)	The amount of energy, measured in MWh supplied or received by the control area operator to balance an entity's load and supply.	D.02-10-062
18	Resource Adequacy Product	A capacity product intended to meet RA obligations.	AL 2615-E AL 2897-E
19	Seasonal Exchange	Electric energy, capacity, or A/S or transmission exchanged between counterparties measured in MW or MWh that is agreed to be supplied during one season or set of months in exchange for receiving an amount in another season or set of months. These transactions may also include an exchange of dollars.	D.02-10-062
20	Tolling Agreement	An agreement to provide (receive) gas in exchange for receiving (providing) electricity.	D.02-10-062 D.04-12-048
21	Emissions Credits Futures or Forwards	Credits or allowances for emissions that can be bought or sold in order to comply with emissions limits.	D.03-12-062
22	Forecast Insurance	A method for managing load forecast (volume and shape) risk.	D.03-12-062
23	Firm Transmission Rights ("FTR") Locational Swaps	Over-the-counter basis swaps associated with Firm Transmission Rights. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.	D.03-12-062
24	Non-FTR Locational Swaps	Over-the-counter basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.	D.03-12-062
25	Weather Triggered Options	A method for managing temperature and other weather forecast risks.	D.03-12-062
26	Resource Adequacy Import Capacity Counting Right	The right to count import energy or import RA product at an intertie toward satisfying RA requirements.	AL 2897-E
27	Long-Term Congestion Revenue Rights	Financial instruments to hedge Locational Marginal Price ("LMP") congestion in MRTU for 10 years.	AL 3095-E



**TABLE II-1
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRIC PRODUCTS
(CONTINUED)**

Line No.	Product	Description	Initial Authorization
28	Congestion Revenue Rights	Financial instruments to hedge LMP congestion in MRTU, including, for example, monthly CRRs and seasonal CRRs.	D.02-10-062 D.07-12-052 AL 3106-E
29	Path 26 Resource Adequacy Capacity Counting Rights	The right to count south of Path 26 RA product toward satisfying RA requirements.	D.07-06-029
30	Convergence Bids	Virtual supply or virtual demand bids submitted in the CAISO day-ahead IFMs that, if cleared, would automatically liquidate with an opposite buy or sell in the CAISO Hour-Ahead Scheduling Process/Real-Time Market ("HASP/RTM").	D.10-12-034 D.11-06-004
31	Tradable Renewable Energy Credits ("TREC")	Tradable Renewable Energy Credits that can be used for compliance with California's RPS Program.	D.10-03-021 D.11-01-025
32	QF Fixed for Short Run Avoided Cost ("SRAC") Floating Swap (purchase)	A fixed-for-floating SRAC swap settled directly with the QF counterparty.	D.12-01-033
33	GHG Allowance	A compliance instrument accepted by CARB providing the right to emit one mtCO ₂ e to satisfy obligations under the Cap-and-Trade regulation.	D.12-04-046
34	GHG Offset	A compliance instrument representing a verified emission reduction that is accepted by CARB in lieu of a GHG Allowance to satisfy obligations under the Cap-and-Trade regulation.	D.12.04-046

b. Gas Products

PG&E uses a variety of physical and financial gas products to support electric procurement. Physical gas products are used to support LCD and reliability. Table II-2 below provides physical gas product names, descriptions and information about the initial regulatory authority approving procurement of these products.



TABLE II-2
PACIFIC GAS AND ELECTRIC COMPANY
NATURAL GAS PHYSICAL PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Natural Gas Purchases (Physical Supply)	Purchases/sales/exchanges of physical natural gas for terms of one month or longer.	D.02-10-062
2	Spot Natural Gas (Physical Supply)	Purchases/sales/exchanges of physical natural gas for terms less than one month.	D.02-10-062
3	Physical Options on Natural Gas Supply (Purchase or Sale)	The right, but not the obligation, to buy (call) physical gas for delivery on a particular date at a fixed or index price (strike). The right to sell is a put option.	D.02-10-062
4	Biomethane (Purchase or Sale)	Pipeline quality natural gas produced from renewable (non-fossil based) resources.	D.07-12-052
5	Contingent Forward (Purchase or Sale)	A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.	AL 2615-E
6	Gas Storage (Purchase or Sale)	Includes firm and as-available storage inventory, injection and withdrawal. Also includes parking and borrowing services.	D.02-10-062
7	Gas Transportation (Purchase or Sale)	Interstate, intrastate, and distribution gas transportation services. Includes firm, as-available and interruptible services.	D.02-10-062

Financial products are used to support gas hedging. Table II-3 below provides financial gas product names, descriptions and information about the initial regulatory authority approving procurement of these products.



TABLE II-3
PACIFIC GAS AND ELECTRIC COMPANY
NATURAL GAS FINANCIAL PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Natural Gas Financial Swaps (Purchase or Sale)	Over-the-counter gas forward products including fixed-for-floating swaps, locational spread (basis) swaps, time spread swaps, cross-commodity swaps and swing-swaps (fixed-price or monthly index for daily index). Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse. Margin-free swaps require just one counterparty or neither counterparty to post collateral.	AL 2615-E D.02-10-062 AL 3482-E
2	Natural Gas Futures (Purchase or Sale)	Standardized forward contracts for gas that trade on an exchange. Futures may be physically or financially settled. Physically settled futures may be unwound by an offsetting trade, exchanged for a physical position, or held to physical delivery.	AL 2615-E
3	Financial Options (Call or Put) or Swaptions (Purchase or Sale)	The right, but not the obligation, to buy (call) a forward gas contract on gas on a particular date (expiration) at a particular price (strike). The right to sell is a put option. Over-the-Counter ("O-T-C")-traded options settle in cash, whereas exchange traded (NYMEX) options are exercised, which causes delivery of a futures position to the option holder. Additional examples include locational spread options, time spread options, cross-commodity options, and exotic (combination) options. A Swaption is an option on a Financial Swap.	D.02-10-062 AL 3482-E

c. Credit Products

Credit products are used to support electric and gas hedging. Table II-4 below provides credit product names, descriptions and information about the initial regulatory authority approving procurement of these products.



TABLE II-4
PACIFIC GAS AND ELECTRIC COMPANY
CREDIT PRODUCTS

Line No.	Product	Description	Initial Authorization
1	Counterparty Credit Insurance	A method for managing payment or performance risk for a fee. Applies to physical and financial electric and gas products.	D.02-10-062 AL 3482-E
2	Counterparty Sleeves	Facilitating a transaction with an un-contracted or non-creditworthy counterparty through a contracted, creditworthy counterparty. Applies to physical and financial electric and gas products.	D.02-10-062 D.03-12-062 AL 3482-E
3	Credit Intermediation Arrangement	Eliminates the need to post collateral on specific, identified, existing hedge positions. Under this arrangement, PG&E would novate existing positions from one counterparty to a financial institution. The financial institution becomes PG&E's counterparty to the positions. The financial institution does not require PG&E to post collateral in exchange for a negotiated fee. The financial institution may or may not post collateral to PG&E, depending on the arrangement.	AL 3482-E

The products presented in Section II.A.3 include those products PG&E is currently authorized to transact. Authorized GHG products are further described in Appendix L, along with PG&E's GHG procurement framework which was approved in D.12-04-046. PG&E will request approval through advice letter filings of new products that arise from changed policies or market developments that are not covered by the above lists. Such products may be necessary to satisfy procurement needs arising from, for example, CAISO market initiatives, new legislation, regulatory requirements, or financial and administrative requirements.



4. Overview of Energy Product Markets

This section provides an overview of the markets available to PG&E to purchase the products described in Section II.A.3, above. PG&E's specific procurement practices are described in detail in Section II.A.5, which follows this section.

a. Exchanges

For electric and gas markets there are several types of transparent exchanges: O-T-C electronic trading platforms such as the Intercontinental Exchange ("ICE"), NYMEX Clearport, NYMEX Globex, and the Natural Gas Exchange ("NGX"); and open outcry exchanges such as the NYMEX. A list of authorized exchanges that PG&E is authorized to use is included in Appendix H.

The electronic platforms allow market participants to post bids and offers for specific gas and electric products. To complete a trade, a buyer must lift an offer or a seller must hit a bid. Once completed, the exchange confirms the transactions to both parties. NYMEX hosts open outcry trading for its natural gas futures contracts and natural gas options. Buyers and sellers transmit bids and offers to the trading pits through a Futures Commission Merchant ("FCM"). The trade is executed by the trader in the trading pit. The results of the trade are communicated back to the buyer or seller through the FCM.

For the electronic exchanges, buyers post bids to the system. If a seller hits the bid, the trade is completed. If a seller does not hit the bid, the buyer can adjust its bid until it is hit by a seller. Alternatively, if the buyer likes an offer already posted on the exchange, the buyer can lift that offer to complete the trade.



For open outcry trading, the buyers work through their FCM to trade on the exchange. Buyers can submit two types of orders with their FCM, a limit order (a bid at a specific price) or a market order (which will buy the current offer in the trading pit). FCMs will work a limit order until it is executed in the pit or until the floor trader indicates that the order is unlikely to trade. At this point, the buyer can cancel the order or raise its bid. In this manner, the buyer can adjust its bid until the trade is executed.

Since the transparent exchanges trade standard products and trading is anonymous, selection is made on product availability, credit availability, and price.

b. Voice Brokers

Voice brokers facilitate trades in the wholesale market for electricity and gas. Brokers communicate bids and offers to market participants through squawk boxes³ and telephone calls. Brokers work with buyers and sellers to facilitate trades. Once completed, brokers confirm the transactions with both parties and may initiate financial clearing with both NYMEX and the ICE. Brokers facilitate the trading of physical and financial gas and electric products. Brokers, as part of their price discovery role, provide price reporting services to subscribing clients.

Buyers communicate bids to the broker. If a seller hits the bid the trade is completed. If a seller does not hit the bid, the buyer can ask the broker to work its bid in the market. The broker will provide the buyer feedback if its bid is not hit by a seller. The buyer can adjust its bid until it is hit by a seller. Alternatively, if the buyer likes an

³ A squawk box is an intercom speaker used for communication between brokers and traders. The box allows brokers to broadcast market information to traders and to have one-on-one conversations with traders. PG&E records all communication on its squawk boxes as part of its trading process controls.



offer communicated by the broker, the buyer can lift that offer to complete the trade. Since brokers facilitate trades of standard products and trading is anonymous, selection is made by product availability, credit availability and price. A list of authorized brokers that PG&E is authorized to use is included in Appendix H.

c. Spot Markets

The spot market for electricity and gas is the wholesale market for day-ahead, hour-ahead, and real-time for electric energy and day-ahead for natural gas. Day-ahead for electricity normally includes two, two-day strips for weekends (Friday-Saturday and Sunday-Monday) and other combinations of days to accommodate holidays. Hour-ahead for electricity is the market as traded intra-day. Real time is the CAISO real-time market. Day-ahead for gas normally includes a 3-day strip for weekends (Saturday-Monday) or a longer combination of days to accommodate holidays.

The bilateral spot market consists of buyers and sellers communicating bids and offers to counterparties through telephone calls and Instant Messaging. Traders negotiate until a trade is completed. Spot trades are normally executed and then confirmed over the phone by schedulers and not with paper confirmation documents. Spot market trades are also executed through voice brokers, ICE and NGX.

Buyers communicate bids to potential sellers. If a seller hits the bid the trade is completed. If a seller does not hit the bid, the buyer adjusts the bid to entice the seller or the buyer can call another potential seller. The process continues until the buyer finds a willing seller at the buyer's price. Alternatively, sellers communicate offers to potential buyers, negotiate prices, and keep searching until they find a willing buyer. It is common



for buyers and sellers to trade through brokers, exchanges and the bilateral spot market simultaneously. Selection is made by product availability, credit terms, credit availability, and price.

d. Electronic Solicitations

Electronic solicitations facilitate the competitive purchase or sale of commodity products with approved counterparties and are defined as any competitive process where products are requested from the market. PG&E may participate in or administer as either a buyer or seller in an electronic solicitation that does not involve utility-owned resources. In an electronic solicitation, the buyer or seller may post a product for purchase or sale through a variety of electronic platforms. These platforms include but are not limited to: a secure internet site, an instant message communication, email, or via a voice solicitation to participants. Participants compete in a competitive process to provide the buyer or seller with the most advantageous price. Both sealed bid and live, open outcry solicitations are considered a competitive process. Bidders are required to meet the buyer or organizer's credit qualifications in order to participate. Selection is made by product availability and price. The current IE rules and requirements apply to PG&E's participation in an electronic solicitation.

e. Renewable Portfolio Standard Procurement

PG&E pursues renewable procurement through a number of different procurement methods. Each of these processes is described below.

- **RPS RFO** – Consistent with its Commission-approved RPS Procurement Plan, PG&E issues an RFO for all RPS-eligible resources.⁴ As a result of

⁴ See e.g., D.09-06-018 (approving 2009 RPS Procurement Plans).



D.11-01-025 regarding Renewable Energy Credits (“REC”), PG&E’s 2011 RPS RFO will also allow offers for REC-only products, as well as more traditional bundled RPS products. Once offers are received, PG&E then reviews all offers received, short-lists offers, and then negotiates with the short-listed bidders to execute an RPS agreement.

- **Photovoltaic (“PV”) Program** – Pursuant to the authority granted in D.10-04-052, PG&E also conducts two separate RFOs to implement its PV Program: one for utility-ownership bids and the second for PPAs.
- **Renewables Auction Mechanism (“RAM”)** – In D.10-12-048, the Commission directed the utilities to conduct RFOs for renewable resources under 20 MW as a part of the RAM Program.
- **REC-Only RFO** – In the future, PG&E may issue a separate RFO for RECs.
- **Feed-In Tariffs (“FIT”)** – The Commission has directed PG&E to provide tariffs and standard form contracts (i.e., a FIT) for small renewable resources that are 1.5 MW and less. In D.07-07-027, and subsequent advice letters and Commission Resolutions implementing that decision, the Commission has approved PG&E’s Electric Schedules E-PWF and E-SRG, which include standard form contracts for eligible renewable resources. The Commission is also currently considering the implementation of Senate Bill (“SB”) 32, which would increase the MW size of small renewables eligible for the FIT tariff from 1.5 MW to 3 MW.⁵
- **Bilateral Negotiations** – PG&E also procures RPS-eligible resources through bilateral negotiations.

f. Solicitations and Request for Offers

PG&E can also purchase or sell electric and gas products through solicitations.

PG&E defines the products it is seeking in its RFO or requests for bids and then reviews bids and offers received. PG&E can conduct RFOs for long-term resources or for shorter-term products, such as capacity to satisfy Local or System RA requirements.

PG&E may also participate in solicitations or RFOs held by generation owners, Load

⁵ See R.08-08-009 (addressing implementation of SB 32).



Serving Entities (“LSE”), or other market participants. Proposals for non-RPS eligible UOG cannot be bid into utility-run RFOs for new generation resources. New UOG resources shall be procured only after a corresponding utility RFO has “failed,” as that term is described in D.12-04-046 or subsequent Commission decisions addressing the definition of RFO failure in the context of a UOG proposal. As provided in OP 7 of D.12-04-046, applications for new UOG resources “shall be evaluated using criteria comparable to those used to evaluate independently-owned generation.” These criteria are described in more detail in D.12-04-046.

g. Bilaterally Negotiated Contracts

Bilateral negotiations can be used for the purchase and sale of electric and gas products. The phrase “bilateral negotiations” is generally used in the context where negotiations take place in a one-on-one setting rather than as a part of a competitive solicitation.

h. Qualifying Facility/Combined Heat and Power Standard Form Contracts

PG&E is required to offer three standard offer contracts as a result of Commission decisions issued in Rulemaking (“R.”) 08-06-024 implementing AB 1613. These contracts are for new, eligible CHP facilities under 20 MW. Two of these contracts—one for units with a power rating under 20 MW and one for units which export no more than 5 MW—have been approved by the Commission and a simplified contract for units with a capacity under 500 kilowatt (“kW”) has been submitted to the Commission.



In addition, PG&E is offering five standard form contracts as part of its implementation of the QF/CHP Settlement, which was approved by the Commission in D.10-12-035 and became effective November 23, 2011.

i. Inter-Utility Swaps

Inter-utility swaps can be used for the purchase and sale of electric and gas products. Inter-utility swaps historically have been used for transactions that offer some form of operational and reliability benefits to both utilities. The process consists of direct one-on-one negotiations, with negotiated terms and conditions constantly weighed against best available market price benchmarks to justify the transactions. The decision to proceed is based on LCBF principles. Evaluation criteria and methodologies are very similar, if not the same used to evaluate transactions in recent and comparable product RFOs. PG&E uses the best available market price benchmarks in the evaluation process.

j. Convergence Bidding

The CAISO markets were expanded to include convergence bidding products starting January 31, 2011, effective for the February 1, 2011 trade day. Convergence bids are financial transactions (i.e., virtual bids for energy that will not be consumed or produced), that can only be submitted in the day-ahead market, and are recognized by the CASIO as not being physical. Convergence bids represent a financial commitment to sell (or buy) energy in the day-ahead IFM at the individual pricing node location where the convergence bid is submitted. If these bids are cleared in the day-ahead market, they are automatically liquidated by the CAISO with an opposite buy-back by seller or sell-back by buyer of the same quantity of energy in the 5-minute RTM for locations inside the



CAISO, and in the HASP for Interties. In D.10-12-034, the Commission authorized, but did not require, PG&E to submit convergence bids specifically to manage generator performance risks, load forecast uncertainty risks, renewable resource scheduling and hedging, and also to provide defensive bids against market dynamics.

5. PG&E's Procurement Methods and Practices

In this section, PG&E describes its electric procurement methods and practices for short-term, medium-term and long-term contracts. Table II-5 below reflects the procurement methods and practices that PG&E is authorized to use.



TABLE II-5
PACIFIC GAS AND ELECTRIC COMPANY
PROCUREMENT METHODS AND PRACTICES

Item #	Transaction Process	Description	Initial Authorization
1	Competitive Solicitations ("RFO")	Widely distributed request for offers or proposals. Required items include among other things: Description of product requirements, term, minimum and maximum bid quantities, scheduling and delivery attributes, credit requirements, and pricing attributes. Additional requirements for the RFO process are specified in D.07-12-052, pages 142-152. See Appendix I for other specific information on administering the RFO process.	D.02-10-062 D.04-12-048 AL 2615-E
2	Direct bilateral contracting with counterparties for short-term products (e.g., three months or less)	Bilateral process for products procured with a term three months or less. IOUs demonstrate that such transactions are reasonable based on available and relevant market data supporting the transaction. The demonstration may include showing competing price offers, result of market surveys, broker and online quotes, and/or other source of price information such as published indices, historical price information for similar time blocks, and comparison to RFOs completed within one month of the transaction.	D.02-10-062 D.04-12-048 AL 2615-E
3	Negotiated bilateral contracts for non-standard products which terms exceed three months provided that the IOUs include a product justification in quarterly compliance filings.	Process to purchase products provided they are included in quarterly compliance filings to justify the need and process in each case. Terms and conditions are benchmarked against the best available market information for similar products recently offered.	D.03-12-062 D.04-12-048 AL 2615-E
4	Inter-Utility Exchanges	Exchange with other regulated utilities and other load-serving entities negotiated through private negotiation crafted to best fit the resources and needs of both parties.	D.02-10-062 D.04-12-048 AL 2615-E
5	ISO Markets: Imbalance Energy, Hour-Ahead, Day-Ahead and Convergence Bids	Spot market transactions are authorized to meet short-term needs. Convergence Bids are authorized to manage specific areas of portfolio risks and renewable scheduling limitations.	D.02-10-062 D.04-12-048 AL 2615-E D.10-12-034



**TABLE II-5
PACIFIC GAS AND ELECTRIC COMPANY
PROCUREMENT METHODS AND PRACTICES
(CONTINUED)**

Item #	Transaction Process	Description	Initial Authorization
6	Transparent Exchanges, such as Bloomberg and Intercontinental Exchange, Voice and On-Line Brokers	Electronic trading exchanges for transparent prices.	D.02-10-062 D.03-12-062 D.04-12-048 AL 2615-E
7	RPS-Eligible Utility Ownership of Generation	Utility ownership of generation can be pursued through an RFO under certain conditions (see D.07-12-052 at 198-205; D.08-11-008 at 18-20) or outside of the RFO process under certain conditions (see D.07-12-052 at 209-213; D.08-11-008 at 20-23).	D.07-12-052 D.08-11-008
8	Non-RPS-eligible Utility Ownership of Generation	Utility ownership of generation can be pursued outside of an RFO process under certain conditions (see D.07-12-052 at 209-213; D.08-11-008 at 20-23 and D.12-04-046 at pp. 28-39).	D.07-12-052 D.08-11-008 D.12-04-046
9	Open Access Same-Time Information Systems	Procure standard electric transmission products from transmission providers throughout the Western Electric Coordinating Council ("WECC") region at FERC tariffed rates and voice and on-line brokers.	D.03-12-062 D.04-12-048 AL 2615-E
10	Electronic Solicitations	IOUs are authorized to conduct purchase or sale through an electronic solicitation format for non-utility-owned products requested from the market.	D.03-12-062 D.04-12-048 AL 2615-E D.12-01-033
11	Market Requests for Proposals ("RFP")	IOUs can bid in open season or RFPs held by generator owners, LSEs and other market participants.	D.04-01-050 AL 2615-E D.12-01-033
12	CAISO Allocations and Auctions	CAISO allocation and auctions for LT-CRRs and CRRs and allocation of RA counting rights.	AL 3095-E AL 3106-E D.06-07-029 AL 2897-E
13	CARB Auction	Authorization to procure GHG Allowances through any CARB Auction in accordance with the Cap-and-Trade regulation.	D.12-04-046
14	Allowance Price Containment Reserve	Authorization to procure GHG Allowances through CARB's Allowance Price Containment Reserve.	D.12-04-046



In the remainder of this section, PG&E describes its procurement methods and practices for: (a) short- and medium-term procurement transactions; (b) long-term transactions; and (c) RPS transactions.

a. Procurement Methods and Practices for Short-Term and Medium-Term Transactions

This section describes PG&E's methods and practices for short- and medium-term procurement transactions. PG&E utilizes various Commission-approved transaction methods that are set forth in Table II-5 for short- and medium-term transactions.

PG&E's electric procurement process is not a one-time event. Rather, it is comprised of a series of ongoing analyses and activities that focus on different time frames and decisions. This process ensures that resources are available to meet energy, capacity and A/S requirements and allows PG&E to minimize the cost of generation and risks by participating in a variety of transactions over time.

The electric procurement process for all time frames, from multi-year to hour ahead, is conceptually identical. Only the input assumptions and the granularity of those assumptions differ. The remainder of this discussion summarizes the short- and medium-term procurement process and describes some of the Commission-approved transaction methods that PG&E has undertaken in each timeframe.

(1) Multi-Year

PG&E initially determines its need for short- and medium-term transactions. Multi-year transactions typically involve competitive solicitations that are reviewed in consultation with the PRG. PG&E begins by determining total load requirements, including bundled customer demand, wholesale sales, transmission and distribution



losses, A/S, and any and all operating constraints. PG&E then determines the quantity of generation from “must-run” resources such as the DCP, QFs, and some CDWR novated contracts. Finally, PG&E assesses market conditions in order to optimize production from dispatchable resources and market transactions. PG&E’s objectives are to meet any remaining load requirements as well as extract value from resources when it is economic to sell into the market. Required electric procurement or sales are spread over the short- and medium-term time frames to minimize market impacts and to allow for changing load requirements.

(2) Annual, Quarterly and Monthly

PG&E performs and updates assessments of its net open position for a 12-month forward period on a regular basis to determine whether additional resources are required or it has excess resources for potential surplus sales. This process ensures that PG&E has resources to meet requirements, and determines by the close of the month prior to an operating month that it will control resources within 5% of expected requirements, as recommended by the Commission in D.02-10-062. However, consistent with D.04-01-050 at page 33, PG&E may exceed the 5% of expected energy requirements if it has satisfied the monthly RA requirements.

The analysis is the same as that employed for the multi-year time frame, with the primary difference being the assumptions used—forecasted loads, resource availability, gas prices, hydro availability and market prices are further refined as PG&E moves closer to the operating period and resource requirements and market opportunities become clearer.



Forward Energy Products (e.g., term, balance-of-month and balance of week purchases and sales) are transacted to diversify the portfolio and reduce reliance on spot markets. Transactions with delivery terms greater than three months' in duration are reviewed by the PRG. Typically, bilateral contracts are benchmarked against pricing information obtained from recent competitive solicitations for a similar product, forward price curves or the best available market information for similar products recently offered or at a published index price. In addition, brokers play a critical role in almost all of these transactions. Voice brokers and electronic exchanges are used for the purpose of price discovery and matching buyers with sellers in an anonymous fashion.

(3) Intra-Month and Weekly

As part of an integrated process, results from the actions described in the previous section determine the amount of the residual open position (long or short) that is carried into the prompt month. Inside the month time horizon, PG&E reviews the availability of resources, hydro conditions, and makes an assessment of market prices and conditions to further assess how best to manage the open position. If market transactions are needed, the transaction methods listed in Section II.A.5 are generally used.

(4) Daily

On a daily basis, generally between 5:30 a.m. and 7:00 a.m., PG&E conducts a least-cost analysis to determine unit dispatch and market transactions to meet energy and A/S requirements. This analysis incorporates weather-adjusted load forecasts, resource availability, dispatch costs, current electric market prices, and PG&E's prices forecast of the CAISO's IFM. The results of this analysis will determine the bidding or dispatch of



CDWR contracts that were novated to PG&E, PG&E-owned or controlled thermal and hydro generation, QFs, demand-side options, existing bilateral contracts, as well as purchases or sales in the CAISO markets. In addition, PG&E bids separately for its load in the IFM, bidding to purchase up to 100% of its load in each hour based on forecast prices.

PG&E must anticipate and plan for potential schedule changes that occur after the IFM closes. Between the day-ahead and real-time market timeframes, changes in system conditions, such as weather, transmission, resource availability, and energy prices are inevitable. In anticipation of these changes, PG&E incorporates flexible resources with the capability to increase and decrease generation in response to load and operating requirements into its day-ahead schedules.

Generation and load bids are created for individual hours at individual hourly prices and submitted to the IFM. A/S are also bid for in the IFM and not normally self-scheduled in by PG&E. Through the bidding of generation, load and A/S, the IFM simultaneously determines schedules and prices for energy and A/S while also solving for congestion.

(5) Hour-Ahead Planning and CAISO's Real-Time Market

"Hour-ahead" planning is something of a misnomer since it effectively begins at the conclusion of day-ahead trading. As day-ahead analysis and trading occurs early in the morning prior to the operating day, there can be substantial changes to operating requirements. PG&E prepares weather-adjusted load forecasts throughout the day to determine if changes in generation or system operation are required. Further, unit



outages, transmission outages, and other constraints may also affect resource requirements prior to real-time. In order to address its portfolio during this time frame, PG&E's hour-ahead staff has several resources at its disposal, such as generation, including PG&E-owned thermal and hydro; demand-side options; the Helms pumped storage unit; certain novated CDWR contracts that may be adjusted at unique dispatch prices; and facilities under contract. Hour-ahead personnel optimize the portfolio based on operating requirements and market opportunity costs, and decide whether any generating resources should be adjusted to minimize system costs and whether market transactions are required or beneficial.

The bilateral hourly market, while active, is far less transparent than the day-ahead market or the RTM. As there are few brokers operating in the hourly market and limited electronic exchange opportunities, the majority of transactions are bilateral in nature, making it difficult to broadly characterize the hour-ahead market. PG&E evaluates participation in the hour-ahead bilateral markets as a potential hedge against CAISO RTM costs.

b. Procurement Methods and Practices for Long-Term Transactions

Long-term transactions (e.g., contracts with a duration of five years or greater), including UOG proposals, are approved by the Commission either through an application or advice letter process. PG&E uses the following method for long-term transaction procurement.



(1) Solicitations

PG&E typically conducts RFO solicitations for long-term transactions. PG&E has conducted two Long-Term RFOs (“LTRFO”) for non-RPS, new generation resources since it resumed procurement responsibilities in 2004 and 2008. The results of the LTRFOs have been addressed in Commission decisions. Specific information related to conducting RFOs is included in Appendix I.

(2) Bilateral Contracts

PG&E also conducts bilateral negotiations when appropriate and beneficial for its customers. For example, PG&E’s acquisition through a bilateral transaction of the Gateway facility stemmed from a settlement of PG&E’s claims against Mirant. The Commission approved PG&E’s acquisition of Gateway in D.06-06-035.

c. Procurement Methods and Practices for Renewable Portfolio Standard-Eligible Resources

PG&E procures RPS resources through competitive solicitations, bilateral negotiations, and Commission-approved FITs. These procurement methods are described in more detail in Section II.A.4.e, above.

d. Procurement Methods for Qualifying Facility and Combined Heat and Power Resources

PG&E procures CHP and QF resources through competitive solicitations, bilateral negotiations, and Commission-approved form contracts. These procurement methods are described in more detail in Section II.A.4.h, above.

6. Electrical Capacity Procurement Limits and Ratable Rates

Electrical capacity procurement limits and ratable rates apply to electric capacity transactions with deliveries beyond the prompt calendar year (*e.g.*, for electrical capacity



transactions occurring in 2012, procurement limits and ratable rate shall apply to contract deliveries in 2014 and beyond).⁶ The procurement limits and ratable rates reflect a limit on net capacity procurement, which is purchases less sales of capacity in a given year. No limits or ratable rates apply to PG&E meeting its RA capacity requirements for the current calendar year and prompt calendar year (*i.e.*, the calendar delivery year immediately following the current year).

Delivery years two through ten have maximum annual electrical capacity procurement limits equal to the difference between: (1) PG&E's forecast electrical capacity requirement to meet its RA requirement (*i.e.*, peak annual hour load using a 1-in-2 year load forecast multiplied by 117%); and (2) the forecast Net Qualifying Capacity ("NQC") of PG&E's committed resources⁷ and planned preferred resources.⁸

Ratable rates equal to the annual electrical capacity procurement limits divided by the number of years between the delivery year and transaction year apply for delivery years two through ten and reflect the maximum capacity procurement of non-preferred electrical capacity allowed under the BPP in that year. For example, the ratable rate for delivery Year 4 is one-third the annual electrical capacity procurement limit for Year 4 (*i.e.*, the Year 4 electrical capacity procurement limits divided by the annual time

⁶ No formal limits or ratable rates are set beyond the term of the BPP. Approval for any capacity procurement in this timeframe will be sought through an application.

⁷ Assuming no re-contracting of resources that are not preferred.

⁸ For purposes of calculating PG&E's annual electrical capacity procurement limits and compliance with such limits, preferred resources are EE programs, DR programs, Renewable Sources (including energy imports associated with approved RECs), and Distributed Generation including CHP resources (or those resources qualified to count toward the Commission's CHP goals) including procurement of preferred resources above the Commission's targets or goals.



difference between Year 4 and Year 1). The unused portion of each year's ratable rate accumulate year-to-year, producing cumulative ratable rate for each delivery year. The electrical capacity procurement limits and ratable rates are shown in Appendix A. Procurement at two-times the ratable rate, subject to the electrical capacity procurement limits, for delivery years 2 through 5 is allowed if the prompt 12-month forward on-peak implied market heat rate at the time of execution is less than the two standard deviation historical high value as shown in Appendix A. Otherwise, procurement at one-times the ratable rate is used.

A transaction counts against the annual electrical capacity procurement limits and ratable rates in the year the contract is effective.⁹ A transaction is compliant with PG&E's authorized procurement limits and ratable rates if, at the time the contract becomes effective, the transaction does not cause PG&E to exceed its procurement limit or ratable rate for the applicable year. A transition from a two-times ratable rate to a one-times ratable rate within a given year will not cause any transaction activity that occurred prior to the transition date to be non-compliant with PG&E's ratable rates, provided that such transactions complied with the applicable ratable rate when executed.

On occasion, whether due to the lumpiness of procurement, Commission mandated procurement (such as non-renewable, non-CHP QFs), or unique and fleeting opportunities, transactions in a given year may exceed the electrical capacity procurement limits and/or ratable rates for that year. For these transactions, PG&E will request from

⁹ Procurement at two-times the ratable rate is allowed only when the contract is effective upon execution since the ability to procure at this level is determined at the time of execution.



the Commission an exemption from the annual electrical capacity procurement limits and/or ratable rates as necessary when seeking approval for the transaction.

PG&E will file an annual (or more frequent, if necessary) update to its electrical capacity procurement limits and ratable rates in a Tier 1 advice letter during years in which PG&E does not file an updated conformed bundled procurement plan.¹⁰ This update will provide PG&E with the opportunity to adjust its procurement limits and ratable rates to reflect changes in PG&E's portfolio and updated forecast assumptions.

7. Contracting Rules for Once-Through Cooling Units

PG&E may procure authorized products from OTC facilities through the authorized processes identified in this BPP subject to the conditions approved by the Commission in D.12-04-046. PG&E is not required to file by separate advice letter or application agreements with OTC facilities with a contract duration of two years or less and which terminate more than one year prior to the applicable State Water Resources Control Board ("SWRCB") compliance deadline. Agreements with OTC facilities with a contract duration greater than two years but less than five years or that terminate one year or less prior to the applicable SWRCB compliance deadline must be submitted to the Commission for approval in a Tier 3 advice letter. Agreements with OTC units with a contract duration five year or greater must be submitted to the Commission for approval via an application consistent with normal procurement rules.

For agreements with OTC facilities with a contract duration greater than two years but less than five years, PG&E will show in its advice letter: (1) how the contract helps

¹⁰ The updated limits calculations shall be consistent with the methodology employed in Appendix A.



facilitate compliance with the SWRCB OTC policy, or at a minimum why it does not delay compliance; (2) the expected operation of the OTC facility under normal load (1-in-2) and high load (1-in-10) conditions, including the number of starts and the run time after each start; (3) the local capacity requirement net position with and without the OTC facility over the contract duration and two years beyond the contract duration; and (4) how any other available generation resources compare under these criteria.

For agreements with OTC facilities that terminate one year or less prior to the applicable SWRCB compliance deadline, PG&E will show in its advice letter how the agreement helps facilitate compliance with the SWRCB OTC policy.

PG&E may procure from OTC facilities beyond the applicable SWRCB OTC compliance deadline provided that the contracts: (1) allow for utility purchase or receipt of power generated by a unit using non-compliant OTC only up to the SWRCB OTC policy compliance deadline in effect on the date the contract is signed (the contract shall not allow the utility to continue to purchase or receive power generated using non-compliant OTC beyond that date even if SWRCB extends the compliance deadline); (2) protect utility ratepayers against stranded costs; (3) protect ratepayers against the risk of future unspecified cost increases resulting from increases in the cost of the generation unit compliance with the SWRCB OTC policy (for PG&E to recover such cost increases from ratepayers, it must obtain the necessary approval from the Commission); (4) are consistent with a need authorization from the System Track of the Long-Term Procurement Plan (“LTPP”) proceeding; and (5) are consistent with other procurement rules, including the D.12-05-046 requirement to file either a Tier 3 Advice Letter (for



contracts with a duration of less than five years) or an application (for contracts with a duration of more than five years).

Any OTC-related advice letter or application must show compliance with all relevant SWRCB policies and regulations, and also must show how the contract provides or facilitates cost-effective and reliable service.

PG&E will consider a resource's use of OTC in its evaluation of offers in RFOs or solicitations.

8. The Application of Least-Cost, Best-Fit and the Loading Order in PG&E's Procurement Planning and Transactions

LCBF provides for resource alternatives to be selected based on their relative cost effectiveness and their ability to meet the specific needs of the portfolio. A resource's cost effectiveness is determined relative to common market benchmarks or "market value," as explained below. A resource's portfolio fit can be a qualitative assessment or quantitative measure that represents how well its energy profile, location, and other operating characteristics meet the needs of the portfolio for a particular product in a given location.

In planning and procurement decisions, PG&E applies a consistent evaluation methodology to both supply-side and demand-side resources. By applying LCBF principles to supply-side and demand-side alternatives, PG&E obtains the lowest cost for customers for a given set of portfolio needs. PG&E's procurement evaluation methodology considers both the market value and the portfolio fit of alternative resources that are available.



a. Market Valuation

Market value represents a resource's net market value from a market perspective, based on its costs and benefits, regardless of its fit with the rest of PG&E's portfolio. The costs that PG&E uses in calculating a resource's net market value include the cost associated with GHG emissions. In some circumstances, PG&E adjusts market value to include the costs of transmission system upgrades, since part of those costs are borne by PG&E's bundled customers.

b. Portfolio Fit

Portfolio fit assesses how well a resource alternative matches PG&E's portfolio needs. For example, a resource that produces energy during time periods in which PG&E's portfolio is expected to be long (i.e., periods in which PG&E expects to make spot market energy sales) has a poorer portfolio fit than a resource that produces energy during time periods in which PG&E's portfolio is expected to be short (i.e., periods in which PG&E expects to make spot market energy purchases). As a result, the portfolio fit of a resource is different from, but complementary to, the net market value of that resource.

In the planning phase, PG&E considers portfolio fit based on how well a particular resource provides the power products that need to be added to the portfolio. Not all resources provide the same products. For example, PV distributed generation and energy efficiency do not provide dispatchable peaking energy.

In the planning phase, PG&E first identifies the types and amounts of power products that it needs to fill its open position over the planning horizon. Those power products include energy products (e.g., baseload, peaking and shaping), capacity or RA



products, and A/S products (e.g., spinning, non-spinning, regulation, and black-start capacity). Then, PG&E identifies the energy products that each alternative resource can provide (e.g., baseload energy and dispatchable shaping or peaking energy). Most resources can provide a capacity product, or have an RA value that PG&E can estimate by using the Commission-adopted RA counting rules. However, some resources are more likely to provide energy in the hours when the system's peak demand is most likely to occur, and which as a result may have a higher RA value (per unit of installed capacity).

In the procurement phase, when evaluating transactions, portfolio fit can be a qualitative assessment or quantitative measure that represents how well a resource fits the portfolio's need. In addition to the market valuation, resources are compared based on their ability to meet the particular need being met, or their ability to provide additional features that are complementary to the portfolio. For example, if the proposed resource is not dispatchable by the utility, the offer with a generation profile that best matches the hourly profile of the open position will score more highly on PG&E's portfolio fit measure. Other portfolio fit considerations can include location and the volatility of the remaining portfolio open position.

c. Loading Order

According to the EAP, cost-effective EE and DR are preferred to meet the State's growing energy needs, followed by cost-effective renewable and distributed generation, and finally clean and efficient fossil-fired generation. Pursuant to D.12-01-033, PG&E shall procure additional EE and DR resources to the extent they are feasibly available and cost effective. This approach continues for each step down the loading order, including



renewable and distributed generation. The EAP also requires improvements to transmission and distribution (“T&D”) system to support demand growth and enable the interconnection of new generation.

9. PG&E’s Use of the Procurement Review Group Process

PG&E consults with the PRG on a wide range of transactions generally on a monthly basis, and sometimes more often as necessary. The Commission initially directed PG&E to consult with the PRG for specific types of transactions including: (1) overall interim procurement strategy; (2) proposed procurement contracts before the contracts are submitted to the Commission for expedited review; and (3) proposed procurement processes including but not limited to RFOs which result in contracts being entered into in compliance with the terms of the RFO.¹¹ Since 2002, the Commission has expanded the role of the PRG, including reporting requirements such as congestion bidding activities and CRRs. Although the PRG acts in an advisory capacity only, PG&E actively solicits feedback from PRG members and incorporates that feedback into its procurement processes regularly. Consistent with Commission directives, PG&E confers with the PRG on:

- **Bundled Procurement Plan and Customer Risk Tolerance (D.03-12-062, D.07-12-052, D.12-01-033)** – PG&E provides the PRG monthly updates of its portfolio position and risk. If the Customer Risk Tolerance (“CRT”) is expected to be hit or exceeded within the next quarter, PG&E informs and confers with the PRG to discuss the underlying risk drivers and factors affecting the change in portfolio risk and to decide whether specific hedging strategies and/or plan modifications are needed to reduce portfolio risk to within the CRT threshold.

¹¹ See D.02-08-071 at p. 24.



- **Capacity Position Limits (D.12-01-033)** – PG&E provides the PRG quarterly updates of its current position relative to the Commission-approved capacity limit on a rolling 24-month forward basis compared to the previous quarter.
- **Procurement Transactions With Delivery Periods Greater Than Three Months (D.03-12-062, D.04-12-048, D.07-12-052)** – PG&E consults with the PRG at least once, and sometimes several times, on transactions that have delivery periods greater than three months. PG&E discusses how transactions meet portfolio needs, solicitation or other procurement processes, evaluation methods, negotiation processes and contract selection.
- **LTRFO Design and Administration (D.04-12-048 and D.07-12-052)** – PG&E discusses both all-source and renewable RFOs with the PRG. Consultation with the PRG may encompass RFO design, the evaluation processes, short-list selection, negotiation strategy, and bid selection.
- **Electric Portfolio Hedging and Gas Supply Plans** – PG&E provides the PRG any updates to its hedging plan strategies and other aspects of its hedging plan such as changes or exceedance of liquidity limits. PG&E also informs the PRG of any hedging strategy changes that are presented to the Commission for approval.
- **Participation in a Generator Request for Bids (D.04-01-050)** – PG&E consults with the PRG prior to making an offer in other LSE solicitations or generator requests for bids.
- **Annual and Monthly CRRs (Resolutions E-4122 and E-4135, Appendix F)** – PG&E consults with its PRG prior to annual nominations for allocations and auctions. PG&E provides the PRG participants with information regarding the CRR it is buying or selling, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). PG&E will notify the PRG of all CRRs awarded in the monthly process after submission. The notification will include information about every CRR awarded in the monthly process, including the source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). The notification will be provided within three business days of the posting of the results of the *final* market process of a month's CRR process (currently the auction).



- **LT-CRRs (Resolutions E-4122 and E-4135, Appendix F)** – For any LT-CRR transaction, PG&E must provide the PRG participants with information regarding the LT-CRR, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description the underlying arrangement that the LT-CRR will hedge (or, in the case of a sale of a LT-CRR, no longer hedge). In addition, PG&E will report to the PRG the performance of its LT-CRRs on a quarterly basis including source, sink, MW quantity and performance using average congestion prices as published by CAISO.
- **Convergence Bidding (BPP, Appendix G)** – PG&E provides quarterly presentations to the PRG regarding its convergence bidding strategies, performance and market analysis.
- **Other Products and Processes Resulting From Commission Decisions** – PG&E has presented new proposed products and processes to its PRG. Such products include convergence bidding and other future products to support the CAISO system current market or new federal energy policy as approved by the Commission. In addition, PG&E has presented new technologies that PG&E may engage for its procurement activities or products.
- **GHG Procurement (D.12-04-046)** - The PRG is consulted on various aspects of procurement of GHG Products including the resale of GHG Products, PG&E's adopted CARB auction bidding strategy (including discussion of the total volume of GHG allowances that PG&E might acquire and its GHG position); transacting for any GHG Product in the Secondary Market with a vintage year¹² more than three years in the future beyond the current calendar year, and any forecast updates and corresponding revision to the GHG purchase limits as a part of PG&E's quarterly position update. Appendix L includes a more detailed discussion of PRG consultation with regard to GHG Products.

Although PG&E is required to discuss only a specified set of procurement matters with the PRG, PG&E and the PRG discuss a wider range of topics related to procurement. PG&E provides educational sessions to the PRG on topics including credit, market

¹² A "vintage year" is an attribute of each allowance that refers to the compliance year that CARB associates with the allowance at issuance. The vintage year designation restricts the allowance's eligibility for use to certain compliance periods. In the case of offsets, the vintage year refers to the year in which the offset is created.



valuation and portfolio fit, risk management and TeVaR, and the principles and processes of electric portfolio gas hedging. Appendix I includes specific information on the administration of the PRG.

10. PG&E's Use of the Independent Evaluator

PG&E uses an IE in competitive solicitations for electric supply-side resources that seek products with a contract term of two years or more. PG&E also uses an IE in all solicitations that involve an IOU-affiliate or utility bidder. In addition, consistent with D.09-06-050, PG&E uses an IE for bilateral negotiations for RPS-eligible resources. Appendix I includes specific information on IE qualifications, evaluation, entrance into the IE pool and other administrative items. Consistent with D.12-04-046, PG&E will make the public version of an IE report identical to the corresponding confidential version, except for the visible redaction of confidential material.

B. Risk Management Policy and Strategy

1. Portfolio Risk Assessment and Customer Risk Tolerance

PG&E manages the net open positions of the bundled electric portfolio in accordance with Commission guidelines. The portfolio, and PG&E's ability to manage the portfolio, are affected by numerous risks, including: price, market liquidity, model, counterparty credit exposure, and credit liquidity.

First, with regard to price risk, increases in electricity and gas commodity prices increase the costs of the portfolio and increase the risk of even higher costs of the portfolio. Increases in price volatility also increase the risk of higher costs of the portfolio. The portfolio's exposure to price risk is included in the TeVaR measure.



Changes in how electricity and gas commodity fluctuate, including changes in price volatility, make managing the portfolio more difficult. Among the challenges in managing the portfolio's exposure to price risk are balancing how much to hedge, when to hedge and what products to use to hedge.

Second, the portfolio and PG&E face market liquidity risk. Depending on the size of the portfolio's net open positions, prices may move adversely when transactions are executed to reduce those net open positions. Depending on market conditions, this adverse price movement could be significant. In formulating a plan to execute transactions, and in actual transaction execution, PG&E considers the potential effects of market liquidity risk.

Third, the portfolio and PG&E can be affected by model risk. Model risk relates to the risks involved in using models to estimate portfolio risk and manage the portfolio's net open positions. Often, PG&E's portfolio positions are not directly traded in any marketplace. In this situation, models are used to estimate net open position exposure, measure portfolio risk, and guide in managing the portfolio. Model risk includes the risk of estimating, extrapolating, or forecasting inputs needed for portfolio evaluation, such as energy demand, hydro supply, forward prices, volatilities, and correlations. PG&E's risk management policies and procedures include provisions and activities to assess and manage model risk.

Fourth, the portfolio and PG&E can be affected by counterparty credit risk. The portfolio and PG&E hold contracts with counterparties, and there is a risk that counterparties may not pay or perform on their contractual obligations. PG&E's credit



department manages this risk. Since returning to procurement in 2003, PG&E's credit department has employed a credit policy whereby all transactions with counterparties are subject to term and dollar limits. Generally, these limits are based on collateral thresholds, credit ratings, and contractual conditions that both PG&E and counterparties have agreed to for managing collateral obligation of each party to more effectively manage counterparty credit risk.

Additionally, the portfolio and PG&E face credit liquidity risk. PG&E is obligated to post collateral with counterparties as well as exchanges. The collateral posting by PG&E results from the combination of accruals for delivered physical energy and mark to market of obligations above and beyond the negotiated credit threshold with counterparties. In addition, most of the portfolio's contractual agreements require PG&E to post collateral if PG&E's credit rating by external rating agencies were to fall below investment grade. For exchanges and cleared transactions, PG&E is required to post initial margin as well as mark to market and the portfolio does not benefit from any unsecured credit limits.

PG&E reports its electric portfolio TeVaR to the Commission's Energy Division ("ED") on a monthly basis. Consistent with D.07-12-052, PG&E measures TeVaR as the potential change in portfolio costs under a low probability (5%) outcome or a 95% confidence level. The TeVaR measure assumes that no further forward hedging is performed, and that all existing positions are taken to delivery. In addition, D.07-12-052 and D.12-01-033 require PG&E to notify and meet and confer with the PRG if PG&E's CRT level is expected to be hit or exceeded within the next quarter. In D.12-01-033, the



CRT level was set by the Commission at 10% of PG&E's system average rate. The calculation of the CRT value is derived by multiplying 10% of the adopted bundled system average rate by the bundled forecasted sales for the rolling 12-month period. Pursuant to D.12-01-033, this CRT calculation will be updated every two years in each LTPP filing. If the LTPP filing is delayed or not made, the CRT will be updated two years from the filing of the previous LTPP via a Tier 1 advice letter. A description of PG&E's TeVaR methodology is included in Appendix E.

2. PG&E's Current Risk Management Practices

PG&E hedges to keep the portfolio's risk within the CRT level established by the Commission. PG&E uses the electric TeVaR measure to assess portfolio risk. While hedging reduces the risk of adverse price movements and leads to more stable portfolio costs, hedging does not reduce the expected (that is, average or mean) portfolio cost.

PG&E hedges the price risk of its portfolio in accordance with its Commission-approved electricity and gas hedging plan. Under the hedging plan, PG&E is authorized to utilize financial instruments in addition to physical contracts to hedge its price risk. This hedging plan provides PG&E with an approved guideline for volume, term and tenor, and permitted product type. The hedging plan also establishes the credit liquidity amount that can be allocated to the hedging of PG&E's electric portfolio as outlined in the credit and collateral requirement section.

PG&E hedges using swaps and options, as well as fixed-price contracts. These hedges complement other portfolio positions. A significant fraction of portfolio price risk is currently "hedged" through PG&E's ownership of physical assets or the rights to



output from physical assets (power plants, long-term power contracts, gas pipelines, and gas in storage). Along with existing physical positions, PG&E uses financial swaps and options to further hedge commodity price risk.

In selecting financial hedge instruments, PG&E considers risk reduction, liquidity impacts, and costs to transact and execute. An option requires a known up-front payment, and results in a later cash inflow that is unknown until expiration and settlement. On the other hand, a financial swap has no up-front payment and results in a later cash inflow or outflow that is unknown until expiration and settlement. Swaps are also subject to collateral posting requirements and do not allow the buyer to take advantage of lower prices if commodity prices drop in the future.

Typically, PG&E is the buyer of the hedge instruments. On rare occasions, PG&E anticipates, in advance, having more commodity than needed to serve customer demand. On such occasions, the sale of hedge instruments would serve as a hedge reducing the portfolio's exposure to commodity price risk.

3. PG&E's Credit and Collateral Requirements

The Commission has not established specific rules for counterparty or customer risk that apply to credit exposure. PG&E's credit and collateral requirements evolved from accepted energy industry practices, including concepts that can be found in Edison Electric Institute ("EEI"), North American Energy Standards Board ("NAESB"), and International Swaps and Derivatives Association, Inc. ("ISDA") master agreements. The primary elements of PG&E's credit and collateral requirements include: collateral thresholds (unsecured credit lines), collateral posting for purchases and sales of physical



or financial gas and power, and mark to market posting to cover the change in value of a contract relative to the market. The general goal is to protect the customer against the risk of default by parties with whom PG&E enters into wholesale commodity transactions or hedging transactions. PG&E's credit risk management process includes: creditworthiness evaluations, collateral requirements for various types of transactions, and the level of collateral authority. Each of these aspects of credit risk management is described below.

PG&E manages the credit risk regarding each counterparty by assigning unsecured credit limits or unsecured credit thresholds to each counterparty. In establishing unsecured credit lines for counterparties, PG&E performs evaluations of counterparty creditworthiness. PG&E assesses each counterparty's financial strength, transaction risk and duration, credit standing, and other credit criteria, as deemed appropriate. PG&E periodically reviews the unsecured credit lines assigned to a counterparty to ensure the unsecured credit lines are appropriate for the then-current credit quality of the counterparty.

If a counterparty is a rated entity (e.g., the debt of the entity is rated by Standard and Poor's ("S&P"), Moody's or Fitch) assigned a credit rating below investment grade (for example investment grade is considered BBB- or above by S&P or Baa3 by Moody's) or is a "non-rated entity" not considered creditworthy by PG&E, then PG&E generally will require the counterparty to provide acceptable credit support. Such credit support can be in the form of a cash deposit, guaranty from an investment grade entity, or a letter of credit from an acceptable credit support provider, in form and substance



satisfactory to PG&E. For creditworthy counterparties, PG&E establishes a specified unsecured credit limit beyond which posting of acceptable credit support is required.

Some of the specific collateral requirements that apply to various categories of transactions are described below.

- **Standard Physical Contracts** – Physical power contracts are generally executed under standard agreements such as the Western System Power Pool, or EEI form master agreements. These master agreements generally have a credit annex where parties can specify unsecured credit limits and conditions that apply for parties to honor the levels. For natural gas physical contracts, either NAESB or Gas Industries Standards Board are commonly used. Credit terms of the master agreements for natural gas have similar clause and treatment as power. For the most part power and gas contract exposure cannot be netted without a bridging agreement. Bridging agreements are difficult to establish as the executed contracts may be with various subsidiary or affiliate of a credit support provider.
- **Standard Financial Contracts** – Financial transactions are executed directly through the exchanges or executed bilaterally with a counterparty in the O-T-C market. When executed with exchanges, PG&E must post appropriate collateral based on the exchange's requirements for initial margin and ongoing margin maintenance associated with mark to market value of the transactions on a daily basis. O-T-C transactions can be submitted for clearing with a clearing entity such as the ICE, or remain with the counterparty. Similar to exchanges, cleared contracts will require collateral posting based on the mark to market value of the contracts. Bilateral financial transactions are generally executed under the negotiated terms of the ISDA. Similar to standard physical agreement, an ISDA master agreement has a credit annex for specifying conditions and level of unsecured credit limit among the parties to the agreement.
- **Renewable Contracts** – Renewable counterparties are required to post a bid deposit of \$3 per kW; a development and construction period deposit of up to \$100 per kW multiplied by the greater of: (1) the capacity factor; or (2) 0.5 for intermittent technologies; and a delivery term security of up to 12 months of the average revenue depending on contract term once commercial operations begin.



- **Resource Adequacy** – RA counterparties (rated as non-investment grade) are generally required to post 16% to 33% of annual capacity payments depending on term of the contract, particularly when RA is a clearly identified component.
- **Intermediate Term Tolling, Forward or Option Contracts** – Intermediate term tolling counterparties are subject to mark to market posting in accordance to the Market Intrinsic Value methodology.
- **Long-Term Tolling Contracts** – Long-term tolling counterparties are required to post a bid deposit of \$5 per kW; post an additional \$10 per kW when an executed contract is submitted to the Commission (for a total of \$15 per kW); an additional developmental and construction period deposit of \$85 per kW at the time the Commission approves the contract (for a total of \$100 per kW); and once commercial operations begin the counterparty is subject to mark to market posting (this amount is capped and the cap depends on the technology).
- **Procurement Activities Through the CAISO** – PG&E schedules all its energy procurement through CAISO system. It also procures a portion of its physical needs daily and hourly through the CAISO or may resell any excess energy it may have. In addition, PG&E manages transmission congestion risks through procurement of financial contracts for CRRs through the CAISO auction and term allocation process. PG&E is also responsible for various CAISO charges related to T&D, Losses, and administrative. The combined exposure to a market participant is referred to as Estimated Aggregate Liability (“EAL”) by CAISO and is used for monitoring and collecting appropriate level of security to mitigate counterparty risk. CAISO allocates a maximum of \$50 million of unsecured credit to the most creditworthy market participants. PG&E currently qualifies for this unsecured credit limit, but must post additional collateral above and beyond the \$50 million limit within three business day of receiving the request from CAISO. In addition, during the period of bidding for CRR or during convergence bidding, PG&E may need to maintain additional amount of collateral above and beyond the projected daily EAL to ensure its bids are not rejected because of lack of credit support.
- **Short-Term Transactions** – Short-term transactions include hour-ahead, day ahead, balance of the month, multi-month, and swing deals. Exposures from purchases and sales of power and gas are tracked daily. Collateral



requirements are governed by the master agreements under which these transactions are executed.

D.09-05-002 grants PG&E, among other things, authority to issue up to \$4.0 billion of short-term debt, subject to the restriction that \$500 million of that authority may only be used for the following purposes:

- Procuring natural gas for PG&E’s customers during price spikes.¹³
- Procuring electricity for PG&E’s customers during price spikes.
- Responding to major natural disasters, large scale terrorist attacks, or other cataclysms.
- Providing liquidity during a major disruption of PG&E’s ability to bill, collect, and/or process utility customer bills.

Given these restrictions, PG&E effectively has \$3.5 billion of general short-term debt authority, with the additional \$500 million of authorization reserved for the foregoing specified contingencies. Short-term debt is used to meet the liquidity requirements of the electric portfolio and finance other operations at PG&E. The liquidity management structure specified in Appendix B deploys short-term debt to the electric portfolio.

III. Description of Commission-mandated Case

This section summarizes the load and resource assumptions as required by the *Assigned Commissioner’s and Administrative Law Judge’s Scoping Memo for Track II Bundled Procurement Plans* issued January 13, 2011 (“Track II Scoping Memo”) and further modifications from D.12-01-033. PG&E prepared a case based on the standardized planning assumptions that were established in Appendix B of the

¹³ D.04-10-037 defines the commencement of a “price spike” as an increase in the price of gas or electricity of at least 50% over the average of the preceding 12 months.

Administrative Law Judge's Ruling Requesting Post-Workshop Comments, Updating Standardized Planning Assumptions, and Providing Lawrence Berkeley Report on Modeling Issues issued December 23, 2010 ("Standardized Assumptions") and further modifications from D.12-01-033. PG&E neither explicitly nor implicitly adopts these planning assumptions as its own and is submitting this Commission-mandated case and its results in Section V to meet the requirement of the Track II Scoping Memo and further modifications from D.12-01-033. Appendix A includes the capacity (PGE-1) and energy (PGE-2) tables. The assumptions used and described below correspond to both the energy and capacity tables in Appendix A.

A. Load Forecast (Appendix A, Table PGE-1, Lines 1-8)

The load forecast in Table PGE-1, line 1, is the 2009 1-in-2 Integrated Energy Policy Report ("IEPR") base case load forecast including updated assumptions for Community Choice Aggregation¹⁴ and Direct Access (Table PGE-1, line 7) based on Public Utilities Code Section 365.1(b), D.10-03-022 and D.12-01-033. Line 1 also includes the demand-side resources and the impacts of EVs.

EE savings (Table PGE-1, line 3) included in the Commission-mandated case through 2020 are based on the 2009 IEPR demand forecast and include mid-case values from the CEC's final Committee Report on Incremental Uncommitted Energy

¹⁴ PG&E's load calculation in Tables PGE-1 and PGE-2 does not include the Marin Energy Authority's ("MEA") Phase 2B implementation plan rollout which would begin in 2013. While MEA has recently met the binding notice requirements under PG&E's Electric Tariff Rule 23.2 in which MEA would assume responsibility for the planning and purchase of its customers' electrical power requirements, PG&E plans to reflect MEA's load for Phase 2B in its next annual update to the electrical capacity procurement limits.



Efficiency,¹⁵ except for Big Bold Energy Efficiency Strategies, for which the CEC's low case was mandated. Savings decay makeup and adjusted line loss savings are included to arrive at generation-level MW savings.

DR values (Table PGE-1, line 4) include those DR programs reported in the April 1, 2010 load impact filings (as updated in June 2010) and "AMI-enabled DR, such as price-responsive programs adopted or directed by the Commission, but yet to be implemented, and any default and optional dynamic rates expected in the forecast period. In addition, the forecasts include the Peak Time Rebate program and the Programmable and Communicating Thermostat program underling the AMI related DR benefit assumptions in the Commission AMI decisions."¹⁶ The Time-of-Use ("TOU") figures reported in the load impact filings include PG&E's large Commercial and Industrial ("C&I") customers. PG&E's largest C&I customers (greater than 500 kW) have been on mandatory TOU rates since the late 1970s. The remaining largest C&I customers greater than 200 kW have been on mandatory TOU rates since 2001, therefore, the TOU affect on C&I usage is embedded in the load forecast. Given that the large C&I TOU impact is embedded in the load forecast, including the impact as a load modifier as well results in double-counting. Therefore, PG&E has excluded the large C&I TOU impacts from the DR load modifier in the Commission-mandated case, per a February 27, 2011 conference call with Energy Division.

¹⁵ *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 integrated Energy Policy Report Adopted Demand Forecast*, May 2010 and *Attachment A: Technical Report*, January 2010.

¹⁶ Attachment 1: Standardized Planning Assumptions (Part 1) for System Resources, December 23, 2010, p. 11.



Self-generation values (Table PGE-1, line 5) represent on-site generators excluding the California Solar Initiative (“CSI”). The CHP component of this amount includes the additional new CHP of 401 MW by 2020 which includes losses. CSI values are shown on Table PGE-1, line 6. The CSI generation levels are from the 2009 IEPR base case-load forecast. In the preparation of the analysis, for demand-side CHP, a coincidence factor of 0.922 and an on-peak availability of 1.0 were used.

B. Existing and Planned Resources (Table PGE-1, Lines 15-23)

PG&E-owned fossil resources (Table PGE-1, line 15) include two combined cycle (“CC”) plants (Gateway and Colusa) and a series of 10 gas-fired reciprocating engines that replaced the Humboldt Bay Power Plant. The combined fossil capacity is currently 1,384 MW. In addition, PG&E’s request to own and operate the Oakley Generating Station, a 586 MW CC that will be operational in 2016, is included in line 15.

PG&E owns and operates two nuclear power units at DCPD with a combined peak capacity of 2,240 MW (Table PGE-1, line 16). The plant is expected to have an availability of over 98% annually, excluding refueling outages.

PG&E owns and operates 68 hydroelectric facilities (Table PGE-1, line 17), including run-of-river and dispatchable hydroelectric facilities as well as the Helms Pumped Storage Facility. Forty-two of these facilities are RPS-eligible resources.

Existing and planned resources also include CDWR contracts. At the beginning of 2011, eight unexpired CDWR contracts were still allocated to PG&E (Table PGE-1, line 19). The counterparties include CalPeak, Shell, Kings River Conservation District, Iberdrola, Fresno Cogeneration Partners and Wellhead. These contracts total 1,168 MW



of generation. However, half of these MWs expired at the end of 2011 and all but 96 MW expire by the end of June 2012. Kings River, the last contract, runs through September 2015. The contracts are forecast to generate approximately 2,800 gigawatt-hours (“GWh”) in 2011 and half that amount in 2012. *De minimus* quantities are expected to be generated in 2013-2015. In particular, PG&E has the following CDWR contracts:

**TABLE III-1
PACIFIC GAS AND ELECTRIC COMPANY
CDWR CONTRACTS**

DWR Counterparty	End Date	MW
CalPeak Power—Panoche	12/27/2011	52.6
CalPeak Power—Vaca Dixon	12/31/2011	51.9
Shell	6/30/2012	550
Kings River Conservation District	9/18/2015	96
Iberdrola Renewables	6/30/2011	300
Fresno Cogeneration Partners	10/31/2011	21.5
Wellhead Power Gates	10/31/2011	46.4
Wellhead Power Panoche	10/31/2011	49.9

PG&E has PPAs with approximately 230 operating QFs (Table PGE-1, line 20). The QF contracts cover a wide range of technologies including RPS-eligible resources and large-scale CHP. The Standardized Assumptions provided limited guidance on CHP contracting assumptions for the Bundled Plan and directed the IOUs to the guidance provided in the Joint Scoping Memo. In *Standardized Planning Assumptions (Part 1) for System Resource Plans*, the CHP assumptions for the PG&E planning area are:

- Maintenance of 1,888 MW of existing CHP NQC.
- Addition of 409 MW of new CHP NQC serving the system planning area load.
- Addition of 373 MW of new demand side CHP serving behind the meter load (401 MW impact to the system planning table).



In accordance with D.12-01-033, supply-CHP MWs included in the bundled portfolio are as follows:

- 100 percent renewal of existing contracts. All CHP Transition Contracts expiring on June 30, 2015 renewed for four months at 55 percent (427 MW of 776 MW expiring). CHP Transition Contracts achieve 100 percent renewal on November 1, 2015.
- New CHP capacity exporting to grid: 8.4 MW per year through 2015 plus 204.8 MW in November 2015 and then approximately 40 MW per year thereafter; a total of 409 MW (nameplate) by 2020.

Consistent with the recontracting assumptions used for the RPS PPA portfolio, expiring RPS-eligible QF contracts are assumed to be recontracted at 70% of the original contract volumes.

In addition to QFs, PG&E also has contracts with RPS-eligible resources (Table PGE-1, line 21). PG&E developed RPS assumptions for the Commission-mandated case consistent with the Commission direction for the Track I Trajectory Scenario. Using the RPS projects and generation volumes from PG&E's March 1, 2011 RPS Compliance Report as a foundation, the RPS portfolio reflected in the Commission-mandated case:

- Meets the RPS targets outlined in the CARB 33% Renewable Electricity Standard regulation, specifically: 20% renewables in 2011-2014; 24% renewables in 2015-2017; 28% renewables in 2018-2019; and 33% renewables in 2020. RPS targets for the Commission-mandated case were calculated based on the PG&E Bundled Sales forecast included in the E3 RPS Calculator.
- Includes all executed contracts at 100% of negotiated energy deliveries.¹⁷ Online dates reflect the best available information on the development status of projects under contract to PG&E.

¹⁷ RPS contracts that have been terminated or expired are not included in PGE-1 or PGE-2.



- Assumes PG&E will re-contract with resources whose contracts expire before 2020 at a rate of 70% of their current volumes. PG&E elected to include all expiring contracts at a discounted volume in the years following expiration rather than hand-picking projects with which it would not renew purchase agreements.
- Assumes that the CPUC-mandated TREC cap of 25% of Annual Procurement Target (“APT”) volumes is extended in perpetuity beyond the current sunset date of December 31, 2013. Results for the Commission-mandated case project that PG&E does not exceed the REC cap in any year except 2011, where REC-only deliveries represent 28% of APT volumes. PG&E assumes that it will bank the 3% of REC-only overages and save for use in later years when it is comfortably under the REC cap but may need additional generation volumes due to unforeseen project failure.
- Fills PG&E’s RPS-specific net short position in 2020 with generic RPS resources using the following technology mix: 30% in-state wind; 30% out-of-state wind; 30% solar PV; 5% biomass; and 5% geothermal. This technology mix was PG&E’s best estimate of its desired blend of technologies for long-term RPS procurement purposes when the BPP was filed in March 2011.¹⁸

PG&E’s Bilateral Contractual Resources (Table PGE-1, Line 22) consist of bilateral contracts including: (1) incremental supply-side CHP; (2) CDWR contract novations; (3) contracts resulting from the 2004 and 2008 LTRFOs; (4) intermediate-term contracts; and (5) RA contracts.

With regard to incremental supply-side CHP, PG&E used the following assumptions:

- 409 MW of contracts with new CHP by the end of 2020
- Capacity factor of 0.922 and on-peak availability of 1.0

¹⁸ Commercial negotiations and market factors will ultimately determine the technology makeup of PG&E’s renewable portfolio in 2020, so the numbers presented here may change over time.



With regard to CDWR novations, on October 1, 2010, three former CDWR contracts: Calpine 3, Calpine 4 and GWF (Tracy, Henrietta and Hanford) were novated by PG&E for a combined contracted capacity of 1,051 MW. All of the contracts expire prior to 2013 with the exception of Calpine 3 which extends through 2021.

The 2004 LTRFO resulted in PPAs for CalPeak Firebaugh, Panoche Energy and Russell City for a combined contracted capacity of 1,067 MW. The 2008 LTRFO and CDWR novations resulted in PPAs for Mariposa, Marsh Landing, Midway-Sunset, GWF Tracy Expansion and Calpine 2 Los Esteros Expansion for a combined contracted capacity of 1,648 MW. Finally, intermediate length contracts (five years or less) were entered into for Moss Landing 6 and 7 and Delta Energy Center for a combined capacity of 2,312 MW. These contracts expire by the end of 2013.

IV. Procurement Plan Strategies for Implementing the Loading Order

A. Introduction to Resource Procurement Strategy

PG&E's BPP is designed to implement California's EAP loading order and Legislative and Commission directives regarding procurement. The BPP balances three primary objectives: (1) assembling a portfolio of reliable and operationally flexible resources; (2) supporting development of environmentally preferred resources; and (3) managing customer price and price volatility. In this section, PG&E describes its resource acquisition strategies for EE, DR, RPS-eligible resources, DG, clean-efficient conventional generation, and other generation including imports. Section IV.G briefly addresses electric and gas hedging and fuel strategies. Specific strategies are described in more detail in the appendices.



B. Energy Efficiency

1. PG&E's Long-Term Commitment to Energy Efficiency

PG&E has been, and will continue to be, supportive of California's efforts to promote EE. In 1976, PG&E became one of the first utilities in the nation to offer EE programs to its customers. Since then, PG&E has received numerous awards and recognition for its leadership by industry leaders such as Energy Star and the American Council for an Energy Efficient Economy. Since 1976, PG&E and its customers have kept more than 155 million tons of CO₂ out of the atmosphere.¹⁹ PG&E has been and continues to be supportive of the EAP "loading order" for energy needs in California, which places EE at the top of the list, followed by other demand-side resources and renewable resources. The 2008 EAP Update lays out specific action areas, including EE, and acknowledges the need for coordination and integration, broadening perspectives and the focus on action, and the leveraging of partnerships. As described below, this coordination is a key part of PG&E's current and future EE programs.

2. PG&E's 2010-2012 Programs

PG&E's 2010-2012 EE portfolio is described in D.09-09-047. After this decision, PG&E filed Compliance AL 3065-G-A/3562-E-A conforming PG&E's EE portfolio to D.09-09-047. PG&E's 2010-2012 EE portfolio builds upon successes of prior EE programs and realigns program delivery to offer an Integrated Demand-Side Management portfolio to better meet the needs of PG&E's customers and deliver energy savings to the state of California in line with the California Energy Efficiency Long Term Strategic Plan ("Strategic Plan"). This integrated portfolio has been streamlined to a limited number of

¹⁹ See <http://www.pge.com/about/environment/pge/energyefficiency/index.shtml>.



statewide programs with coordinated marketing and outreach, smaller targeted programs to meet unique conditions in PG&E's service area, and contains pilots for new and innovative EE approaches, in addition to 57 third-party programs.

As directed by the Commission,²⁰ the Joint IOUs, in collaboration with ED staff, developed the following Statewide and Local Programs to align with California's Strategic Plan:

Core Statewide Programs

- 1) Residential
- 2) Commercial
- 3) Industrial
- 4) Agriculture
- 5) New Construction
- 6) Lighting Market Transformation
- 7) Heating, Ventilating and Air Conditioning
- 8) Codes and Standards
- 9) Emerging Technologies
- 10) Workforce Education and Training
- 11) Marketing, Education and Outreach
- 12) Statewide Demand-Side Management ("DSM") Coordination and Integration

Government Partnerships

- 1) Government Partnerships

²⁰ For background on the 2010-2012 EE portfolio, see D.09-09-047, at p. 16.



- 2) Innovator Pilot Program
- 3) Green Communities

Third Party Programs

Other Local Programs

- 1) Local DSM Coordination and Integration
- 2) ZNE Pilots
- 3) On-Bill Financing Program
- 4) On-Bill Financing Revolving Loan Pool

D.09-09-047 included utility specific goals for the program cycle. The goals established for PG&E can be found in Table IV-1 below.

TABLE IV-1
PACIFIC GAS AND ELECTRIC COMPANY
PG&E GOALS FOR 2010 – 2012

Metric ('10-'12 Program Cycle)	Commission Goal (D.09-09-047)
Electricity Savings (GWh)	3,110
Peak Savings (MW)	703

3. Post-2012 Programs

In recent years, it has become clear that EE programs can no longer rely on inexpensive, easy to obtain EE. Rather, California must pursue more challenging and costly implementation efforts to achieve its energy savings goals. As a result, PG&E expects funding requirements for future EE programs to increase as less cost effective measures are pursued to address remaining market potential. Despite the challenges of increasing efficiency beyond easy and inexpensive measures, PG&E is committed to helping California achieve deep and lasting improvements, while maintaining California's



role as the nation's most energy efficient state. PG&E will continue to work closely with the Commission, the other IOUs, and interested parties to develop future EE portfolios which continue California's national leadership in EE achievement. PG&E anticipates the current 2010-2012 portfolio cycle will be extended by one or more years; however, the exact timing, goals, and budget have not yet been determined. PG&E will continue to actively propose innovative programs to the Commission in line with the historical EE leadership of PG&E and California.

C. Demand Response

DR is second in the EAP Loading Order after EE. DR is a valuable resource for meeting PG&E's peak demand, improving system reliability through RA, avoiding costly capital investments, advancing SmartGrid goals, facilitating integration of intermittent renewable resources, and furthering the objectives of California's EAP. As such, PG&E has developed a portfolio of DR resources that are capable of furthering these goals. PG&E is committed to further developing its DR portfolio, in terms of efficiency, flexibility and size.

1. PG&E's 2009-2011 Demand Response Program

PG&E's 2009-2011 DR Program, which was approved in D.09-08-027, includes a variety of programs designed to elicit DR from all customer classes to meet systemwide and PG&E specific needs. PG&E's DR portfolio can be broadly divided into two categories: non-event based DR resources and event based DR resources.



Non-event based resources are those resources that provide an ongoing financial incentive for customers to shift usage outside of peak hours. PG&E's non-event based programs include the Permanent Load Shifting program and TOU rates.

Event based programs provide financial incentives for customers to shift their usage outside of peak hours on days when system usage is critically high or when there is a critical local condition. These event based programs include the Base Interruptible Program, Capacity Bidding Program, Demand Bidding Program, Dynamic Pricing Programs (Peak Day Pricing & SmartRate™), PeakChoice™, SmartAC™, and the Aggregator Managed Portfolio Program, each of which qualifies for credit towards PG&E's RA requirement.

Both event based and non-event based programs have established histories of predictable and verifiable performance and are evaluated annually according to the Load Impact Protocols mandated by the Commission in D.08-04-050, Attachment A.

2. PG&E's Adopted 2012-2014 Demand Response Program

DR opportunities are expanding both in terms of diversity and load impact potential as the deployment of SmartMeters is opening DR to a large number of PG&E customers. PG&E's 2012-2014 DR Application 11-03-001, filed on March 1, 2011, seeks to leverage these opportunities through expansion of highly effective programs to new customers and improvements in DR for existing participants.

PG&E's adopted 2012-2014 DR Program also incorporates changes to allow PG&E's DR programs to bid into the CAISO market as a supply resource via the RDRP or the PDR product. In D.10-12-036, the Commission approved PG&E authority to bid



PDR into the CAISO's market. The Commission approved AL 3635-E-A and 3689-E-A on June 7, 2011 to further implement bidding PDR. Consistent with this authority, PG&E is adding PDR and RDRP as products that it can bid into the CAISO markets.

D. Renewable Portfolio Standard-Eligible Resource Procurement

PG&E strongly supports the development of renewable resources consistent with the EAP Loading Order. As of March 2011 when the BPP was filed, PG&E had signed 109 contracts with RPS-eligible resources totaling over 8,800 MW of capacity, capable of delivering more than 20% of PG&E's future energy needs. PG&E is continuing to procure RPS-eligible resources to achieve the 33% by 2020 goal established by SB 2 in the First Extraordinary Session ("SB 2 1X").

PG&E's renewable procurement strategy is described in detail in its RPS Procurement Plan ("Plan" or "RPS Plan") filed in R.08-08-009. Although PG&E has executed contracts that represent over 20% of its future energy needs, PG&E's ability to meet the RPS targets is dependent upon timely completion of renewable energy projects, which are subject to uncertainties and risks. Chief among the uncertainties facing renewable projects under development are permitting challenges related to time-intensive and potentially high-cost transmission planning and development, and access to financing.

In light of these issues, PG&E plans to continue to hold regular RPS RFOs to account for continued uncertainty in project development and expand its portfolio of RPS-eligible resources to meet the 33% RPS requirement. Section II.A.4.e. contains a



detailed description of several RPS procurement methods that PG&E may use to meet its RPS requirements.

E. Distributed Generation

PG&E has supported DG before the California Legislature, the Commission, and through a variety of internal process improvements. PG&E's customers continue to play an important role in developing DG by adding generation to the electrical grid. In addition to RPS programs which can include DG, such as the AB 1969 FIT, PG&E also administers several programs that support DG: the CSI, the Self-Generation Incentive Program ("SGIP"), the Fuel Cell Program, and several Net Energy Metering ("NEM") Programs. The following sections describe PG&E's DG strategies.

1. California Solar Initiative

PG&E is committed to retaining its role as a leader in the solar market. In recent years, PG&E has supported regulation and legislation that created or extended programs providing assistance to customers who choose to install solar generation. PG&E supported the CSI established by the Commission in 2005 and supported SB 1, which codified CSI and increased the cap on the net metering program from 0.5% to 2.5% of PG&E's peak load.

In terms of solar interconnections, PG&E is the leading solar utility in the United States and is committed to continuing and expanding that leadership role. Thousands of additional photovoltaic solar systems are interconnected to PG&E's system every year by customers seeking to address environmental concerns or to fulfill a desire for energy independence. CSI will provide approximately \$1 billion in rebates for customers in



PG&E's service territory over a 10-year period; to date, the program has resulted in installations of 278 MW of solar generation by PG&E's customers. Customers installing these systems have received or will receive \$486 million in incentives.

CSI has four major sub-programs. First, CSI provides incentives for residential and non-residential customers choosing to install solar. Systems over 30 kW earn the rebate as a per-kilowatt-hour ("kWh") incentive based on actual generation from their solar installation. This incentive has contributed to increased performance of solar for our customers. Systems up to 30 kW may receive a one-time rebate based on an estimate of the power the system will produce. This estimate models the effects of orientation, geographic location, shading, etc.

Second, there are two low income CSI programs: the Single-Family Affordable Solar Housing Program ("SASH") and the Multi-Family Affordable Solar Housing Program ("MASH"). PG&E has led a cooperative effort with representatives of the low income housing development community to better understand how to bring solar benefits to low income customers. The SASH program, administered by Grid Alternatives for PG&E's customers, is closely aligned with the low income EE program. PG&E has integrated the MASH program with the low income EE program as well.

Finally, the fourth solar program is the New Solar Homes Partnership ("NSHP") – which was established by the same legislation as the CSI and low income programs. Responsibility for the NSHP resides with the CEC, which has hired PG&E to administer the program. This allows the NSHP to be closely integrated with the other three CSI



programs, including taking advantage of economies of scale, cross-training, and integration with PG&E's Residential New Construction EE program.

2. Self-Generation Incentive Program

The second incentive program available for our customers who choose to install DG to help meet customer need is the SGIP. PG&E has administered the SGIP since 2001. For the first six years of the program, incentives were available for installations up to 1 MW of solar, wind, fuel cell, and efficient combustion engines. In 2007, the solar incentives were subsumed into the CSI. Starting in 2008, the SGIP was only available for wind and fuel cells, with storage technologies added in 2010 when used in conjunction with qualifying wind or fuel cells. Passage of SB 412 in 2009 expanded the program to include efficient CHP and renewable technologies. As of December 2010, 678 customers had taken advantage of the SGIP program to install 163 MW of generation to meet their energy needs, receiving \$346 million in incentives.

For clean and renewable customer generation, the SGIP can improve a customer's project economics by providing a rebate to offset the capital cost. As the Commission implements SB 412, PG&E anticipates that some systems will instead receive some portion of their compensation through a performance based incentive, similar to that established in the CSI program. Whether or not a customer takes advantage of the SGIP program, any customer installing at-site generation will benefit from both interconnection process improvements and savings on energy bills.



3. Fuel Cell Program

On February 2, 2009, PG&E filed an application with the Commission requesting authority to develop, own and operate three fuel cell electric generating facilities at two California State Universities: San Francisco State University (“SF State”) and California State University East Bay (“CSU East Bay”). PG&E filed supplemental testimony on August 10, 2009, revising the total MW capacity from 2.9 MW to 3.0 MW and increasing the capital cost request from \$21.3 million to \$21.5 million, along with recovery of actual Operations and Maintenance costs. While the electric generation will be exported to PG&E’s distribution grid, the universities will benefit by utilizing the fuel cell waste heat to serve thermal load at both campuses and by utilizing discharged water for landscape irrigation. In addition, both universities plan to incorporate the fuel cell facilities into their science, technology, engineering and math curriculum. An educational kiosk will be installed at each campus as well.

On April 8, 2010, the Commission authorized capital costs of \$20.3 million for PG&E’s fuel cell demonstration project in D.10-04-028. PG&E subsequently executed lease agreements with both universities as well as engineering, procurement and construction agreements with two vendors: FuelCell Energy (“FCE”) and Bloom Energy (“Bloom”). FCE, based in Connecticut, installed two 1.4 MW molten carbonate fuel cell facilities – one at SF State and one at CSU East Bay. Bloom, based in Sunnyvale, California, installed two 100 kW solid oxide fuel cell units at SF State. The facilities became operational in 2011.



4. Net Metering Programs

PG&E administers four net metering programs. The first, NEM, allows customers with solar installations up to one MW and wind installations up to 50 kW to export power when their generator produces more than they need at any given time. These exports can be used to offset customer usage when solar and wind power can't meet on-site needs. On a monthly basis, any excess kWh exports are converted to a monetary credit using the customer's retail rate. These credits are available to offset charges over an annual "true-up" period. Historically, the Legislature required that at the end of the true-up period, any excess credits be forfeited. However, in 2009, the Legislature passed AB 920, which provides for payment for net excess generation over the course of the true-up period. On June 9, 2011, the Commission approved the net surplus compensation ("NSC") rate for NEM customers who produce more electricity (kWh) than they use over their true-up period, usually 12 billing months.²¹ The NSC rate is based on a rolling 12 month average of spot market prices. Based on current market prices, the rate would be approximately 4 cents per kWh. This compensation is for the energy only. The Commission has placed a hold on any payments for RECs until the CEC can set up a process to verify and track these attributes. Once this process is in place, PG&E should be allowed to make an additional payment for the REC value of the excess kWh.

The second and third net metering programs, Wind Energy Co-Metering and Net Energy Metering for Fuel Cell Customers-Generators, provide customers a credit for generation exports that is valued at the generation component of the customers' energy

²¹ D.11-06-016.



rate and can be used to offset generation charges incurred at any point in an annual true-up period.

Finally, PG&E administers Renewable Energy Self-Generation – Bill Credit Transfer, a net metering program that allows local governments, including school districts and the University of California/California State Universities to site renewable generation at one location and export excess electricity to PG&E's grid. PG&E calculates a credit for those exports, based on the generation component of the energy rate of the customer's tariff at the point where the generator is located. This credit can be used to offset generation charges at any other account for that local government customer.

F. Other Generation Supply Resources

1. California Department of Water Resources Contracts

CDWR entered into contracts during the 2000-2001 energy crisis that were subsequently allocated to the three IOUs. In D.02-09-053, the Commission allocated to PG&E the power from all CDWR contracts with a specified delivery point at North of Path-15, plus the Coral contract. Since the allocation, PG&E has novated the Calpine 3, Calpine 4 and GWF contracts, and some contracts have expired. Contracts currently delivering to PG&E provide 550 MW of must-take generation and 618 MW of dispatchable generation for a total of 1,168 MW. Most CDWR contracts will expire by 2012, except for the Kings River contract which expires in 2015. PG&E expects that the underlying resources will still be in operation and will be eligible to bid into PG&E's competitive solicitations.



2. Reliability Must-Run and Other CAISO Backstop Capacity Contracts

RMR contracts are yearly contracts procured and administered by the CAISO to meet local reliability needs. PG&E participates in the CAISO's determination of local reliability need and in the CAISO's pricing of RMR contracts, but does not directly contract for the RMR deliveries. California has transitioned from RMR to Local Capacity Requirements ("LCR"). Unlike RMR, which is procured by the CAISO, LCR capacity is procured by the LSE, and any residual local reliability need may be purchased by the CAISO through RMR and other CAISO backstop capacity procurement mechanisms. The amount of LCR and the need for RMR or other backstop capacity procurement is determined annually by the CAISO through technical studies of the electric transmission system.

LSEs contract for capacity in local areas (LCR capacity) which creates an obligation from the unit to the CAISO. The general requirements for the CAISO are that the unit will either run or bid its capacity into the CAISO market. PG&E procures LCR capacity as part of its other short-, medium- and long-term solicitations, bilateral negotiations and market purchases. If necessary, PG&E may conduct special solicitations and negotiations for LCR capacity to fully meet local reliability needs. Any needs not met by LSEs in aggregate will likely be filled by the CAISO through RMR contracting and/or other backstop capacity procurement. RMR capacity is generally allocated to LSEs to count toward their RA requirement (both local and systemwide). Other CAISO backstop capacity procurement made on an annual basis is also allocated to LSEs for RA counting. However, most backstop capacity procurement is made on a month-to-month



basis and LSEs do not receive credit for this capacity purchased by the CAISO toward their RA obligations.

3. Market Purchases

PG&E enters into market purchases through several different mechanisms:

- Transparent exchanges, such as the ICE and NYMEX
- Futures Commission Merchants
- Voice brokers
- Day-Ahead, Real-Time and spot markets
- Electronic Solicitations

Each of these markets has methods to communicate bids and offers and to complete trades. PG&E makes use of these market purchases to trade hour-ahead, day-ahead, month-ahead and term (one month to five years) electricity, and to enter into options and hedges. Market purchases are commonly used to procure power from existing resources.

4. Qualifying Facilities and Combined Heat and Power

On December 16, 2010, the Commission approved the QF/CHP Settlement in D.10-12-035. Consistent with the terms of the QF/CHP Settlement, PG&E, Southern California Edison Company and San Diego Gas & Electric Company have filed an application at FERC to terminate their respective obligations under the Public Utility Regulatory Policy Act ("PURPA") for QF projects that are larger than 20 MW.

The QF/CHP Settlement became effective on November 23, 2011. Since the QF/CHP Settlement became effective, PG&E issued new standard offer contracts and



conducted its first RFO for additional CHP generation, in addition to amending certain existing QF PPAs. New contracts included as a part of the QF/CHP Settlement include the Transition PPA (for QFs that will expire prior to July 1, 2015), an As-Available PPA, and a QF PPA for facilities under 20 MW. The QF/CHP Settlement also included a Form PPA to be used in CHP RFOs.

In addition to procurement under the QF/CHP Settlement, PG&E is also required to offer three standard offer contracts as a result of Commission decisions issued in R.08-06-024, which implements AB 1613. These contracts are for new, eligible CHP units under 20 MW and are separate agreements from those established as a part of the QF/CHP Settlement. Two of these contracts—one for units with a capacity under 20 MW and one for units which export no more than 5 MW—have been approved and a simplified contract for units with a capacity under 500 kW has been submitted to the Commission for approval.

5. Non-Renewable Generation and Resource Adequacy Capacity

PG&E conducts RFOs to procure energy, capacity, A/S and RA capacity from conventional resources in the long-, medium- and short-term period. These RFOs can be for either new or existing generation resources. While these resources are predominately procured through RFOs, PG&E may also procure these resources using bilateral negotiations and other approved procurement mechanisms. Since 2006, PG&E has conducted one LTRFO and has executed long-term contracts for over 2,000 MW of new conventional resource capacity. PG&E has also conducted two intermediate-term RFOs



and many short-term RFOs and executed many contracts for conventional resources in these time frames.

6. Utility-Owned Generation

As of this filing, PG&E owned and operated the following generation facilities:

TABLE IV-2
PACIFIC GAS AND ELECTRIC COMPANY
PG&E'S UTILITY-OWNED GENERATION

Generation Type	Number of Units	Net Operating Capacity (MW)
<u>Nuclear</u>		
Diablo Canyon	2	2,240
<u>Hydroelectric</u>		
Conventional	107	2,684
Helms Pumped Storage	3	1,212
Hydroelectric Subtotal	110	3,896
<u>Fossil Fuel</u>		
Gateway Generating Station	1	530
Humboldt Bay Generating Station	1	163
Colusa Generating Station	1	657
Fossil Fuel Subtotal	3	1,350
Total	115	7,486

In addition, PG&E has entered into a Purchase and Sale Agreement for the Oakley Project.

7. Irrigation District and Water Agency

PG&E currently purchases approximately 700 MW of hydroelectric generation through long-term Power Sales Agreements with various IDs and Water Agencies.

Originating in the 1960s, the majority of these contracts will expire in 2016. However,



PG&E expects that the underlying resources will still be in operation and will be eligible to bid into PG&E's competitive solicitations.

8. Imported Generation

The PG&E electric system is within the CAISO control area and it is electrically integrated with the western states included in the WECC electric grid. Electric power can be imported into the CAISO control area along transmission lines as far north as Canada and as far south as the Mexico/Desert Southwest regions. In PG&E's electric portfolio, imported generation consists of market purchases, existing contracts and future contracts as described below. Historically, PG&E has obtained most of its imported power from the Pacific Northwest.

Market purchases occur when the net open position is short and when it is economic (including transmission costs and constraints), compared to other alternatives, to purchase power outside the CAISO control area and import the power to meet demand. When the net open position is long, PG&E may sell and export the power when economic.

Currently, in PG&E's electric portfolio there are two conventional contracts for generation located in the Northwest and a number of contracts for renewable generation located both in the Northwest and Southwest. The Puget Sound Energy ("PSE") Exchange contract and CDWR Iberdrola contract import from the Northwest. PSE is an exchange of 413 GWh on a calendar year energy basis between PSE and PG&E. PG&E can take up to 300 MW hourly between June-September and in return PSE can take up 300 MW on an hourly basis between January-February and November-December. This



contract is an ever-green contract with a 5-year termination notice. The CDWR Iberdrola contract has a dispatchable contract capacity of 300 MW. This contract expired in June 2011.

PG&E manages the risk of transmission congestion on the various import paths by procuring CRRs according to its CRR procurement strategy discussed in Appendix F. PG&E also considers the need, availability and economics of procuring firm transmission to support the deliver of import power to its interconnection point with the CAISO.

PG&E's imported generation will change with the CDWR Iberdrola contract expired in 2011 and as more renewable contracts outside of the CAISO area are added to PG&E's electric portfolio. In its future contracting for imported power, PG&E will consider the "preferred loading order" and the GHG effects in evaluating the use of imported resources.

G. Fuel, Congestion Revenue Rights and Hedging Procurement Strategies

In addition to PG&E's Resource Procurement Strategy described above, PG&E's BPP also includes the following procurement strategies:

- Electric Portfolio Hedging Plan (Appendix B)
- Nuclear Fuel Procurement Plan (Appendix C)
- Electric Portfolio Gas Supply Plan (Appendix D)
- Congestion Revenue Rights (Appendix F)
- Convergence Bidding (Appendix G)

The duration, timing, quantity, and implementation of each of these elements of PG&E's BPP are described in detail in the respective appendices identified above.



V. Evaluation of Commission-mandated Case

As required by the Track II Scoping Memo, PG&E prepared and evaluated the Commission-mandated case based on the Standardized Assumptions and further modifications from D.12-01-033. PG&E neither explicitly nor implicitly adopts these assumptions as its own and is submitting the Commission-mandated case, and its evaluation of this case, as required by the Track II Scoping Memo and further modifications from D.12-01-033. This section summarizes PG&E's evaluation of the Commission-mandated case in terms of cost, risk, and GHG emissions and is included primarily for illustrative purposes.

A. Cost Evaluation

The revenue requirement and rate projections are presented in Table V-1 below, which also presents the Present Value of Revenue Requirement ("PVRR"). The revenue requirements are discounted at the Weighted Average Cost of Capital ("WACC") rate for this calculation. The average rate is calculated as prescribed by the Standardized Assumptions, and is the division of PVRR with the discounted bundled sales also using the WACC rate. This calculation represents the levelized rate that is referred to as the average rate by the Commission.



TABLE V-1
PACIFIC GAS AND ELECTRIC COMPANY
BUNDLED REVENUE REQUIREMENTS AND RATES

	Forecast Period	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bundled Revenue Requirement (\$ Million)	\$103,373(a)	\$11,579	\$12,191	\$12,867	\$13,567	\$14,275	\$14,998	\$15,640	\$15,919	\$16,365	\$16,805
Bundled Rate (¢/kWh)	18.2(b)	15.1	15.7	16.5	17.6	18.5	19.4	20.3	20.7	21.2	21.7

(a) Net Present Value ("NPV") Revenue Requirement (\$ Million) 2011.

(b) Levelized Rate (¢/kWh).

B. Risk Evaluation

As prescribed by the Standardized Assumptions, PG&E is providing risk metrics that include TeVaR calculations in Appendix E together with sensitivity analysis results as shown below.

The sensitivity analyses presented in Tables V-2 and V-3 are as prescribed by the Standardized Assumptions. Table V-2 presents the impact of drivers on revenue requirements and Table V-3 shows the impacts of the same on bundled rates.



TABLE V-2
PACIFIC GAS AND ELECTRIC COMPANY
REVENUE REQUIREMENTS: SENSITIVITY

		Bundled Revenue Requirement (\$ Million)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	\$103,373	\$11,579	\$12,191	\$12,867	\$13,567	\$14,275	\$14,998	\$15,640	\$15,919	\$16,365	\$16,805
High Load	\$107,132	\$11,579	\$12,652	\$13,355	\$14,117	\$14,853	\$15,587	\$16,249	\$16,559	\$17,033	\$17,738
Low Load	\$99,541	\$11,579	\$11,745	\$12,390	\$12,998	\$13,669	\$14,359	\$14,977	\$15,232	\$15,646	\$16,003
High CO ₂ Prices	\$103,221	\$11,579	\$12,181	\$12,847	\$13,536	\$14,249	\$14,972	\$15,619	\$15,898	\$16,348	\$16,752
Low CO ₂ Prices	\$103,550	\$11,579	\$12,190	\$12,876	\$13,578	\$14,303	\$15,035	\$15,682	\$15,964	\$16,412	\$16,874
High Gas Prices	\$110,481	\$11,579	\$12,938	\$13,955	\$14,923	\$15,643	\$16,229	\$16,775	\$17,033	\$17,437	\$17,802
Low Gas Prices	\$94,950	\$11,579	\$11,294	\$11,675	\$12,263	\$12,975	\$13,679	\$14,257	\$14,373	\$14,678	\$15,120

(a) NPV Revenue Requirement (\$ Million 2011).



TABLE V-3
PACIFIC GAS AND ELECTRIC COMPANY
BUNDLED RATES: SENSITIVITY

		Bundled Rate (¢/kWh)									
	Forecast Period(a)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Case	18.2	15.1	15.7	16.5	17.6	18.5	19.4	20.3	20.7	21.2	21.7
High Load	17.4	15.1	14.8	15.6	16.7	17.5	18.4	19.1	19.5	20.1	20.8
Low Load	19.2	15.1	16.8	17.7	18.7	19.7	20.7	21.6	22.0	22.5	23.0
High CO ₂ Prices	18.2	15.1	15.7	16.5	17.6	18.5	19.4	20.2	20.6	21.2	21.6
Low CO ₂ Prices	18.2	15.1	15.7	16.6	17.6	18.5	19.5	20.3	20.7	21.3	21.8
High Gas Prices	19.4	15.1	16.6	17.9	19.4	20.3	21.0	21.7	22.1	22.6	23.0
Low Gas Prices	16.7	15.1	14.5	15.0	15.9	16.8	17.7	18.5	18.6	19.0	19.5
(a) Levelized Rate (¢/kWh).											

C. Greenhouse Gas Emissions Evaluation

Table V-4 presents emission forecasts for the Commission-mandated case. PG&E reports both physical emissions (metric tons per year) and financial exposure (also expressed in metric tons per year).

TABLE V-4
PACIFIC GAS AND ELECTRIC COMPANY
GHG EMISSIONS

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Financial (MMT CO ₂ e)	14.1	15.7	15.8	13.9	15	14.7	14.9	14.8	15.2	14.8
Physical (MMT CO ₂ e)	15.2	16.4	16.5	14.6	13.7	13.8	14.0	14.7	15.2	15.0



VI. Commission Review of Implementation of Procurement Plan

A. Compliance With AB 57

AB 57 includes detailed requirements for an IOU's procurement plan. PG&E's BPP fully complies with these requirements, as the table below demonstrates:

**TABLE VI-1
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH AB 57**

PUC Section 454.5(b) Requirements	Citation To PG&E's BPP
1. An assessment of price risk associated with PG&E's portfolio.	Sections II.B, V.B, and Appendix E
2. Definition of electricity products, electricity-related products and procurement-related financial products, including justification and the amount to be procured.	Section II.A.2 –A.5
3. The plan duration.	Section I
4. The duration, timing and range of quantities of each product to be procured.	Sections II.A.5 and IV, and Appendix A
5. A description of PG&E's competitive procurement process.	Sections II.A.4-II.A.5, and IV, and Appendix I
6. Any proposed incentive mechanism.	Not applicable
7. The upfront standards and criteria for the acceptability and eligibility for rate recovery, and any expedited approval process.	Sections II.A, II.B, IV, VI, and Appendices B, C, D, F, G, H and L
8. Procedures for updating the plan.	Sections I and VI.E
9. A showing that the plan achieves: (a) the 20% RPS standard and 1% incremental RPS procurement standard; (b) a diversified portfolio; and (c) meeting resource needs through energy efficiency and demand reduction when it is cost effective, reliable and feasible.	Sections III, IV, V and Appendix A
10. PG&E's risk management policies.	Section II.B and Appendices B, E, F and G



**TABLE VI-1
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH AB 57
(CONTINUED)**

11. A diversity of ownership and fuel supply.	Section III and Appendices A, C and D
12. A mechanism for recovery of reasonable administrative costs related to procurement in the generation component of rates.	Section VI

B. Compliance With the Commission's Procurement Standards of Conduct

In D.02-10-062, the Commission adopted seven Standards of Conduct for utility procurement.²² These standards have subsequently been modified, and two of them have been eliminated.²³ PG&E's BPP is in full compliance with Commission's Standards of Conduct. The following table includes each standards of conduct, a summary of PG&E's compliance with the standard and the portion of the BPP that addresses PG&E's compliance.

²² D.02-10-062 at pp. 51-52.

²³ See D.02-12-074, OP 24 (modifying standards); D.03-06-067, OP 3 (modifying standards and eliminating Standard Nos. 6-7); and D.03-06-076, OP 6 (clarifying that "Standard of Conduct 1 does not preclude anonymous transactions conducted through the ISO or through brokers and exchanges."). PG&E also received a waiver from Standard of Conduct 1 for certain gas transportation transactions in D.04-06-003.



TABLE VI-2
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH THE COMMISSION'S PROCUREMENT STANDARDS OF CONDUCT

Standard of Conduct	Summary of Compliance And Citation To PG&E's BPP
1. Each utility must conduct all procurement through a competitive process with only arms-length transactions. Transactions involving any self-dealing to the benefit of the utility or an affiliate, directly or indirectly, including transactions involving an unaffiliated third party, are prohibited.	PG&E's procurement practices and competitive, arms-length solicitations are described in Sections II.A.4 and Appendix I. To the extent PG&E conducts any affiliate transactions, these transactions will be conducted in full compliance with the Commission's affiliate and procurement rules.
2. Each utility must adopt, actively monitor, and enforce compliance with a comprehensive code of conduct for all employees engaged in the procurement process that: (1) identifies trade secrets and other confidential information; (2) specifies procedures for ensuring that such information retains its trade secret and/or confidential status [e.g., limiting access to such information to individuals with a need to know, limiting locations at which such information may be accessed, etc.]; (3) discusses employee actions that may inadvertently waive or jeopardize trade secret and other privileges; (4) discusses employee or former employee activities that may involve misappropriation of trade secrets or other confidential information, unlawful solicitation of former clients or customers of the utility, or otherwise constitute unlawful conduct; and (5) requires or encourages negotiation of covenants not to compete to the extent such covenants are lawful under the circumstances [e.g., where a business acquires business interests of individuals who subsequently work for the acquiring business, the individuals disposing of their business interests may enter covenants not to compete with their new employer]. All employees with knowledge of its procurement strategies should be required to sign and abide by an agreement to comply with the comprehensive code of conduct and to refrain from disclosing, misappropriating, or utilizing the utility's trade secrets and other confidential information during or subsequent to their employment by the utility.	PG&E's compliance practices are described in Section II.A.1.f.



TABLE VI-2
PACIFIC GAS AND ELECTRIC COMPANY
COMPLIANCE WITH THE COMMISSION'S PROCUREMENT STANDARDS OF CONDUCT
(CONTINUED)

Standard of Conduct	Summary of Compliance And Citation To PG&E's BPP
3. In filing transactions for approval, the utilities shall make no misrepresentation or omission of material facts of which they are, or should be aware.	PG&E has filed procurement information in a number of different reports, which are described in more detail in Section VI.C, below. PG&E has not misrepresented any information, or made any omission of material fact in any of these reports.
4. The utilities shall prudently administer all contracts and generation resources and dispatch the energy in a least-cost manner. Our definitions of prudent contract administration and LCD is the same as our existing standard. Prudent contract administration includes administration of all contracts within the terms and conditions of those contracts, to include dispatching dispatchable contracts when it is most economical to do so. In administering contracts, the utilities have the responsibility to dispose of economic long power and to purchase economic short power in a manner that minimizes ratepayer costs. LCD refers to a situation in which the most cost-effective mix of total resources is used, thereby minimizing the cost of delivering electric services. The utility bears the burden of proving compliance with the standard set forth in its plan.	PG&E's department responsible for contract administration is described in Section II.A.1.d. Filings that address in more detail contract administration are described in Section VI.C. PG&E's dispatch of procurement contracts is described in Section II.A.2.c.
5. The utilities shall not engage in fraud, abuse, negligence, or gross incompetence in negotiating procurement transactions or administering contracts and generation resources.	PG&E procurement practices have been fair, open and transparent. PG&E has used an independent evaluator for long-term transactions and discussed short-, medium- and long-term transactions with the PRG. PG&E's procurement practices are described in detail in Sections II.A and Appendix I. The PRG and use of IEs are described in Sections II.A.9 – A.10. PG&E has also appropriately administered its procurement contracts. PG&E's ongoing administration is reviewed through the ERRA process and quarterly audits described in Section VI.C.



C. Description of PG&E Filings Made to Demonstrate Compliance

PG&E submits monthly, quarterly, and annual filings to demonstrate compliance with its approved procurement plan and Commission policy. These filings are described below.

1. Monthly Reports

a. Portfolio Risk Reduction Report

PG&E reports TeVaR on a monthly basis to both the ED and Division of Ratepayer of Advocates. TeVaR is reported on both a 95% and 99% Confidence Interval for the following periods:

- Monthly for the rolling 12 month period (e.g., October 2006 to October 2007);
- Quarterly for the balance of the current calendar year (e.g., 2006);
- Quarterly for the next three calendar years (e.g., 2007, 2008 and 2009); and
- Yearly for the last calendar year of reporting (e.g., 2010).

2. Monthly ERRA Report

In D.02-12-074, the Commission directed the IOUs to file with the “Energy Division each month a report showing the activity in the ERRA balancing account with copies of original source document supporting each entry over \$100.00 recorded in the account” no later than the 20th following the end of the month and be served on interested parties in the proceeding.²⁴ The stated intention of this report was to give the Commission an opportunity to anticipate when an IOU might file an expedited trigger application and to reduce the time to review such an application. D.07-04-020 directed

²⁴ D.02-12-074 at p. 43.



the IOUs to continue to file a monthly ERRA report, but reduced the amount of supporting documentation.

3. Standing Data Requests From Energy Division

PG&E responds on a monthly basis to the ED data request for electric generation procurement information. The requested procurement information relates to weekly and monthly weighted average cost of electric procurement, monthly energy and maximum capacity load forecasts for a rolling 12-month period, monthly residual net short forecast for a rolling 12-month period, and monthly electricity and gas price forecasts used to derive the residual net short forecast.

4. Quarterly Filings

D.02-10-062 ordered each IOU to file the Quarterly Procurement Compliance Reports (“QCR”). The purpose of this report is to describe all electric generation procurement transactions executed in a given quarter that are not more than five years in duration, not filed through a separate advice filing or application, and within the procurement authority authorized by the Commission in D.02-10-062, D.03-12-062, D.04-01-050, D.04-07-028, D.04-12-048, D.07-12-052 and D.12-01-033. The QCRs are filed within 30 days of the end of the quarter, as specified in D.03-12-062.

As stated in D.07-12-052, QCRs are to be reviewed by the Commission within sixty (60) days. If the Commission receives no protests and the ED staff concludes that the transactions included in this report are in compliance with the IOU’s approved procurement plan, the ED Director can approve the reports. If a protest is filed, a resolution may be drafted for Commission’s final approval. The QCRs include: executed



electric and fuels transactions less than five years in delivery length, strategies implemented in a given quarter, retained investments completed in the quarter, models, transactions and documentation which qualifies under the definition of reasonable showing, briefing to the senior management, related PRG materials, and counterparty information. The purpose is for each IOU to demonstrate compliance with its Commission-approved procurement plan.

Though the CPUC Water Utilities and Water Audit Division reviews the report, the IOUs and the ED may agree upon defining the content of the report and the type of additional information required either in the QCR or through the CPUC Water Utilities and Audit Division for its review. The IOUs have the opportunity to respond to any finding before the report to the ED on the QCR is made final and before the final approval of the filing is made. Consistent with D.12-04-046, ED Staff's audits of QCRs shall be made public. A link to any PG&E's response or rebuttal on PG&E's website shall be posted on the Commission website with the audit report.

5. Semi/Annual Filings

a. ERRA Forecast and Compliance Review Filings

PG&E files two annual filings related to ERRA: an ERRA forecast revenue requirement application and an ERRA compliance review application. In D.02-10-062, the Commission established the ERRA balancing account for all three IOUs and established a semiannual update process whereby the IOUs would once a year: (1) "file applications proposing to establish annual fuel and purchased power forecasts and true up 2002 fuel and purchased costs" (i.e., ERRA Forecast Revenue Requirement proceeding);



and (2) undergo a “review of balancing accounts, contract administration, utility retained generation expenses and least-cost dispatch” (i.e., ERRA Compliance Review proceeding).²⁵ In D.02-12-074, the Commission directed PG&E to file its forecast application on February 1 and the balancing account review application on August 1, 2003.²⁶ In D.04-01-050, the Commission adopted revised schedules for the 2004 and 2005 semi-annual ERRA filings with PG&E’s ERRA compliance review application to be filed on February 15 and the ERRA forecast application to be filed on June 1.

b. ERRA Trigger

In AB 57, the California state legislature established a trigger mechanism that would ensure that any overcollection or undercollection in the appropriate electric procurement balancing account does not exceed 5% of a utility’s recorded generation revenues, excluding CDWR revenues, for the prior year.²⁷ This trigger mechanism provides the necessary assurance to PG&E that its electric procurement costs will be recovered in a timely fashion.

In D.02-10-062, the Commission adopted the AB 57 balancing account trigger mechanism for the IOUs. In that decision, the Commission directed the utilities to file an expedited “trigger” application for approval within 60 days of filing when the ERRA balance reaches or exceeds 4% of the prior year recorded generation revenues excluding CDWR revenues. This application is to include a projected account balance in 60 days or more to illustrate when the balance will reach the 5% threshold. The application is also to

²⁵ D.02-10-062 at p. 62.

²⁶ D.02-12-074 at p. 42.

²⁷ Pub. Util. Code § 454.5(d)(3).



adopt an amortization period of not less than 90 days to ensure timely recovery of the projected ERRA balance.²⁸ In D.04-01-050, the Commission adopted April 1 as the date when all three California utilities are to file their annual ERRA trigger advice letter, which sets the trigger amount for the following 12 months.

c. Biennial Filings

D.05-01-040 adopted the long-term procurement regulatory framework and established that the IOUs shall file long-term plans on a biennial cycle that follows the CEC's adoption of a final IEPR. D.04-12-048, which approved PG&E's 2004 LTPP, established that starting with the 2006 LTPP proceeding, the Short-Term Plans will be eliminated and the IOUs will act in accordance with a single Commission-approved plan. The decision also determined that any updates or modifications to the plans in between the biennial review will be filed with an advice letter.

d. Additional Monthly, Quarterly, Annual Filings and Data Requests

The Commission requires RA reporting on a monthly and yearly basis. RA compliance submissions are made directly to the Commission through the advice filing process. In addition, forecasting related data is submitted to the CEC on a monthly as well as a yearly basis. The CEC submissions are not made through advice filings.

PG&E also files the following reports on a monthly, quarterly, and annual basis:

- RPS Compliance Report – This report identifies all of PG&E's transactions related to RPS compliance. This includes transactions approved and pending. The RPS Compliance Report is submitted twice a year on March 1 and August 1.

²⁸ D.02-10-062 at pp. 63-65, Conclusions of Law 15, and OP 14.



- Convergence Bidding Monthly Compliance Report – This report describes convergence bidding activities for the preceding month. The required elements for this report are identified in D.10-12-034. After the first year of convergence bidding, the IOUs are only required to submit quarterly reports.
- Resource Adequacy Annual Report – This report identifies the RA requirements for PG&E that demonstrates compliance with the Year-Ahead System RA and Local RA obligations. This report is submitted annually in the fall and follows the guidance from the Commission Staff’s annual filing guide.
- Resource Adequacy Monthly Compliance Report – This report provides a monthly forecast and demonstrates that PG&E has acquired sufficient resources to satisfy its commitment obligation for loads plus the reserve requirements. This report is submitted at the end of each month pursuant to D.05-10-042, D.06-06-064, D.08-06-031, D.09-06-028, D.10-06-036 and D.11-06-022.
- Resource Adequacy Month-Ahead Load Migration Report – This report provides load forecast adjustments to reflect anticipated load migrations. This report is submitted at the end of each month pursuant to D.05-10-042.
- Qualifying Facilities – Semi Annual Report – This report provides a list of all cogenerators, currently operational and delivering energy, as well as information related to the primary energy source, location of the generator, nameplate capacity identified in the contract, and operational start date. This report is in compliance with D.97-05-021 (as modified by Resolution E-1738), D.82-01-103, D.82-12-120, D.90-03-060, D.91-10-039, D.93-04-001, and D.96-12-028. This report is submitted annually and in subsequent quarters only if there is new information to report.
- Semi-Annual CHP Program Report – This report provides progress toward both MW targets and GHG emission reduction targets pursuant to the QF/CHP Settlement adopted in D.10-12-035. This semi-annual report is submitted twice a year in March and September.

D. Description of Costs Recovered Through ERRA

PG&E’s ERRA is to record and recover power costs, excluding CDWR contract costs, associated with PG&E’s authorized procurement plan, pursuant to D.02-10-062, D.02-12-074 and California Public Utilities Code § 454.5(d)(3), and any succeeding



decision, which approves PG&E's procurement activities. Power costs recorded in ERRRA include, but are not limited to, utility retained generation fuels, QF contracts, inter-utility contracts, CAISO charges, irrigation district contracts and other PPAs, revenues or costs related to CRRs, convergence bidding, IE costs related to authorized procurement transactions, the technical assistance costs incurred by the Commission and paid by PG&E in connection with the Commission's implementation and administration of the LTPP process, fees associated with participating in the Western Renewable Energy Generation Information System, all expenditures related to PG&E's wave energy project ("WaveConnect"), bilateral contracts, forward hedges, bilateral demand response agreements, pre-payments and collateral requirements associated with procurement (including disposition of surplus power), costs associated with GHG products, and A/S. These costs are offset by RMR revenues, PG&E's allocation of surplus sales revenues and the ERRRA revenue. Revenues received from Electric Schedule Transitioning Bundled Commodity Cost will also be recorded to the ERRRA. All specific and associated costs, expenses, and revenues will be identified in Electric Preliminary Statement CP – Energy Resource Recovery Account.

E. Pre-Approval, Approval and Filing Requirements

As explained in Section II.A.2.b, PG&E may execute contracts that are consistent with the BPP with a contract duration of less than five years without Commission pre-approval. The contract duration or term begins: (1) at the time the contracted resource begins delivery if delivery begins within one year of contract execution; or (2) at the time of contract execution if delivery does not begin within one year of contract



execution. The length of the contract duration includes any extension options provided for in the contract.

For contracts with a duration of five years or greater, PG&E will file an application for pre-approval of the contract. The only exceptions to this requirement are for: (1) RPS contracts which are filed by advice letter pursuant to D.04-07-029; (2) LT-CRRs as described in Appendix F; (3) nuclear fuel contracts pursuant to the Nuclear Fuel Procurement Plan (Appendix C); and (4) gas supply, storage and transportation contracts pursuant to the Electric Portfolio Natural Gas Supply Plan (Appendix D). In addition, the Commission may issue decisions providing that specific types of contracts or transactions that are five years or greater in duration do not require an application for pre-approval.

With regard to filing, the Commission has adopted the following requirements:

Type of Transaction	Filing Requirements
Non-RPS Transactions with a contract duration less than five years	Annual ERRA Compliance Report
Non-RPS Transactions with a contract duration five years or greater	Application
RPS-eligible Energy Transactions (including amendments to approved RPS-eligible PPAs)	Advice Letter
Gas Supply, Pipeline Capacity, and Storage Transactions pursuant to the GSP	Less than five years in contract duration – Quarterly Compliance Report Five years or longer in contract duration – Advice Letter
Amendments to existing QF contracts	Less than five years in contract duration – Annual ERRA Compliance Report or Advice Letter Five years or longer in contract duration – Application



Type of Transaction	Filing Requirements
Nuclear Fuel Contracts pursuant to the Nuclear Fuel Procurement Plan	Annual ERRA Compliance Report
LT-CRRs and CRR	Annual ERRA Compliance Report
Non-RPS-eligible UOG	Tier 3 Advice Letter filing demonstrating RFO failure. After the Commission issues a resolution determining that an RFO has failed, PG&E may file an application for a proposed new Non-RPS eligible UOG resource.
RPS-eligible UOG	Application
Contracts with OTC resources	Contracts that are two years or less in duration and terminated more than a year before the SWRCB compliance deadline in the Quarterly Compliance Report. Contracts that are more than two years but less than five years in duration or terminate a year or less before the SWRCB compliance deadline in a Tier 3 advice letter. Contracts that are five years or more in duration by Application. Contracts with duration beyond the SWRCB compliance deadline either by advice letter (for contracts that are less than five years in duration) or application (for contracts that are five years or more in duration).
GHG Products	Transactions for GHG Products with vintage years four years or less into the future, Quarterly Compliance Report and the annual ERRA Compliance proceeding. Transactions for GHG Products with vintage years more than four years into the future, Tier 3 Advice Letter.



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. 103
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX A
CAPACITY AND ENERGY TABLES
AND PROCUREMENT LIMITS

REDACTED VERSION



TABLE PGE-1
PACIFIC GAS AND ELECTRIC COMPANY
CAPACITY BALANCE

		MW									
Line	Peak PG&E Load Calculations	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Forecast Total Peak-Hour 1-in-2 Demand	20,386	20,737	21,090	21,367	21,648	21,937	22,219	22,489	22,758	23,062
2	CCA	0	0	0	0	0	0	0	0	0	0
3	Uncommitted Energy Efficiency (-)	-98	-129	-389	-619	-872	-1,180	-1,510	-1,856	-2,183	-2,496
4	Demand Response/Interruptible Programs (-)	-1,148	-1,413	-1,445	-1,488	-1,539	-1,588	-1,636	-1,681	-1,724	-1,769
5	Self Generation (non CSI)	-40	-80	-120	-161	-201	-241	-281	-321	-361	-401
6	California Solar Initiative (-)	-193	-227	-261	-296	-330	-365	-368	-372	-375	-379
7	Direct Access & CCA Loads (-/+)	-924	-1,409	-1,466	-1,598	-1,598	-1,582	-1,582	-1,582	-1,590	-1,598
8	Subtotal: Adjustments Peak-Hour Demand (Lines 2 thru 7)	-2,403	-3,258	-3,682	-4,162	-4,540	-4,955	-5,377	-5,811	-6,234	-6,643
9	Adjusted Peak-Hour Demand for End-Use Customers Line 1+ Line 8)	17,983	17,479	17,409	17,206	17,108	16,981	16,843	16,678	16,524	16,419
10	Coincidence Adjustment (-)	-573	-549	-549	-544	-546	-548	-549	-550	-552	-554
11	Net Peak-Hour Demand (Sum Line 9+ Line 10)	17,410	16,930	16,859	16,661	16,563	16,434	16,293	16,127	15,972	15,865
12	Specified Planning Reserve Margin (Line 11*15%)	2,612	2,539	2,529	2,499	2,484	2,465	2,444	2,419	2,396	2,380
13	Firm Sales Obligation (+)										
14	Firm PG&E Peak-Hour Requirement (Sum Lines 11 thru 13)	20,022	19,469	19,388	19,160	19,047	18,899	18,737	18,547	18,368	18,245
	Existing and Planned Resources:										
15	PG&E-Owned Fossil Resources	1,384	1,384	1,384	1,384	1,384	1,970	1,970	1,970	1,970	1,970
16	PG&E-Owned Nuclear Resources	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240
17	PG&E-Owned Hydroelectric Resources (1 in 5)	3,579	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582	3,582
18	PG&E-Owned Solar Resources	147	292	292	292	292	292	292	292	292	292
19	DWR Contractual Resources	868	96	96	96	96	0	0	0	0	0
20	Qualifying Facility (QF) Contractual Resources										
21	Renewable Energy Contractual Resources	1,116	1,008	1,518	2,668	3,394	3,393	3,691	3,516	3,495	3,553
22	Other Bilateral Resources	9,189	8,521	8,996	4,091	4,100	3,899	3,878	3,919	3,778	3,607
23	Total Existing and Planned Resources (Sum lines 15 thru 22)										
24	(Resource Need) or Surplus (Line 23- Line 14)										



TABLE PG&E-2
PACIFIC GAS AND ELECTRIC COMPANY
ENERGY BALANCE

Line	PG&E Load Calculations	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Forecast Total energy Demand/Consumption	95,917	97,393	99,076	100,332	101,577	102,862	104,099	105,273	106,446	107,681
2	CCA	(211)	(303)	(303)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)	(1,160)
3	Uncommitted Energy Efficiency (-)	(536)	(698)	(1,590)	(2,254)	(2,865)	(3,650)	(4,569)	(5,478)	(6,215)	(6,816)
4	Demand Response/Interruptible Programs (+)	9	12	15	16	16	16	16	16	16	16
5	Self Generation (non CSI)	(324)	(649)	(973)	(1,297)	(1,621)	(1,946)	(2,270)	(2,594)	(2,918)	(3,243)
6	California Solar Initiative (-)	(914)	(1,075)	(1,238)	(1,401)	(1,564)	(1,727)	(1,744)	(1,760)	(1,777)	(1,794)
7	Direct Access Loads (+/-)	(9,121)	(9,970)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)	(10,339)
8	Subtotal: Adjustments to Energy Demand (Lines 2 thru 7)	(11,097)	(12,683)	(14,428)	(16,435)	(17,533)	(18,806)	(20,065)	(21,315)	(22,393)	(23,335)
9	Adjusted Energy Demand/Consumption Line 1+ Line 8	84,820	84,711	84,648	83,896	84,044	84,057	84,034	83,958	84,053	84,346
10	Firm Sales Obligation (+)	413	413	413	413	413	413	413	413	413	413
11	Firm PG&E Energy Requirement (Sum Line 9 + Line 10)	85,233	85,124	85,061	84,309	84,457	84,470	84,447	84,371	84,466	84,759
	Existing and Planned Resources:										
12	PG&E-Owned Fossil Resources										
13	PG&E-Owned Nuclear Resources										
14	PG&E-Owned Hydroelectric Resources (1 in 2)	13,230	11,850	11,323	11,186	11,105	11,073	11,101	11,041	11,038	10,876
15	PG&E-Owned Renewable Resources	39	144	247	350	451	517	512	508	503	503
16	DWR Contractual Resources	3,279	1,403	176	188	145	0	0	0	0	0
17	Qualifying Facility (QF) Contractual Resources										
18	Renewable Energy Contractual Resources	9,564	9,581	12,150	16,952	18,386	18,543	18,516	18,476	18,434	18,347
19	Other Bilateral Resources	13,106	12,500	13,852	9,699	9,764	10,382	9,819	10,132	10,668	10,655
20	Spot Market Purchases				12,297	11,103	8,440	8,234	8,842	9,311	9,068
21	Spot Market Sales (-)				(2,673)	(3,464)	(5,593)	(6,046)	(5,433)	(5,301)	(5,449)
22	Total Existing and Planned Resources (Sum lines 12 thru 21)	85,233	85,124	85,061	84,309	84,457	84,470	84,447	84,371	84,466	84,162
23	[Energy Need] or Surplus (Line 22 - Line 11)	0	0	0	0	0	0	0	0	0	(597)
	Generic Energy Resource Needs:										
24	Renewable Energy	0	0	0	0	0	0	0	0	0	597
25	Non-Renewable Baseload Energy	0	0	0	0	0	0	0	0	0	0
26	Non-Renewable Peaking Energy	0	0	0	0	0	0	0	0	0	0
27	Total Generic Energy Resource Needs	0	0	0	0	0	0	0	0	0	597



TABLE PGE-3
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRICAL CAPACITY PROCUREMENT LIMIT AND 1 X RATABLE RATE (RR) IN MEGAWATTS (MW)

Delivery Year	Capacity Procurement Limit (MW)	1 x RR in 2012	1 x RR in 2013	1 x RR in 2014	1 x RR in 2015
2014			n/a	n/a	n/a
2015				n/a	n/a
2016					n/a
2017					
2018					
2019					
2020					



TABLE PGE-4
PACIFIC GAS AND ELECTRIC COMPANY
ELECTRICAL CAPACITY IMPLIED MARKET HEAT RATE ("IMHR") MARKET CONDITION MEASURE

Measure	Value (MMBtu/MWh)
2 Standard Deviation High	

The forward power curves used to calculate the 2-standard-deviation measure span periods that predate the January 2013 start-date of California's cap-and-trade program. In contrast, the forward curve used to calculate the IMHR that is to be calculated at the time of procurement and compared to the measure extends beyond December 2012.

Because implied greenhouse gas ("GHG") cost is embedded in the post December 2012 monthly forward prices, an adjustment to the relevant monthly forward prices is necessary when calculating the IMHR at the time of procurement. In calculating IMHR, forward prices for delivery months January 2013 and after will be reduced.² For the calculation of this reduction, as a conservative choice, GHG auction reserve prices (floor prices) set by California Air Resources Board ("CARB") will be used.³ After the first GHG auction, Pacific Gas and Electric Company ("PG&E") may propose to make adjustments to the IMHR calculation using market-based forward GHG and power price curves.

² Reduction in on-peak power price for months January 2013 and after will be calculated as the multiplication of: (1) the average of the historical 12-month forward on-peak IMHR for the historical period used for the calculation of the Market Condition Measure; (2) the GHG emissions from natural gas of 0.05307 metric-tons/Millions of British Thermal Units ("MMBtu"); and (3) the GHG price for that year.

³ The auction reserve price has been set by CARB at \$10/metric ton for vintage 2013 allowances, in all auctions during 2012 and 2013. [Source: Section 95911(b)(6)(A) of final regulations <http://www.arb.ca.gov/regact/2010/capandtrade10/finalrevfro.pdf>.] For 2014, PG&E will escalate this floor price by 5 percent plus rate of inflation.



APPENDIX B
ELECTRIC PORTFOLIO HEDGING PLAN

CONFIDENTIAL

REDACTED IN ITS ENTIRETY
UNDER PROTECTIONS OF D.06-06-066
AND
CALIFORNIA PUBLIC UTILITIES CODE
SECTIONS 454.5(G) AND 583



APPENDIX C
NUCLEAR FUEL PROCUREMENT PLAN

CONFIDENTIAL

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UNDER PROTECTIONS OF D.06-06-066
AND
CALIFORNIA PUBLIC UTILITIES CODE
SECTIONS 454.5(G) AND 583



APPENDIX D
ELECTRIC PORTFOLIO GAS SUPPLY PLAN

CONFIDENTIAL

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AND
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SECTIONS 454.5(G) AND 583



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APPENDIX E
PG&E'S TEVAR METHODOLOGY

REDACTED VERSION



Fluctuations in natural gas and electric power prices, hydroelectric generation, and electric load variations result in fluctuations in the overall cost of the Pacific Gas and Electric Company (“PG&E”) electric portfolio. The To-expiration-Value-at-Risk (“TeVAr”) metric is a measure of unexpected changes in PG&E’s variable electric portfolio procurement costs, net of electric portfolio revenues from sales of cumulative long positions over some specified time period, typically twelve months. TeVaR measures how high the net portfolio cost for the projection period may become if certain market changes occur.

Revenues and costs which accrue to PG&E’s electric portfolio, and thus to PG&E customers, depend on prices for natural gas and power at specific locations. Currently, PG&E’s TeVaR model includes forward and spot natural gas daily prices, and forward and day-ahead electricity prices. Day-ahead electricity prices are based on time of use, such as super-peak hours (hour ending 13 through 20 Monday through Friday), on-peak but not super-peak hours (hour ending 7 through 22 Monday through Saturday except Super-peak hours), “Sunday and holiday” hours, off-peak hours (all other remaining hours).

The TeVaR metric is computed using a Monte Carlo simulation. In this simulation, for each Monte Carlo “trial,” daily spot prices are randomly generated for each of the specified locations and for each day of the projection period, and hydro generation and electric load are simulated at hourly level for the projection period. Daily electricity spot prices are further shaped into time-of-use prices. Forward prices for natural gas and electricity are also simulated to compute pay-off from the financial hedge



positions (swaps and options). The prices used in the simulation are consistent with current market forward prices, volatility term-structures implied by market data, and with historical correlations of market data. For each day of the projection period, the net cost at delivery is computed for every position in the portfolio. Net costs over the projection period then produce a single (aggregated) net cost for each such trial. The variation of net costs over trials produces a probability distribution of net costs. Costs are represented as negative numbers, so the 1st percentile in the distribution of net cost represents more cost to customers than the 10th percentile in the same distribution of net cost. The difference between the mean net cost and the 5th percentile of net cost is identified as TeVaR at the 95th percentile, or “TeVaR95.”

TeVaR95 represents the largest additional unexpected variable procurement cost for PG&E’s electric portfolio, with probability 0.95. There is a 0.05 probability that unexpected costs can be even greater than TeVaR95. Using TeVaR95 to measure portfolio risk enables close monitoring of potential unexpected costs to PG&E’s customers.

As discussed in Section V.B., Table E-1 is the risk metric based on the Standardized Assumptions prescribed by the California Public Utilities Commission.

TABLE E-1
PACIFIC GAS AND ELECTRIC COMPANY
TIME TO EXPIRATION VALUE AT RISK

TeVaR (\$ Million)									
2011	2012	2013	2014	2015	2016	2017	2018	2019	2020



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APPENDIX F

CONGESTION REVENUE RIGHTS

REDACTED VERSION



A. Introduction

Pacific Gas and Electric Company (“PG&E”) is authorized to procure Congestion Revenue Rights (“CRR”) under two California Public Utilities Commission (“CPUC” or “Commission”) resolutions. CRRs are financial instruments issued by the California Independent System Operator (“CAISO”). Resolution E-4135 authorized PG&E to procure CRRs in the CAISO’s monthly and annual processes. Resolution E-4122 authorized PG&E to procure Long-Term Congestion Revenue Rights (“LT-CRR”) in the CAISO’s long-term process. Both resolutions authorized PG&E to purchase and sell CRRs in the secondary markets.

The monthly and annual CRR processes consist of up to three allocation tiers and an auction. In the allocation tiers, only Load Serving Entities (“LSE”) such as PG&E can nominate CRRs that they wish to obtain at no direct cost. In the auctions, which are open to all market participants, PG&E can purchase or sell CRRs at market based prices determined through the competitive auction. The Annual CRR process releases CRRs with calendar quarter delivery periods that occur over the next year. The monthly CRR process releases CRRs with monthly delivery periods for the next month. The LT-CRR process consists of one allocation tier each year and is performed as part of the annual CRR process. In this Long Term Tier, quarterly-term CRRs previously acquired from the annual Tier 1 allocation can be nominated for conversion to LT-CRRs with same quarter deliveries for the subsequent nine years. Under the CAISO Tariff, only LSEs are eligible to participate in allocation tiers and can procure CRRs up to an amount determined by



their historical or forecasted load. LSEs and non-LSEs are eligible to participate in monthly and annual CRR auctions.

B. Congestion Revenue Rights and Long-Term Congestion Revenue Rights Procurement Objectives

As the Commission determined in Resolutions E-4135 and E-4122, PG&E uses CRRs and LT-CRRs to hedge against congestion costs (expected and anticipated). PG&E does not use CRRs and LT-CRRs for financial speculation.

C. Congestion Revenue Rights Procurement

1. Congestion Revenue Rights Source-Sink Pairs and Paths

PG&E is authorized to acquire CRRs for any path (represented by a source-sink pair) connecting existing generation sources to existing loads (retail loads, Helms pumping load and wholesale load obligations) or for any path that PG&E reasonably anticipates that it might need to flow energy in the future due to the addition of new contracts, resources or load obligations. Additionally, there may be CRRs which are positively correlated in value with CRRs for paths that have limited availability. PG&E is authorized to acquire CRRs for such positively correlated paths as well. Therefore, PG&E will obtain any CRRs that are determined to be valuable as hedges against congestion costs at the time they are offered, subject to risk assessment regarding the specific source/sink combinations as described in Section F of this appendix.

2. Procurement Review Group Consultation

PG&E will consult with its Procurement Review Group ("PRG") prior to annual nominations for allocations and auctions and include the transactions in its Quarterly Compliance Report. Due to the very tight schedule and short lead time with the



associated with the CAISO monthly CRR process, PG&E cannot provide the PRG with its nominations prior to submission or hold PRG consultations. PG&E provides the PRG participants with information regarding the CRR it is buying or selling, including but not limited to source, sink, megawatt (“MW”) quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). PG&E will notify the PRG of all CRRs awarded in the monthly process after submission. The notification will include information about every CRR awarded in the monthly allocation or auction, including the source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the CRR will hedge (or, in the case of a sale of a CRR, no longer hedge). The notification will be provided within three business days of the posting of the results of the *final* market process of a month’s CRR process (currently the auction).

D. Long-Term Congestion Revenue Rights Procurement

1. Long-Term Congestion Revenue Rights Source-Sink Pairs and Paths

PG&E is authorized to acquire LT-CRRs for any path (represented by a source-sink pair) connecting existing generation sources to existing loads (either retail loads or wholesale load obligations) or for any path that PG&E reasonably anticipates that it might need to flow energy in the future due to the addition of new contracts, resources or load obligations. Additionally, there may be LT-CRRs which are positively correlated in value with LT-CRRs for paths that have limited availability. PG&E is authorized to acquire LT-CRRs for such positively correlated paths as well. Therefore, PG&E will



obtain any LT-CRRs that are determined to be valuable as hedges against congestion costs at the time they are entered into, subject to risk assessment regarding the specific source/sink combinations as described in Section F of this appendix.

2. Procurement Review Group Consultation

PG&E will consult with its PRG prior to LT-CRR nominations and include the transactions in its Quarterly Compliance Report. For any LT-CRR transaction, PG&E must provide the PRG participants with information regarding the LT-CRR, including but not limited to source, sink, MW quantity, term, expected value, past performance (if applicable), price and a description of the underlying arrangement that the LT-CRR will hedge (or, in the case of a sale of a LT-CRR, no longer hedge).

PG&E will also report the performance of its awarded LT-CRRs to the PRG on a quarterly basis including source, sink, a description of the underlying arrangement that the LT-CRR hedges and the performance of the LT-CRRs using average congestion prices as published by CAISO.

3. Application for Long-Term Congestion Revenue Rights Not Required

PG&E is not required to file an application with the Commission for approval of the acquisition of LT-CRRs with a duration of more than five years.

E. Volume Limits

PG&E's CRR and LT-CRR procurement is subject to source-specific volume limits. That is, PG&E will limit the "net" volume¹ that it could procure at each source

¹ "Net" volume refers to the result of netting CRRs in one direction with CRRs in the counter-flow direction.



node to the maximum non-coincident capacity of the sources (existing, potential, planned, or “positively correlated”) at that node for that delivery period. There are separate source-specific volume limits for the on-peak and off-peak hours in the delivery period.

Overall or total CRR volume limits are unnecessary because PG&E is already limited by CAISO rules, and to hedging no more than its total expected or anticipated grid use.

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K. Cost Recovery

PG&E will record the revenues and costs related to LT-CRR and CRR transactions in its Energy Resource Recovery Account (“ERRA”) balancing account. LT-CRR and CRR entries will be examined in the Commission’s Quarterly Compliance Reports and annually in the Commission’s ERRA compliance review.



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APPENDIX G

CONVERGENCE BIDDING



A. Background

The California Independent System Operator's ("CAISO") Market Redesign and Technology Upgrade initiative, launched in April 2009, re-introduced a Day-Ahead Market, also known as the Integrated Forward Market and provided for Locational Marginal Pricing ("LMP"). Through its market processes, the CAISO produces LMPs for the Day-Ahead Market (i.e., one day prior to the flow of power) and the Real-Time Markets ("RTM") (i.e., up to two hours prior to the flow of power).

Convergence bidding is intended to reduce the price differences between the day-ahead and RTMs and to provide additional benefits. Convergence bids are financial transactions (i.e., virtual bids for energy that will not be consumed or produced), that can only be submitted in the Day-Ahead Market, and are recognized by system operators as not being physical. Convergence bids represent a financial commitment to sell (or buy) energy in the Day-Ahead Market at the individual pricing node location where the convergence bid is submitted. If these bids are cleared in the Day-Ahead Market, they are automatically liquidated by the CAISO with an opposite buy-back by seller or sell-back by buyer of the same quantity of energy in the 5-minute RTM for locations inside the CAISO, and in the Hour-Ahead Scheduling Process ("HASP") for Interties.

The CAISO initiated convergence bidding on February 1, 2011.

B. CPUC Authorization

On December 21, 2010, the California Public Utilities Commission ("CPUC" or "Commission") issued Decision 10-12-034 authorizing the investor owned utilities ("IOU") to participate in convergence bidding under three separate strategies. The



decision provides interim authority until a subsequent decision supersedes or modifies this authority, or a stop-loss limit¹ is reached. The decision further establishes that the IOUs are not required to use any or all of the three bidding strategies and may apply them flexibly to meet their own circumstances. Decision 10-12-034 was subsequently modified by Decision 11-06-004.

C. PG&E's Convergence Bidding Participation

Pacific Gas and Electric Company ("PG&E") may use one or more of the following convergence bidding strategies authorized by the Commission:

- **Strategy 1** – Generation performance risk and load forecast uncertainty hedging. PG&E is authorized to participate in convergence bidding to manage Real-Time price exposure resulting from unanticipated forced outages, derating of generating units, derating of transmission, or uncertain generation performance for resources scheduled by PG&E in the CAISO's Day-Ahead Market. This strategy also authorized submission of bids related to long-start generation units.²
- **Strategy 2** – Intermittent resource schedule and hedging. PG&E is authorized to submit virtual supply bids in the CAISO's Day-Ahead Market up to, but not exceeding, the amount of the Day-Ahead forecast of intermittent generation in the Day-Ahead Market, followed by buying it back through the convergence sale in the CAISO RTM.
- **Strategy 3** – Defensive bidding against market dynamics. PG&E is authorized to participate in defensive convergence bidding in the CAISO's Day-Ahead and Real-Time energy markets to mitigate real harms from market manipulation or other unintended market dynamics. Any IOU using defensive convergence bidding must report such use on a case-by-case basis with actual market and settlement data, and not just hypothetical scenarios showing how engaging in convergence bidding by the IOUs protected ratepayers. Each IOU

¹ A 365-day rolling stop net-loss limit of \$20 million for PG&E and Southern California Edison Company, and \$5 million for San Diego Gas & Electric Company, that requires suspension of convergence bidding pending IOU explanation and CPUC re-authorization.

² D.11-06-004, OP 1.



must report if and how it employed convergence bidding strategies intended to protect the IOU's ratepayers from avoidable risks at identified locations. This information will be used for future review of convergence bidding authority and not for post-hoc reasonableness reviews of utility bidding activities.

PG&E's convergence bidding under all strategies will be restricted to the nodes or locations where PG&E-owned or contracted resources or loads are physically located, at interties where utility resources or loads are located, as well as at the previously authorized nodes or locations.³

D. Utility Convergence Bidding Reporting

PG&E will provide convergence bidding reports to the CPUC's Energy Division ("ED") and periodically confer with PG&E's Procurement Review Group ("PRG").

During the first year after the initiation of convergence bidding within the CAISO, PG&E will provide ED with a monthly report⁴ on its convergence bidding activities.

The reports will include:

- 1) For that month, a list of each cleared convergence bid, containing the hour, location, volume, and justification for the transaction.
- 2) A list of the Day-Ahead and relevant HASP or Real-Time prices corresponding with each convergence bid during the month.
- 3) For each day during the month, the gains or losses, in dollars, as a result of convergence bidding.
- 4) For that month, and any past months during the calendar year in which convergence bids were transacted, a monthly total of volume, gains or losses (in dollars), the number of times (by hourly bid) each strategy was employed, and the number of bids conducted outside of PG&E's service territory.

³ *Id.*

⁴ Monthly reports will be provided within two weeks from the end of each month.



- 5) The approved convergence bidding strategies utilized during that time period.
- 6) Qualitative analysis of convergence bidding impacts upon other related products, such as Congestion Revenue Rights during the period.
- 7) A list of any PG&E affiliates who have or are registered with the CAISO to participate in convergence bidding.

After one year of CAISO convergence bidding, PG&E will replace the monthly reporting with quarterly reporting that will be included as part of the Quarterly Compliance Report filings beginning with the First Quarter 2012 filing. PG&E will also consult quarterly with the PRG to provide a review of PG&E's convergence bidding strategies, performance and market analysis.

E. Stop Net-Loss

PG&E will monitor the net profit and losses associated with submittal of convergence bids. In the event that the 365-day rolling net-loss exceeds or is expected to exceed \$20 million, PG&E will cease implementation of all convergence bidding strategies and confer with the PRG. To the extent that PG&E determines that continuation of convergence bidding is warranted, it will file a Tier 3 Advice Letter ("AL") with the Commission. The AL must contain, at a minimum: (1) an explanation for why PG&E exceeded the stop-loss limit; (2) an explanation of what actions or changes to its bidding activity PG&E will implement to ensure that future convergence bidding will not continue to lose ratepayer funds; and (3) an explanation for why PG&E's authority to engage in convergence bidding should be reinstated, in light of the specific facts of PG&E's convergence bidding history and remedial activities to protect ratepayer funds. Unless and until the Commission approves the AL with or without conditions,



PG&E shall have no authority to engage in convergence bidding regardless of how long the Commission takes to issue a ruling on the AL.

F. California Independent System Operator Notification Requirements

PG&E shall, within one (1) business day of its receipt of notice, provide written notice to the CPUC's Executive Director, the Director of Energy Division and the General Counsel of: (1) notice from the CAISO or its Department of Market Monitoring that PG&E or its scheduling coordinator is the subject of an investigation pursuant to the CAISO Tariff, including Section 37.8.4; (2) notice from the CAISO that the conduct of PG&E or its scheduling coordinator's conduct has been referred to the Federal Energy Regulatory Commission by the CAISO pursuant to the CAISO Tariff, including Section 37.8.2; or (3) notice from the CAISO that PG&E or its scheduling coordinator's convergence bidding trading has been suspended or limited by the CAISO.

G. Future Convergence Bidding Strategies

PG&E may seek authority through a Tier 3 AL filing to participate in additional convergence bidding areas and/or propose additional convergence bidding strategies.



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APPENDIX H

BROKERAGES AND EXCHANGES



Brokerages

- Tullett Liberty (acquired Natsource)
- ICAP Energy LLC (acquired APB)
- Prebon
- TFS
- Amerex (recently acquired by GFI Group, Inc.)
- Landmark
- Saddleback
- Anahau Energy LLC (a Women, Minority and Disabled Veteran Business Enterprise (“WMDVBE”))
- Evolution Markets Inc
- Bluesource Energy, LLC (WMDVBE)
- Energy Trade Management GP, LLC
- Equus Energy Group, LLC
- Spectron Energy Inc.
- Karbone Inc.
- BGC Environmental Brokerage Services, L.P.
- Edge Energy, LLC

Exchanges and Futures Commission Merchants

- Intercontinental Exchange (“ICE”) – Exchange and Cleared (Clear Europe) trades
- New York Mercantile Exchange (“NYMEX”) – Exchange and Cleared trades
- Green Exchange, LLC (GreenX) – Exchange and Cleared (CME Clearing) trades
- Natural Gas Exchange (“NGX”) – Physical and Financially Cleared Gas Products
- Barclays Capital (allows accessibility to NYMEX, NYMEX Clearing, and ICE Clear Europe)
- J.P. Morgan Securities, LLC, (allows accessibility to NYMEX, NYMEX Clearing, ICE Clear Europe, and GreenX/CME Clearing)
- Mizuho Securities, USA, (allows accessibility to NYMEX, NYMEX Clearing, ICE Clear Europe, and GreenX/CME Clearing)
- Wells Fargo Advisors, LLC., (allows accessibility to NYMEX, NYMEX Clearing, and ICE Clear Europe)
- BNP Paribas Prime Brokerage Inc. (allows accessibility to ICE Clear Europe and GreenX/CME Clearing)
- Parity Energy, Inc. – the Parity Energy Platform (online energy derivative trading)
- ICAP Energy, LLC – the ICAPture Electronic Trading Platform (online energy derivative trading)



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APPENDIX I

PRG, IE AND RFO REQUIREMENTS



A. Procurement Review Group

1. Membership

Procurement Review Group (“PRG”) membership includes both organizations and individuals. Energy Division (“ED”) employees are ex-officio participants of the PRG. All PRG members must be nominated and then evaluated for participation in the PRG by Pacific Gas and Electric Company (“PG&E”) and then PG&E may recommend the individual to ED for approval. PRG members must be non-market participants and are required to execute a non-disclosure agreement.

When procuring or potentially procuring Cost Allocation Mechanism (“CAM”) resources pursuant to California Public Utilities Commission (“CPUC” or “Commission”) Decisions (“D.”) 06-07-029 and 07-09-044 or Combined Heat and Power resources under D.10-12-035 where the costs are allocated to all benefitting customers, PG&E will utilize an advisory CAM Group consistent with the proposal as presented in D.07-12-052, Attachment D.

2. Scope of Procurement Review Group Review

Topics presented to the PRG shall include (but are not limited to):

- Transactions with delivery terms greater than three months’ in duration
- Request for Offers (“RFO”)/Request for Bids development (including protocols, bid evaluation and ranking, shortlist, and resulting executed transactions)
- Gas supply plans
- Electric supply plans
- Electric procurement portfolio position and transactions (quarterly)



- Electric portfolio hedging plan and strategy modifications
- Consumer Risk Tolerance triggers (e.g., liquidity and To-expiration Value-at-Risk (“TeVaR”) notifications for exceedance)
- Nuclear fuel plans
- California Independent System Operator related procurement (e.g., Congestion Revenue Rights, Convergence bidding)
- New technologies and products
- Procurement portfolio position and transactions (on a quarterly basis, as noted)
- Independent Evaluator (“IE”) (evaluation and re-evaluation of organization and individuals or other selection processes)
- All Renewable Portfolio Standard (“RPS”)-related transactions
- Electric-related transactions resulting from any settlements
- Greenhouse Gas (“GHG”) Product procurement consistent with the PRG consultation requirements in PG&E’s GHG Procurement Plan (Appendix L)

3. Meeting and Notification Requirements

Agendas: PG&E will provide PRG members with meeting agendas and materials at a minimum of 48 hours in advance of the PRG meeting, unless there are unusual, extenuating circumstances that PG&E communicates to PRG members in an e-mail announcing a meeting or distributing meeting materials on a tighter timeframe.

Summaries: PG&E will provide confidential meeting summaries to PRG members that include a list of attending PRG members (including the organizations represented), a summary of topics presented and discussed, and a list of information requested or offered to be supplied after the meeting (and identify the requesting party). PG&E will distribute meeting summaries on the earlier of (a) 14 days after the PRG meeting, or (b) 48 hours



before the next regularly scheduled PRG meeting. If, due to unusual circumstances, 14 days will be inadequate time to prepare a meeting summary, PG&E may distribute the summary 21 days after the PRG meeting, but may do so only if PG&E sends an email to the PRG members informing them of the delay in distribution.

Web-Based Calendar: PG&E maintains a web-based PRG calendar. PG&E will provide the following information to the public through a web-based forum: date, meeting time and duration of the meeting; the individuals participating in the meeting and organization represented by the individual; and a list of non-confidential items discussed or a summary of general topics discussed.

Notifications to the PRG: In addition to the agenda, presentations, and meeting summaries, PG&E may provide notification to the PRG in between scheduled meetings. Periodic notifications may include notification of transactions to be executed. Monthly notifications include status of monthly TeVaR. However, upon exceedance of either TeVaR or liquidity, notification may be provided upon the initial potential execution of a transaction, upon initial hedging strategy changes (already approved) and upon the initial exceedance for liquidity and TeVaR. Additional notifications to the PRG will be provided upon request by the PRG.

B. Independent Evaluators

1. Independent Evaluator Pool

PG&E, in conjunction with its respective PRG, shall develop a pool of at least three, but preferably more, IEs. PG&E will develop and periodically add to its IE pool as follows:



1. PG&E shall develop a list of prospective IEs via industry contacts, literature searches, PRG recommendations, and similar methods, solicit information from the prospective IEs and circulate the list of candidates and their “resumes” to the PRG and ED for feedback. All individuals who perform the specific IE responsibilities and duties are covered under the IE organization or company.
2. PG&E shall rely on the guidance regarding IE expertise and qualifications provided in D.04-12-048 and D.07-12-052. However, these qualifications should represent the minimum necessary for an IE to be effective, and PG&E and the PRG will include any additional relevant information that it has gained through its experiences implementing the IE requirements.
3. PG&E and its PRG shall interview a subset of prospective candidates that PG&E, PRG and ED staff deem most suitable for the role.
4. PG&E shall coordinate the development and submittal to the PRG of its recommendations on each prospective candidate (including the general consensus and any opposition to the consensus). PG&E shall submit a written list of qualified IEs to ED to add to the contracting pool. The list will contain the recommendations of the PRG that were submitted to the PRG. ED will evaluate the proposed IE’s competencies based on the guidelines in D.04-12-048 as well as evaluating the IE’s independence including any conflicts of interest. ED shall give final approval for inclusion of an IE in the IE pool by letter to PG&E. ED will also have the right to final approval of the use of a particular IE for each RFO.
5. Beyond the development of the initial IE pool, additional IEs may be added to the pool by following the same procedures listed above.
6. An IE may remain in the IE pool for two consecutive years, within which he/she must go through a reevaluation process based upon the inclusion criteria to assure continued compliance. The re-evaluation process will involve additional reviews of the IE candidate by the PG&E, PRG, and ED staff including additional interviews, or other evaluation tools, if necessary. The re-evaluation of an IE is based on both the organization and the individuals who have participated as an IE within that organization. The conclusions may include the inclusion of an organization and specific IEs in that organization. The resulting conclusions may also identify the specific IEs that will not continue in the pool for the next succeeding two years.



7. PG&E has developed a pro forma master contract to be used each time it contracts with an IE. If deviations from the pro forma contract are necessary, the modifications must be approved by the ED.

PG&E will provide to the PRG the name of the IE to be used in a specific procurement solicitation and the estimated and actual IE costs before and after the solicitation takes place.

2. Independent Evaluator Requirements

PG&E uses an IE in competitive solicitations for electric supply-side resources that seek products with a contract term of two years or more. PG&E also uses an IE in all solicitations that involve an investor-owned utility-affiliate or utility bidder. In addition, consistent with D.09-06-050, PG&E uses an IE for bilateral negotiations for RPS-eligible resources.

3. Independent Evaluator Reports

For solicitations of less than five years and not filed separately through an advice filing, the IE report shall be filed with the Quarterly Compliance Report ("QCR"). For solicitations greater than five years, the IE report shall be filed with the application. If an IE report was prepared for a stand-alone bilateral of less than five years and not filed separately through an advice filing, the IE report shall also be filed with the QCR. If an IE report was prepared for a stand-alone bilateral whose term is greater than five years, the IE report shall be filed with the application. IEs shall use the template approved by the ED. The template(s) may be modified by ED or the Commission as appropriate. Public versions of IE reports shall be identical to the corresponding confidential versions, except for the visible redaction of confidential material.



4. Independent Evaluator Disclosure Requirements

PG&E developed a comprehensive conflict of interest disclosure requirement for the IE. An IE may be disqualified from participating in an RFO process if there are particular egregious conflicts of interest that arise during the contract. The IE pro forma contract currently (see Attachment 1 of Appendix I: “General Conditions: Consulting Services”) includes a conflict of interest section (Section 17.2). In addition, PG&E requires that all IEs sign a Non-Disclosure Agreement (see Attachment 2 of Appendix I: “Specification for Independent Evaluator Services”) which addresses potential conflicts of interest, including establishing business relationships between the IE and the parties with respect to the transaction (of which he or she is evaluating).

C. Request for Offers Process

PG&E shall hold a meeting with the IE, PRG and ED to outline its plans and solicit feedback prior to drafting RFO bid documents. Draft RFO bid documents are to be developed under the oversight of an IE, vetted through the PRG and any differences resolved by ED staff in advance of the public issuance of the bid documents. PG&E shall present and consult with its PRG on its RFO protocols, bid evaluation, bids, and shortlist list.

If PG&E needs new fossil resources not formally authorized in a Commission decision, PG&E shall make a showing through an advice letter that unusual or extreme circumstances warrant such an action.

PG&E shall recognize the effects of debt equivalence when comparing Power Purchase Agreements (“PPA”) against PPAs in their bid evaluations.



PG&E shall consider the use of brownfield sites first before building new generation on Greenfield sites, subject to the parameters set forth in D.07-12-052.

PG&E shall publicly reveal the names of winning bidders after key commercial terms have been finalized, within 30 days of filing an application, or withdraw the application until the bidder's identity and other required information can be released. The actual contract will not be revealed. This activity would be addressed and made consistent as part of any Commission confidentiality decision and currently under D.06-06-066 and as with D.07-12-052.

PG&E shall use the project application template developed by ED when developing an application for approval of winning bid projects in an RFO.



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APPENDIX I
ATTACHMENT 1
GENERAL CONDITIONS: CONSULTING SERVICES

CONFIDENTIAL

Consulting Services
Updated 09/07/2010 KBW4

General Conditions

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1.0 DEFINITIONS

- 1.1 "Change Order": A revision or modification to the Contract reflected on a PG&E Field Order form or a PG&E Change Order form.
- 1.2 "Consultant" or "Contractor": The entity or entities entering into this Contract with PG&E to perform the Work.
- 1.3 "Contract": This agreement between PG&E and Consultant, including the Specification and appendices, together with any other material specifically incorporated therein.
- 1.4 "Party" or "Parties": In the singular, PG&E or Consultant, and in the plural, both PG&E and Consultant.
- 1.5 "PG&E": Pacific Gas and Electric Company, a California corporation.
- 1.6 "Specification": PG&E's specification which includes the specific conditions, these general conditions, and any addenda to these.
- 1.7 "Subcontract": An agreement between Consultant and Subcontractor or between Subcontractors at any level for a portion of the Work under this Contract.
- 1.8 "Subcontractor": Party or parties entering into a Subcontract with Consultant or another Subcontractor to perform a portion of the Work covered by the Contract.
- 1.9 "Work": All services (including but not limited to professional, engineering, analytical and other consulting services), labor, supervision, materials, equipment, actions and other requirements to be performed and furnished by Consultant under this Contract.

2.0 INDEPENDENT CONTRACTOR: In assuming and performing the obligations of this Contract, Consultant is an independent contractor and shall not be eligible for any benefits which PG&E may provide its employees, except as expressly provided for in this Contract. All persons, if any, hired by Consultant shall be employees or Subcontractors of Consultant and shall not be construed as employees or agents of PG&E in any respect.

3.0 AMENDMENTS, SUBCONTRACTS AND ASSIGNMENTS

- 3.1 AMENDMENT: No provision of the Contract will be deemed amended or waived by PG&E without prior written approval in the form of a signed Contract Change Order. No oral statement will modify or otherwise affect the terms and conditions set forth herein.
- 3.2 SUBCONTRACTS: Consultant shall not enter into Subcontracts and no Subcontractor shall be permitted to perform Work without the prior written approval of PG&E. PG&E's approval of any Subcontract shall not relieve Consultant of its obligations to PG&E under this Contract. Consultant's obligations under this Contract shall apply to any Subcontract, and Consultant shall be responsible to PG&E for any damages to PG&E arising out of Subcontracts not in accordance with this Contract. Nothing in the Contract or any subcontract shall create any direct contractual relations between a Subcontractor and PG&E.
- 3.3 ASSIGNMENT: PG&E may assign all or any part of this Contract, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise, without the Consultant's prior approval or written consent, provided PG&E remains obligated to pay for services rendered up to the effective date of such assignment. Consultant may not assign all or any part of this Contract or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise without PG&E's prior written consent, except that Consultant

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may assign to Consultant's corporate affiliate in which Consultant holds a majority interest, provided that the Consultant and the affiliate remain obligated under this Contract. Subject to the foregoing, this Contract shall be binding upon and inure to the benefit of the successors and assigns of the Parties hereto.

4.0 BILLING AND PAYMENT

4.1 LUMP SUM WORK: The following provisions shall apply to all Work performed on a lump sum basis.

4.1.1 INVOICE SUBMITTAL INSTRUCTIONS: Consultant shall submit a monthly invoice to PG&E for compensation earned in the preceding calendar month. Consultant shall submit invoices to PG&E in accordance with the requirements of this Section and with the instructions printed in the Contract or Contract Change Order. The Consultant shall include the Contract number, and if applicable the Contract Work Authorization number, on the invoice.

4.1.2 INVOICE DEFICIENCIES: Should PG&E determine that Consultant's invoice does not meet the invoicing requirements of this Contract, PG&E will notify Consultant of the deficiencies or return the invoice to Consultant with noted deficiencies. Consultant shall provide to PG&E such documents or information correcting such deficiencies, or for invoices returned to Consultant, Consultant shall resubmit a corrected invoice.

4.1.3 PG&E PAYMENT: Payment by PG&E to Consultant for Work performed on a lump sum basis will be monthly, in the full amount of the cost of the Work performed less any negotiated percentage withholding, computed in accordance with the terms of the Contract, and satisfactorily completed during each month. PG&E reserves the right to discount payment(s) to Consultant by Two (2) percent of the invoice total amount for payment(s) made to Consultant within Fifteen (15) days; or payable to Consultant within Forty-Five (45) days. All payments will be made, subject to PG&E approval after receipt of a correct invoice. Payment of the balance of the amount will occur at the end of the Contract after all Work is satisfactorily completed.

4.1.4 FINAL INVOICE: The final invoice shall be marked "FINAL" and must be received by PG&E within Sixty (60) calendar days after completion of the Work. PG&E will not be liable for payment of any late invoices that are received by PG&E beyond the Sixty (60) day period.

4.1.5 BILLING RATES AND CONFLICTS: Consultant's lump sum price(s) stated in the Contract fee schedule shall not change during the term of this Contract without prior written approval by PG&E. The lump sum price(s) shall be inclusive of all Consultant's overhead costs, administrative and general fees, and profit. To the extent such lump sum price(s), or any invoice or other billing instrument as provided for in this Article 4, "Billing and Payment", contains terms and conditions which are in addition to or in conflict with the terms and conditions in this Contract, whether Specific or General, those terms and conditions in the fee schedule, invoice, or other billing instrument shall be null and void.

4.2 TIME AND MATERIALS AND UNIT PRICE WORK: The following provisions shall apply to all Work performed on a time and materials or unit price basis.

4.2.1 INVOICE SUBMITTAL INSTRUCTIONS: Consultant shall submit invoices to PG&E in accordance with the requirements of this Section and with the instructions printed in the Contract or Contract Change Order. The Consultant

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shall include the Contract number, and if applicable the Contract Work Authorization number, on the invoice.

4.2.2 MONTHLY INVOICE: Consultant shall submit a monthly invoice to PG&E for review and approval of compensation earned and reimbursable expenses incurred in the preceding calendar month. Each invoice shall be broken down by Contract tasks; for each task the invoice shall include the following information:

- a. STATUS: Task description, estimated cost to complete, total cost incurred to date, percentage of Work completed and date completed.
- b. LABOR: Employee name, employee labor classification, employee salary rate, number of hours spent, and billing rate.
- c. REIMBURSABLE EXPENSES: Unit cost and quantity of each item of expense.

4.2.3 BILLING RATES AND CONFLICTS: Consultant's billing rates or fees stated in the Contract fee schedule shall not change during the term of this Contract without prior written approval by PG&E. These billing rates and fees shall be inclusive of all Consultant's overhead costs, administrative and general fees, and profit. To the extent such fee schedule, or any invoice or other billing instrument as provided for in this Article 4, "Billing and Payment", contains terms and conditions which are in addition to or in conflict with the terms and conditions in this Contract, whether Specific or General, those terms and conditions in the fee schedule, invoice, or other billing instrument shall be null and void.

- a. Overtime hours shall be billed at straight-time rates, unless otherwise approved by PG&E prior to the use of overtime, and limited to those hours for which Consultant's employee is actually compensated. If applicable, Consultant's overhead cost shall not be applied to the premium portion of the overtime cost.
- b. Individuals other than employees of Consultant (nonemployees) retained by Consultant, such as Subcontractors, outside consultants, or agency personnel, shall not be billed as Consultant's employees and shall be shown separately on the invoice. Such nonemployees working in Consultant's established office under Consultant's direct supervision shall be billed to PG&E at the cost charged to Consultant times 1.05. All other nonemployees shall be billed at Consultant's direct costs.

4.2.4 EXPENSES: All reimbursable expenses shall be reasonable, ordinary, and necessary and shall be billed at cost. All reimbursable expenses other than those listed in this Article shall be authorized in writing by PG&E's authorized representative prior to expenditure by the Consultant. PG&E will not reimburse Consultant for any expenses not so approved.

- a. Overhead costs are Consultant's responsibility and will not be reimbursed as expenses. The following types of costs are all considered to be overhead: Miscellaneous costs, such as routine telephone communications, routine copying, electronic mail, facsimile transmissions, computer time and use of in-house technical software.

4.2.5 TRAVEL TIME AND COSTS: All air travel costs within or outside of the United States will be reimbursed only on a coach fare basis and all rental car costs will be

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reimbursed only on a subcompact rate basis. Travel time to and from the Work site shall be at Consultant's expense.

- 4.2.6 MILEAGE AND USE OF PERSONAL CAR: in the event Consultant uses its personal car in the performance of Work under the Contract and such use is included as a reimbursable expense, normal commuting such as trips from home to first business stop and from the last business stop to home represents personal use of car and shall not be reimbursed. All other reimbursable mileage shall be at the current IRS rate.
- 4.2.7 SUPPORTING DOCUMENTATION: For each expense item over \$100, supporting data and documentation shall be furnished with the invoice. Copies of detailed expense reports to support travel costs shall be attached to the invoice. Although travel receipts need not be attached, Consultant shall retain them for the term of the audit period.
- a. Each invoice shall be assembled such that attached supporting documentation shall be placed in the order listed in the invoice, and each item of expense chargeable to PG&E shall be highlighted or clearly delineated.
- 4.2.8 INVOICE DEFICIENCIES: Should PG&E determine that Consultant's invoice does not meet the invoicing requirements of this Contract, PG&E will notify Consultant of the deficiencies or return the invoice to Consultant with noted deficiencies. Consultant shall provide to PG&E such documents or information correcting such deficiencies, or for invoices returned to Consultant, Consultant shall resubmit a corrected invoice.
- 4.2.9 FINAL INVOICE: The final invoice shall be marked "FINAL" and must be received by PG&E within Sixty (60) calendar days after completion of the Work. PG&E will not be liable for payment of any late invoices that are received by PG&E beyond the Sixty (60) day period.
- 4.2.10 UNIT PRICE BASIS: When invoices include Work performed on a unit price basis, Consultant shall attach to the invoice a list stating the unit price item numbers, unit prices, quantities, dollar amounts and other information as required to identify the Work.
- 4.2.11 PG&E PAYMENT: Payment by PG&E to Consultant for Work performed on a time and materials or unit price basis will be monthly, in the full amount due for Work performed less any negotiated percentage withholding, computed in accordance with the terms of the Contract, and satisfactorily completed during each month including reimbursable expenses, if any. After receipt and approval of the Consultant's itemized invoice, PG&E reserves the right to discount payment(s) to Consultant by Two (2) percent of the invoice total amount for payment(s) made to Consultant within Fifteen (15) days; or payable to Consultant within Forty-Five (45) days. Payment of any remaining balance of the amount due will occur at the end of the Contract after all Work is satisfactorily completed.

- 5.0 PRIOR WORK: Services performed by Consultant pursuant to PG&E's authorization, but before the execution of this Contract, shall be considered as having been performed subject to the provisions of this Contract.

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- 6.0 NO GUARANTEE OF WORK: THIS IS NOT AN EXCLUSIVE CONTRACT. THIS CONTRACT DOES NOT GUARANTEE THE CONSULTANT ANY WORK NOR IS THERE ANY GUARANTEE AS TO ANY VOLUME OR DURATION OF WORK.
- 7.0 ADDITIONAL WORK OR CHANGES IN WORK
- 7.1 PROCEDURE FOR ADDITIONAL WORK: BEFORE PROCEEDING WITH ANY WORK INVOLVING POSSIBLE CLAIMS FOR EXTRA COMPENSATION NOT SPECIFIED IN THE CONTRACT, CONSULTANT SHALL SUBMIT IN WRITING TO PG&E A DETAILED ESTIMATE OF THE COST FOR SUCH WORK. Consultant shall provide PG&E with a detailed breakdown and estimated cost of such anticipated contract work, including extensions and Change Orders, as follows:
- 7.1.1 Description of work to be performed including detailed breakdown by identifiable tasks.
- 7.1.2 Estimated cost of each task.
- 7.1.3 Expected date of completion of each task.
- 7.2 APPROVAL NEEDED FOR ADDITIONAL WORK: Consultant shall not proceed with any such additional work prior to receiving written authorization or a Change Order issued to Consultant by PG&E. CONSULTANT AGREES THAT ALL COSTS FOR ANY SUCH MODIFICATION OR CHANGE THAT IS PERFORMED BY CONSULTANT WITHOUT PG&E'S PRIOR WRITTEN APPROVAL SHALL BE AT CONSULTANT'S SOLE RISK AND EXPENSE.
- 7.3 PG&E CHANGES TO WORK: PG&E reserves the right to make such changes in Work, specifications, or level of effort, as may be necessary or desirable and any difference in Contract price resulting from such changes shall be approved in writing by PG&E before the Work is begun.
- 8.0 REPLACEMENT OF PERSONNEL
- 8.1 BY CONSULTANT: Consultant acknowledges that in the event that the individuals who are initially assigned by Consultant to perform services under this Contract are removed, replaced or reassigned by Consultant, such removal, replacement, or reassignment may result in serious harm and costs to PG&E. Consultant agrees not to remove, replace or reassign such individuals without the approval of PG&E. Such approval shall not be unreasonably withheld or delayed. Consultant will make reasonable efforts to maintain continuity in its staffing and will provide PG&E with ample notification if any such changes are made. Consultant agrees not to charge PG&E for the time spent in familiarizing replacement personnel with the Work.
- 8.2 BY PG&E: Consultant shall employ personnel qualified to perform the Work. If PG&E finds Consultant's employee to be unsatisfactory, Consultant shall replace that employee within Twenty Four (24) hours of notification. For the avoidance of doubt, this provision addresses only the assignment of personnel to PG&E jobs; it does not require the Consultant to terminate the employment of any employee replaced hereunder, nor does PG&E endorse or approve, either expressly or impliedly, Consultant's termination of any such employee.
- 9.0 SAFETY PRECAUTIONS AND PROTECTION OF PROPERTY: Consultant shall plan and conduct its Work to safeguard persons and property from injury. Consultant shall direct performance of Work in compliance with reasonable safety and work practices and applicable federal, state and local laws, rules and regulations, including but not limited to, "Occupational

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Safety and Health Standards" promulgated by the U.S. Secretary of Labor and the California Division of Occupational Safety and Health. PG&E may designate safety precautions in addition to those in use or proposed by Consultant. PG&E reserves the right to inspect the Work and to halt Work to ensure compliance with reasonable and safe work practices and with applicable federal, state, and local laws, rules and regulations. Neither the requirement that Consultant follow said practices and applicable laws, rules and regulations, and any special instructions given by PG&E nor the adherence thereto by Consultant shall relieve Consultant of the sole responsibility to maintain safe and efficient working conditions.

10.0 **LAWFUL DISPOSAL OF SAMPLED AND OTHER WASTE:** If the scope of Work under this Contract requires Consultant to perform hazardous waste site investigations, the following provisions shall apply:

10.1 PG&E will be responsible for disposal of onsite samples. Charges for disposal of samples taken offsite for testing are included in the Consultant's proposed rates.

10.2 Consultant shall lawfully dispose of all test samples after completion of the required tests, along with any residue or byproducts of the testing process. Consultant shall comply with all of the existing federal, state and local laws, rules, regulations, and/or ordinances applicable to the services to be performed, including but not limited to, to the extent applicable, the Code of Federal Regulations, Title 40, Part 260 et seq. and the California Health and Safety Code, Section 25, 100 et seq., and the Title 22, California Code of Regulations, Section 66,000 et seq.

11.0 **INTELLECTUAL PROPERTY**

11.1 **OWNERSHIP OF DELIVERABLES:** PG&E shall own all data, reports, information, manuals, computer programs or other written, recorded, photographic or visual materials, or other deliverables produced in the performance of this Contract. Consultant shall retain no ownership, interest, or title in them except as may otherwise be provided in the Contract.

11.2 **PROPRIETARY RIGHTS :** PG&E shall own all proprietary rights, including, but not limited to, exclusive patent and copyright rights, in and to any and all inventions, software, works of authorship, designs or improvements of equipment, tools or processes, including the items referenced in the Section titled "Ownership of Deliverables" (collectively, the "Developments"), conceived, developed, implemented, or produced by Consultant in the performance of this Contract, and Consultant shall retain no ownership, interest or title in or to them except as otherwise provided in this Contract. Consultant agrees to assign and hereby assigns all its right, title and interest in and to the patents, copyrights and other intellectual property rights in the Developments and hereby agrees to fully cooperate and to do all things reasonably necessary to allow PG&E to claim sole ownership, including the execution of documents deemed necessary by PG&E.

11.3 **USE AND REPRODUCTION RIGHTS:** If and to the extent that Consultant retains any preexisting rights in any materials furnished hereunder, including Developments, Consultant hereby grants to PG&E the irrevocable, perpetual, non-exclusive, worldwide, royalty free right and license to (i) make, use, execute, reproduce, display, perform, distribute copies of, and prepare derivative works based upon such preexisting rights and derivative works thereof in connection with PG&E's business and (ii) authorize others to do any or all of the foregoing in connection with PG&E's business. Any claims of Consultant to proprietary rights in materials furnished hereunder must be expressly set forth in this Contract or shall have been previously disclosed to PG&E in writing.

11.4 **INFRINGEMENT PROTECTION:** Consultant represents to PG&E that the material to be prepared under this Contract will not infringe upon the copyright, patent or license, or otherwise violate the proprietary rights, including trade secret rights, of any person or entity.

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Consultant agrees to indemnify and hold PG&E, its parent company, subsidiaries and/or affiliates, harmless from and against any and all liabilities, costs and damages arising out of any such infringement, and from any suit, demand or claim made against PG&E, its parent company, subsidiaries and/or affiliates, alleging any such infringement or violation. In addition to the foregoing, if there is such a suit, demand or claim, Consultant agrees, as soon as possible, to either procure for PG&E the right to continue using the material, replace the material with non-infringing material or modify it so it becomes non-infringing; provided, however that the replaced or modified material shall be equal to that contracted for hereunder and satisfactory to PG&E. Consultant further agrees to pay any judgment or reasonable settlement offer resulting from a suit, demand or claim, and pay any reasonable attorney's fees incurred by PG&E in defense against such suit.

- 11.5 COPYRIGHT REGISTRATION: Notice of PG&E copyright ownership shall be placed by Consultant on all reports, information or instructional manuals, computer programs or other written, recorded, photographic or visual materials or other deliverables to which PG&E has the right of such ownership as provided in this Contract. Such notice shall be placed on the materials in a manner and location as to give reasonable notice of the claim of copyright, and shall consist of the copyright symbol or the word "Copyright" followed by the year in which the material is produced and the words "Pacific Gas and Electric Company". Application for copyright registration shall be the responsibility of PG&E.
- 11.6 ROYALTIES AND LICENSE FEES: Royalties, license fees or other charges for patents, copyrights and other intellectual property for designs, processes, technology, published or unpublished data, information or technical materials including, but not limited to, manuals, computer programs, or other deliverables furnished by Consultant, or for processes or methods employed by Consultant in performing the services, shall be included in the Contract price.
- 11.7 DELIVERY AND RETENTION OF RECORDS: To the extent PG&E does not otherwise specifically request delivery of records or results, Consultant agrees to retain all records and results of Work performed under this Contract for a period of not less than two years from the date the Work is accepted by PG&E. At PG&E's request Consultant will deliver a copy of any or all original field notes, investigative notes, tests, photographs, records, calculations, summaries, reports, and records produced and collected in the course of the Work performed under this Contract.
- 11.8 PUBLIC RELEASE OF RESULTS: Consultant agrees not to release any results of the Work without first providing PG&E with the material sought to be released and a description of the publication for PG&E's prior approval. Consultant further agrees that no release shall present any material findings not reasonably inferable from the data. Any public release shall acknowledge PG&E's sponsorship of the Work.
- 11.9 CONSULTANT'S USE OF PG&E PROPERTY: All records, reports, computer programs, written procedures and similar materials, documents or data, in whatever form, provided by PG&E for Consultant's use in the performance of services under this Contract shall remain the confidential property of PG&E and shall be returned to PG&E immediately upon completion of Consultant's use for the performance of the Work or earlier upon the request of PG&E.
- 11.10 CONFIDENTIALITY: In the course of performing the services under this Contract, Consultant may have access to confidential commercial or personal information concerning, but not limited to, California residents, technological, ratemaking, legislative and personnel matters and practices of PG&E, its parent company, subsidiaries, affiliates, or members of the public. Consultant agrees not to disclose any such confidential information or otherwise make it available to any other person, including any affiliate of PG&E that produces energy or energy-related products or services, without the prior written approval of PG&E.

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Consultant shall implement and maintain reasonable security procedures and practices appropriate to the nature of the information, to protect any personal or confidential information from unauthorized access, destruction, use, modification, or disclosure.

11.11 PUBLIC TESTIMONY: It is further agreed between the Parties that, if requested by PG&E, Consultant shall provide testimony before any federal, state or local court, regulatory body or any other public agency to substantiate any Work performed or data, reports, or materials supplied to PG&E. Reasonable fees for such testimony will be negotiated at that time.

12.0 WARRANTY: Consultant warrants to PG&E that the Work under this Contract shall be performed with the degree of skill and care that is required by current, good and sound professional procedures and practices, and in conformance with generally accepted professional standards prevailing at the time the Work is performed so as to ensure that the services performed are correct and appropriate for the purposes contemplated in this Contract and related specifications.

13.0 INDEMNIFICATION, WITHHOLDING AND LIMITATION OF LIABILITY

13.1 INDEMNIFICATION

13.1.1 Consultant shall indemnify, hold harmless and defend PG&E, its affiliates, subsidiaries, parent company, officers, managers, directors, agents, and employees, from and against all claims, demands, losses, damages, costs, expenses, and liability (legal, contractual, or otherwise), which arise from or are in any way connected with any: i) injury to or death of persons, including but not limited to employees of PG&E or Consultant; (ii) injury to property or other interests of PG&E, Consultant, or any third party; (iii) violation of local, state, or federal common law, statute or regulation, including but not limited to environmental laws or regulations; or (iv) strict liability imposed by any law or regulation; so long as such injury, violation, or strict liability (as set forth in (i) - (iv) above) arises from or is in any way connected with Consultant's performance of, or failure to perform, this Contract, however caused, regardless of any strict liability or negligence of PG&E, whether active or passive, excepting only such loss, damage, cost, expense, liability, strict liability, or violation of law or regulation that is caused by the sole negligence or willful misconduct of PG&E, its officers, managers, or employees.

13.1.2 Consultant acknowledges that any claims, demands, losses, damages, costs, expenses, and liability that arise from or are in any way connected with the release or spill of any legally designated hazardous material or waste and arise from or is in any way connected with the Work performed under this Contract, are expressly within the scope of this indemnity. Likewise, the costs, expenses, and legal liability for environmental investigations, monitoring, containment, abatement, removal, repair, cleanup, restoration, remedial work, penalties, and fines arising from strict liability or the violation of any local, state, or federal law or regulation, attorney's fees, disbursements, and other response costs incurred as a result of such releases or spills are expressly within the scope of this indemnity.

13.1.4 TAX WITHHOLDING: Consultant represents and warrants that it will withhold all taxes, if any, which are required to be withheld under applicable law with respect to payments to persons hired by Consultant who perform services for PG&E. Consultant shall indemnify and hold PG&E harmless, on an after-tax basis, for any liability incurred by PG&E as a result of Consultant's failure to institute any such required withholding.

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13.1.5 Consultant shall, on PG&E's request, defend any action, claim, or suit asserting a claim which might be covered by this indemnity, using counsel acceptable to PG&E. Consultant shall pay all costs and expenses that may be incurred by PG&E in enforcing this indemnity, including reasonable attorney's fees. To the extent necessary, each Party was represented by counsel in the negotiation and execution of this Contract.

13.2 LIMITATION OF LIABILITY: TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, PG&E SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES, WHETHER IN CONTRACT, TORT, EQUITY, OR OTHERWISE, FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE, OR EXEMPLARY DAMAGES, EVEN IF SUCH DAMAGES ARE FORESEEABLE, AND REGARDLESS OF WHETHER OR NOT PG&E HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR UNRECOVERED OVERHEAD AND, UNLESS EXPRESSLY AUTHORIZED IN ADVANCE IN WRITING AND SPECIFICALLY ASSUMED BY PG&E, COMMITMENTS TO THIRD PARTIES, SUCH AS SUBCONTRACTS, RENTAL OR LEASE AGREEMENT(S), AND PERSONAL SERVICES CONTRACTS.

14.0 INSURANCE REQUIREMENTS

Consultant shall maintain the following insurance coverage. Consultant is also responsible for its Subcontractors maintaining sufficient limits of the appropriate insurance coverage.

14.1 Workers' Compensation and Employers' Liability

14.1.1 Workers' Compensation insurance or self-insurance indicating compliance with any applicable labor codes, acts, laws or statutes, state or federal, where Consultant performs Work.

14.1.2 Employers' Liability insurance shall not be less than \$1,000,000 for injury or death each accident.

14.2 Commercial General Liability

14.2.1 Coverage shall be at least as broad as the Insurance Services Office (ISO) Commercial General Liability Coverage "occurrence" form, with no coverage deletions.

14.2.2 The limit shall not be less than \$1,000,000 each occurrence/\$2,000,000 aggregate for bodily injury, property damage and personal injury.

14.2.3 Coverage shall: a) By "Additional Insured" endorsement add as insureds PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of or connected with the Work performed by or for the Consultant. (ISO Form CG2010 or equivalent is preferred). In the event the Commercial General Liability policy includes a "blanket endorsement by contract," the following language added to the certificate of insurance will satisfy PG&E's additional insured requirement: "PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of the work performed by or for the Consultant are additional insureds under a blanket endorsement."; b) Be endorsed to specify that the Consultant's insurance is primary and that any insurance or self-insurance maintained by PG&E shall not contribute with it.

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14.3 Business Auto

14.3.1 Coverage shall be at least as broad as the Insurance Services Office (ISO) Business Auto Coverage form covering Automobile Liability, code 1 "any auto."

14.3.2 The limit shall not be less than \$1,000,000 each accident for bodily injury and property damage.

14.4 Professional Liability Insurance

14.4.1 Errors and Omissions Liability insurance appropriate to the Consultant's profession. Coverage shall be for a professional error, act or omission arising out of the scope of services shown in the Contract.

14.4.2 The limit shall not be less than \$1,000,000 each claim/\$2,000,000 aggregate.

14.5 Additional Insurance Provisions

14.5.1 Before commencing performance of Work, Consultant shall furnish PG&E with certificates of insurance and endorsements of all required insurance for Consultant.

14.5.2 Should any of the above described policies be cancelled before the expiration date thereof, the insurer shall deliver notification to PG&E in accordance with the policy provisions.

14.5.3 PG&E uses a third party vendor, Exigis, to confirm and collect insurance documents. Certificates of insurance and endorsements shall be signed and submitted by a person authorized by Consultant's insurer to bind coverage on insurer's behalf, and submitted through the website at:
<https://prod1.exigis.com/pgc> and by telephone at (1) (888) 280-0178.

Certificate Holder:
PG&E Corporation
c/o EXIGIS, LLC
589 8th Ave., 8th floor
New York, NY 10018

A copy of all such insurance documents shall be sent to PG&E's Contract negotiator and/or Contract administrator.

14.5.4 PG&E may inspect the original policies or require complete certified copies at any time.

14.5.5 Upon request, Consultant shall furnish PG&E the same evidence of insurance for its Subcontractors as PG&E requires of Consultant.

15.0 FORCE MAJEURE: Neither PG&E nor Consultant shall be considered in default in the performance of its obligations under this Contract, except obligations to make payments hereunder for Work previously performed, to the extent that the performance of any such obligation is prevented or delayed by any cause, existing or future, which is beyond the reasonable control, and without the fault or negligence, of the affected Party. If either Party claims that performance of its obligations was prevented or delayed by any such cause, that Party shall promptly notify the other Party of that fact, and of the circumstances preventing or delaying

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performance. Such Party so claiming a cause-delayed performance shall endeavor, to the extent reasonable, to remove the obstacles which preclude performance.

16.0 CANCELLATION AND TERMINATION OF CONTRACT

16.1 CANCELLATION FOR CAUSE:

16.1.1 PG&E may, at its option, cancel or suspend this Contract for cause including, but not limited to, the following situations: (1) the failure, refusal or inability of the Consultant to perform the Work in accordance with this Contract for any reason (except as specified in the section titled "Force Majeure"); or (2) Consultant has become insolvent, has failed to pay its bills, or has had checks for payment of its bills returned from suppliers and Subcontractors due to insufficient funds; or (3) a legal action is placed against Consultant which, in PG&E's opinion, may interfere with the performance of the Work; or (4) in PG&E's opinion, the Work will not be completed in the specified time and PG&E has requested Consultant to take steps necessary to accomplish the required progress and completion, and Consultant has failed to do so.

16.1.2 PG&E will be the sole judge whether Consultant is substantially performing Work and services in accordance with this Specification. Consultant shall be liable for additional costs to PG&E arising from cancellation.

16.1.3 In the event of such cancellation, PG&E shall pay Consultant for services satisfactorily performed prior to the date of cancellation. In no event shall PG&E be liable for lost or anticipated profits or overhead on uncompleted portions of the Work. Before PG&E will release final payment, Consultant shall deliver to PG&E any reports, drawings or other documents prepared for PG&E prior to the effective date of such cancellation. Consultant shall not enter into any agreements, commitments or Subcontracts which would incur significant cancellation costs without prior written approval of PG&E. Such written approval is a condition precedent to the payment of any cancellation charges by PG&E.

16.1.4 LABOR DISPUTE: In the event of a labor dispute or strike by Consultant's or its Subcontractors' employees which threatens the progress or cost of Work, or PG&E's labor relations, or which disrupts PG&E's operations, or results in a secondary boycott at PG&E's facilities, PG&E reserves the right to restrict and/or require the additional hiring of Consultant's employees, to suspend or discontinue the Work of the Consultant or any Subcontractor, or cancel the Contract for cause. This paragraph shall be applicable whether or not any Consultant or Subcontractor is directly involved in a labor dispute.

16.2 TERMINATION FOR PG&E'S REASONS: PG&E may suspend or terminate the Contract, without cause and upon written notice to Consultant. Consultant thereupon shall take whatever action with respect to performance of the Work as will tend to minimize its claim against PG&E, if any. In the event of termination, PG&E shall be liable to Consultant only for the compensation earned on the Work performed to the date of termination, plus costs reasonably incurred by Consultant in terminating its operation. Consultant shall not be entitled to any payment for lost or anticipated profits or overhead on uncompleted portions of the Work. Any reports, drawings or other documents prepared for PG&E prior to the effective date of such termination shall be delivered to PG&E by Consultant prior to PG&E's release of its final payment to Consultant.

16.3 COOPERATION: To the extent the work hereunder is to be transitioned to a third party or to PG&E, Consultant shall cooperate to ensure a smooth and effective transition.

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17.0 CODE OF CONDUCT, BUSINESS ETHICS, AND AVAILABILITY OF INFORMATION

17.1 CODE OF CONDUCT: CONTRACTOR AND CONTRACTOR'S SUBCONTRACTORS AND THEIR SUPPLIERS AT ALL TIERS SHALL COMPLY WITH PG&E'S CONTRACTOR, CONSULTANT AND SUPPLIER CODE OF CONDUCT IN THE AWARD OF ALL CONTACTS AND SUBCONTRACTS This policy requires that Contractor and Contractor's Subcontractors and suppliers demonstrate a strong commitment to compliance and ethics as a foundation to successful business. Any Work done for PG&E must be completed in full compliance with PG&E's Contractor, Consultant and Supplier Code of Conduct ("Code of Conduct"). Consultant shall access, read and comply with PG&E's Code of Conduct and shall make it available to its Subcontractors and suppliers. The Code of Conduct is available at PG&E's website, www.pge.com, at the following link:

http://www.pge.com/includes/docs/pdfs/b2b/purchasing/contractor_consultant_and_supplier_code.pdf

17.2 CONFLICT OF INTEREST AND BUSINESS ETHICS

17.2.1 REASONABLE CARE: Consultant, in its dealings with PG&E under or in connection with the Contract, will act reasonably and in good faith. Consultant shall exercise reasonable care and diligence to prevent any actions or conditions which could result in a conflict with PG&E's interest.

17.2.2 OTHER EMPLOYMENT: During the term of this Contract, Consultant or its employees will not accept any employment or engage in any work which creates a conflict of interest with PG&E or in any way compromises the performance and completion of Work to be performed under this Contract.

17.2.3 GIFTS: Consultant or its employees shall not offer or cause to be offered gifts, entertainment, payments, loans and/or other services, benefits or considerations of more than a nominal value to PG&E's employees, their families, vendors, Subcontractors and other third parties.

17.2.4 ACCURATE DOCUMENTATION: All financial statements, reports, billings, and other documents rendered shall properly reflect the facts about all activities and transactions handled for the account of PG&E.

17.2.5 NOTIFICATION: The Consultant shall notify PG&E of any and all violations of this clause within three (3) business days after such violation is brought to Consultant's attention.

17.3 AVAILABILITY OF INFORMATION

17.3.1 ACCESS: PG&E's duly authorized representatives shall have, during the term of the Contract and for Three (3) years thereafter, access at all reasonable times to all of the Consultant's and its Subcontractors' personnel, accounts and records of all description, including but not limited to computer files, pertaining to the Contract to verify or review the quantity, quality, work program and progress of the Work, reimbursable costs, amounts claimed by the Consultant, estimates of cost for fixed rates including those applicable to proposed changes, and for any other reasonable purposes including any and all records of the Consultant for the purpose of verifying compliance with the section concerning CONFLICT OF INTEREST AND BUSINESS ETHICS.

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- 17.3.2 **APPLICABILITY:** This AVAILABILITY OF INFORMATION provision shall apply to all PG&E contracts but shall not apply to pricing for contracts performed solely on a lump-sum basis. However, where lump-sum and time and materials work (including unit price, reimbursable cost, fixed rates, etc.) are performed together, either as a part of this Contract or as separate contracts, then the above audit right shall also extend to PG&E's access to all Consultant's records pertaining to all PG&E contracts, including the lump-sum, for assurance that the portions of the Work performed on a time and materials basis are not being charged with time, material or other units or cost which are intended to be covered by lump-sum or fixed rates, etc., provided under this Contract, including Change Orders, or other agreements.
- 17.3.3 **ACCOUNTING:** The Consultant's and its Subcontractors' accounts shall be kept in accordance with generally accepted accounting principles in the particular industry and shall be kept in such a manner and in sufficient detail to clearly disclose the nature and amounts of the different items of service and cost pertaining to the Contract and the basis for charges or allocations to the Contract.
- 17.3.4 **ADJUSTMENTS:** Consultant shall promptly adjust any inaccuracy in the billings. Adjustments shall accrue interest, compounded monthly, at a rate equal to the prime rate charged by the Bank of America, NT&SA, San Francisco, California, at the beginning of each month, from the date of payment of the invoice being adjusted to the date that the adjustment is paid.
- 17.3.5 **TIME PERIOD:** The Consultant and its Subcontractors shall preserve all such accounts and records for a period of three years after the term of the Contract. PG&E's duly authorized representatives shall have the right to reproduce any such accounts and records
- 17.3.6 **SUBCONTRACTORS:** The Consultant shall include the necessary provisions in its Subcontracts to ensure that its Subcontractors comply with this Article.

18.0 SUPPLIER DIVERSITY AND EQUAL OPPORTUNITY

- 18.1 **PG&E'S SUPPLIER POLICY:** It is PG&E's policy that Women, Minority, and Disabled Veteran Business Enterprises (WMDVBES) shall have the maximum practicable opportunity to participate in providing the products and services it purchases.
- 18.1.1 For all Contracts, the Consultant agrees to comply, and to require all Subcontractors and sub-subcontractors to comply, with PG&E's Supplier Diversity Policy, as set forth in Exhibit 1 hereto. The Consultant shall provide to each prospective Subcontractor a copy of Exhibit 1.
- 18.1.2 In addition, for Contracts exceeding \$500,000 (or \$1 million for construction contracts), the Consultant must comply with the Policy Regarding Utilization of Small Business Concerns and Small Disadvantaged Business concerns, as described in Exhibit 2 hereto. The Subcontracting Plan for these contracts must include provisions for implementing the terms prescribed in Exhibit 2.
- a. Small Business, and Small Disadvantaged Business Subcontracting Plans are not required for small business contractors, personal service contracts, contracts that will be performed entirely outside of the United States and its territories, or modifications to existing contracts which do not contain subcontracting potential.

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- 18.1.3 For all Contracts, the Consultant shall act in accordance with the Subcontracting Plan in the performance of the Work and in the award of all Subcontracts.
- 18.1.4 All Bidders must describe with their submission how they will comply with the mandatory requirements of Exhibit 1. The requirements of Exhibit 1 and the successful Bidder's response will be incorporated into the Contract.
- 18.1.5 Each proposal will be evaluated using a formula of weighted and defined criteria including the strength of its proposed compliance with PG&E's Supplier Diversity Policy.
- 18.2 FEDERAL EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION REGULATIONS POLICY: During the performance of this Contract and to the extent they may be applicable, Consultant agrees to comply with all laws, orders, and regulations included by summary or reference in the following paragraphs:
 - 18.2.1 Executive Order 11246, 41 CFR Part 60-1.4: Equal Opportunity Clause.
 - 18.2.2 Executive Order 11246, 41 CFR Part 60-1.8: Nonsegregated Facilities.
 - 18.2.3 Vietnam Era Veterans' Readjustment Assistance Act of 1974, 41 CFR Part 60-250.5.a: Equal Opportunity Clause.
 - 18.2.4 Vietnam Era Veterans' Readjustment Assistance Act of 1974, 41 CFR Part 60-300.5.a: Equal Opportunity Clause.
 - 18.2.5 Section 503 of the Rehabilitation Act of 1973, 41 CFR Part 60-741.5.a: Equal Opportunity Clause.
- 19.0 INJURY AND ILLNESS PREVENTION PROGRAM: In the performance of the Work under this Contract, Consultant acknowledges that it has an effective Injury and Illness Prevention Program which meets the requirements of all applicable laws and regulations, including but not limited to Section 6401.7 of the California Labor Code. Consultant shall ensure that any Subcontractor hired by Consultant to perform any portion of the Work under this Contract shall also have an effective Injury and Illness Prevention Program. If the Consultant has any employees in California, even if those employees do not perform Work under this Contract, the attached Compliance Certificate (Exhibit 3) shall be executed by the person with the authority and responsibility for implementing and administering such Injury and Illness and Prevention Program.
- 20.0 PG&E DRUG AND ALCOHOL ABUSE POLICY: PG&E is committed to maintain and promote job safety and health for all workers at its facilities. In addition, PG&E is determined to protect its employees, customers, and the general public while they are on PG&E property from any harm caused by illegal drug and alcohol use by non-PG&E personnel. To accomplish these objectives, PG&E has established a drug and alcohol policy for access to PG&E facilities by its Consultant and Subcontractor personnel. If any personnel of Consultant or its approved Subcontractors perform any Work or services at PG&E offices and/or other PG&E facilities, then Consultant shall comply with PG&E's Drug and Alcohol Abuse and Testing Policies, attached as Exhibit 4 to these General Conditions.
- 21.0 GENERAL PROVISIONS
 - 21.1 COMPLIANCE WITH LAWS: Consultant shall comply with all applicable federal, state and local laws, rules and regulations, and shall obtain all applicable licenses and permits for the conduct of its business and the performance of the Work called for in this Contract. Consultant shall comply with all environmental and endangered species requirements and shall conduct its operations in a manner that complies with applicable programs and permits. To the extent Consultant's work is subject to PG&E-specific environmental permits or programs, PG&E will provide Consultant with such permit or program requirements. Unless prohibited by law, Consultant shall hold PG&E harmless

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from any liability, fine or penalty incurred as a result of Consultant's failure to comply with applicable legal and regulatory requirements.

- 21.2 REPORTING: In accordance with Section 7912 of the California Public Utilities Code, Consultant agrees to report annually to PG&E the number of California residents employed by Consultant, calculated on a full-time or full-time equivalent basis, who are personally providing services to PG&E.
- 21.3 CHOICE OF LAWS: This Contract shall be construed and interpreted in accordance with the laws of the State of California, excluding any choice of law rules which may direct the application of the laws of another jurisdiction. Any controversy or claim arising out of or in any way relating to this Contract which cannot be amicably settled without court action shall be litigated in a California State Court of competent jurisdiction; or if jurisdiction over the action cannot be obtained in a California State Court, in a Federal Court of competent jurisdiction situated in the State of California.
- 21.4 DISPUTE RESOLUTION
- 21.4.1 PROCEDURE: The Parties shall attempt in good faith to resolve any dispute arising out of or relating to this Contract promptly by negotiations between a vice president of PG&E or his or her designated representative and an executive of similar authority of Consultant. Either Party may give the other Party written notice of any dispute. Within twenty (20) days after delivery of said notice, the executives shall meet at a mutually acceptable time and place, and thereafter as often as they reasonably deem necessary to exchange information and to attempt to resolve the dispute. If the matter has not been resolved within thirty (30) days of the first meeting, either Party may initiate a mediation of the controversy.
- 21.4.2 CONFIDENTIALITY: All negotiations and any mediation conducted pursuant to this clause are confidential and shall be treated as compromise and settlement negotiations, to which Section 1119 of the California Evidence Code shall apply, and Section 1119 is incorporated herein by reference.
- 21.4.3 PRELIMINARY INJUNCTION: Notwithstanding the foregoing provisions, a Party may seek a preliminary injunction or other provisional judicial remedy if in its judgment such action is necessary to avoid irreparable damage or to preserve the status quo.
- 21.4.4 CONTINUATION OF WORK: Each Party shall continue to perform its obligations under this Contract pending final resolution of any dispute arising out of or relating to this Contract.
- 21.5 HAZARDOUS MATERIALS: The California Health and Safety Code requires businesses to provide warnings prior to exposing individuals to materials listed by the Governor as chemicals "known to the State of California to cause cancer, birth defects or reproductive harm." PG&E uses chemicals on the Governor's list at many of its facilities. In addition, many of these chemicals are present at non-PG&E-owned facilities and locations. Accordingly, in performing the Work or services contemplated under this Contract, Consultant, its employee, agents, and Subcontractors may be exposed to chemicals on the Governor's list. Consultant is responsible for notifying its employees, agents, and Subcontractors that Work performed hereunder may result in exposures to chemicals on the Governor's list.
- 21.6 NON-WAIVER: The waiver by either Party of any breach of any term, covenant or condition contained in this Contract, or any default in the performance of any obligations under this Contract, shall not be deemed to be a waiver of any other breach or default of

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the same or any other term, covenant, condition or obligation. Nor shall any waiver of any incident of breach or default constitute a continuing waiver of the same.

- 21.7 ENFORCEABILITY: In the event that any of the provisions, or application of any of the provisions, of this Contract are held to be illegal or invalid by a court of competent jurisdiction or arbitrator/mediator, PG&E and Consultant shall negotiate an equitable adjustment in the provisions of this Contract with a view toward effectuating the purpose of this Contract. The illegality or invalidity of any of the provisions, or application of any of the provisions, of this Contract will not affect the legality or enforceability of the remaining provisions or application of any of the provisions of the Contract.
- 21.8 INTEGRATION: This Contract constitutes the entire agreement and understanding between the Parties as to the subject matter of the Contract. It supersedes all prior or contemporaneous agreements, commitments, representations, writings, and discussions between Consultant and PG&E, whether oral or written, and has been induced by no representations, statements or agreements other than those expressed herein. Neither Consultant nor PG&E shall be bound by any prior or contemporaneous obligations, conditions, warranties or representations with respect to the subject matter of this Contract.
- 21.9 SURVIVAL: The provisions of this Contract which by their nature should survive expiration, cancellation or other termination of this Contract, including but not limited to provisions regarding warranty, indemnity, insurance, confidentiality and availability of information, shall survive such expiration, cancellation or other termination.

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EXHIBIT 1

EXHIBIT 1

PG&E'S SUPPLIER DIVERSITY PURCHASING POLICY

CONTRACTOR AND SUBCONTRACTORS OF ALL TIERS MUST COMPLY WITH PG&E'S SUPPLIER DIVERSITY PURCHASING POLICY IN THE AWARD OF ALL SUBCONTRACTS. This policy requires that Small, Women, Minority, and Disabled Veteran Business Enterprises (WMDVBEs) shall have the maximum practicable opportunity to participate in the performance of Work.¹

1. Contractor shall provide to each prospective Subcontractor a copy of this Exhibit.
2. Contractor shall provide a separate, signed Prime Supplier Plan consisting of a specific list of Subcontractors that will participate in the performance of the Work and a statement setting forth the Contractor's goals for WMDVBE subcontracting of all tiers and setting forth such additional good faith efforts Contractor and Subcontractors will employ to increase the participation of WMDVBE in the performance of the Work.
3. No later than the 10th of each month, Contractor shall submit its subcontracting spend with women, minority, and service disabled veteran owned suppliers direct payments to their diverse subcontractors using PG&E's electronic reporting system located at:
<https://www.pgesupplierdiversity.com/pge/login.asp>
 - a. To establish a user ID, Contractor shall submit a request via email to the following address: supplierdiversityteam@pge.com
4. In addition, for contracts exceeding \$500,000 (or \$1 million for construction contracts), the Contractor must comply with the Policy Regarding Utilization of Small Business Concerns and Small Disadvantaged Business Concerns, as described in Exhibit 1A. The Prime Supplier Plan for these contracts must include provisions for implementing the terms prescribed in Exhibit 1A.
 - a. Small Business and Small Disadvantaged Business Prime Supplier Plans are not required for small business contractors, personal service contracts, contracts that will be performed entirely outside of the United States and its territories, or modifications to existing contracts which do not contain subcontracting potential.
 - b. For all PG&E contracts, the Contractor shall act in accordance with the Prime Supplier Plan in the performance of the Work and in the award of all Subcontracts.
5. Contractor's **supplier diversity subcontracting goal** for this Contract is ____%. Contractor shall report its supplier diversity goal as Contractor's spend with verified WMDVBE Subcontractors on PG&E Work under this Contract.

¹ WMDVBEs must be verified pursuant to the procedures prescribed in Section 2 of CPUC General Order 156.



**Pacific Gas and
Electric
Company**

List of Subcontractors and Disbursement Record

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Sourcing
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EXHIBIT 1-A

Prime Contractor/Supplier:	Name of Preparer:
PG&E Contract Number (if any):	Telephone: ()
PG&E Project/Product:	E-Mail:
Contract Duration (Year):	Total Bid Value:
From:	To:

Name of Subcontractor (1)	WMDVBE Status Code*	V**	NV***	Address (5)	Description of Work (6)	Estimated Amount to be Paid to Subcontractors (7)
* Refer to Instructions/Codes/Definitions on back. ** V = Subcontractor is a verified WMDVBE. *** NV = Subcontractor is <u>not</u> a verified a verified WMDVBE				(8) Estimated Total Amount to be Paid to All Verified WMDVBE Subcontractor(s): (9) Total Bid Value: (10) Estimated Percentage to be Paid to All Verified WMDVBE Subcontractor(s) (a-b):		

* Refer to Instructions/Codes/Definitions on back.
** V = Subcontractor is a verified WMD/VBE.

*** NV = Subcontractor is not a verified a verified WMDVBE

Signature:

I hereby verify that the listed information is true and accurate to the best of my knowledge.

The successful bidder(s) will be expected to register and report all monthly subcontracting spending with verified WMDVBE subcontractors at www.pgcsupplierdiversity.com for the duration of the contract.

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STEP-BY-STEP INSTRUCTIONS

Complete column numbers 1-10 and return this form with your bid proposal (Please attach copies of diverse Subcontractors certifications with your bid proposal).

- (1) Include the complete name of the subcontractor.
- (2) Indicate the supplier's minority code (see definitions and codes below).
- (3) Place a "V" in the box if the subcontractor is a **verified** WBE or MBE supplier by the CPUC Clearinghouse or a **verified** DVBE certified by the Department of General Services.
- (4) Place a "NV" in the box if the subcontractor is **not verified**.
- (5) Include the address, city, state and zip of the subcontractor.
- (6) Describe the work that the subcontractor will be performing.
- (7) Indicated the estimated amount to be paid to each subcontractor for the duration of the contract.
- (8) Indicate the estimated total amount to be paid to all **verified** subcontractors for the duration of the contract.
- (9) Indicate the proposed bid value.
- (10) Indicate the percentage of the bid value to be paid to all verified subcontractors. Divide the estimated dollars to be paid to all **verified** WMDVBE subcontractors by the total bid value.

DEFINITIONS AND CODES

WBE	Women Business Enterprise: A business enterprise that is at least 51 percent owned by a woman or women, or, in the case of any publicly-owned business, at least 51 percent of the stock of which is owned by one or more women, and whose management and daily business operations are controlled by one or more of those individuals												
MBE	Minority Business Enterprise: A business enterprise that is at least 51 percent owned by a minority group or groups, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more minority-group individuals, and whose management and daily business operations are controlled by one or more of those individuals.												
	Minority Status:	001	African American Male	008	Hispanic American Female	009	Caucasian Male	010	Caucasian Female	011	Multi-Status	012	Other Groups
		002	African American Female									013	Small Business Enterprise
		003	Asian Pacific American Male									014	Service Disabled Veteran Business Enterprise
		004	Asian Pacific American Female										
		005	Native American Male										
		006	Native American Female										
		007	Hispanic American Male										
African Americans	Persons having origins in any black racial groups of Africa.												
Asian Pacific Americans	Persons having origins in Asia or the Indian Subcontinent, including, but not limited to, persons from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, Taiwan, India, Pakistan, and Bangladesh.												
Native Americans	Persons having origin in any of the original peoples of North America or the Hawaiian Islands, in particular, American Indians, Eskimos, Aleuts, and Native Hawaiians.												
Hispanic Americans	All persons of Mexican, Puerto Rican, Cuban, South or Central American, Caribbean, or other Spanish culture or origin.												
Caucasian	Includes all people of European and North African descent.												
Multi-Status	An enterprise that is wholly owned and controlled by a combination of minorities or women but whose majority ownership (at least 51%) is not vested with any one of these individuals.												
Other Groups	Groups whose members are found to be socially and economically disadvantaged by the Small Business Administration pursuant to Section 8 (d) of the Small Business Act as amended (15 U.S.C. 637 (d)), or by the Secretary of Commerce pursuant to Section 5 of Executive Order 11625.												
Small Business Enterprise (SBE)	A business defined pursuant to Section 3 of the Small Business Act (SBA) and relevant regulations pursuant thereto. If unsure, please contact your local Small Business Administration office for clarification.												
Service Disabled Veterans Business Enterprise (DVBE)	Has the same meaning as defined in subdivision (g) of the Military and Veterans Code and must meet the "Control" and "Operate" criteria. An enterprise which is 51 percent owned, or the stock is 51 percent owned, by one or more disabled veterans.												

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EXHIBIT 2

**POLICY REGARDING UTILIZATION OF SMALL BUSINESS CONCERNS AND
SMALL DISADVANTAGED BUSINESS CONCERNS**

The following policy of the United States shall be adhered to in the performance of this Contract:

- a) It is the policy of the United States that small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals shall have the maximum practicable opportunity to participate in performing contracts let by any Federal Agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals.
- b) Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of Contractor's compliance with this clause.
- c) As used in this Contract, the term "small business concern" shall mean a small business as defined in Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals" shall mean a small business concern (1) which is at least 51 percent unconditionally owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 percent of the stock of which is unconditionally owned by one or more socially and economically disadvantaged individuals; and (2) whose management and daily business operations are controlled by one or more of such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one of these entities which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirement of 13 CFR Part 124. Contractor shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, and other minorities, or any other individual found to be disadvantaged by the Administration pursuant to Section 8(a) of the Small Business Act. Contractor shall presume that socially and economically disadvantaged entities also include Indian Tribes and Native Hawaiian Organizations.
- d) Contractor acting in good faith may rely on written representations by its subcontractors regarding their status as either a small business concern or a small business concern owned and controlled by socially and economically disadvantaged individuals.²

EXHIBIT 3

**INJURY AND ILLNESS PREVENTION PROGRAM
Compliance Certificate**

The undersigned, the _____ of
(title/position)

_____, (Consultant), hereby certifies to PG&E as follows:
(name of Consultant)

1. That Consultant has an effective Injury and Illness Prevention Program which meets the requirements of all applicable laws and regulations, including but not limited to Section 6401.7 of the California Labor Code and that any Subcontractor hired by Consultant to perform any portion of the Work under this Contract has an effective Injury and Illness Prevention Program; and
2. That he or she is the person with the authority and responsibility for implementing and administering Consultant's Injury and Illness Prevention Program.

IN WITNESS WHEREOF, the undersigned has executed this Compliance
Certificate on _____

Signature

Print Name

EXHIBIT 4

**PG&E DRUG AND ALCOHOL
ABUSE AND TESTING POLICIES**

- 1.0 PREFACE: PG&E is committed to maintain and promote job safety and health for all workers at its facilities. In addition, PG&E is determined to protect its employees, customers, and the general public while they are on PG&E property from any harm caused by illegal drug and alcohol use by non-PG&E personnel. To accomplish these objectives, PG&E has established the following drug and alcohol policy for access to PG&E facilities by its Contractor and Subcontractor personnel.
- 2.0 COVERAGE: This policy applies to the personnel of all PG&E Contractors and Subcontractors performing any work or services at PG&E offices and/or any other PG&E facilities.
- 3.0 POLICY: PG&E may deny access to, or remove from, its facilities the personnel of any Contractor or Subcontractor, who PG&E has reasonable grounds to believe has:
 - 3.1 Engaged in alcohol abuse or illegal drug activity which in any way impairs PG&E's ability to maintain safe work facilities, to protect the health and well-being of PG&E employees, customers, and the general public, and to promote the public's confidence in PG&E's service and operations; or
 - 3.2 Been found guilty, pled guilty, or pled nolo contendere to a charge of sale or distribution of any illegal drug or controlled substance as defined under Federal or California law within the past five years, unless the criminal record was later expunged or sealed by a court order.
- 4.0 PROHIBITED ACTIVITIES: The following activities are prohibited at all facilities owned or leased by PG&E:
 - 4.1 Possessing, furnishing, selling, offering, purchasing, using or being under the influence of illegal drugs or other controlled substances as defined under Federal or California law;
 - 4.2 Possessing, furnishing, selling, offering, or using alcoholic beverage, or being under the influence of alcohol.
- 5.0 ACTIONS: Where reasonable cause exists that paragraph 18.4 of this policy has been violated, the Contractor or Subcontractor must inform the PG&E representative responsible for the Contract. The Contractor or Subcontractor is also expected to take any or all of the following actions to the fullest extent they are permitted under governing collective bargaining agreements and/or its applicable security and human resources policies.
 - 5.1 Search the individual, his or her vehicle, locker, storage area, and personal effects;
 - 5.2 Require the individual to undergo a medical examination to determine their fitness for duty. Such examination shall include obtaining a urine and/or blood specimen for drug or alcohol analysis unless the examining physician deems such tests to be inappropriate;
 - 5.3 Take any other appropriate action to determine if there has been a violation of paragraph 18.4. Refusal to comply with a request made under this paragraph shall be grounds for denying access to, or immediate removal from, any PG&E facility.
- 6.0 PERMISSION TO RE-ENTER: Any individual who has been denied access to, or removed from, PG&E facilities or violating this policy may obtain permission to enter or reenter provided the individual establishes, to the satisfaction of his or her employer and PG&E, that the previous activity which formed the basis for denying access or removal has been corrected and his or her future conduct will conform with this policy. PG&E retains the right of final approval for the entry or reentry of any individual previously denied access to or removed from PG&E facilities.



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. 206
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX I
ATTACHMENT 2
SPECIFICATION FOR INDEPENDENT EVALUATOR SERVICES

CONFIDENTIAL

Attachment No. 1 Specific Conditions



**PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA**

SPECIFICATION

for

Independent Evaluator Services

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Attachment 2: CONSULTING SERVICES GENERAL CONDITIONS

SPECIFIC CONDITIONS

(hereinafter referred to as "Consultant") located at _____ and
PACIFIC GAS AND ELECTRIC COMPANY (hereinafter referred to as "PG&E"), a California
corporation, whose corporate offices are located at 77 Beale Street, San Francisco, CA 94105,
agree as follows:

1.0 GENERAL AND PURPOSE

This Contract is to establish the terms and conditions for Consultant to
and as described in Section 4.0, Scope of Work, of the Specific Conditions (hereinafter referred to
as "Work") on as needed basis. Work shall comply with the requirements of this Specification. In
the event that PG&E shall desire the performance of Work by Consultant, the Work will be
described in detail in the form of a Contract Work Authorization ("CWA") and in accordance with
Section 3.0, Contract Work Authorization Process, of these Specific Conditions. Consultant agrees
that all Work shall be performed as outlined in the Specific Conditions and the General Conditions,
attached and made part of the Contract, and each specific CWA that PG&E issues hereunder.

- 1.1 Consultant shall coordinate Work with PG&E Work Supervisor during project bid solicitation
to ensure that PG&E's competitive bid process is transparent to Consultant. This Contract is
effective for the period of time specified in Section 7.0, Term of Contract, of the Specific
Conditions. Any amendment related to the services provided in this Contract must be
authorized by the issuance and execution of a Contract Change Order by both Consultant
and PG&E prior to performance of the amended services defined in this Contract.
- 1.2 It is mutually agreed that no funds have been committed or will be paid by PG&E upon
execution of the Contract.
- 1.3 **NON-EXCLUSIVITY: THE PARTIES AGREE THAT THIS CONTRACT DOES NOT
ESTABLISH AN EXCLUSIVE CONTRACT BETWEEN PG&E AND CONSULTANT NOR
CONSTITUTE A COMMITMENT BY PG&E, WHETHER EXPRESSED OR IMPLIED, TO
CONTRACT WITH CONSULTANT TO PERFORM OR SUPPLY ANY WORK; NOR IS
THERE ANY GUARANTEE AS TO VOLUME OF WORK OR THE DURATION OF THIS
CONTRACT. PG&E EXPRESSLY RESERVES ALL ITS RIGHTS, INCLUDING BUT NOT
LIMITED TO THE FOLLOWING: THE RIGHT TO UTILIZE OTHERS TO PERFORM OR
SUPPLY WORK OF THE TYPE CONTEMPLATED BY THE CONTRACT; THE RIGHT TO
REQUEST PROPOSALS FROM OTHERS WITH OR WITHOUT REQUESTING
PROPOSAL(S) FROM CONSULTANT FOR WORK OF THE TYPE CONTEMPLATED BY
THE CONTRACT AND THE UNRESTRICTED RIGHT BY PG&E TO BID OR PERFORM
ANY SUCH WORK.**

2.0 DEFINITIONS

The definitions in Section 1.0, Definitions, of the General Conditions are supplemented with the
following:

- 2.1 **Bidder:** Participant in a competitive solicitation for power contracts pursuant to CPUC
Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 conducted by PG&E.
- 2.2 **PG&E Work Supervisor:** PG&E's employee or agent representing PG&E's interest in
connection with the Work described in this Contract to be issued under this Contract and who
has ultimate oversight and approval over Work pertaining to the Contract, monitoring
Contract expenditures and authorizing invoice payments.
- 2.3 **PRG:** PG&E's Procurement Review Group, established by the CPUC to oversee PG&E's
procurement strategy, processes, and contracts.

2.4 **Supplier:** Vendor of services and/or products to PG&E.

3.0 CONTRACT WORK AUTHORIZATION PROCESS

Consultant agrees to perform the Work in accordance with the terms and conditions set forth in the Contract. Any CWA that PG&E may issue under this Contract will provide more detailed information for Consultant. The process that Consultant shall follow in performing Work is outlined below. A sample CWA form is incorporated herein as Exhibit A.

3.1 When PG&E has identified a potential need for Consultant's services under the Contract, the PG&E Work Supervisor will first submit to the Consultant a written or verbal request for proposal soliciting Consultant's estimates for performing the proposed Work. PG&E's request for proposal will include but is not limited to the following:

- description of Work,
- location of Work,
- start date, timeline, end date, deliverables and associated deliverable due dates,
- acceptance criteria
- performance criteria or guarantees
- Consultant responsibilities
- PG&E's responsibilities
- industry standard to be followed
- special qualification for the Consultant employee(s) performing the Work
- special conditions to be considered
- special equipment or software required to perform Work
- maximum not-to-exceed amount on Time and Material basis or fixed price amount on Lump Sum basis for Work to be performed
- and other requirements as appropriate for the Work.

3.1.1 Consultant acknowledges that PG&E may elect to solicit proposals from other sources for the same proposed Work.

3.2 Within the timeframe specified in PG&E's request for proposal, Consultant shall provide PG&E Work Supervisor with a copy of Consultant's proposal for the performance of the Work. The proposal shall include a detailed breakdown as follows:

3.2.1 Consultant's estimated costs including labor, materials, and other direct project expenses.

3.2.2 Consultant's work schedule shall include work completion dates. Consultant shall note any proposed changes to, or problems meeting, PG&E's proposed schedule, and explain in writing why the changes are being proposed.

3.2.3 Consultant shall list all pre-existing rights to any materials to be utilized for specific CWA.

3.3 PG&E will review Consultant's proposal. If necessary, PG&E Work Supervisor will discuss with the Consultant any modifications or changes to the proposal. If PG&E Work Supervisor recommends authorizing Consultant to perform the services and tasks, then PG&E Work Supervisor will order the services in writing using a CWA, authorizing Consultant to commence with the Work.

3.4 Each CWA issued will include the detailed description of the Work to be performed by Consultant; specific Work location(s); required start and completion date, deliverables and other requirements as appropriate for the Work.

3.4.1 Each CWA will state:

- A maximum not-to-be exceeded amount for Work to be performed on a Time and Material basis, or
- A fixed price amount for work to be performed on a Lump Sum basis, or
- A combination of both

3.4.2 Each CWA will state all of Consultant's pre-existing rights to any materials furnished thereunder.

- 3.5 Consultant shall not commence Work until a CWA has been fully executed by both parties. Consultant's acceptance will be noted by signing a copy of the CWA and returning it to PG&E by electronic or facsimile transmission. Work shall be completed in accordance with the terms specified in the CWA. Time is of the essence in Consultant's performance of the Work.
- 3.6 Any Work performed by Consultant prior to approval by PG&E Work Supervisor and the signing by both parties of a CWA shall be at Consultant's risk.
- 3.7 Changes to an executed CWA shall be prepared and approved in the same manner as an original CWA, with both parties signing the amended CWA.
- 3.8 CWAs which are executed pursuant to this Contract and which have completion dates beyond the completion date of the Contract shall continue to be governed by the terms of the Contract until the expiration of such CWAs.
- 3.9 THE TERMS AND CONDITIONS OF THIS CONTRACT SHALL APPLY INDEPENDENTLY TO EACH CWA ISSUED UNDER THIS CONTRACT.
- 3.10 THE TERMS AND CONDITIONS OF THIS CONTRACT SHALL NOT BE MODIFIED IN WHOLE OR IN PART, NOR SHALL ANY SUCH PURPORTED MODIFICATION OR CHANGE BE BINDING OR EFFECTIVE, BY THE USE OF ANY CWA.

4.0 SCOPE OF WORK

5.0 CONSULTANT RESPONSIBILITIES

- 5.1 When providing Work as described in this Contract for PG&E, Consultant shall not perform any activity other than those listed above without the express prior written consent of PG&E.
- 5.2 In performing Work described in this Contract, Consultant will be provided access to any and all of PG&E's data and evaluation models used in the solicitation, and all communications between PG&E, Suppliers and Bidders. Consultant shall treat such information as confidential and in accordance with Section 11, Confidentiality, of the Specific Conditions.
- 5.3 In performing Work as described in this Contract, if Consultant perceives he is the target of any attempt to improperly influence, pressure, or otherwise affect is finding – whether by PG&E, any Bidder, any market participant, any individual member of the PRG, or any other party whatsoever, Consultant shall immediately notify the PRG of such attempt.
- 5.4 SUBCONTRACTOR: Assignment of part or parts of the Work pursuant to this Contract to Subcontractor(s) shall be in accordance with Section 3.0, Subcontract, of the General Conditions. Consultant shall obtain approval of assignment from PG&E Work Supervisor. The assigning or subcontracting of any such Work shall not relieve the Consultant of any of its liabilities under this Contract.
- 5.4.1 Consultant shall submit a list of all proposed Subcontractor(s) in the performance of Work prior to the beginning of Work. PG&E reserves the right to refuse any person, organization or subcontractor to participate in the performance of Work. PG&E shall not honor any claims arising from PG&E exercising this right of refusal.

5.4.2 Consultant shall ensure that Subcontractor(s) shall comply with this Contract and shall perform the Work in accordance therewith. Without limiting the foregoing, Subcontractors shall, for example, have the required credentials to perform Work (e.g. capability of performing independent market valuation of renewable energy contracts, substantial prior experience with electric procurement, power generation technologies, and the economics of generation and power markets); shall provide insurance of the same type and limits as required of Consultant (See Section 30.0, Insurance, of the General Conditions), unless otherwise authorized in writing by PG&E; and shall abide by provision of Section 11.0, Confidentiality, of the Specific Conditions.

5.4.3 Subcontractor(s) shall be responsible to the Consultant, and Work performance by the Subcontractor(s) shall be the sole responsibility of the Consultant; however, PG&E Work Supervisor, and/or PG&E personnel authorized by PG&E Work Supervisor shall have the privilege and rights provided under the Contract governing the Work of the Consultant. Nothing in this Contract shall create any contractual relationship between a Subcontractor and PG&E.

5.5 CONSULTANT VALUES: PG&E places high value on our Customers, employees and shareholders; the environment; safety; continuous improvement; and conducting business in an ethical manner, as stated in Exhibit B, Contractor Values and Section 4.0 of the General Conditions. We expect Consultant and its Subcontractor working for PG&E to do the same.

6.0 PG&E'S RESPONSIBILITIES

6.1 PG&E Work Supervisor identified in each CWA will be the point of contact for Consultant.

6.2 PG&E Work Supervisor will confirm Consultant invoices and approve payments.

7.0 TERM OF CONTRACT

7.1 The effective date of this Contract is the execution of Contract by both parties and shall expire

7.2 MODIFICATION TO A CONTRACT: As set forth in Section 10, Amendments, of the General Conditions and reiterated here to reinforce the point, changes to an executed Contract shall be in the form of a Contract Change Order with both parties signing the Contract Change Order.

8.0 PAYMENT TERMS

8.1 COMPENSATION: Work performed by Consultant under the Contract shall be compensated on Time and Materials as set forth in Consultant Hourly Rate Schedule, Exhibit C, of the Specific Conditions, and in accordance with Section 6.0, Billing and Payment, of the General Conditions.

8.1.1 RATE ADJUSTMENT: At PG&E's discretion, Consultant Hourly Rate Schedule (Exhibit C) may be adjusted annually based on the percentage change in US Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U).

8.1.2 Any substitution or additions to Subcontractor(s) listed in Exhibit C of the Specific Conditions shall be provided in accordance with Section 5.4 of the Specific Conditions.

8.1.3 REIMBURSABLE EXPENSE: PG&E will reimburse Consultant for expenses incurred in the performance of Work in accordance with Sections 6.2.4, Expenses; 6.2.6, Mileage and Use of Personal Car; and 6.2.7, Supporting

Documentation, of the General Conditions. Consultant shall not charge a markup on reimbursable expenses.

- 8.2 **INVOICE PAYMENT:** For Consultant's satisfactory performance of the Work and any associated deliverables and upon acceptance of Work and any associated deliverables by PG&E Work Supervisor, Consultant shall invoice PG&E in accordance with the Section 6.0, Billing and Payment, of the General Conditions. All payments will be made, subject to PG&E approval, within forty five days (45) days after receipt of a correct invoice.

- 8.2.1 Should Consultant elect for an earlier payment schedule, PG&E offers payment within fifteen (15) days after receipt of correct invoice subject to an early payment discount of one and one half percent (2.0%) of the invoiced amount.

9.0 NOTICES

- 9.1 Any notices required or permitted to be given under this Contract shall be in writing and shall be sent by U.S. Mail, telecopy, facsimile or delivered personally, addressed to the parties listed below or such other address as either party may from time to time designate by written notice in the manner set forth below. Any such notice shall be deemed given, if mailed, on the date of receipt, or if telecopied or hand-delivered, on the date of such delivery. All notices of breach shall be sent by Certified Mail, Return Receipt Requested to:

Consultant Representative:

Contract Issues:

PG&E Work Supervisor: To be provided in each CWA

10.0 CONFLICTS BETWEEN TERMS

- 10.1 Where there is any conflict in the Specific Conditions stated herein and the General Conditions, the Specific Conditions shall control. Should a conflict exist between the Specific Conditions and General Conditions and applicable Federal, State or local law, rule regulation, order or code, the law, rule, regulation, order or code shall control. Varying degrees of stringency between the General Conditions, Specific Conditions, drawings, laws, rules, regulation, order, or codes are not deemed conflicts; and the most stringent requirement shall control.

11.0 CONFIDENTIALITY

- 11.1 In addition to the requirements found at Section 25.0 of the General Conditions, Consultant shall abide by the following additional terms of this Section 11.0, Confidentiality, regarding the handling of confidential or proprietary information from PG&E.
- 11.2 Consultant agrees that all confidential or proprietary information:
- shall be used solely for the purpose of performing services and Work for PG&E and as mandated by CPUC Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050; and
 - shall not be reproduced, copied, in whole or in part, except as specifically, authorized by PG&E and necessary to the purpose set forth in (a) above; and
 - shall, together with any copies, reproductions and other records, thereof, in any form, and all information and materials developed by Consultant therefrom, be returned to PG&E when no longer needed for the performance of Consultant's services and Work for PG&E.
- 11.3 In the event that Consultant is in doubt whether certain information is confidential and/or Proprietary Information, Consultant shall treat the information as confidential and/or Proprietary Information.
- 11.4 Consultant hereby agrees that it will require all of its employees, Subcontractors, and Subcontractor employees who will perform Work or services under this Contract to sign a

non-disclosure agreement in the form attached hereto as Exhibit D, Non-Disclosure and Use of Information Agreement. Prior to starting said Work or services, Consultant shall promptly furnish the original signed non-disclosure agreements to PG&E

12.0 SUPPLIER DIVERSITY PROGRAM POLICY

The Consultant must read and comply with the requirements of PG&E's Supplier Diversity Program Policy contained in Section 32.2, PG&E's Policy, of the General Conditions and Exhibit 1 to the General Conditions.

12.1 CPUC General Order 156 promotes purchasing goods and services from women, minority and disabled veteran-owned and controlled business enterprises (WMDVBEs).

12.2 There are no specific WMDVBE goals that have been established for Consultant to meet in this Contract. However, PG&E expects Consultant to assist PG&E in working with WMDVBEs. As part of Consultant's proposal, Consultant set forth WMDVBE spending which it deems to be appropriate for this Contract.

12.3 Consultant shall submit to PG&E, in writing, a subcontracting and/or supplier plan in accordance with the requirements of Exhibit 1 to the General Conditions.

12.4 In addition to the subcontracting plan, Consultant shall provide to PG&E a list of verified WMDVBE's that it expects to do business with during the term of this Contract and shall submit this information on Exhibit 1-A.

12.5 Primary verification of WMDVBEs shall be the CPUC WMDVBE Clearinghouse.

12.6 **REPORTING COMMITMENT:** Consultant shall provide timely and accurate reporting of Consultant's detailed spent information with diverse suppliers on PG&E's Supplier Diversity Management System (SDMS) as described in Exhibit 1 of the General Conditions.



Exhibit A

Contract Work Authorization (CWA)

This Contract Work Authorization ("CWA") No. [enter #] is issued under and pursuant to the Blanket Agreement or Master Service Agreement No. [enter #] dated [enter Date] (the "MSA") between the below-named Contractor ("Contractor"), [enter Legal Title], and Pacific Gas and Electric Company ("PG&E"), a California corporation with its headquarters located at 77 Beale Street, San Francisco, California 94105. Contractor shall perform all Work under this CWA pursuant to and in accordance with the terms and conditions of the MSA.

Contractor's
Legal Name: [enter Name]

Total Number of Pages: [enter #]

Contractor's
Address: [Street Address]
[PO Box]
[City, State Zip Code]

Project Name: [enter Name]

Job Location: [enter Location]

WORK: Contractor shall, at its own risk and expense, perform the Work described in this Contract Work Authorization and furnish all labor, equipment, and materials necessary to complete the Work as summarized below and as more fully described in Attachment 1, Scope of Work.

[enter Work Summary here]

ATTACHMENTS: Each of the following documents are attached to this CWA and are incorporated herein by this reference:

Attachment 1: Scope of Work, [enter Pages # through #]

[enter Attachment # (Use for additional attachments or Delete)]

CWA TERM: This CWA is effective upon signature by both parties and expires on [enter Date]. Time is of the essence.

CWA COMPLETION: Contractor shall commence performance hereof when directed to do so by PG&E and Work shall be completed by the completion date of [enter Date].

CONSIDERATION: As full consideration for satisfactory performance of the Work under this CWA by Contractor, PG&E's total obligation to Contractor shall not exceed the following amount. This amount is inclusive of all taxes incurred in the performance of the Work. Any change to this amount shall only be authorized in writing by a PG&E CWA Change Order, fully executed by both PG&E and Contractor.

TOTAL: [enter total dollar amount and appropriate language based on pricing method for Work]

THE PARTIES, BY SIGNATURE OF THEIR AUTHORIZED REPRESENTATIVES, HEREBY AGREE TO THE TERMS OF THIS CONTRACT WORK AUTHORIZATION.

PACIFIC GAS AND ELECTRIC COMPANY		CONTRACTOR: [enter FIRM NAME HERE]	
Signature		Signature	
Name	[enter Name]	Name	
Title	[enter Title]	Title	
Date		Date	

62 1220 CWA (12-1-08)

Decision No. 12-01-033

Sourcing

Issued by
Brian K Cherry
Vice President
Regulation and Rates

Date Filed April 11, 2012
Effective
Resolution No.

CWA No. [enter #]
Page 2 of [enter #]

ADMINISTRATION			
PG&E Negotiator	[enter Name]	Contractor Represent	
Phone	[enter #]	Phone	
Email	[enter Address]	Email	
Accounting Reference	[enter Account # if known or Delete]		
PG&E Work Supervisor:	[enter Name]	Phone:	[enter #]
INVOICE INSTRUCTIONS: Contractor shall send invoices for each payment when due, showing the CWA number, to: PACIFIC GAS AND ELECTRIC COMPANY	Send ORIGINAL Invoice to:	PG&E Accounts Payable* PO Box 7760 San Francisco, CA 94120-7760	
	Send COPY of Invoice to:	[Name] [Street Address/Mail Code] [City, State Zip Code]	
	For information regarding invoice status, call PG&E's Paid Help Line at (800) 756-PAID (7243) or go to AP Web Reporting site at www.pge.com/actpay . *Note: Contractors using the XIGN System do not need to mail a copy of the invoice to PG&E.		

INTERNAL PG&E USE ONLY		
Distribution Date		
Distribution of Copies:	☐ Document Services (Signed Original Copy) Mail Code N5D 245 MARKET ST., SAN FRANCISCO	☐ Contractor (Signed Original Copy)
	☐ Work Supervisor	☐ Manager
	☐ Invoice Approver	☐ Supervisor
	☐ V.P.	☐ Sourcing/ Purchasing
	☐ Director	☐ Law



Pacific Gas and Electric Company **Contractor Values**

Exhibit B

PG&E places high value on our customers, employees, and shareholders, the environment, safety, continuous improvement; and conducting our business in an ethical manner. We expect contractors working for PG&E to do the same. We will judge their performance, in part, on how these values are met in the course of working for us.

CUSTOMER RELATIONS: PG&E is committed to understanding the services that are of value to our customers in an increasingly diverse society and providing those services safely, dependably, courteously, and at fair prices. Actions of our contractor affect our customers' and the general public's perception of PG&E; therefore, we expect our contractors to conduct their work in this same safe, dependable, and courteous manner.

ENVIRONMENT: PG&E is dedicated to being a leader in the energy industry with respect to environmental issues. Environmental protection and enhancement is a fundamental corporate direction as PG&E recognizes that a sound environmental policy and sound business practices go hand in hand. PG&E expects its contractors to contribute to the success of maintaining our leadership in the environmental arena by conducting all aspects of work performed for PG&E in an environmentally sensitive manner which maintains and, when feasible, improves the quality of the environment.

SAFETY: PG&E is committed to maintain and promote job safety and health for our employees, customers and the general public, and we expect contractors performing work for PG&E to do the same. We are committed to working with contractors who conduct their work safely by providing adequate training and a safe work environment.

CONTINUOUS IMPROVEMENT: PG&E includes among its corporate goals providing its employees with fair compensation and the opportunity for fulfilling careers and individual growth. One way of accomplishing this objective is by continually improving our work processes in all aspects of our business. A major element of continuous improvement is employee involvement. We expect our contractors to be a part of this process by joining with PG&E in creating a work environment that encourages all employees to become involved by sharing experiences, viewing other employees as a resource, recognizing and reinforcing behaviors that lead to work process improvements and participating in collaborative efforts with PG&E to improve the work process.

BUSINESS ETHICS: Integrity, honesty, professionalism, and ethical business conduct are expected of all our contractors.

Exhibit C

2010 CONSULTANT HOURLY RATE SCHEDULE

Company	Name	Labor Classification	Billing Rates (\$/Hr)

Other Reimbursable Expenses

Reference Contract's General Conditions Sections 6.2.4, Expenses; 6.2.5, Travel Time and Costs; 6.2.6, Mileage and Use of Personal Car; 6.2.7, Supporting Documentation; and 6.2.8, Invoice Deficiencies

Exhibit D

**PACIFIC GAS AND ELECTRIC COMPANY
NONDISCLOSURE AGREEMENT**

THIS NON-DISCLOSURE AGREEMENT (this "Agreement") is made as of _____, 200_ ("Effective Date") and entered into between Pacific Gas and Electric Company ("PG&E"), and _____ ("Consultant").

In consideration of the mutual covenants set forth below, the parties hereby agree as follows:

1. "Confidential Information" shall mean, collectively, all agreements and associated documents (regardless of whether such agreement(s) and associated documents are executed or in draft form), technical, financial and business information of any kind whatsoever including, where appropriate and without limitation, all data, specifications, technology, ideas, know-how, improvements, maps, technical drawings, inventions (whether or not patentable or copyrightable), trade secrets, that is provided by or on behalf of PG&E, and without limiting the foregoing, any other information as well as any and all tangible and intangible embodiments thereof of any kind whatsoever that would reasonably be considered the confidential or proprietary information of PG&E, its parent company, its subsidiaries or affiliates and/or third parties who have licensed or provided such information to PG&E given the nature of the information or manner of disclosure, in each case disclosed by or on behalf of PG&E to Consultant or obtained by Consultant through observation or examination of the foregoing, regardless of whether such information or embodiment has been marked as confidential or proprietary. Confidential Information shall not include information that Consultant can establish by written documentation:

- (a) has been publicly known prior to disclosure by PG&E of such information to Consultant;
- (b) has become publicly known, without fault on the part of Consultant or its Representatives, subsequent to disclosure by PG&E of such information to Consultant;
- (c) has been or is received by Consultant at any time on a non-confidential basis from a source, other than PG&E, lawfully having possession of and the right to disclose such information; or
- (d) has been independently developed by Consultant, as demonstrated by the written records of Consultant, without use of Confidential Information.

2. In the course of reviewing and evaluating information in connection with Work as California Public Utility Commission Independent Evaluator pursuant to California Public Utility Commission ("CPUC" or "Commission") Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 (the "Transaction"), PG&E may disclose certain Confidential Information to Consultant, with each such disclosure being subject on the terms and conditions of this Agreement. Consultant agrees to be bound by the terms and conditions in this Agreement in exchange for PG&E's disclosure of its Confidential Information.

3. Consultant hereby acknowledges that PG&E is the owner or licensee or rightfully has possession of the Confidential Information. Consultant shall not use any of the Confidential Information at any time except for the Transaction. Consultant shall hold the Confidential Information in strict confidence and shall not, directly or indirectly, disclose the Confidential Information to any third party without the prior written consent of PG&E. Consultant shall keep the Confidential Information in a safe and secure location. Consultant agrees to only disclose the Confidential Information to Consultant's employees on a need-to-know basis, as reasonably necessary, who are bound by written agreements with Consultant to maintain the Confidential Information of PG&E in confidence on terms that are materially similar to those set forth herein (collectively, the "Representatives").

4. Notwithstanding the foregoing, in the event that Consultant becomes legally compelled by deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar process to disclose any of the Confidential Information, Consultant shall give PG&E prompt prior written notice of such requirement so that PG&E may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Agreement and if such protective order or other remedy is not obtained, or PG&E waives compliance with the terms hereof, Consultant agrees to provide only that limited portion of the Confidential Information that it is required by the Commission pursuant to CPUC Decisions 04-12-048, 06-05-039, 07-012-052, and 09-06-050 and to ensure that all Confidential Information that is so disclosed will be accorded confidential treatment. PG&E may request that Consultant disclose certain information to the CPUC pursuant to the decisions referred to above. In that case, prior to such disclosure, Consultant shall work with PG&E to determine whether or not such information shall be marked confidential before being provided to the CPUC.

5. Upon the written request of PG&E, Consultant shall immediately return all tangible items relating to Confidential Information, including all written material, photographs, models, compounds, compositions and the like made available or supplied by PG&E to Consultant, and all copies and derivatives thereof. Without limiting the foregoing, Consultant that all confidential or proprietary information shall, together with any copies, reproductions and other records, thereof, in any form, and all information and materials developed by Consultant therefrom, be returned to PG&E or destroyed by Consultant, as PG&E shall instruct upon Consultant's completion of the Transaction. Consultant shall provide PG&E with a written certification of return or destruction signed by an officer or other individuals authorized to bind Consultant.

6. As between PG&E and Consultant, PG&E's Confidential Information will remain the property of PG&E. Nothing contained in this Agreement will be construed as obligating PG&E to disclose Confidential Information to Consultant, or as granting to or conferring on Consultant, expressly or by implication, any rights or license to the Confidential Information.

7. Consultant is aware, and will advise its Representatives who are informed of the matters that are the subject of this Agreement, of the restrictions imposed by the United States securities laws on the purchase or sale of securities by any person who has received material, non-public information from the issuer of such securities and on the communication of such information to any other person when it is reasonably foreseeable that such other person is likely to purchase or sell such securities in reliance upon such information.

8. Consultant will not disclose any information or make any news release, advertisement, public communication, response to media inquiry or other public statement regarding this Agreement, the Confidential Information, the Transaction and/or the potential commercial relationship between the parties or Consultant's performance hereunder without the prior written consent of PG&E. Consultant shall immediately refer all media inquiries concerning PG&E to PG&E. Consultant will not make any reference to PG&E or to the existence of this Agreement in any advertising or other publication (except for confidential, internal company publications), without PG&E's prior written consent and Consultant will not associate or in any way connect its name, trademark or any other intellectual property right to any name, trademark or any other intellectual property right of PG&E without PG&E's prior written consent. The fact that PG&E and Consultant have entered into this Agreement does not constitute, nor does it imply in any way, endorsement by PG&E of Consultant, and Consultant will not indicate or imply that PG&E endorses, recommends, or vouches for Consultant in any form of written, verbal, or electronic advertisement, communication, or any other business development effort, without PG&E's prior written consent.

9. PG&E and its agents, auditors (internal and external), and other representatives as PG&E may designate will have the right to inspect, examine and audit the systems, records, data, practices and procedures of Consultant with respect to Consultant's performance hereunder.

10. This Agreement shall last until and cover Confidential Information received by the Consultant for five (5) years following the Effective Date. Notwithstanding the foregoing, all of the Consultant's duties of confidentiality and non-use shall, with respect to Confidential Information, continue until such time that Confidential Information is no longer deemed confidential by PG&E or falls within one of the exceptions set forth in Section 1.

11. Consultant may not transfer or assign all or part of this Agreement, whether by operation of law or otherwise, without the prior written consent of PG&E.

12. PG&E makes no express or implied warranty or representation relating to the Confidential Information (including as to completeness) or its use, and hereby disclaims all warranties, including without limitation, the implied warranties of merchantability, fitness of a particular purpose and non-infringement. PG&E provides the Confidential Information on an "as is" basis and Consultant's use of the Confidential Information shall be at its own risk.

13. This Agreement represents the entire agreement between the parties regarding the subject matter hereof and shall supersede all previous communications, representations, understandings, acknowledgements and agreements, whether oral or written, by or between the parties with respect to Confidential Information, whether heretofore or hereafter disclosed between the parties.

14. No change, modification, extension, termination or waiver of this Agreement, or any of the provisions herein contained, shall be valid unless made in writing and signed by duly authorized representatives of the parties hereto. Regardless of PG&E's review, audit or inspection of Consultant, or other act or omission, Consultant will remain responsible for complying with all the terms and conditions of this Agreement and such acts or omissions of PG&E will not constitute a waiver.

15. This Agreement shall in no way be construed to (i) preclude in any way either party from pursuing any business opportunities; (ii) establish any relationship between the parties with respect to such business opportunities; or (iii) establish any relationship between the parties with respect to the Transaction.

16. Consultant shall be responsible for any breach of the provisions of this Agreement by it and its Representatives. In the event that Consultant learns of any unauthorized use or disclosure of Confidential Information or any other breach of this Agreement by the Consultant or its Representatives or reasonably believes such use, disclosure or breach to have occurred, Consultant shall immediately notify PG&E in writing, and shall cooperate with PG&E in every reasonable way to help PG&E regain possession of such Confidential Information and to prevent its further unauthorized use.

17. This Agreement shall be construed and interpreted in accordance with the laws of the State of California, excluding any choice of law rules which may direct the application of the laws of another jurisdiction. Any controversy or claim arising out of or in any way relating to this Agreement which cannot be amicably settled without court action shall be litigated in a California State Court of competent jurisdiction; or if jurisdiction over the action cannot be obtained in a California State Court, in a Federal Court of competent jurisdiction situated in the State of California..

18. Consultant understands and agrees that, because of the unique nature of the Confidential Information, PG&E will suffer irreparable harm if Consultant fails to comply with any of its obligations under this Agreement, and monetary damages inadequate to compensate PG&E for such breach. Accordingly, Consultant agrees that PG&E shall, in addition to any other remedies available to PG&E at law or in equity, be entitled to injunctive relief to enforce the terms of this Agreement without posting will be a bond or other undertaking. It is further understood and agreed that no failure or delay by PG&E in exercising any right, power or privilege hereunder shall cooperate as a waiver thereof, nor shall any single or partial exercise thereof preclude any other or further exercise thereof or the exercise of any right, power or privilege hereunder.

19. The covenants and agreements set forth in this Agreement are each deemed separate and independent, and if any such covenant or agreement is determined by any court of competent jurisdiction to be invalid or unenforceable for any reason, including without limitation by reason of such covenant or agreement extending for too great a period of time or over too great a geographical area, or by reason of its being too extensive in any other respect, such covenant or agreement, to the specific extent that it is unenforceable, shall be deemed automatically deleted from this Agreement and shall be interpreted to extend only over the maximum period of time and geographical area, and to the maximum extent in all other respects, as to which it is valid and enforceable, in order to effectuate the parties' intent to the greatest extent possible. Any such deletion or interpretation shall have no effect on the validity or enforceability of any remaining provision of this Agreement.

20. This Agreement has been negotiated by both parties and shall not be strictly construed against either party.

21. This Agreement may be executed in one or more original or faxed counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same instrument.

Intending to be legally bound, each of the undersigned Parties has caused its duly authorized representative to execute the Agreement as of the Effective Date.

Pacific Gas and Electric Company
By: _____
Printed: _____
Title: _____
Date: _____

By: _____
Printed: _____
Title: _____
Date: _____



Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. 223
Pacific Gas and Electric Company
Bundled Procurement Plan

APPENDIX J

GLOSSARY



A

ABOVE-MARKET COST - The cost of a service in excess of the price of comparable services in the market.

ABNORMAL PEAK DAY (APD) - An abnormal peak day is the coldest day which could reasonably be expected to occur within the Pacific Gas and Electric Company system for planning purposes and is based on the coldest day of record for the Pacific Gas and Electric Company territory.

ACCESS CHARGE - A charge paid by all market participants withdrawing energy from the ISO controlled grid. The access charge will recover the portion of a utility's transmission revenue requirement not recovered through the variable usage charge.

AFFILIATE – A company that is controlled by another or that has the same owner as another company.

AFFILIATED POWER PRODUCER - A generating company that is affiliated with a utility.

AGGREGATION - The process of organizing small groups, businesses or residential customer into a larger, more effective bargaining unit that strengthens their purchasing power with utilities.

AGGREGATOR - An entity that puts together customers into a buying group for the purchase of a commodity service. The vertically integrated investor owned utility, municipal utilities and rural electric cooperatives perform this function in today's power market. Other entities such as buyer cooperatives or brokers could perform this function in a restructured power market.

ALTERNATIVE ENERGY SOURCES – (See RENEWABLE ENERGY)

ANCILLARY SERVICES – Capacity, measured in MW, that is utilized by the control area operator to ensure electric system reliability.

ANIMAL WASTE CONVERSION - Process of obtaining energy from animal wastes. This is a type of biomass energy.

ANNUAL MAXIMUM DEMAND - The greatest of all demands of the electrical load which occurred during a prescribed interval in a calendar year.



AREA LOAD - The electrical load in given geographic area irrespective of what LSEs are providing generation services to end-users within the area.

Service Area Load is generally used to mean the load in an IOU distribution service area including loads served by IOUs through bundled service tariffs, loads served by ESPs under direct access, and loads served by CCAs through the provisions of AB 117. In addition, for the SCE service area the generation and loads of MWD Metropolitan Water district included.

Planning Area Load is generally used to mean Service Area Load plus the loads of publicly-owned utilities embedded within an IOU distribution service area or adjacent to the IOU distribution service area which collectively received transmission service from the PTO unit of an IOU.

PG&E and SCE provide transmission services to, and plan such services for, an extensive list of publicly-owned utilities in common with their own distribution service area customers. In contrast, SDG&E provides no such transmission services to publicly-owned utilities.

ASSOCIATED GAS - Natural gas that can be developed for commercial use, and which is found in contact with oil in naturally occurring underground formations.

ATTRIBUTES - The outcomes by which the relative “goodness” of a particular expansion plan is measured, e.g., fuel usage.

AUXILIARY ENERGY SUBSYSTEM - Equipment using conventional fuel to supplement the energy output of a solar system. This might be, for example, an oil-fueled generator that adds to the electrical output of substitutes for the solar system during long overcast periods when there is not enough sunlight.

AUXILIARY EQUIPMENT - Extra machinery needed to support the operation of a power plant or other large facility.

AVAILABLE BUT NOT NEEDED CAPABILITY - Capability of generating units that are operable but not necessary to carry load.

AVERAGE COST - The revenue requirement of a utility divided by the utility’s sales. Average cost typically includes the costs of existing power plants, transmission, and distribution lines, and other facilities used by a utility to serve its customers. It also included operating and maintenance, tax, and fuel expenses.



AVERAGE DEMAND - The energy demand in a given geographical area over a period of time. For example, the number of kilowatt-hours used in a 24-hour period, divided by 24, tells the average demand for that period.

AVERAGE HYDRO - Rain, snow and runoff conditions that provide water for hydroelectric generation equal to the most commonly occurring levels. Average hydro usually is a mean indicating the levels experienced most often in a 104-year period.

AVOIDED COST (Regulatory) - The amount of money that an electric utility would need to spend for the next increment of electric generation to produce or purchase elsewhere the power that it instead buys from a cogenerator or small-power producer.

B

BALANCED SCHEDULE - A Scheduling Coordinator's schedule is balanced when generation, adjusted for transmission losses, equals demand.

BALANCING - Making receipts and deliveries of gas into or withdrawals from a pipeline equal. Balancing may be accomplished daily, monthly or seasonally, with non-compliance charges generally assessed for excessive imbalance.

BASE LOAD - The lowest level of power production needs during a season or year.

BASE LOAD (For Gas) - As applied to gas, a given consumption of gas remaining fairly constant over a period of time, usually not temperature-sensitive.

BASE LOAD UNIT - A power generating facility that is economic to run in all hours at full or near full capacity levels.

BASELINE FORECAST - A prediction of future energy needs which does not take into account the likely effects of new conservation programs that have not yet been started.

BASELOAD CAPACITY - Generating equipment operated to serve loads 24-hours per day.

BASE RATE - That portion of the total electric or gas rate covering the general costs of doing business unrelated to fuel expenses.

BILATERAL CONTRACT - A two-party agreement for the purchase and the sale of energy and/or capacity products and services or financially settled products.

BIO-GAS - Methane produced by the decomposition or processing of organic matter.



BIOMASS - Energy resources derived from organic matter. These include wood, agricultural waste and other living-cell material that can be burned to produce heat energy. They also include algae, sewage and other organic substances that may be used to make energy through chemical processes.

BIOMETHANE (Purchase or Sale) - Pipeline quality natural gas produced from renewable (non-fossil based) resources. May include renewable or environmental attributes.

BLACK START – Critical generating units to ensure “black start” capability for purposes of system restoration.

BLACKOUT - A power loss affecting many electricity consumers over a large geographical area for a significant period of time.

BRITISH THERMAL UNIT (Btu) - The quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit from 58.5 to 59.5 degrees Fahrenheit under standard pressure of 30 inches of mercury at or near its point of maximum density. One Btu equals 252 calories, (gram), 778 foot-pounds, 1,055 joules or 0.293 watt hours.

BULK POWER MARKET - Wholesale purchases and sales of electricity.

BULK POWER SUPPLY - Often this term is used interchangeably with wholesale power supply. In broader terms, it refers to the aggregate of electric generating plants, transmission lines, and related-equipment. The term may refer to those facilities within one electric utility, or within a group of utilities in which the transmission lines are interconnected.

BUNDLED CUSTOMERS - Bundled customers are those customers of the IOU for whom the IOU provides a suite of “bundled” services, including procuring and supplying electricity, as well as providing transmission, distribution and customer services.

BUNDLED SERVICE - Electric power, transmission, distribution, billing, metering and related service provided by the IOU.

BURNER TIP - A generic term that refers to the ultimate point of consumption for natural gas.

BUSBAR - In electric utility operations, a busbar is a conductor that serves as a common connection for two or more circuits. It may be in the form of metal bars or high-tension cables.



BUY THROUGH - An agreement between utility and customer to import power when the customer's service would otherwise be interrupted.

BUYER - An entity that purchases electrical energy or services from the Power Exchange (PX) or through a bilateral contract on behalf of end-use customers.

C

CALIFORNIA ENERGY COMMISSION - The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000, *et seq.*) responsible for energy policy. The Energy Commission's five major areas of responsibilities are:

1. Forecasting future statewide energy needs;
2. Licensing power plants sufficient to meet those needs;
3. Promoting energy conservation and efficiency measures;
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels; and
5. Planning for and directing state response to energy emergencies.

Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account and other sources.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA - pronounced See' quah) - Enacted in 1970 and amended through 1983, established state policy to maintain a high-quality environment in California and set up regulations to inhibit degradation of the environment.

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) - A state agency created by constitutional amendment in 1911 to regulate the rates and services of more than 1,500 privately owned utilities and 20,000 transportation companies. The CPUC is an administrative agency that exercises both legislative and judicial powers; its decisions and orders may be appealed only to the California Supreme Court.

The major duties of the CPUC are to regulate privately owned utilities, securing adequate service to the public at rates that are just and reasonable both to customers and shareholders of the utilities; including rates, electricity transmission lines and natural gas



pipelines. The CPUC also provides electricity and natural gas forecasting, and analysis and planning of energy supply and resources. Its main headquarters are in San Francisco.

CALL-BACK - A provision included in some power sale contracts that lets the supplier stop delivery when the power is needed to meet certain other obligations.

CAPABILITY - Maximum load that a generating unit can carry without exceeding approved limits.

CAPACITY (Demand side) – The amount of power consumed by a customer, measured in MWs, that can be produced upon request.

CAPACITY (Purchase or Sale) - The amount of power capable of being generated, measured in MWs, that can be reduced upon request.

There are various types of electricity capacity:

Dependable Capacity: The system's ability to carry the electric power for the time interval and period specific, when related to the characteristics of the load to be supplied. Dependable capacity is determined by such factors as capability, operating power factor, weather, and portion of the load the station is to supply.

Installed (or Nameplate) Capacity: The total manufacturer-rated capacities of equipment such as turbines, generators, condensers, transformers, and other system components.

Peaking Capacity: The capacity of generating equipment intended for operation during the hours of highest daily, weekly or seasonal loads.

Purchased Capacity: The amount of energy and capacity available for purchase from outside the system.

Reserve Capacity: Extra generating capacity available to meet peak or abnormally high demands for power and to generate power during scheduled or unscheduled outages. Units available for service, but not maintained at operating temperature, are termed "cold." Those units ready and available for service, though not in actual operation, are termed "hot."

CAPACITY CHARGE - An assessment on the amount of capacity being purchased.

CAPACITY FACTOR - A percentage that tells how much of a power plant's capacity is used over time. For example, typical plant capacity factors range as high as 80 percent for geothermal and 70 percent for cogeneration.



CAPACITY RELEASE - A secondary market for capacity that is contracted by a customer which is not using all of its capacity.

CARBON DIOXIDE - A colorless, odorless, non-poisonous gas that is a normal part of the air. Carbon dioxide, also called CO₂, is exhaled by humans and animals and is absorbed by green growing things and by the sea.

CARBON MONOXIDE (CO) - A colorless, odorless, highly poisonous gas made up of carbon and oxygen molecules formed by the incomplete combustion of carbon or carbonaceous material, including gasoline. It is a major air pollutant on the basis of weight.

CIRCUIT - One complete run of a set of electric conductors from a power source to various electrical devices (appliances, lights, etc.) and back to the same power source.

CITYGATE, PG&E - On the PG&E gas system, the Citygate is any point at which the backbone transmission system connects to the local transmission and distribution system.

CLEAN FUEL VEHICLE - Is frequently incorrectly used interchangeably with "alternative fuel vehicle." Generally, refers to vehicles that use low-emission, clean-burning fuels. Public Resources Code Section 25326 defines clean fuels, for purposes of the section only, as fuels designated by ARB for use in LEVs, ULEVs or ZEVs and include, but are not limited to, electricity, ethanol, hydrogen, liquefied petroleum gas, methanol, natural gas, and reformulated gasoline.

COGENERATION - Cogeneration means the sequential use of energy for the production of electrical and useful thermal energy. The sequence can be thermal use followed by power production or the reverse, subject to the following standards:

- (a) At least 5 percent of the cogeneration project's total annual energy output shall be in the form of useful thermal energy.
- (b) Where useful thermal energy follows power production, the useful annual power output plus one-half the useful annual thermal energy output equals not less than 42.5 percent of any natural gas and oil energy input.

COGENERATOR - Cogenerators use the waste heat created by one process, for example during manufacturing, to produce steam which is used, in turn, to spin a turbine and generate electricity. Cogenerators may also be QFs.

COINCIDENCE FACTOR - The ratio of the coincident maximum demand of two or more loads to the sum of their noncoincident maximum demands for a given period. The



coincidence factor is the reciprocal of the diversity factor and is always less than or equal to one.

COMBINED CYCLE PLANT - An electric generating station that uses waste heat from its gas turbines to produce steam for conventional steam turbines.

COMBUSTION - Rapid oxidation, with the release of energy in the form of heat and light.

COMBUSTION TURBINE - A fossil-fuel-fired power plant that uses the conversion process known as the Brayton cycle. The fuel, oil, or gas is combusted and drives a turbine-generator.

COMMERCIAL OPERATION - Occurs when control of the generator is turned over to the system dispatcher.

COMMODITY CHARGE - A charge per unit volume or heat content (i.e., therm) of gas delivered to the buyer. Compare **DEMAND CHARGE**.

COMPETITIVE TRANSMISSION CHARGE (CTC) - A non-bypassable charge that customers pay to a utility for the recovery of its stranded costs.

COMMUNITY CHOICE AGGREGATION SERVICE (CCA SERVICE) - Allows customers to purchase electric power and, at the customer's election, participate in additional energy efficiency or conservation programs from non-utility entities known as Community Choice Aggregators (CCAs). It is a form of direct access.

COMMUNITY CHOICE AGGREGATOR - Any city, county, or city and county, or group of cities, counties, or cities and counties, whose governing board or boards elect to combine the loads of their residents, businesses, and municipal facilities in a community wide electricity buyers' program. (see PU Code § 331.5.) A CCA may also provide certain energy efficiency and conservation programs to its CCA customers.

COMPETITIVE BIDDING - This is a procedure that utilities use to select suppliers of new electric capacity and energy. Under competitive bidding, an electric utility solicits bids from prospective power generators to meet current or future power demands.

CONDENSER - A heat exchanger in which the refrigerant, compressed to a hot gas, is condensed to liquid by rejecting heat.

CONGESTION - A condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules simultaneously.



CONGESTION MANAGEMENT - Alleviation of congestion by the ISO.

CONSERVATION - Steps taken to cause less energy to be used than would otherwise be the case. These steps may involve improved efficiency, avoidance of waste, reduced consumption, etc. They may involve installing equipment (such as a computer to ensure efficient energy use), modifying equipment (such as making a boiler more efficient), adding insulation, changing behavior patterns, etc.

CONTINGENT FORWARD (Purchase or Sale) - A contract entered into in advance of delivery time, the performance of which is contingent upon the subsequent occurrence of one or more events agreed upon by the counterparties.

CONTRACT PATH - The most direct physical transmission tie between two interconnected entities. When utility systems interchange power, the transfer is presumed to take place across the "contract path," notwithstanding the electric fact that power flow in the network will distribute in accordance with network flow conditions. This term can also mean to arrange for power transfer between systems.

CONTRACTS FOR DIFFERENCES - A type of bilateral contract where the electric generation seller is paid a fixed amount over time which is a combination of the short-term market price and an adjustment with the purchaser for the difference.

CONTROL AREA - An electric power system, or a combination of electric power systems, to which a common automatic generation control (AGC) is applied to match the power output of generating units within the area to demand. The control area of the ISO is the state of California.

CORE CUSTOMERS - Residential and small commercial customers who must rely on the traditional distributor bundled service of sales and transportation. Compare **NON-CORE CUSTOMERS**.

COUNTERPARTY SLEEVES (For Electric Products) - An agreement by a counterparty to buy (sell) electricity from one counterparty and sell it to (buy it from) another counterparty.

COUNTERPARTY SLEEVES (For Natural Gas Physical Products) - Facilitating a transaction with an un-contracted or non-creditworthy through a contracted, creditworthy counterparty.

CRUDE OIL - Petroleum as found in the earth, before it is refined into oil products.



CUSTOMER CLASS - Refers to, in general, a group of customers with similar service requirements. Typical customer classes include residential, industrial, commercial and agricultural.

D

DAILY PEAK - The maximum amount of energy or service demanded in one day from a company or utility service.

DAY-AHEAD MARKET - The forward market for energy and ancillary services to be supplied during the settlement period of a particular trading day that is conducted by the ISO, the PX, and other Scheduling Coordinators. This market closes with the ISO's acceptance of the final day-ahead schedule.

DAY-AHEAD SCHEDULE – Day-ahead Schedule A schedule prepared by a Scheduling Coordinator or the ISO before the beginning of a trading day. This schedule indicates the levels of generation and demand scheduled for each settlement period of that trading day.

DAYLIGHTING - The use of sunlight to supplement or replace electric lighting.

DEKATHERM - A unit of heating value equivalent to 10 therms or 1,000,000 Btus.

DELIVERY POINT - Point at which gas leaves a transporter's system completing a sale or transportation service transaction between the pipeline company and a sale or transportation service customer.

DEMAND (Utility) - The level at which electricity or natural gas is delivered to users at a given point in time. Electric demand is expressed in kilowatts.

DEMAND CHARGE - The sum to be paid by a large electricity consumer for its peak usage level.

DEMAND CHARGE - The portion of a rate for gas service which is billed to the customer whether they use the service or not. Depending on the rate design this charge is based on actual or estimated peak usage (1 or 3 days), annual needs or a combination of the two. Compare **COMMODITY CHARGE**.

DEMAND RESPONSE PROGRAMS - "Demand response" refers to actions taken by end-users to reduce power demand during critical peak times or to shift demand to off-peak times. A demand response program provides customers with incentives for reducing load in response to an event signal. These incentives can take the form of a financial credit or their bill, a dynamic rate or exemption from rolling blackouts. Events can be called for economic or reliability reasons. Because demand response programs are



designed to operate only a few hours per event, they typically reduce capacity (kW) but not energy (kWh).

DEMAND SIDE MANAGEMENT (DSM) - The methods used to manage energy demand including energy efficiency, load management, fuel substitution and load building. (See **LOAD MANAGEMENT**)

DEMONSTRATION - The application and integration of a new product or service into an existing or new system. Most commonly, demonstration involves the construction and operation of a new electric technology interconnected with the electric utility system to demonstrate how it interacts with the system. This includes the impacts the technology may have on the system and the impacts that the larger utility system might have on the functioning of the technology.

DEPENDABLE CAPACITY - The system's ability to carry the electric power for the time interval and period specified. Dependable capacity is determined by such factors as capability, operating power factor and portion of the load the station is to supply.

DEREGULATION - The elimination of regulation from a previously regulated industry or sector of an industry.

DERIVATIVES - A specialized security or contract that has no intrinsic overall value, but whose value is based on an underlying security or factor as an index. A generic term that, in the energy field, may include options, futures, forwards, etc.

DIRECT ACCESS - The ability of end-use customers located in the service territory of an IOU to purchase electricity from retail sellers other than their local utility. (See also **RETAIL COMPETITION**)

DIRECT ACCESS CUSTOMERS - Customers located within the service territory of an IOU who purchase electricity from sellers other than their local utility. DA customers continue to receive and pay for delivery services from their local utility.

DIRECT ACCESS-ELIGIBLE CUSTOMER – A customer located within the service territory of an IOU who is eligible for Direct Access.

DISPATCH - The operating control of an integrated electric system to: Assign generation to specific generating plants and other sources of supply to effect the most reliable and economical supply as the total of the significant area loads rises or falls. Control operations and maintenance of high-voltage lines, substations and equipment, including administration of safety procedures. Operate the interconnection. Schedule energy transactions with other interconnected electric utilities.



DISPATCHABILITY - This is the ability of a generating unit to increase or decrease generation, or to be brought on line or shut down at the request of a utility's system operator.

DISTRIBUTION - The delivery of electricity to the retail customer's home or business through low voltage distribution lines.

DISTRIBUTED GENERATION - A distributed generation system involves small amounts of generation located on a utility's distribution system for the purpose of meeting local (substation level) peak loads and/or displacing the need to build additional (or upgrade) local distribution lines.

DISTRIBUTION LINES - Overhead and underground facilities which are operated at distribution voltages, and which are designed to supply two or more customers.

DISTRIBUTION SYSTEM (Electric utility) - The substations, transformers and lines that convey electricity from high-power transmission lines to ultimate consumers, or for Electric Microutilities, the distribution lines that convey electricity from the generating units to the ultimate customer. (See GRID)

DISTRIBUTION UTILITY - The regulated electric utility entity that constructs and maintains the distribution wires connecting the transmission grid to the final customer. The distribution utility can also perform other services such as aggregating customers, purchasing power supply and transmission services for customers, billing customers and reimbursing suppliers, and offering other regulated or non-regulated energy services to retail customers. The "wires" and "customer service" functions provided by a distribution utility could be split so that two totally separate entities are used to supply these two types of distribution services.

DISTRIBUTIVE POWER - A packaged power unit located at the point of demand. While the technology is still evolving, examples include fuel cells and photovoltaic applications.

DIVESTITURE or DISAGGREGATION - The stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Most commonly associated with spinning-off generation assets so they are no longer owned by the shareholders that own the transmission and distribution assets.

DUCT - A passageway made of sheet metal or other suitable material used for conveying air or other gas at relatively low pressures.



DWR CONTRACTS - Contracts for generating resource capacity and energy deliveries executed by the California Department of Water Resources during 2001 and allocated to the investor owned utilities for contract administration purposes only.

E

ECONOMIC DISPATCH - The distribution of total generation requirements among alternative sources for optimum system economy with consideration to both incremental generating costs and incremental transmission losses.

ECONOMY ENERGY (Electricity utility) - Electricity purchased by one utility from another to take the place of electricity that would have cost more to produce on the utility's own system.

EI CONTRACT – Edison Electric Institute contract is a standard master agreement that provides the base terms and conditions for transactions executed between two parties of a particular master agreement.

EFFICIENCY - The ratio of the useful energy delivered by a dynamic system (such as a machine, engine, or motor) to the energy supplied to it over the same period or cycle of operation. The ratio is usually determined under specific test conditions.

ELECTRIC CAPACITY - This refers to the ability of a power plant to produce a given output of electric energy at an instant in time, measured in kilowatts or megawatts (1,000 kilowatts).

ELECTRIC PLANT (PHYSICAL) - A facility that contains all necessary equipment for converting energy into electricity.

ELECTRIC SERVICE PROVIDER (ESP) - An entity that is licensed by the CPUC to provide electric power service to Direct Access Customers (see PU Code §§ 218.3 and 394). An end-use customer can act as its own ESP as long as it complies with all requirements of being an ESP. Also referred to as Energy Service Providers.

ELECTRIC SYSTEM - This term refers to all of the elements needed to distribute electrical power. It includes overhead and underground lines, poles, transformers, and other equipment.

ELECTRIC UTILITY - Any person or state agency with a monopoly franchise (including any municipality), which sells electric energy to end-use customers; this term includes the Tennessee valley Authority, but does not include other Federal power marketing agency (from EPCAct).



ELECTRICITY - A property of the basic particles of matter. A form of energy having magnetic, radiant and chemical effects. Electric current is created by a flow of charged particles (electrons).

ELECTRONIC QUARTERLY REPORTS (EQRs) - All FERC jurisdictional public utilities, including power marketers, must file EQRs, in which they:

- Summarize contractual terms and conditions in their agreements for all jurisdictional services, including:
 1. Market-based power sales;
 2. Cost-based power sales; and
 3. Transmission service.
- Detail transaction information for short-term and long-term market-based power sales and cost-based power sales during the most recent calendar quarter.
- Tariff holders without effective contracts and transactions must file the ID Data portion of the EQR.

ELECTRICITY TRANSMISSION PRODUCTS – The amount of electricity transportation capability of a transmission line measured in MWs.

EMISSIONS CREDITS FUTURES OR FORWARDS - Credits or allowances for emissions that can be bought or sold in order to comply with emissions limits.

END-USE - The specific purpose for which electric is consumed (i.e., heating, cooling, cooking, etc.).

ENERGY - The amount of electricity produced, flowing or supplied by generation, transmission or distribution facilities or consumed over time. Usually it is measured in units of watt-hours or standard multiples thereof, e.g., 1,000 Wh=1kWh, 1,000 kWh=1MWh, etc.

ENERGY CHARGE - The amount of money owed by an electric customer for kilowatt-hours consumed.

ENERGY CONSUMPTION - The amount of energy consumed in the form in which it is acquired by the user. The term excludes electrical generation and distribution losses.



ENERGY DELIVERIES - Energy generated by one system delivered to another system.

ENERGY EFFICIENCY - Programs and measures designed to reduce consumer energy consumption. Example of programs and measures include lighting retrofit, process redesign and appliance rebates which encourage consumers to purchase high-efficiency appliances.

ENERGY POLICY ACT OF 1992 - This act which was the first comprehensive federal energy law promulgated in more than a decade will help create a more competitive U.S. electric power marketplace by removing barriers to competition. By doing so, this act allows a broad spectrum of independent energy producers to compete in wholesale electric power markets. The act also made significant changes in the way power transmission grids are regulated. Specifically, the law gives the Federal Energy Regulatory Commission the authority to order electric utilities to provide access to their transmission facilities to other power suppliers.

ENERGY RECEIPTS - Energy generated by one utility system that is received by another through transmission lines.

ENERGY RESERVES - The portion of total energy resources that is known and can be recovered with presently available technology at an affordable cost.

ENERGY RESOURCES - Everything that could be used by society as a source of energy.

ENERGY USE - Energy consumed during a specified time period for a specific purpose (usually expressed in kWh).

ENTHALPY - The quantity of heat necessary to raise the temperature of a substance from one point to a higher temperature. The quantity of heat includes both latent and sensible.

ENTITLEMENT - Electric energy or generating capacity that a utility has a right to access under power exchange or sales agreements.

ENVIRONMENTAL ATTRIBUTES - Environmental attributes quantify the impact of various options on the environment. These attributes include particulate emissions, SO₂ or NO_x, and thermal discharge (air and water).

ENVIRONMENTAL PROTECTION AGENCY (EPA) - A federal agency created in 1970 to permit coordinated governmental action for protection of the environment by systematic abatement and control of pollution through integration or research, monitoring, standards setting and enforcement activities.



EXCHANGE (Electric utility) - Agreements between utilities providing for purchase, sale and trading of power. Usually relates to capacity (kilowatts) but sometimes energy (kilowatt-hours).

EXCHANGE TRADED CONTRACTS - Contract for electric capacity and energy executed through electronic and voice exchange markets under standard product terms and conditions. Products are generally for “standard products” (peak, on-peak or flat) and standard periods of duration (hourly, daily, balance of month, monthly, quarterly).

EXHAUST - Air removed deliberately from a space, by a fan or other means, usually to remove contaminants from a location near their source.

EXPORTS (Electric utility) - Power capacity or energy that a utility is required by contract to supply outside of its own service area and not covered by general rate schedules.

F

FACILITY - A location where electric energy is generated from energy sources.

FEDERAL ENERGY REGULATORY COMMISSION (FERC) - An independent regulatory commission within the U.S. Department of Energy that has jurisdiction over energy producers that sell or transport fuels for resale in interstate commerce; the authority to set oil and gas pipeline transportation rates and to set the value of oil and gas pipelines for ratemaking purposes; and regulates wholesale electric rates and hydroelectric plant licenses.

FEDERAL POWER ACT - An act that includes the regulation of interstate transmission of electrical energy and rates. This act is administered by the Federal Energy Regulatory Commission.

FEEDER - This is an electrical supply line, either overhead or underground, which runs from the substation, through various paths, ending with the transformers. It is a distribution circuit, usually less than 69,000 volts, which carries power from the substation.

FINANCIAL CALL (OR PUT) OPTION (For Electric Products) – The right, but not the obligation, to buy (call) a forward electric contract on a specific date (expiration) at a specific price (strike). The right to sell is a put option.

FINANCIAL CALL (OR PUT) OPTION (For Natural Gas Financial Products) - The right, but not the obligation, to buy (call) a forward gas contract on gas on a particular date (expiration) at a particular price (strike). The right to sell is a put option.



OTC-traded options settle in cash, whereas exchange traded (NYMEX) options must be exercised, which causes delivery of a futures position to the option holder. Options may be combined to hedge a wide variety of positions.

FINANCIAL SWAP – An agreement to exchange one type of pricing for another. Examples include fixed-for-floating swaps and basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through a financial clearing house.

FIRM ENERGY - Power supplies that are guaranteed to be delivered under terms defined by contract.

FIRM SERVICE - Service offered to customers (regardless of Class of Service) under schedules or contracts which anticipate no interruptions. The period of service may be for only a specified part of the year as in Off-Peak Service. Certain firm service contracts may contain clauses which permit unexpected interruption in case the supply to residential customers is threatened during an emergency. Compare **INTERRUPTIBLE SERVICE** and **OFF-PEAK SERVICE**.

FIXED COSTS - The annual costs associated with the ownership of property such as depreciation, taxes, insurance, and the cost of capital.

FORCED OUTAGE - An outage that results from emergency conditions and requires a component to be taken out of service automatically or as soon as switching operations can be performed. The forced outage can be caused by improper operation of equipment or by human error. If it is possible to defer the outage, the outage becomes a scheduled outage.

FORECAST INSURANCE - A method for managing load forecast (volume and shape) risk.

FORWARD ENERGY (Demand side) – Electric energy planned to be consumed by a customer, measured in MWhs that is agreed to be reduced for a specific period for a specified time in the future.

FORWARD ENERGY (Purchase or Sale) – Electric energy purchased or sold by a counterparty, measured in MWhs that is agreed to be supplied or received for a specific period at a specific location for a specified time in the future.

FORWARD SPOT (DAY-AHEAD & HOUR-AHEAD) PURCHASE, SALE, OR EXCHANGE – Electric energy, capacity, ancillary services or transmission purchased or sold by a counterparty, or exchanged between counterparties measured in MWs or MWhs



that is agreed to be supplied, received or exchanged for a specific period at a specific location in the Day-Ahead or Hour-Ahead markets.

FOSSIL FUEL - Oil, coal, natural gas or their by-products. Fuel that was formed in the earth in prehistoric times from remains of living-cell organisms.

FREQUENCY - The number of cycles which an alternating current moves through in each second. Standard electric utility frequency in the United States is 60 cycles per second, or 60 Hertz.

FTR LOCATIONAL SWAPS – Over-the-counter basis swaps associated with Firm Transmission Rights. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

FUEL - A substance that can be used to produce heat.

FUEL CELL - A device or an electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes, thus producing electricity.

FUEL DIVERSITY - Policy that encourages the development of energy technologies to diversify energy supply sources, thus reducing reliance on conventional (petroleum) fuels; applies to all energy sectors.

FUEL OIL - Petroleum products that are burned to produce heat or power.

FUTURES MARKET - A trade center for quoting prices on contracts for the delivery of a specified quantity of a commodity at a specified time and place in the future.

G

GAS - Gaseous fuel (usually natural gas) that is burned to produce heat energy.

GAS IMBALANCE -

- a. **Producer/Producer** - When one or more producers sell or utilize a volume of natural gas in excess of their gross working interest.
- b. **Pipeline/Pipeline** - When a pipeline receives a volume of natural gas and redelivers a larger or smaller volume of natural gas under the terms of a transportation agreement.



- c. Producer/Pipeline - When a producer delivers a volume of natural gas that is larger or smaller than the volume of natural gas that the pipeline redelivers for the producer's account to another party.

GAS, NATURAL - A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in porous geologic formations beneath the earth's surface, often in association with petroleum. The principal constituent is methane.

1. Dry. Gas whose water content has been reduced by a dehydration process. Gas containing little or no hydrocarbons commercially recoverable as liquid product. Specified small quantities of liquids are permitted by varying statutory definitions in certain states.
2. Liquefied (LNG). See LIQUEFIED NATURAL GAS.
3. Sour. Gas found in its natural state, containing such amounts of compounds of sulfur as to make it impractical to use, without purifying, because of its corrosive effect on piping and equipment.
4. Sweet. Gas found in its natural state, containing such small amounts of compounds of sulfur that it can be used without purifying, with no deleterious effect on piping and equipment.
5. Wet. Wet natural gas is unprocessed natural gas or partially processed natural gas produced from strata containing condensable hydrocarbons. The term is subject to varying legal definitions as specified by certain state statutes. (The usual maximum allowable is 7 lbs./MMcf water content and .02 gallons/Mcf of Natural Gasoline.)

GAS STORAGE (Purchase or Sale) - Includes firm and as-available storage inventory, injection and withdrawal. Also includes parking and borrowing services.

GAS TRANSPORTATION (Purchase or Sale) - Interstate, Intrastate, and distribution gas transportation services. Includes firm, as-available and interruptible services.

GAS UTILITY - Any person engaged in, or authorized to engage in, distributing or transporting natural gas, including, but not limited to, any such person who is subject to the regulation of the Public Utilities Commission.

GENERATING STATION - A station that consists of electric generators and auxiliary equipment for converting mechanical, chemical, or nuclear energy into electric energy.



GENERATING UNIT - Any combination of physically connected generators, reactors, boilers, combustion turbines, and other prime movers operated together to produce electric power.

GENERATION (Electricity) - Process of producing electric energy by transforming other forms of energy.

GENERATION COMPANY or GENERATOR - A regulated or non-regulated entity (depending upon the industry structure) that operates and maintains existing generating plants. The generation company may own the generation plants or interact with the short term market on behalf of plant owners.

GENERATION DISPATCH AND CONTROL - Aggregation and dispatching (sending off to some location) generation from various generating facilities, providing backup and reliability services.

GEOHERMAL - An electric generating station in which steam tapped from the earth drives a turbine-generator, generating electricity.

GIGAWATT (GW) - One thousand megawatts (1,000 MW) or, one million kilowatts (1,000,000 kW) or one billion watts (1,000,000,000 watts) of electricity. One gigawatt is enough to supply the electric demand of about one million average California homes.

GIGAWATT-HOUR (GWH) - One million kilowatt-hours of electric power. California's electric utilities generated a total of about 270,000 gigawatt-hours in 1988.

GLOBAL CLIMATE CHANGE - Gradual changing of global climates due to buildup of carbon dioxide and other greenhouse gases in the earth's atmosphere. Carbon dioxide produced by burning fossil fuels has reached levels greater than what can be absorbed by green plants and the seas.

GREENFIELD PLANT - Refers to a new electric power generating facility built from the ground up.

GRID - A system of interconnected power lines and generators that is managed so that the generators are dispatched as needed to meet the requirements of the customers connected to the grid at various points.

GROSS GENERATION - Amount of electric energy produced by generating units as measured at the generator terminals.



H

HEAT RATE - A number that tells how efficient a fuel-burning power plant is. Measured by Btu/kWh. The heat rate equals the Btu content of the fuel input divided by the kWh or power output. The lower the heat rate of a generating unit is, the more efficient the unit is.

HEAT STORM - Heat storms occur when temperatures exceed 100 degrees Fahrenheit over a large area for three days in a row. Normal hot temperatures cause electricity demand to increase during the peak summertime hours of 4 to 7 p.m. when air conditioners are straining to overcome the heat. If a hot spell extends to three days or more, however, nighttime temperatures do not cool down, and the thermal mass in homes and buildings retains the heat from previous days. This heat build-up causes air conditioners to turn on earlier and to stay on later in the day. As a result, available electricity supplies are challenged during a higher, wider peak electricity consumption period.

HEATING VALUE - The amount of heat produced by the complete combustion of a given amount of fuel.

HEDGING - Any method of minimizing the risk of price change. Since the movement of cash prices is usually in the same direction and about in the same degree as the movement of the present prices of futures contracts, any loss (or gain) resulting from carrying the actual merchandise is approximately offset by a corresponding gain (or loss) when the contract is liquidated.

HEDGING CONTRACTS - Contracts which establish future prices and quantities of electricity independent of the short-term market. Derivatives may be used for this purpose. (See the following: 1.) CONTRACTS FOR DIFFERENCES, 2.) FUTURES MARKET, and 3.) OPTIONS.)

HENRY HUB - A pipeline interchange, located in Vermilion Parish, Louisiana, which serves as the delivery point of natural gas futures contracts.

HIGH HEAT VALUE (HHV) - The high or gross heat content of the fuel with the heat of vaporization included; the water vapor is assumed to be in a liquid state.

HYDROELECTRIC POWER - Electricity produced by falling water that turns a turbine generator. (Also referred to as HYDRO).



I

ICE – Intercontinental Exchange (ICE) is the world’s leading electronic marketplace for energy trading and price discovery.

IMBALANCE ENERGY - The real-time change in generation output or demand requested by the ISO to maintain reliability of the ISO-controlled grid. Sources of imbalance energy include regulation, spinning and non-spinning reserves, replacement reserve, and energy from other generating units that are able to respond to the ISO’s request for more or less energy.

IMPORTS (Electric utility) - Power capacity or energy obtained by one utility from others under purchase or exchange agreement.

INDEPENDENT POWER PRODUCER (IPP) - A private entity that operates a generation facility and sells power to electric utilities for resale to retail customers. Although IPPs generate power, they are not franchised utilities, government agencies or QFs. IPPs usually do not own transmission lines to transmit the power that they generate.

INDEPENDENT SYSTEM OPERATOR (ISO) - The entity charged with reliable operation of the grid and provision of open transmission access to all market participants on a non-discriminatory basis. The ISO performs its function by controlling the dispatch of flexible plants to ensure that loads match resources available to the system.

INDEX PRICE - Tying the commodity price in a contract to other published prices, such as spot prices for gas or alternate fuels, or general indexes like the Consumer Price Index or Producer Price Index.

INFILTRATION - The uncontrolled inward leakage of air through cracks and gaps in the building envelope, especially around windows, doors and duct systems.

INFRASTRUCTURE - Generally refers to the recharging and refueling network necessary to successful development, production, commercialization and operation of alternative fuel vehicles, including fuel supply, public and private recharging and refueling facilities, standard specifications for refueling outlets, customer service, education and training, and building code regulations.

INSTALLED CAPACITY - The total generating units’ capacities in a power plant or on a total utility system. The capacity can be based on the nameplate rating or the net dependable capacity.

INSURANCE (COUNTERPARTY CREDIT INSURANCE, CROSS COMMODITY HEDGES) – A method for managing payment or performance risk for a fee.



INTEGRATED RESOURCE PLAN - A comprehensive and systematic blueprint developed by a supplier, distributor, or end-user of energy who has evaluated demand-side and supply-side resource options and economic parameters and determined which options will best help them meet their energy goals at the lowest reasonable energy, environmental, and societal cost.

INTEGRATED RESOURCE PLANNING (IRP) - A public planning process and framework within which the costs and benefits of both demand- and supply-side resources are evaluated to develop the least-total-cost mix of utility resource options. In many states, IRP includes a means for considering environmental damages caused by electricity supply/transmission and identifying cost-effective energy efficiency and renewable energy alternatives. IRP has become a formal process prescribed by law in some states and under some provisions of the Clean Air Act amendments of 1992.

INTEGRATED RESOURCE PLANNING PRINCIPLES - The underlying principles of IRP can be distinguished from the formal process of developing an approved utility resource plan for utility investments in supply- and demand-side resources. A primary principle is to provide a framework for comparing a variety of supply- and demand-side and transmission resource costs and attributes outside of the basic provision (or reduction) of electric capacity and energy. These resources may be owned or constructed by any entity and may be acquired through contracts as well as through direct investments. Another principle is the incorporation of risk and uncertainty into the planning analysis. The public participation aspects of IRP allow public and regulatory involvement in the planning rather than the siting stage of project development.

INTERCHANGE (Electric utility) - The agreement among interconnected utilities under which they buy, sell and exchange power among themselves. This can, for example, provide for economy energy and emergency power supplies.

INTERCONNECTION (Electric utility) - The linkage of transmission lines between two utilities, enabling power to be moved in either direction. Interconnections allow the utilities to help contain costs while enhancing system reliability.

INTERESTED PARTY - Any person whom the commission finds and acknowledges as having a real and direct interest in any proceeding or action carried on, under, or as a result of the operation of, this division.

INTERMEDIATE LOAD – Range from base load to a point between that and peak load.

INTERMEDIATE UNIT - A generator unit that is used for energy production as required with a capacity factor normally in the range of 15-60%.



INTERMITTENT RESOURCES - Resources whose output depends on some other factory that cannot be controlled by the utility, e.g., wind or sun. Thus, the capacity varies by day and by hour.

INTERRUPTIBLE LOADS - Loads that can be interrupted in the event of capacity or energy deficiencies on the supplying system.

INTERRUPTIBLE POWER - This refers to power whose delivery can be curtailed by the supplier, usually under some sort of agreement by the parties involved.

INTERRUPTIBLE SERVICE OR TARIFF (Electric utility) - Electricity supplied under agreements that allow the supplier to curtail or stop services at times. A service under which, upon notification from the Independent System Operator, the IOU requires the customer to reduce the demand imposed on the electrical system to firm service level (i.e., a level below which the customer's load will not be interruptible), and the customer must comply within 30 minutes.

INTERTIE - A transmission line that links two or more regional electric power systems.

INTERVAL METERING - The process by which power consumption is measured at regular intervals in order that specific load usage for a set period of time can be determined.

INVESTOR-OWNED UTILITY (IOU) - A private company owned by stockholders that provides electric utility services to a specific service area. A designation used to differentiate a utility owned and operated for the benefit of shareholders from municipally owned and operated utilities and rural electric cooperatives. A California investor-owned utility is regulated by the California Public Utilities Commission.

INVOLUNTARY DIVERSION - Involuntary Diversions are called when there is a severe supply shortage and deliveries to core customers are threatened. Emergency Flow Order provisions apply and Pacific Gas and Electric Company may divert as from non-core to core customers. Pacific Gas and Electric Company may also divert as-available off-system deliveries, but firm off-system deliveries will not be diverted.

J

No entries for the letter J.



K

KILOVOLT (kv) – One-thousand volts (1,000). Distribution lines in residential areas usually are 12 kv (12,000 volts).

KILOWATT (kW) - One thousand (1,000) watts. A unit of measure of the amount of electricity needed to operate given equipment. On a hot summer afternoon a typical home, with central air conditioning and other equipment in use, might have a demand of four kW each hour.

KILOWATT-HOUR (kWh) - The most commonly-used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour. In 1989, a typical California household consumes 534 kWh in an average month.

L

LEVELIZED - A lump sum that has been divided into equal amounts over period of time.

LINE - A system of poles, conduits, wires, cables, transformers, fixtures, and accessory equipment used for the distribution of electricity to the public.

LIQUEFIED NATURAL GAS (LNG) - Natural gas which has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure. It remains a liquid at -116 degrees Fahrenheit and 673 psig. In volume, it occupies 1/600 of that of the vapor at standard conditions.

LOAD - The amount of electric power supplied to meet end users' needs. Load is also an end-use device of an end-use customer that consumes power. Load should not be confused with demand, which is the measure of power that a load receives or requires.

LOAD CENTERS - A geographical area where large amounts of power are drawn by end-users.

LOAD DIVERSITY - The condition that exists when the peak demands of a variety of electric customers occur at different times. This is the objective of "load molding" strategies, ultimately curbing the total capacity requirements of a utility.

LOAD DURATION CURVE - A curve that displays load values on the horizontal axis in descending order of magnitude against percent of time (on the vertical axis) the load values are exceeded.



LOAD FACTOR - The ratio of the average load supplied to the peak or maximum load during a designated period. Load factor, in percent, also may be derived by multiplying the kWh in a given period by 100, and dividing by the product of the maximum demand in kW and the number of hours in the same period. The term also is used to mean the percentage of capacity of an energy facility - such as power plant or gas pipeline – that is utilized in a given period of time.

LOAD MANAGEMENT - Steps taken to reduce power demand at peak load times or to shift some of it to off-peak times. This may be with reference to peak hours, peak days or peak seasons. The main thing affecting electric peaks is air-conditioning usage, which is therefore a prime target for load management efforts. Load management may be pursued by persuading consumers to modify behavior or by using equipment that regulates some electric consumption.

LOAD-SERVING ENTITY (LSE) - An entity that provides electric power service to end-use customers. LSEs include but are not limited to IOUs, ESPs, CCAs and public-owned utilities.

LOAD SHAPE - A curve on a chart showing power (kW) supplied (on the horizontal axis) plotted against time of occurrence (on the vertical axis), and illustrating the varying magnitude of the load during the period covered.

LOAD SHIFTING - A load shape objective that involves moving loads from peak periods to off-peak periods. If a utility does not expect to meet its demand during peak periods but has excess capacity in the off-peak periods, this strategy might be considered.

LOSS OF LOAD PROBABILITY (LOLP) - A measure of the probability that system demand will exceed capacity during a given period; this period is often expressed as the expected number of days per year over a long period, frequently taken as ten consecutive years. An example of LOLP is one day in ten years.

LOSSES (Electric utility) - Electric energy or capacity that is wasted in the normal operation of a power system. Some kilowatt-hours are lost in the form of waste heat in electrical apparatus such as substation conductors. **LINE LOSSES** are kilowatts or kilowatt-hours lost in transmission and distribution lines under certain conditions.



M

MARGINAL COST - The sum that has to be paid the next increment of product of service. The marginal cost of electricity is the price to be paid for kilowatt-hours above and beyond those supplied by presently available generating capacity. In the utility context, the cost to the utility of providing the next (marginal) kilowatt-hour of electricity, irrespective of sunk costs.

MARKET-BASED PRICE - A price set by the mutual decisions of many buyers and sellers in a competitive market.

MARKET CLEARING PRICE - The price in a market at which supply equals demand. All demand prepared to pay at least this price has been satisfied and all supply prepared to operate at or below this price has been purchased.

MARKET PARTICIPANT - An entity, including a Scheduling Coordinator, who participates in the energy marketplace through the buying, selling, transmission, or distribution of energy or ancillary services into, out of, or through the ISO-controlled grid.

MARKET REDESIGN AND TECHNOLOGY UPGRADE (MRTU) - represents the largest change to the California wholesale energy market since electric restructuring began in 1998. CAISO has proposed that MRTU become effective in November 2007. Significant efforts will be required by PG&E to implement the systems and software to interface with the CAISO.

MARKETER (For Gas) - Marketers generally purchase gas supplies from producers and then resell them to end-users. Marketers add value and make a profit by saving producers and end-users the trouble of finding each other, arranging transportation and storage, and sometimes by arranging financing or assumption of price risk. Marketers also sometimes market a specific producer's gas without taking title in return for a marketing fee. Numerous marketers currently serve the California market.

MASTER FILE - A file maintained by the PX for use in bidding and bid evaluation protocol that contains information on generating units, loads, and other resources eligible to bid into the PX.

MAXIMUM DEMAND - Highest demand of the load within a specified period of time.

MCF - The quantity of natural gas occupying a volume of one thousand cubic feet at a temperature of sixty degrees Fahrenheit and at a pressure of fourteen and seventy-three hundredths pounds per square inch absolute.



MDQ - The term MDQ refers to maximum daily quantity of gas which a buyer, seller, or transporter is obligated to receive or deliver at each receipt or delivery point or in the aggregate as specified in an agreement.

MEGAWATT (MW) - One thousand kilowatts (1,000 kW) or one million (1,000,000) watts. One megawatt is enough energy to power 1,000 average California homes.

MEGAWATT HOUR (MWh) - One thousand kilowatt-hours, or an amount of electricity that would supply the monthly power needs of 1,000 typical homes in the Western U.S. (This is a rounding up to 8,760 kWh/year per home based on an average of 8,549 kWh used per household per year [U.S. DOE EIA, 1997 annual per capita electricity consumption figures]).

METER - A device for measuring levels and volumes of a customer's gas and electricity use.

METHANE (CH₄) - The first of the paraffin series of hydrocarbons. The chief constituent of natural gas. Pure methane has a heating value of 1,012 Btu per cubic foot.

MINIMUM GENERATION - Generally, the required minimum generation level of a utility system's thermal units. Specifically, the lowest level of operation of oil-fired and gas-fired units at which they can be currently available to meet peak load needs.

MMBTU - A thermal unit of energy equal to 1,000,000 Btus, that is, the equivalent of 1,000 cubic feet of gas having a heating content of 1,000 Btus per cubic foot, as provided by contract measurement terms. See DEKATHERM.

MMCF - A million cubic feet.

MUNICIPAL UTILITY - A provider of utility services owned and operated by a municipal government.

MUNICIPALIZATION - The process by which a municipal entity assumes responsibility for supplying utility service to its constituents. In supplying electricity, the municipality may generate and distribute the power or purchase wholesale power from other generators and distribute it.



MUST-TAKE GENERATION - Utilities are mandated to take electricity from specific resources identified by the CPUC. Except for Electric Microutilities, the receiver of must-take generation will pay for the electrical energy output of must-take resource even if they refuse to schedule and receive that energy. For this reason, these resources are always economic to receive and scheduled in order to minimize financial loss. Regulatory must-take generation include QF generating units under federal law, nuclear units and pre-existing power-purchase contracts that have minimum-take provisions.

N

NATURAL GAS - Hydrocarbon gas found in the earth, composed of methane, ethane, butane, propane and other gases.

NATURAL GAS FINANCIAL SWAPS (Purchase or Sale) – Over-the-counter forward products including fixed-for-floating swaps, basis swaps and swing-swaps for gas. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

NATURAL GAS FUTURES (Purchase or Sale) - Standardized forward contracts for gas that trade on an exchange. Futures may be physically or financially settled. Physically settled futures may be unwound by an offsetting trade, exchanged for a physical position, or held to physical delivery.

NATURAL GAS PURCHASES (Physical Supply) - Purchases/sales/exchanges of physical natural gas for terms of one month or longer.

NETWORK - A system of transmission and distribution lines cross-connected and operated to permit multiple power supply to any principal point on it. A network is usually installed in urban areas. It makes it possible to restore power quickly to customers by switching them to another circuit.

NEW-WORLD CONTRACTS - IOU Contracts for electric capacity and energy executed after January 1, 2003 when utilities returned to procurement.

NON-BYPASSABLE CHARGE - charge generally placed on distribution services to recover utility costs incurred as a result of restructuring (stranded costs - usually associated with generation facilities and services) and not recoverable in other ways.

NON-CORE CUSTOMERS - End-users with enough gas volume to justify consideration of transportation-only service from the distributor. Compare CORE CUSTOMERS.

NON-FIRM ENERGY - Electricity that is not required to be delivered or to be taken under the terms of an electric purchase contract.



NON-FTR LOCATIONAL SWAPS – Over-the-counter basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse.

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL (NERC) - Council formed by electric utility industry in 1968 to promote the reliability and adequacy of bulk power supply in utility systems of North America. NERC consists of ten regional reliability councils: Alaskan System Coordination Council (ASCC); East Central Area Reliability Coordination Agreement (ECAR); Electric Reliability Council of Texas (ERCOT); Mid-America Interconnected Network (MAIN); Mid-Atlantic Area Council (MAAC); Mid-Continent Area Power Pool (MAPP); Northeast Power Coordinating Council (NPCC); Southeastern Electric Reliability Council (SERC); Southwest Power Pool (SPP); Western Systems Coordinating Council (WSCC).

NOx - Oxides of nitrogen that are a chief component of air pollution that can be produced by the burning of fossil fuels. Also called nitrogen oxides.

NUCLEAR ENERGY - Power obtained by splitting heavy atoms (fission) or joining light atoms (fusion). A nuclear energy plant uses a controlled atomic chain reaction to produce heat. The heat is used to make steam run conventional turbine generators.

NUCLEAR REGULATORY COMMISSION (NRC) - An independent federal agency that ensures that strict standards of public health and safety, environmental quality and national security are adhered to by individuals and organizations possessing and using radioactive materials. The NRC is the agency that is mandated with licensing and regulating nuclear power plants in the United States. It was formally established in 1975 after its predecessor, the Atomic Energy Commission, was abolished.

NYMEX - New York Mercantile Exchange. The New York Mercantile Exchange, Inc., is the world's largest physical commodity futures exchange and the preeminent trading forum for energy and precious metals.

O

OFF-PEAK - Periods of low demands. All the time outside the on-peak period.

ON-PEAK - Periods of the highest demand.

ON-SITE ENERGY OR CAPACITY (SELF-GENERATION ON CUSTOMER SIDE OF THE METER) – The amount of power measured in MWs or MWhs that can be generated downstream of the customer's electric meter that can be used to offset the customer's load served by the electric service provider.



OPTIONS - An option is a contractual agreement that gives the holder the right to buy (call option) or sell (put option) a fixed quantity of a security or commodity (for example, a commodity or commodity futures contract), at a fixed price, within a specified period of time. May either be standardized, exchange-traded, and government regulated, or over-the-counter customized and non-regulated.

OUTAGE (Electric utility) - An interruption of electric service that is temporary (minutes or hours) and affects a relatively small area (buildings or city blocks). (See **BLACKOUT**)

OVER GENERATION - A condition that occurs when total PX participant demand is less than or equal to the sum of regulatory must-take generation, regulatory must-run generation, and reliability must-run generation.

OVERLOAD - The flow of electricity into conductors or devices when normal load exceeds capacity.

P

PARKING SERVICE – Short-term storage of a shipper's excess gas so that shipper doesn't have to sell it in the market.

PARTIAL LOAD - An electrical demand that uses only part of the electrical power available. [See California Code of Regulations, Title 24, Section 2-5342(e) 2]

PEAK DAY CURTAILMENT - Curtailment imposed on a day-to-day basis during periods of extremely cold weather when demands for gas exceed the maximum daily delivery capability of a pipeline or distribution system. Peak day curtailment is applied independent of seasonal curtailment and does not affect overall authorized volumes to customers under seasonal curtailment.

PEAK DEMAND OR PEAK LOAD - The electric load that corresponds to a maximum level of electric demand in a specified time period.

PEAK FOR OFF-PEAK EXCHANGE – Electric energy, capacity, or ancillary services or transmission exchanged between counterparties measured in MWs or MWhs that is agreed to be supplied in an on-peak period in exchange for receiving an amount in an off-peak period.

PEAKER - A nickname for a power generating station that is normally used to produce extra electricity during peak load times. Typically peaking resources are fully dispatchable and deliver in approximately 10% of hours.



PEAKING CAPACITY - Generating equipment normally operated only during the hours of highest daily, weekly, or seasonal loads; this equipment is usually designed to meet the portion of load that is above base load.

PG&E (PACIFIC GAS AND ELECTRIC COMPANY) - An electric and natural gas utility serving the central and northern California region.

PHOTOVOLTAICS - A technology that directly converts light into electricity. The process uses modules, which are usually made up of many cells (thin layers of semiconductors).

PHYSICAL CALL (OR PUT) OPTION - The right, but not the obligation, to buy (call) physical electricity for delivery on a specific date at a fixed or indexed price (strike). The right to sell is a put option.

PHYSICAL OPTIONS ON NATURAL GAS SUPPLY (Purchase or Sale) - The right, but not the obligation, to buy (call) physical gas for delivery on a particular date at a fixed or index price (strike). The right to sell is a put option.

PIPELINE - A line of pipe with pumping machinery and apparatus (including valves, compressor units, metering stations, regulator stations, etc.) for conveying a liquid or gas.

PIPELINE CAPACITY - The maximum quantity of gas that can be moved through a pipeline system at any given time based on existing service conditions such as available horsepower, pipeline diameter(s), maintenance schedules, regional demand for natural gas, etc.

PIPELINE FUEL - Natural gas consumed in the operation of a natural gas pipeline, primarily in compressors.

POINT(S) OF DELIVERY - Point(s) for interconnection on the Transmission Provider's System where capacity and/or energy are made available to the end user.

PORTFOLIO MANAGEMENT - The functions of resource planning and procurement under a traditional utility structure.

POWER - Electricity for use as energy.

POWER EXCHANGE - This is a commercial entity responsible for facilitating the development of transparent spot prices for energy capacity, and/or ancillary services.

POWER GRID - A network of power lines and associated equipment used to transmit and distribute electricity over a geographic area.



POWER MARKETER - An agent for generation projects who markets power on behalf of the generator. The marketer may also arrange transmission, firming or other ancillary services as needed. Though a marketer may perform many of the same functions as a broker, the difference is that a marketer represents the generator while a broker acts as a middleman.

POWER PLANT - A central station generating facility that produces energy.

POWER PURCHASE AGREEMENT - Specifies the terms and conditions under which electric power will be generated and purchased. Power purchase agreements require the Seller to supply power under specific terms and conditions for the life of the agreement. While power purchase agreements vary, their common elements include: specification of the size, pricing structure, operating flexibility, delivery point, various service and performance obligations; dispatchability options; credit/collateral terms, and conditions of termination or default.

PREFERRED SCHEDULE - The initial schedule produced by a Scheduling Coordinator that represents its preferred mix of generation to meet demand. The schedule includes the quantity of output (generators) and consumption (loads), details of any adjustment bids, and the location of each generator and load. The schedule also specifies the quantities and location of trades between the Scheduling Coordinator and all other Scheduling Coordinators, and is balanced with respect to generation, transmission losses, load, and trades.

PRICE CAP - Situation where a price has been determined and fixed.

PRICE CURVES -

- **Forward Curve (or Futures Price)** - A term structure of forward prices observed in the market. Forward contracts, like futures, are agreements to buy or sell a commodity at a future time. Forward price is the price to be paid at delivery.
- **Price Forecast** - A projection of future price levels (these could be day-ahead prices, futures prices, monthly prices etc.) expressed either in nominal or a given year's dollars, not necessarily reflective of market prices.

PRODUCTION - The act or process of generating electric energy.

PROVIDER OF LAST RESORT - A legal obligation (traditionally given to utilities) to provide service to a customer where competitors have decided they do not want that customer's business.



PUBLIC ADVISOR - An appointee of the governor who attends all meetings of the California Energy Commission and provides assistance to members of the public and intervenors in cases before the Commission.

PUBLICLY OWNED UTILITIES (POUs) - Municipal utilities (utilities owned by branches of local government) and/or co-ops (utilities owned cooperatively by customers).

PUMPED STORAGE - Facility designed to generate electric power during peak load periods with a hydroelectric plant using water pumped into a storage reservoir during off-peak periods.

PURCHASE AND SALE AGREEMENT - The written contract between buyer and seller indicating all terms and conditions of the sale.

PURPA (THE PUBLIC UTILITY REGULATORY ACT OF 1978) - Among other things, this federal legislation requires utilities to buy electric power from private “qualifying facilities,” at an avoided cost rate. This avoided cost rate is equivalent to what it would have otherwise cost the utility to generate or purchase that power themselves. Utilities must further provide customers who choose to self-generate a reasonably priced back-up supply of electricity.

PURPA is implemented by the Federal Energy Regulatory Commission and the California Public Utilities Commission (CPUC). Under PURPA each electric utility is required to offer to purchase available electric energy from cogeneration and small power production facilities.

Q

QUALIFYING FACILITY (QF) - “Qualifying facilities” (QFs) are non-utility cogeneration or other power producers that often generate electricity using renewable and alternative resources, such as hydro, wind, solar, geothermal, or biomass (solid waste). QFs must meet certain operating, efficiency, and fuel-use standards set forth by the Federal Energy Regulatory Commission (FERC) pursuant to PURPA (The Public Utility Regulatory Policies Act of 1978).

QUICK-START CAPABILITY - Refers to generating units that can be available for load within a 30-minute period.



R

R-VALUE - A unit of thermal resistance used for comparing insulating values of different material. It is basically a measure of the effectiveness of insulation in stopping heat flow. The higher the R-value number, a material, the greater its insulating properties and the slower the heat flow through it. The specific value needed to insulate a home depends on climate, type of heating system and other factors.

RAMP RATE - The rate at which you can increase load on a power plant. The ramp rate for a hydroelectric facility may be dependent on how rapidly water surface elevation on the river changes.

RAMP UP (SUPPLY SIDE) - Increasing load on a generating unit at a rate called the ramp rate.

REACTIVE POWER AND VOLTAGE CONTROL – Required to maintain adequate transmission system voltage for reliable interconnected system operation.

REAL-TIME (Purchase or Sale) - The amount of energy, measured in MWhs supplied or received by the control area operator to balance an entity's load and supply.

REAL-TIME MARKET - The competitive generation market controlled and coordinated by the ISO for arranging real-time imbalance energy.

REAL-TIME PRICING - The instantaneous pricing of electricity based on the cost of the electricity available for use at the time the electricity is demanded by the customer.

REACTOR - A device in which a controlled nuclear chain reaction can be maintained, producing heat energy.

REGULATION - The service provided by generating units equipped and operating with automatic generation controls that enables the units to respond to the ISO's direct digital control signals to match real-time demand and resources, consistent with established operating criteria.

REGULATION AND RAMPING CAPABILITY – The portion of a generating unit's unloaded capability which can be loaded, or loaded capability which can be unloaded, in response to Automatic Generation Control signals from the ISO's energy management system control computer.



RELIABILITY - Electric system reliability has two components – adequacy and security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

RELIABILITY MUST-RUN (RMR) AGREEMENTS - A Must-Run Service Agreement between the owner of an RMR Unit and the ISO within geographical areas identified via the Local Area Reliability Service (LARS) process.

RELIABILITY MUST-RUN (RMR) GENERATION - Generation that the ISO determines is required to be on line to meet applicable reliability criteria requirements. This includes:

- i) Generation constrained on line to meet NERC and WECC reliability criteria for interconnected systems operation;
- ii) Generation needed to meet load demand in constrained areas; and
- iii) Generation needed to be operated to provide voltage or security support of the ISO or a local area.

RELIABILITY MUST-RUN (RMR) UNIT - In return for payment, the ISO may call upon the owner of a generating unit under a Reliability Must-Run Agreement to run the unit when required for grid reliability.

RENEWABLE ENERGY - Resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro and wood. Although particular geothermal formations can be depleted, the natural heat in the earth is a virtually inexhaustible reserve of potential energy. Renewable resources also include some experimental or less-developed sources such as tidal power, sea currents and ocean thermal gradients.

RENEWABLE RESOURCES - Renewable energy resources are naturally replenishable, but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include: biomass, hydro, geothermal, solar and wind. In the future they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed



electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies.

REPLACEMENT RESERVE – A quantity of capacity that will ramp up within 60 minutes.

RESERVE - The extra generating capability that an electric utility needs, above and beyond the highest demand level it is required to supply to meet its users $\frac{1}{4}$ needs.

RESERVE CAPACITY - Capacity in excess of that required to carry peak load.

RESERVE MARGIN - The differences between the dependable capacity of a utility's system and the anticipated peak load for a specified period.

RESIDUAL NET LONG FOR CAPACITY (SURPLUS) – When the capacity resources under an LSE's control exceed the peak hourly demand (MW), including the required planning reserve margin, of the LSE's customers, the LSE is in a residual net long situation for capacity.

RESIDUAL NET LONG FOR ENERGY - When the energy requirement (kWh or MWh) of the LSE's customers load, for a given period of time (i.e., hour, month, year, etc.), is less than the total energy supply available to serve the LSE's customers, the LSE is in a residual net long situation for energy.

RESIDUAL NET SHORT FOR CAPACITY (DEFICIT) - When the peak hourly demand (MW), including the required planning reserve margin, of the LSE's customers exceeds the capacity resources under the LSE's control, the LSE is in a residual net short situation for capacity.

RESIDUAL NET SHORT FOR ENERGY - When the energy requirement (kWh or MWh) of an LSE's customer load, for a given time interval (i.e., hour, month, year, etc.), is greater than the total energy supply available to serve the LSE's customers, the LSE is in a residual net short situation for energy.

RESOURCE ADEQUACY - A common term used to describe sufficiency of capacity resources to meet contingencies that may be caused by unexpected energy usage (e.g., heat storm or cold spell), generation outages or transmission constraints.

RESOURCE ADEQUACY PROCEEDING - The CPUC undertook a process of addressing Resource Adequacy (RA) through the implementation of system and local RA standards. The system RA implemented in 2006 requires LSEs to meet a 15% to 17% planning reserve margin within their service territory. More recently, the CPUC implemented local RA standards for 2007, which requires LSEs to meet specific capacity



targets (or Local Capacity Requirements known as LCR) within one of the nine transmission constrained areas (or load pockets) located within the ISO's control area. Both system and local RA standards are in the process of being clarified, modified and potentially expanded through the current RA proceeding (R.05-12-013).

RESOURCE EFFICIENCY - The use of smaller amounts of physical resources to produce the same product or service. Resource efficiency involves a concern for the use of all physical resource and materials used in the production and use cycle, not just the energy input.

RETAIL COMPETITION - A system under which more than one electric provider can sell to retail customers, and retail customers are allowed to buy from more than one provider. (See also **DIRECT ACCESS**)

RETAIL MARKET - A market in which electricity and other energy services are sold directly to the end-use customer.

S

SCE (SOUTHERN CALIFORNIA EDISON COMPANY) - An electric utility serving the southern California region.

SDG&E (SAN DIEGO GAS & ELECTRIC) - An electric and natural gas utility serving the San Diego, California, region.

SCHEDULING COORDINATOR - Scheduling coordinators (SCs) submit balanced schedules and provide settlement-ready meter data to the ISO. Scheduling coordinators also:

- Settle with generators and retailers, the PX and the ISO
- Maintain a year-round, 24-hour scheduling center
- Provide non-emergency operating instructions to generators and retailers
- Transfer schedules in and out of the PX. (The PX is a marketplace. As bids are accepted, power is being bought and sold. Once a bid is accepted, the power sold is "transferred out" of the PX, since it is no longer available. Power that is available for sale is "transferred in" to the PX. These transfers may also take place directly between the buyer and seller, without involvement of the PX.)

The PX is considered a scheduling coordinator.



SEASONAL EXCHANGE - Electric energy, capacity, or ancillary services or transmission exchanged between counterparties measured in MWs or MWhs that is agreed to be supplied during one season or set of months in exchange for receiving an amount in another season or set of months. Dollars may or may not be exchanged in such a transaction.

SELF-GENERATION - A generation facility dedicated to serving a particular retail customer, usually located on the customer's premises. The facility may either be owned directly by the retail customer or owned by a third party with a contractual arrangement to provide electricity to meet some or all of the customer's load.

SERVICE, LENDING (BORROWING) – Short-term borrowing of a pipeline or storage provider's working gas by a shipper.

SERVICE AREA - The geographical territory served by a utility.

SERVICE LIFE - The length of time a piece of equipment can be expected to perform at its full capacity.

SERVICE TERRITORY - This is the state, area or region served exclusively by a single electric utility.

SETTLEMENT - The process of financial settlement for products and services purchased and sold. Each settlement involves a price and quantity. Both the ISO and PX may perform settlement functions.

SITE - Any location on which a facility is constructed or is proposed to be constructed.

SMALL POWER PRODUCER - Refers to a producer that generates at least 75% of its energy from renewable sources.

SOLAR ENERGY - Heat and light radiated from the sun.

SPARK SPREAD - The difference between the market price of electricity and its cost of production for a specific natural gas fired generating plant.

SPINNING RESERVE – The portion of unloaded synchronized generating capacity, controlled by the ISO, which is capable of being loaded in 10 minutes, and which is capable of running for at least two hours.

SPOT MARKET - A market in which transactions take place at most one day ahead of scheduled delivery.



SPOT MARKET (For Gas) - A market characterized by short-term, interruptible (or best efforts) contracts for specified volumes of gas. Participants may be any of the elements of the gas industry - producer, transporter, distributor, or end user. Brokers may also be utilized.

SPOT NATURAL GAS (Physical Supply) - Purchases/sales/exchanges of physical natural gas for terms less than one month.

SPOT PRICE - The price for spot transactions. (Also see **MARKET CLEARING PRICE**)

STORAGE, UNDERGROUND - The utilization of subsurface facilities for storing gas which has been transferred from its original location for the primary purposes of load balancing. The facilities are usually natural geological reservoirs such as depleted oil or gas fields or water-bearing sands sealed on the top by an impermeable cap rock. The facilities may be man-made or natural caverns.

STRANDED COSTS - Costs incurred by a utility which may not be recoverable under market-based retail competition. Costs incurred by a utility which may not be recoverable under market-based retail competition.

STRUCTURED TRANSACTIONS - Transactions that involve non-standard provisions for supplying electricity or electricity related products.

SUBSTATION - A facility that steps up or steps down the voltage in utility power lines. Voltage is stepped up where power is sent through long-distance transmission lines. It is stepped down where the power is to enter local distribution lines.

SUMMER - As applied to gas, the period April 1 of one year through October 31 of that same year.

SUMMER PEAK - The greatest load on an electric system during any prescribed demand interval in the summer.

SUPPLIER - A person or corporation, generator, broker, marketer, aggregator or any other entity, that sells electricity to customers, using the transmission or distribution facilities of an electric distribution company.

SUPPLY BID - A bid into the PX indicating a price at which a seller is prepared to sell energy or ancillary services.



SUPPLY-SIDE - Activities conducted on the utility's side of the customer meter. Activities designed to supply electric power to customers, rather than meeting load though energy efficiency measures or on-site generation on the customer side of the meter.

SURPLUS (Electric utility) - Excess firm energy available from a utility or region for which there is no market at the established rates.

SYSTEM - A combination of equipment and/or controls, accessories, interconnecting means and terminal elements by which energy is transformed to perform a specific function, such as climate control, service water heating, or lighting. [See California Code of Regulations, Title 24, Section 2-5302]

SYSTEM NET ENERGY FORECAST - Energy used by IOU and direct access customers, as measured at generation (includes T&D losses).

SYSTEM PEAK DEMAND - The highest demand value that has occurred during a specified period for the utility system.

T

TEMPERATURE - Degree of hotness or coldness measured on one of several arbitrary scales based on some observable phenomenon (such as the expansion).

TOLLING AGREEMENT – An agreement to provide (receive) gas in exchange for receiving (providing) electricity.

TRANSFER - To move electric energy from one utility system to another over transmission lines.

TRANSFORMER - A device, which through electromagnetic induction but without the use of moving parts, transforms alternating or intermittent electric energy in one circuit into energy of similar type in another circuit, commonly with altered values of voltage and current.

TRANSITION COSTS – Stranded costs which are charged to utility customers through some type of fee or surcharge after the assets are sold or separated from the vertically-integrated utility.

TRANSMISSION - Transporting bulk power over long distances.



TRANSMISSION AND DISTRIBUTION (T&D) LOSSES - Electric energy or capacity that is wasted in the normal operation of a power system. Some kilowatt-hours are lost in the form of waste heat in electrical apparatus such as substation transformers. Line losses are kilowatts or kilowatt-hours lost in transmission and distribution of electricity.

TRANSMISSION AND DISTRIBUTION (T&D) SYSTEM - An interconnected group of electric transmission lines and associated equipment for the movement or transfer of electric energy in bulk between points of supply and points at which it is transformed for delivery to the ultimate customers.

TRANSMISSION LINES - Heavy wires that carry large amounts of electricity over long distances from a generating station to places where electricity is needed. Transmission lines are held high above the ground on tall towers called transmission towers.

TRANSMISSION OWNER - An entity that owns transmission facilities or has firm contractual right to use transmission facilities.

TURBINE GENERATOR - A device that uses steam, heated gases, water flow or wind to cause spinning motion that activates electromagnetic forces and generates electricity.

U

UPGRADE (Electric utility) - Replacement or addition of electrical equipment resulting in increased generation or transmission capability.

U.S. DEPARTMENT OF ENERGY (DOE) - The DOE manages programs of research, development and commercialization for various energy technologies, and associated environmental, regulatory and defense programs. DOE announces energy policies and acts as a principal advisor to the President on energy matters.

UNCERTAINTIES - Uncertainties are factors over which the utility has little or no foreknowledge, and include load growth, fuel prices, or regulatory changes. Uncertainties are modeled in a probabilistic manner. However, in the Detailed Workbook, you may find it is more convenient to treat uncertainties as “unknown but bounded” variables without assuming a probabilistic structure. A specified uncertainty is a specific value taken on by an uncertainty factor (e.g., 3 percent per year for load growth). A future uncertainty is a combination of specified uncertainties (e.g., 3 percent per year load growth, 1 percent per year real coal and oil price escalation, and 2.5 percent increase in housing starts).

UNSERVED ENERGY - The average energy that will be demanded but not served during a specified period due to inadequate available generating capacity.



UPGRADE - An increase in the rating or stated measure of generation or transfer capability.

UTILITY - A regulated entity which exhibits the characteristics of a natural monopoly. For the purposes of electric industry restructuring, “utility” refers to the regulated, vertically-integrated electric company. “Transmission utility” refers to the regulated owner/operator of the transmission system only. “Distribution utility” refers to the regulated owner/operator of the distribution system which serves retail customers.

UTILITY-OWNED GENERATION - Resources owned by an investor-owned utility. Does not include resources that may be under contract or otherwise available to utilities, such as DWR contracts.

V

VARIABLE COSTS - Costs, such as fuel costs, that depend upon the amount of electric energy supplied.

W

WASTE-TO-ENERGY - This is a technology that uses refuse to generate electricity. In mass burn plants, untreated waste is burned to produce steam, which is used to drive a steam turbine generator. In refuse-derived fuel plants, refuse is pre-treated, partially to enhance its energy content prior to burning.

WEATHER SCENARIOS – 1:5, 1:10, & 1:20 - Forecasts of expected highest demand (MW) under different weather scenarios. 1:2 means average weather conditions. 1:5, 1:10, 1:20 mean probability of hot temperature (one in every five, ten or twenty years).

WEATHER TRIGGERED OPTIONS - A method for managing temperature and other weather forecast risks.

WHEELING - The transmission of electricity by an entity that does not own or directly use the power it is transmitting. Wholesale wheeling is used to indicate bulk transactions in the wholesale market, whereas retail wheeling allows power producers direct access to retail customers. This term is often used colloquially as meaning transmission.

WHOLESALE COMPETITION - A system whereby a distributor of power would have the option to buy its power from a variety of power producers, and the power producers would be able to compete to sell their power to a variety of distribution companies.



WHOLESALE POWER MARKET - The purchase and sale of electricity from generators to resellers (who sell to retail customers) along with the ancillary services needed to maintain reliability and power quality at the transmission level.

WINTER - As applied to gas, the period November 1 of one year through March 31 of the following year.

WINTER PEAK - The greatest load on an electric system during any prescribed demand interval in the winter season or months.

WIRES CHARGE - A broad term which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires.

X

X-RAY - A type of electromagnetic radiation having low energy levels.

Y

No entries for the letter Y.

Z

No entries for the letter Z.

List of Sources:

1. <http://www.energy.ca.gov/glossary/>
2. <http://www.energycentral.com/reference/glossary>
3. <http://www.eia.doe.gov/tools/glossary/>
4. CPUC Decisions (D.) 02-10-062, 03-12-062, 04-12-048, and 06-06-066
5. Advice Letter E-2615
6. <http://www.aga.org>
7. <http://www.pge.com>



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APPENDIX K

ACRONYM LIST



Acronym	Full Name
A.	Application
AB	Assembly Bill
ACEEE	American Council for an Energy Efficient Economy
AL	Advice Letter
AMP	Aggregator Managed Portfolio Program
APT	Annual Procurement Target
A/S	Ancillary Services
BBEES	Big Bold Energy Efficiency Strategies
BIP	Base Interruptible Program
Bloom	Bloom Energy
BPP	Bundled Procurement Plan
C&I	Commercial and Industrial
C&S	Codes and Standards
CAISO	California Independent System Operator
CARB	California Air Resources Board
CBP	Capacity Bidding Program
CC	Combined Cycle
CCA	Community Choice Aggregation
CDWR or DWR	California Department of Water Resources
CEC	California Energy Commission
CHP	Combined Heat and Power



Acronym	Full Name
CO ₂	carbon dioxide
CPA	California Consumer Power and Conservation Financing Authority
CPUC or Commission	California Public Utilities Commission
CRR	Congestion Revenue Rights
CRT	Customer Risk Tolerance
CSI	California Solar Initiative
CSU East Bay	California State University East Bay
D.	Decision
DA	Direct Access
DBP	Demand Bidding Program
DCPP	Diablo Canyon Power Plant
DG	Distributed Generation
DR	Demand Response
DRA	Division of Ratepayer Advocates
DSM	Demand-Side Management
EAL	Estimated Aggregate Liability
EAP	Energy Action Plan
ECMS	Energy Contract Management & Settlements
ED	Energy Division
EE	Energy Efficiency



Acronym	Full Name
EEI	Edison Electric Institute
enricher	enrichment services supplier
EP	PG&E's Energy Procurement organization
EPPA	Energy Policy, Planning & Analysis
ERRA	Energy Resource Recovery Account
ESM	Energy Supply Management
ET	Emerging Technologies
EUP	Enriched Uranium Product
EV	Electric Vehicle
FCE	FuelCell Energy
FCM	Futures Commission Merchant
FERC	Federal Energy Regulatory Commission
FIT	Feed-in Tariff
FNM	Full Network Model
FTR	Firm Transmission Rights
GDP-IPD	Gross Domestic Product – Implicit Price Deflator
GHG	greenhouse gas
GISB	Gas Industries Standards Board
GO 156	General Order 156
GSP	Gas Supply Plan
GWh	gigawatt-hour



Acronym	Full Name
HASP	Hour Ahead Scheduling Process
HVAC	Heating, Ventilating and Air Conditioning
ICE	Intercontinental Exchange
ID	Irrigation District
IDSMD	Integrated Demand-Side Management
IE	Independent Evaluator
IEPR	Integrated Energy Policy Report
IFM	Integrated Forward Market
IM	Instant Messaging
IOU	investor-owned utility
ISDA	International Swaps and Derivatives Association, Inc.
kgU	kilograms uranium
kW	kilowatt
kWh	kilowatt-hour
LCBF	least-cost, best-fit
LCD	least-cost dispatch
LCR	Local Capacity Requirements
LMP	Locational Marginal Price
LSE	Load Serving Entity
LT	Long-Term
LT-CRR	Long-Term Congestion Revenue Rights



Acronym	Full Name
LT-FTR	Long-Term Firm Transmission Rights
LTPP	Long-Term Procurement Plan
LTRFO	Long-Term Request for Offers
MASH	Multi-Family Affordable Solar Housing Program
ME&O	Marketing, Education and Outreach
MIV	Market Intrinsic Value
MMBtu	Millions of British Thermal Units
MRTU	Market Redesign and Technology Upgrade
MW	megawatts
MWh	megawatt-hour
NAESB	North American Energy Standards Board
NEM	Net Energy Metering
NEMFC	Net Energy Metering for Fuel Cell Customers-Generators
NEMW	Wind Energy Co-Metering
NERC	North American Electric Reliability Corporation
NGX	Natural Gas Exchange
Non-FTR	Non-Firm Transmission Rights
NP15	North of Path-15
NPV	Net Present Value
NQC	Net Qualifying Capacity
NRC	Nuclear Regulatory Commission



Acronym	Full Name
NSHP	New Solar Homes Partnership
NYMEX	New York Mercantile Exchange
O&M	Operations and Maintenance
Oakley Project	Oakley Generating Station
OASIS	Open Access Same-time Information Systems
OP	Ordering Paragraph
O-T-C	Over-The-Counter
PCT	Programmable and Communicating Thermostat
PDP	Peak Day Pricing
PDR	Proxy Demand Response
PG&E	Pacific Gas and Electric Company
PL	Participating Load
PLS	Permanent Load Shifting
PPA	Power Purchase Agreement
PRG	Procurement Review Group
PSA	Purchase and Sale Agreement
PSE	Puget Sound Energy
PTR	Peak Time Rebate
PURPA	Public Utility Regulatory Policy Act
PV	Photovoltaic
PVRR	Present Value of Revenue Requirement



Acronym	Full Name
QCR	Quarterly Compliance Report
QF	Qualifying Facility
QF/CHP Settlement	Qualifying Facility and Combined Heat and Power Settlement
R.	Rulemaking
RA	Resource Adequacy
RAM	Renewable Auction Mechanism
RDRP	Reliability Demand Response Product
REC	Renewable Energy Credit
RES	Renewable Electricity Standard
RES-BCT	Renewable Energy Self-Generation – Bill Credit Transfer
RFO	Request for Offers
RFP	Request for Proposals
RMR	Reliability Must-Run
RPS	Renewable Portfolio Standard
RTM	Real-Time Market
S&P	Standard and Poor's
S&T	Supplier's and Transporter's
SASH	Single-Family Affordable Solar Housing Program
SB	Senate Bill
SCE	Southern California Edison Company



Acronym	Full Name
SDG&E	San Diego Gas & Electric Company
SEC	Securities and Exchange Commission
SF State	San Francisco State University
SGIP	Self-Generation Incentive Program
SI	Strategic Inventory
SOX	Sarbanes-Oxley
Standardized Assumptions	Appendix B of the <i>Administrative Law Judge's Ruling Requesting Post-Workshop Comments, Updating Standardized Planning Assumptions, and Providing Lawrence Berkeley Report on Modeling Issues</i> issued December 23, 2010
Strategic Plan	California Energy Efficiency Long Term Strategic Plan
SWU	Separative Work Unit
T&D	transmission and distribution
TeVAr	To-expiration Value-at-Risk
TOU	Time-of-Use
Track II Scoping Memo	<i>Assigned Commissioner's and Administrative Law Judge's Scoping Memo for Track II Bundled Procurement Plans</i> issued January 13, 2011
TREC	Tradable Renewable Energy Credits
UOG	utility-owned generation
U.S.	United States
WACC	Weighted Average Cost of Capital



Acronym	Full Name
WaveConnect	PG&E's wave energy project
WE&T	Workforce Education and Training
WECC	Western Electric Coordinating Council
WMDVBE	Women, Minority and Disabled Veteran Business Enterprise
WREGIS	Western Renewable Energy Generation Information System
WSPP	Western System Power Pool



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APPENDIX L
GHG PROCUREMENT PLAN

CONFIDENTIAL



A. Background

1. California Air Resource Board's Cap-and-Trade Regulations

Assembly Bill ("AB 32") is California's groundbreaking greenhouse gas ("GHG") legislation that requires the reduction of statewide GHG emissions to 1990 levels by 2020. To this end, the California Air Resources Board ("CARB") proposed a statewide Cap-and-Trade regulation and other programmatic measures, including a Renewable Energy Standard, Customer Energy Efficiency, and Combined Heat and Power, to achieve these emissions reductions. The Cap-and-Trade regulation, which became effective on January 1, 2012, is intended to establish a market-based price for GHG emissions and, over time, provide market signals for efficient resource utilization and procurement activities to reduce GHG emissions. This regulation is and will likely continue to be amended; should changes to the regulation necessitate modifications to this plan, Pacific Gas and Electric Company ("PG&E") will submit an advice letter to the California Public Utilities Commission ("CPUC" or "Commission") requesting changes.

Compliance with the emissions cap established in the CARB Cap-and-Trade regulation begins in 2013 and is broken up into three compliance periods. The first compliance period—for the years 2013 through 2014—is scheduled to commence on January 1, 2013. Covered entities in the first compliance period include operators of any facility that annually emits at least 25,000 metric tons of carbon dioxide equivalent ("mtCO₂e").¹ Operators are required to obtain and surrender compliance instruments equivalent to the annual GHG emissions for each such facility. Importers of electricity into California are also responsible for obtaining and retiring compliance instruments for

¹ Units of GHG are typically measured in terms of mtCO₂e.



GHG emissions deemed to be associated with electricity imports for purposes of compliance with Cap-and-Trade.

There are two types of compliance instruments:

- i. **Allowances** are limited tradable authorizations created by CARB to emit up to one mtCO₂e. Allowances are year-specific and can be used for an annual compliance filing for the year it was issued or for any subsequent compliance filing. An allowance can be bought, sold, transferred, or “banked” for use in a particular compliance period. Allowances will be available via direct allocation² by CARB, auctions to be conducted under the auspices of CARB, and the Allowance Price Containment Reserve³ (“APCR”) to be established by CARB. CARB auctions are currently scheduled to be held quarterly.⁴ Allowances may also become available in secondary markets.
- ii. **Offset Credits** (“Offsets”) are tradable compliance instruments issued by CARB that represent verified reductions of one mtCO₂e from projects whose emissions or avoided emissions are not from a source covered under the Cap-and-Trade program. For compliance purposes, an offset and an allowance are virtually interchangeable for the year issued, however, an entity can only use offsets to meet up to 8% of its compliance obligation in any compliance period. In addition, CARB’s Cap-and-Trade regulation allows CARB to invalidate an offset for errors, regulatory violations or fraud. CARB has proposed specific rules for using offsets for Cap-and-Trade compliance, including the types of projects that qualify and the process for offset verification, issuance, and registration.

² According to the Cap-and-Trade regulation, the investor-owned utilities (“IOU”) are required to consign 100% of their directly allocated allowances to the auctions in the allocation year; any allowances unsold in the previous year will remain in the IOU’s consignment account. An IOU cannot use a directly allocated allowance to satisfy its compliance obligation.

³ The CARB APCR will be populated with a finite quantity of allowances available for purchase at fixed prices and only by entities that are required (“covered entities”) to participate in the Cap-and-Trade program.

⁴ In 2012, there will only be one auction, on November 14, 2012. For that auction, IOUs must consign one-third of 2013’s allowances allocated to them; the balance of those allowances must be consigned to the auctions in 2013. This change was noted in the March 30, 2012 proposed amendments to the cap-and-trade regulation. CARB’s Board is scheduled to consider these amendments on June 28, 2012.



Allowances and offsets may also be available from external GHG Emissions Trading System (“GHG ETS”) to which California has linked.⁵

PG&E’s actual Cap-and-Trade compliance obligation for a given year is determined by the GHG emissions reported annually to CARB per the Mandatory Reporting Rule.⁶ Annual reports are due to CARB by April 10 of the calendar year following the emission year for facility operators or suppliers, and June 1 for electric power entities. Cap-and-Trade compliance showings are made annually and at the end of each compliance period. In order to demonstrate compliance in a given year, PG&E must surrender enough compliance instruments to cover 30% of its qualifying emissions by November 1 of the following calendar year (“annual surrender date”). In addition, PG&E must surrender enough compliance instruments to cover the balance of its qualifying emissions over a multi-year compliance period by November 1 of the calendar year following the end of each compliance period (“compliance period surrender date”).

PG&E is expected to receive an allocation of free allowances directly from CARB annually; however, these free allowances cannot be used directly by PG&E to satisfy its compliance obligation. All directly-allocated allowances must be consigned by PG&E into one or more of the auctions. For the 2012 auction, allowances designated for consignment at least ten (10) days before the auction will be available for sale at that auction. Beginning in 2013, allowances consigned at least seventy-five (75) days prior to

⁵ Additional regulatory language referencing external GHG ETS to which California may be linked was added as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation. CARB’s Board is scheduled to consider these amendments on June 28, 2012.

⁶ Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Division 3, Chapter 1, Subchapter 10, Article 2, Sections 95100 to 95133, title 17, California Code of Regulations).



a quarterly auction will be offered for sale at that auction and each consigning entity agrees to accept the auction settlement price for allowances sold at auction. Only IOUs and publicly-owned utilities ("POU") can consign allowances to the auction.

2. Greenhouse Gas Compliance Instruments and California Air Resources Board Auctions

Procurement of compliance instruments may take place through any or all of the following: (1) CARB-sanctioned allowance auctions; (2) APCR; and (3) allowance or offset procurement via secondary markets.

The first CARB allowance auction is scheduled to take place on November 14, 2012, and allowance auctions will be held quarterly thereafter. To participate in an auction, PG&E must register for the auction prior to the auction date. The auction format consists of single-round bidding, with sealed bids consisting of price and quantity, and bid units of 1,000 mtCO₂e. Bidders may submit multiple bids. Each auction will clear at the auction settlement price as follows: beginning with the highest bid price, bids will be considered in declining order by price and bidders at that price will be awarded allowances until: (a) the next lower bid price is less than the auction floor price, in which case the current price is the settlement price; or (b) the total quantity of allowances bid at the next lower bid price is greater than or equal to the number of allowances available to be awarded, in which case the next lower bid price is the settlement price. If the total quantity bid at the settlement price is greater than the number of available allowances, the

regulation describes the process by which these allowances would be distributed to each entity bidding at the auction settlement price.⁷

Prior to each auction, PG&E will also be required to provide a bid guarantee, which will consist of a bond, cash, or letter of credit with a value greater than or equal to the maximum value of bids to be submitted.⁸ The Cap-and-Trade regulation also limits each participating entity's holdings of allowances in its trading or compliance accounts, with certain exemptions. This limits the total amount of allowances any participating entity can purchase and hold. In addition, the March 30, 2012 proposed amendments to the regulation stipulate that CARB shall restrict IOUs and POUs from purchasing more than 40% of the allowances offered at each auction.

Prior to a given auction, CARB will disclose the number of allowances from California and any external GHG ETS to which California has linked that will be offered in that auction. Beginning in 2013, in addition to consigned allowances, in each auction of allowances from the current and previous budget years ("current auction"), CARB will offer one-quarter of its own current year allowances designated for auction. Concurrent with the current auction, CARB will conduct an auction for allowances from future budget years ("advance auctions"). In each advance auction it will offer one-quarter of its own allowances allocated for the budget year three years subsequent to the current calendar year.⁹ Current and advance auctions will be conducted separately.

⁷ The process for resolution of tie bids was changed in March 30, 2012, proposed amendments to the cap-and-trade regulation, and has not yet been finalized.

⁸ This deadline was extended from one week as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation.

⁹ With the exception of 2012, when all of the allowances allocated for advance auction from the 2015 budget will be designated for sale at the advance auction.



The APCR will be filled with 121.8 million mtCO₂e allowances for 2013-2020. There is no refill mechanism proposed for the APCR, and use of the APCR is restricted to entities registered into the California cap-and-trade system. Allowances purchased from the APCR go into an entity's compliance account and cannot be withdrawn or traded. To the extent allowances remain in the APCR, they will become available for purchase by complying entities on March 8, 2013. Subsequent APCR sales will be conducted on the first day six weeks after each quarterly auction. The APCR consists of three tiers with different associated prices; each tier consists of one-third of the 121.8 million mtCO₂e allowances with which the APCR is initially populated. Tier 1 allowances will be sold to entities with a compliance obligation at \$40/mtCO₂e in 2013,¹⁰ Tier 2 at \$45/mtCO₂e in 2013, and Tier 3 at \$50/mtCO₂e in 2013.

Finally, to the extent that allowances are transacted between parties outside of the auction or APCR, within three days of settlement, the seller and buyer must report each transaction to CARB.¹¹

B. PG&E's Allowance Consignment Proposal

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

¹⁰ The APCR price for each tier will rise by 5% plus the Consumer Price Index ("CPI") each year.

¹¹ The timeline for transfer of compliance instruments between accounts may change as part of the March 30, 2012 proposed amendments to the cap-and-trade regulation.



C. PG&E's Potential Greenhouse Gas Risks

1. Greenhouse Gas Obligations

PG&E is required by CARB's Cap-and-Trade regulation to surrender compliance instruments for its qualifying utility-owned generation ("UOG"), imports, and gas compressor stations (herein collectively described as "physical" obligations). Furthermore, PG&E has contractual obligations associated with certain tolling agreements that require it to either: (1) provide the counterparty with compliance instruments for the energy under contract; or (2) reimburse the counterparty for the Cap-and-Trade compliance costs associated with its facility's operation under the contract.

2. Cap-and-Trade Penalties

PG&E could face CARB penalties for failure to surrender an adequate number of compliance instruments for UOG, imports, and gas compressor stations for which it has a compliance obligation.

CARB's Cap-and-Trade rule imposes a four-time excess emissions penalty resulting from "untimely surrender" of allowances. This penalty would be assessed by requiring that additional compliance instruments be surrendered, rather than by cash payment. In addition, if an entity fails to surrender the required compliance instruments within five (5) days of the first auction or reserve sale conducted by CARB following the



applicable surrender date, whichever is the latter, and for which the registration deadline has not passed when the untimely surrender obligation is assessed, CARB's Cap-and-Trade rule would treat each ton of GHG emissions for which a compliance instrument was not surrendered as a separate violation for each day the violation continues.

AB 32 incorporates longstanding air pollution penalty authority pursuant to Health and Safety Code ("HSC") Section 38580. In relevant part, under HSC § 42300 et seq., CARB may impose civil and criminal penalties on corporations and individuals and may also seek injunctive relief. Civil penalty authority (per day of violation) is up to \$10,000 (strict liability); \$20,000 (negligent emissions violation); \$40,000 (knowing emissions violation); \$35,000 (falsification of document with intent to deceive); and \$75,000 (intentional emissions violation). Additional penalties that are more severe can result from negligent or intentional violations causing unreasonable risk of or actual bodily injury or death. AB 32 specifies that any violation of a CARB climate regulation is considered an emissions violation.

[REDACTED]

[REDACTED]

[REDACTED]

3. Offset Credits ("Offsets")

CARB's Cap-and-Trade regulation allows CARB to invalidate an offset for errors, regulatory violations, or fraud. In the case where an offset is used to meet a compliance requirement and is later invalidated, the complying entity must replace the invalidated



offset with a valid compliance instrument within six (6) months of notification by CARB of the offset's invalidation or be subject to compliance penalties. PG&E will only purchase offsets if the purchase contract requires the seller to assume the risk of invalidation and to post appropriate collateral. PG&E will assess the risk of invalidation for each offset transaction.

D. PG&E's GHG-Related Product Procurement

This GHG Procurement Plan addresses the GHG-related procurement authority necessary for PG&E to comply with the obligations associated with emissions from sectors covered by Cap-and-Trade beginning in the first compliance period, namely facilities with GHG emissions greater than or equal to 25,000 mtCO₂e per year and imported electricity.¹³ As an entity that is required to comply with Cap-and-Trade, PG&E will need to procure compliance instruments to meet the compliance requirements associated with its own facilities and imports, as well as the GHG contractual obligations associated with Power Purchase Agreements with third parties that require PG&E to procure GHG compliance products or assume GHG compliance costs for such parties. PG&E's Energy Procurement Department will procure GHG compliance instruments for all of PG&E's emissions subject to Cap-and-Trade, and transfer requested GHG

¹³ Beginning in 2015, concurrent with the start of the second compliance period, CARB intends to expand the scope of covered sectors subject to the cap to include suppliers of natural gas, transportation fuels, and other fuels. PG&E may seek Commission approval of amended procurement authority through the advice letter process if amendments are necessary to ensure PG&E's compliance related to GHG emissions that would fall under this expanded cap.



allowances to PG&E's Gas Transmission and Distribution Department¹⁴ (i.e., for GHG emissions at gas compressor stations) at PG&E's weighted-average cost.¹⁵ Below, PG&E describes its GHG obligations and Commission-approved GHG-related products and procurement processes, as well as its GHG procurement strategy. The products, procurement processes, and GHG procurement strategy establish the upfront achievable standards for PG&E's procurement activities consistent with AB 57.

1. Greenhouse Gas Obligations

PG&E's primary need to procure GHG compliance instruments and engage in GHG transactions for the first compliance period beginning 2013 arises in connection with the following:

- Utility-Owned Facilities: Conventional generation facilities and gas compressor stations owned by PG&E that are either operating or under construction and that emit at least 25,000 mtCO₂e per year, such as the Humboldt Generating Station, Colusa Generating Station, and Gateway Generating Station, will have a compliance obligation under Cap-and-Trade.
- Selected Tolling Agreements: Contracts that allocate to PG&E or where PG&E has assumed GHG compliance instrument procurement responsibility for such counterparties.
- Electricity Imports: PG&E is responsible for GHG emissions deemed to be associated with its electricity imports for purposes of compliance with Cap-and-Trade.

¹⁴ PG&E's Energy Procurement Department will only act as the buying agent for GHG Products requested by the Gas Transmission and Distribution Department for the limited GHG obligations associated with its gas compressor stations. A forecast of GHG position will be conducted by Gas Transmission and Distribution, who will then request a quantity of compliance products from the Energy Procurement Department.

¹⁵ Weighted-average cost is the weighted-average cost of PG&E's allowances and offsets in a given compliance year.



2. Greenhouse Gas-Related Products

The following GHG-related products (“GHG Products”) have been approved by the Commission:

**TABLE APPENDIX L-1
PACIFIC GAS AND ELECTRIC COMPANY
GHG PRODUCTS**

Product	Description
GHG Allowance	A compliance instrument accepted by CARB providing the right to emit one mtCO ₂ e to satisfy obligations under the Cap-and-Trade regulation.
GHG Offset	A compliance instrument representing a verified emission reduction that is accepted by CARB in lieu of a GHG Allowance to satisfy obligations under the Cap-and-Trade regulation.

3. Greenhouse Gas-Related Processes

PG&E will procure GHG Products from the Primary and Secondary Markets¹⁶ to meet its entity-specific and contractual compliance obligations in accordance with its procurement strategy. PG&E is authorized to procure these GHG Products using the following procurement methods:

**TABLE APPENDIX L-2
PACIFIC GAS AND ELECTRIC COMPANY
GHG PROCUREMENT METHODS AND PRACTICES**

Transaction Process	Description
CARB Auction	Authorization to procure GHG Allowances through any CARB Auction in accordance with the Cap-and-Trade regulation.
Allowance Price Containment Reserve	Authorization to procure GHG Allowances through CARB’s Allowance Price Containment Reserve.

In addition to the new GHG Procurement Methods and Practices in Table Appendix L-2, PG&E will use approved procurement methods and practices as

¹⁶ The Primary Market consists solely of the CARB auctions and APCR for allowances. The Secondary Market consists of allowance and offset products offered for purchase outside of the Primary Market.



described in its Bundled Procurement Plan that govern procurement via competitive Requests for Offer (“RFO”) processes and transparent exchanges¹⁷ to procure GHG Products. When procuring via bilateral transactions (including brokers), PG&E will utilize a competitive RFO process, consult with its Procurement Review Group (“PRG”), apply its approved procurement credit and collateral requirements, and apply the applicable affiliate transaction rules. PG&E can also procure GHG Products on exchanges that have been previously approved by the Commission for power procurement. For exchanges not previously approved, PG&E will submit a Tier 2 advice letter detailing: (1) what exchange it is seeking to use; (2) the liquidity and transparency of the exchange, specific for GHG Products, including an explanation of how the Commission can be assured that the price of the products procured on the exchange is reasonable; and (3) the regulatory authority or authorities the exchange is subject to. Finally, PG&E has authority to resell GHG Products, but will report such sales to its PRG.

4. Greenhouse Gas Procurement Strategy

[REDACTED]

[REDACTED]

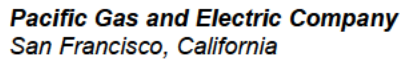
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

¹⁷ The use of exchanges includes the “clearing” of bilateral transactions authorized by the Commission.



- i. Maximum Volume Limits
- j. Financially Hedging GHG Product Price Risk

Each of these elements is described in more detail below.

- Decision No. 12-01-033, 12-04-046*

Issued by
Brian K. Cherry
Vice President
Regulation and Rates

Date Filed May 21, 2012
Effective _____
Resolution No. _____

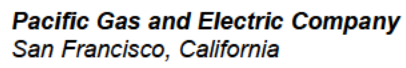


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i. Maximum Volume Limits

Consistent with Decision 12-04-046, specific overall volume limits for PG&E's GHG Product procurement will tie to the actual and forecasted GHG emissions for its facilities, certain tolling agreements, and electric imports. CARB's regulation also set limits on the number of allowances that can be held, and offsets that can be used for compliance. In addition, the March 30, 2012 proposed amendments to the regulation restrict PG&E from purchasing more than 40% of the allowances offered at each auction. These various limits will cap the amount of GHG Products PG&E will procure. PG&E will also transact GHG Products consistent with regulations established regarding the use of such products for compliance with Cap-and-Trade. PG&E may purchase GHG Products in excess of its annual compliance requirements and may "bank" surplus GHG Products to use in future compliance years in accordance with its procurement strategy and the procurement limits set forth below.

Generally in the current year, PG&E may purchase GHG Products to fulfill 100% of its current net remaining compliance obligation and its forecasted compliance obligation for the remainder of the current year. In addition, in the current year PG&E may purchase a portion of its forecasted compliance obligation for the following three compliance years not to exceed a set percentage in total for each year. PG&E will



not purchase GHG Products with vintages more than three years from the current year. Finally, PG&E will not purchase more than 8% of its direct compliance obligation, as defined below, in the form of offsets, provided these purchases also stay within the overall GHG Product procurement limits identified below.

The procurement limit sets the maximum amount of GHG Products PG&E may purchase in the current year to fulfill its “direct compliance obligation,” defined as the tons of emissions for which PG&E has an obligation to retire allowances on its own behalf as a regulated entity under the Cap-and-Trade program, and/or is otherwise obligated to procure GHG Products for a third party that is a regulated entity under the Cap-and-Trade program (i.e., certain contractual arrangements where PG&E is contractually responsible, or could elect to assume that responsibility, for procuring GHG Products for a third party). A “purchase” is defined as taking title of the GHG Product when it is delivered. Thus forward purchases count against the procurement limit in the year delivered, which may not be the current year.

PG&E’s Direct Compliance Obligation Purchase Limit for the current year is calculated as:

$$LCY = A + 100\% * FDCY + 60\% * FDCY + 1 + 40\% * FDCY + 2 + 20\% * FDCY + 3$$

Where:

“L” is the maximum number of GHG Products PG&E can purchase for purposes of meeting its direct compliance obligation.

“CY” is the Current Year, i.e., the year in which PG&E is transacting in the market.

“A” is PG&E’s net remaining compliance obligation to date, calculated as the sum of the actual emissions for which PG&E is responsible for



retiring allowances (or obligated to purchase for a third party) up to the Current Year, minus the total allowances or offsets PG&E has purchased up to the Current Year that could be retired against those obligations. This term in the calculation ensures PG&E is always able to buy sufficient GHG Products to cover any prior years' shortfalls, given that actual emissions may end up being less than forecast and/or prior decisions about how much procurement to do.

"FD" is PG&E's "forecasted compliance obligation", the projected amount of emissions for which PG&E is responsible for retiring GHG Products, or obligated to purchase for a third party, calculated using an implied market heat rate ("IMHR") that is two-standard deviations above the expected IMHR³².

If this equation results in a negative number in a given year, PG&E's Direct Compliance Obligation Purchase Limit for that year should be set at zero.

In addition to its Direct Compliance Obligation Purchase Limit, in the current year PG&E will not purchase GHG Products for future years greater than the percentage allowed in the Direct Compliance Obligation Purchase Limit formula. Therefore, for the prompt year (current year plus one) PG&E will not purchase in aggregate during the current year more than 60% of the prompt year's forecasted compliance obligation (as calculated above). Similarly, the percentages for current year plus two and current year plus three are 40% and 20%, respectively.

³² The IMHR two-standard deviations above the expected IMHR is calculated as follows: (1) the monthly historic IMHR is calculated by dividing monthly forward electricity prices by monthly forward gas prices for the period 2003 through 2011, yielding the forward monthly IMHR for this period; (2) monthly standard deviations of the forward monthly IMHR are then calculated separately for January through December; (3) the IMHR two-standard deviations above the expected IMHR is equal to the forward IMHR plus the standard deviation calculated in (2) multiplied by 2.0. The forward electricity prices to be used in calculating forecasted compliance obligations for the Direct Compliance Obligation Purchase Limits are then calculated by multiplying the IMHR at two-standard deviations above the expected IMHR by the forward gas price.



Consistent with Ordering Paragraph 9 of D.12-04-046, Table Appendix L-4 below details estimated forecast of the amount of greenhouse gas compliance instruments (in metric tons carbon dioxide equivalents) that correspond to the maximum procurement levels detailed in Table Appendix L-5.

[REDACTED]

[REDACTED]

[REDACTED]

33 [REDACTED]

33 [REDACTED]



**j. Financially Hedging Greenhouse Gas Compliance
Instrument Price Risk**

Because the products and markets to financially hedge GHG compliance instrument price risk are not developed at this time, PG&E is not seeking authority financially hedge GHG compliance instrument price risk at this time. PG&E will seek to amend its BPP by advice letter to seek such authority as these markets and products develop. PG&E's purchase of financial instruments to hedge GHG Product price risk will be subject to the procurement limit set forth below.

The "financial exposure" purchase limit sets the specific limit on the amount of GHG Products PG&E can purchase to hedge its financial exposure to GHG costs under the Cap-and-Trade program. As with the Direct Compliance Obligation Purchase Limit formula above, this is a purchase limit, meaning the number that emerges from this calculation would set the maximum amount of GHG Products PG&E is allowed to purchase in the current year for purposes of hedging its financial exposure. As above, "purchase" is defined as taking title of the GHG Product when it is delivered. PG&E is not allowed to purchase allowances or offsets for hedging purposes with vintages more than three years from the current year.

PG&E's Financial Exposure Purchase Limit is calculated as:

$$\text{FLCY} = 20\% * \text{FECY} + 10\% * \text{FECY}+1 + 5\% * \text{FECY}+2 + 2.5\% * \text{FECY}+3 - B$$

Where:

"FL" is the maximum number of GHG Products PG&E can purchase for purposes of hedging its financial exposure to GHG costs.

"CY" is the current year, i.e., the year in which PG&E is transacting in the market.



“FE” is an estimate of PG&E’s financial exposure to GHG costs that will, or are anticipated to be, embedded in the price of energy, calculated based on the tons of GHG emissions for which PG&E believes it will bear the costs through an embedded cost of such emissions as reflected in energy prices. This amount does not include the costs PG&E anticipates incurring as a result of its direct compliance obligation as “direct compliance obligation” is defined above. “B” is PG&E’s net purchases of GHG Products to date for hedging purposes, calculated as the total purchases of GHG Products for purposes of hedging PG&E’s financial exposure up to the current year minus those GHG Products sold up to the current year. This term helps ensure that if PG&E hedged considerably in prior years and those hedges did not pay out (i.e. the price PG&E saw in the market for GHG Products stayed below what PG&E paid for a GHG Product and so PG&E did not sell the instrument), that gets factored into the amount of additional hedging PG&E is allowed to undertake.

Should this equation result in a negative number in a given year, PG&E’s Financial Exposure Purchase Limit for that year will be set at zero.

5. Procurement Review Group Consultation

PG&E will annually review with its PRG its proposed CARB auction bidding strategy, including discussion of the total volume of GHG Products that PG&E might acquire and its GHG position. PG&E will also consult with its PRG on RFOs for GHG Products, and prior to transacting for any GHG Product in the Secondary Market with a vintage year³⁴ more than three years in the future beyond the current calendar year. PG&E will report any GHG Product sales to the PRG. Finally, PG&E will report any forecast updates, corresponding revisions to the purchase limits and GHG Product transactions to the PRG at its quarterly position update.

³⁴ A “vintage year” is an attribute of each allowance that refers to the compliance year that CARB associates with the allowance at issuance. The vintage year designation restricts the allowance’s eligibility for use to certain compliance periods. In the case of offsets, the vintage year refers to the year in which the offset is created.



6. Quarterly Compliance Reports and Energy Resource Recovery Account Recovery

Forecast updates and corresponding revision to the purchase limits along with all GHG Product transactions will be reported in PG&E's Quarterly Procurement Compliance Report ("QCR"). In addition, the QCR will provide a summary of current market conditions and all GHG Product transactions conducted by PG&E. PG&E's will record costs for GHG Products³⁵ in its Energy Resource Recovery Account ("ERRA") for recovery in rates.

PG&E's request for cost recovery of GHG Products through ERRA implicitly assumes the purchase of these products can be financed with short-term debt. However, PG&E's short-term borrowing capacity is limited, and much of that capacity is needed to meet day-to-day operational needs, other balancing account under-collections and collateral to support energy procurement. Thus, depending on the cost and tenor of these products, PG&E may need to resort to financing with long-term debt and/or equity. In that event, PG&E may seek alternative cost recovery mechanisms in order to recover its actual cost of financing of these products.

7. Approval for Contract Term Duration

For transactions of GHG Products with vintage years four years or fewer into the future, PG&E will include these transactions in its QCR and the annual ERRA Compliance proceeding. For transactions of GHG Products with vintage years more than four years into the future, PG&E will submit the transactions for review through the

³⁵ Including costs related to offset development, if authorized, in accordance with the procurement strategy.



Commission's advice letter process. PG&E will not enter into a contract whose delivery term extends beyond 2020.

8. Independent Evaluator

For contracts with delivery terms that are greater than two years, PG&E will include an Independent Evaluator ("IE") in any competitive solicitation and an IE Report in its respective QCR or advice letter filings.

9. Updates Via Advice Letter

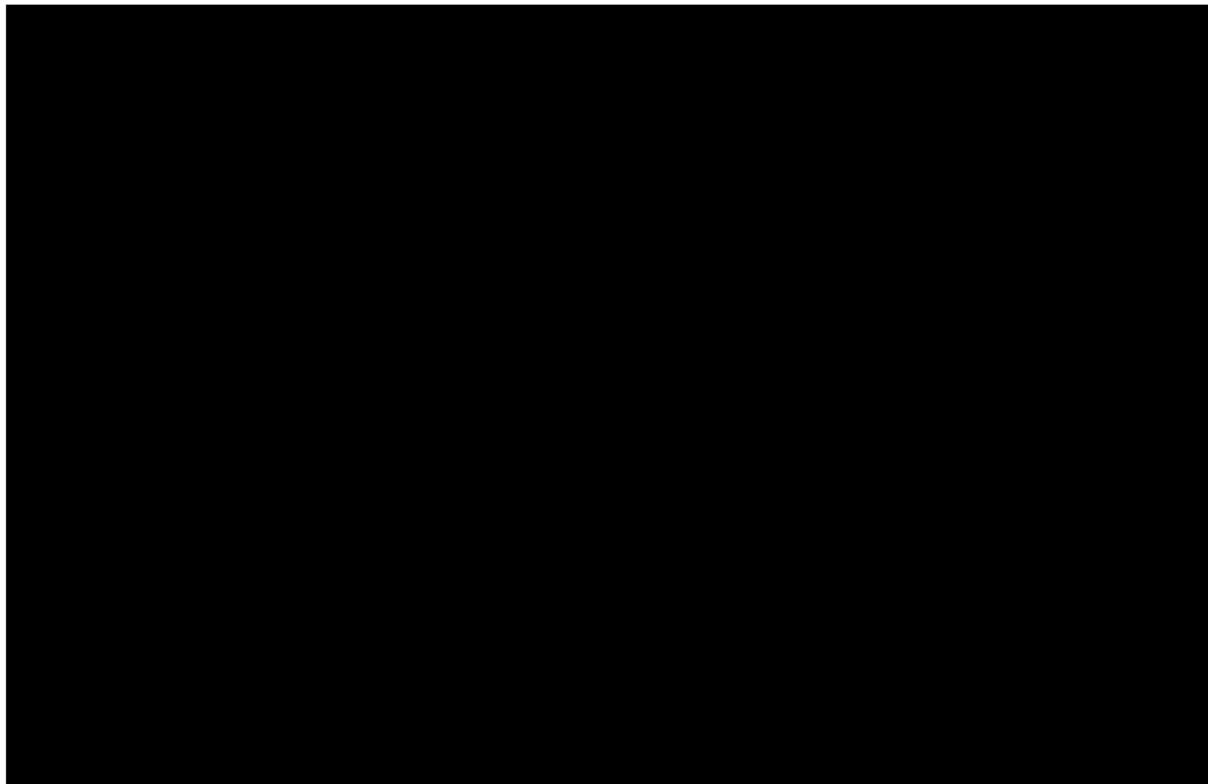
The procurement strategy for which approval is requested above is based on the final CARB Cap-and-Trade and Mandatory Reporting Rule regulations, and where noted, the March 30, 2012 proposed amendments to the Cap-and-Trade regulation. Certain changes to CARB's regulations may affect implementation of this plan for GHG-related procurement. Should market conditions, CARB's regulations, or the electric portfolio change to the point of necessitating modifications to the plan, PG&E will submit an advice letter to the Commission requesting changes.

PG&E will update its GHG compliance forecasts and corresponding purchase limits as necessary via a Tier 2 advice letter. The advice letter will include a description and workpapers detailing the calculation of the estimated purchase limits and an explanation of the key drivers of differences from the prior estimates.



Pacific Gas and Electric Company
San Francisco, California

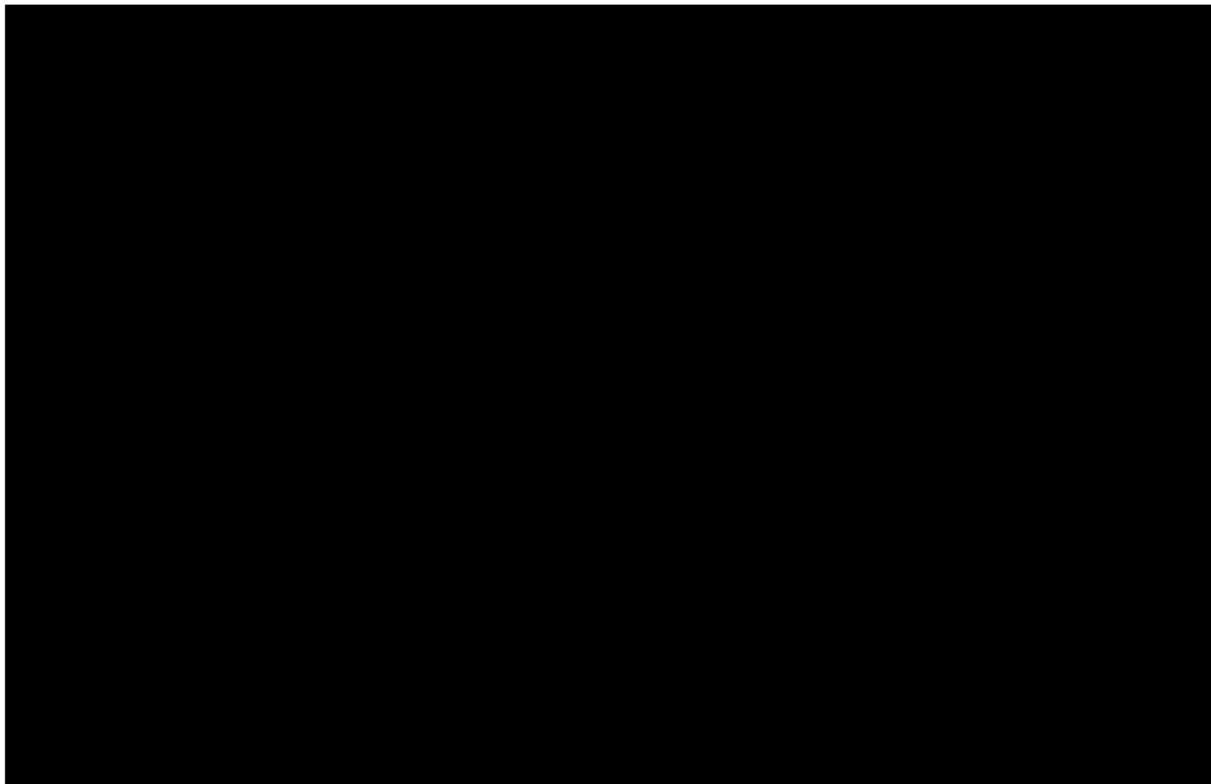
Cal. P.U.C. Sheet No. 308
Pacific Gas and Electric Company
Bundled Procurement Plan





Pacific Gas and Electric Company
San Francisco, California

Cal. P.U.C. Sheet No. 309
Pacific Gas and Electric Company
Bundled Procurement Plan



**PG&E Gas and Electric
Advice Filing List
General Order 96-B, Section IV**

AT&T	Department of Water Resources	North America Power Partners
Alcantar & Kahl LLP	Dept of General Services	North Coast SolarResources
Ameresco	Douglass & Liddell	Northern California Power Association
Anderson & Poole	Downey & Brand	Occidental Energy Marketing, Inc.
BART	Duke Energy	OnGrid Solar
Barkovich & Yap, Inc.	Economic Sciences Corporation	Praxair
Bartle Wells Associates	Ellison Schneider & Harris LLP	R. W. Beck & Associates
Bloomberg	Foster Farms	RCS, Inc.
Bloomberg New Energy Finance	G. A. Krause & Assoc.	Recurrent Energy
Boston Properties	GLJ Publications	SCD Energy Solutions
Braun Blaising McLaughlin, P.C.	GenOn Energy, Inc.	SCE
Brookfield Renewable Power	Goodin, MacBride, Squeri, Schlotz & Ritchie	SMUD
CA Bldg Industry Association	Green Power Institute	SPURR
CLECA Law Office	Hanna & Morton	San Francisco Public Utilities Commission
CSC Energy Services	Hitachi	Seattle City Light
California Cotton Ginners & Growers Assn	In House Energy	Sempra Utilities
California Energy Commission	International Power Technology	Sierra Pacific Power Company
California League of Food Processors	Intestate Gas Services, Inc.	Silicon Valley Power
California Public Utilities Commission	Lawrence Berkeley National Lab	Silo Energy LLC
Calpine	Los Angeles Dept of Water & Power	Southern California Edison Company
Cardinal Cogen	Luce, Forward, Hamilton & Scripps LLP	Spark Energy, L.P.
Casner, Steve	MAC Lighting Consulting	Sun Light & Power
Center for Biological Diversity	MBMC, Inc.	Sunrun Inc.
Chris, King	MRW & Associates	Sunshine Design
City of Palo Alto	Manatt Phelps Phillips	Sutherland, Asbill & Brennan
City of Palo Alto Utilities	Marin Energy Authority	Tecogen, Inc.
City of San Jose	McKenzie & Associates	Tiger Natural Gas, Inc.
City of Santa Rosa	Merced Irrigation District	TransCanada
Clean Energy Fuels	Modesto Irrigation District	Turlock Irrigation District
Coast Economic Consulting	Morgan Stanley	United Cogen
Commercial Energy	Morrison & Foerster	Utility Cost Management
Consumer Federation of California	Morrison & Foerster LLP	Utility Specialists
Crossborder Energy	NLine Energy, Inc.	Verizon
Davis Wright Tremaine LLP	NRG West	Wellhead Electric Company
Day Carter Murphy	NaturEner	Western Manufactured Housing Communities Association (WMA)
Defense Energy Support Center	Norris & Wong Associates	eMeter Corporation