

PUBLIC UTILITIES COMMISSION

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REVISED

August 23, 2013

Advice Letters 4155-E

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

Subject: Update to PG&E's Bundled Procurement Plan - Modify Product Names

Dear Mr. Cherry:

Advice Letter 4155-E is effective August 15, 2013 per Resolution E-4585.

Sincerely,

A handwritten signature in cursive script that reads "Edward F. Randolph".

Edward F. Randolph, Director
Energy Division



Brian K. Cherry
Vice President
Regulatory Relations

Pacific Gas and Electric Company
77 Beale St., Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

Fax: 415.973.7226

December 5, 2012

Advice 4155-E

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: Update to Pacific Gas and Electric Company's Bundled Procurement Plan – Modify Product Names

Purpose

Pacific Gas and Electric Company (PG&E) hereby requests approval from the California Public Utilities Commission (CPUC or Commission) to modify the swaps product naming convention to conform with recent changes in the financial markets resulting from the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank). PG&E's proposed changes are restricted to product names and naming conventions and do not change PG&E's current authorized hedging strategies or limits.

Summary of Update Filing

In accordance with Decision (D.) 12-01-033, approving PG&E's Bundled Procurement Plan (BPP), all updates proposed to PG&E's approved BPP between procurement plan filings are made through the advice letter filing process. An advice letter filing should include redlined pages of PG&E's approved BPP, as well as the corresponding clean pages. Accordingly, Attachments A and B (redlined and clean – Public version) and C and D (redlined and clean – Confidential version) include the relevant pages of the changes to swap and future product descriptions in Section II of the narrative, Appendices B (Electric Portfolio Hedging Plan) and J (Glossary) of PG&E's BPP.

Background

Dodd-Frank was signed into law by President Obama on July 10, 2010. It was intended to reduce the systematic risk and increase the transparency in the financial markets. Since that time, the Commodity and Futures Trading Commission (CFTC) has issued a myriad of regulations, limits and reporting requirements that will be phased in over several years.

In response to the uncertainty caused by implementation of Dodd-Frank and feedback from market participants, the Intercontinental Exchange (ICE) converted the majority of its U.S. energy swaps to futures contracts on October 15, 2012. This conversion moved these products from the new, less-than-clear Dodd-Frank regulations to the more well-established CFTC futures regulations. These “new” futures products are financially identical to the swaps that they replaced.

In addition, the New York Mercantile Exchange (NYMEX) division of the CME Group recently announced that the “swap” products traded through its Clearport service were futures contracts and has renamed them to reflect this designation. The Natural Gas Exchange (NGX) in Alberta, Canada issued a formal clarification that its financial “swap” products are futures contracts for U.S. regulatory purposes.

Request

With the announcements described above by the three “approved” exchanges in PG&E’s BPP, all of the financial energy products (electric and gas) that PG&E trades and clears through these exchanges are now formally futures contracts. Although these products have exactly the same characteristics (i.e., trading, margining and settlement specifications) as they did when they were classified as swaps, they are now classified as futures contracts.

With the reclassification of these products, PG&E proposes to clarify the language in its BPP to ensure that it conforms with the financial products traded in the market. PG&E will retain the definition of swaps in its BPP, but it needs to expand the definition of futures to ensure that these products are explicitly covered in the BPP.

Specifically, PG&E is requesting the following changes to its BPP as denoted in the attached “redline” of its BPP document:

- Modification of the definition of [Electric] “Financial Call Option or Swaption” to include options on futures. (Section II.A.3.a. Electric Products, Sheet 18 Table II-1, Line 7).
- Modification of the definition of “NYMEX Electricity Futures” to remove “NYMEX” from the definition and to broaden the definition of electric futures to match the definition of [Electric] “Financial Swap” (Section II.A.3.a. Electric Products, Sheet 19, Table II-1, Line 13).
- Modification of the definition of “Non-FTR Locational Swaps” to include futures (Section II.A.3.a. Electric Products, Sheet 20, Table II-1, Line 24).
- Modification of the definition of “Natural Gas Futures” to match the definition of “Natural Gas Financial Swaps (Section II.A.3.b. Gas Products, Sheet 23, Table II-3, Line 2).

- Modification of the definition of [Natural Gas] “Financial Options or Swaptions” to remove the reference to NYMEX and to include options on futures. (Section II.A.3.b. Gas Products, Sheet 23, Table II-3, Line 3).
- Adding a footnote to the discussion of PG&E’s Current Risk Management Practices to indicate that use of the term Swap is intended to mean either financial swaps or financial futures. (Section II.B.2. PG&E’s Current Risk Management Practices, Sheet 49, first paragraph).
- Replacing the term “swap” with the defined term “Swap” throughout Appendix B Electric Portfolio Hedging Plan and footnoting the first use of this term that use of this term is intended to mean either financial swap or financial futures. (Appendix B, Electric Portfolio Hedging Plan, Sheets 107 – 122).
- Addition of the definition of “Financial Futures” similar to the definition of “Financial Swap”. (Appendix J, Glossary, Sheet 231).
- Deletion of the commodity-specific definitions of “Natural Gas Financial Swaps” and “Natural Gas Futures” because they are no longer needed. (Appendix J, Glossary, Sheet 242).
- Modification of the definition of “Non-FTR Locational Swaps” to include futures (Appendix J, Glossary, Sheet 243).

Confidential Information

The revised Appendix B pages (Electric Portfolio Hedging Plan) are confidential in their entirety. The information included in these attachments falls within the long-term fuel (gas) buying and hedging plans category from the Investor Owned Utility Matrix, Appendix 1 of D.06-06-066, which allows confidential treatment for three years (Item I.A.4). The confidentiality declaration and matrix of Peter E. Koszalka is attached.

Protests

Anyone wishing to protest this advice letter may do so by letter sent via U.S. mail, facsimile or E-mail, no later than **December 26, 2012**, which is 21 days¹ from the date of this submission. Protests must be submitted to:

¹ The 20 day protest period concludes on a CPUC holiday. PG&E hereby moves this date to the following business day.

CPUC Energy Division
E D Tariff Unit
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

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

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

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

Brian K. Cherry
Vice President, Regulatory Relations
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-7226
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter. (General Order 96-B, Section 7.4.) The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

Effective Date

PG&E requests that this advice letter become effective on regular notice, January 4, 2013, which is 30 calendar days after the date of submission. This advice letter is submitted with a Tier 3 designation.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service list for R.12-03-014. Address changes to the General Order 96-B service list should be directed to PG&E at email address 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. Send all electronic approvals to PGETariffs@pge.com. Advice letter submissions can also be accessed electronically at: <http://www.pge.com/tariffs>



Vice President, Regulatory Relations

cc: Service List R.12-03-014

Attachments:

- Attachment A – Public Redline Version of PG&E's Conformed BPP: Narrative, Appendix B, and Appendix J
- Attachment B – Public Clean Version of PG&E's Conformed BPP: Narrative, Appendix B, and Appendix J
- Attachment C – Confidential Redline Version of PG&E's Conformed BPP: Narrative, Appendix B, and Appendix J
- Attachment D – Confidential Clean Version of PG&E's Conformed BPP: Narrative, Appendix B, and Appendix J

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) #: **4155-E**

Tier: **3**

Subject of AL: **Update to Pacific Gas and Electric Company's Bundled Procurement Plan – Modify Product Names**

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. 12-01-033

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) 973-6146

Resolution Required? Yes No

Requested effective date: **January 4, 2013**

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:

California Public Utilities Commission

Energy Division

EDTariffUnit

505 Van Ness Ave., 4th Flr.

San Francisco, CA 94102

E-mail: EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company

Attn: Brian Cherry

Vice President, Regulatory Relations

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 PETER E. KOSZALKA IN SUPPORT
OF THE CONFIDENTIAL TREATMENT OF APPENDIX B
OF PG&E'S BUNDLED PROCUREMENT PLAN**

I, Peter E. Koszalka, declare:

1. I am the director of 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 Appendix B as part of its Bundled Procurement Plan. This declaration is based on my personal knowledge of PG&E's electric 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 certain information contained in PG&E's Advice Letter 4155-E.

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 or constitutes information that should be protected under General Order 66-C. 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 December 5, 2012 at San Francisco, California.



PETER E. KOSZALKA

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
PG&E'S ADVICE LETTER 4155-E
December 5, 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: Attachments A to D, Appendix B: Electric Portfolio Hedging Plan							
Entire document	Y	I.A.4 – Long-term fuel (gas) buying and hedging plans. Electric portfolio hedging plan should be confidential. General Order 66-C	Y	Y	Y	Appendix B describes PG&E's electric hedging strategy, which should be confidential by analogy to the protections for gas hedging plans in 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 position, which could harm ratepayers because suppliers could adjust either the availability or pricing of supply available to PG&E. This material is also protected as confidential material under General Order 66-C.	3 years



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

ATTACHMENT A
REDLINED PUBLIC VERSION
NARRATIVE, APPENDIX B, APPENDIX J



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 <u>or Futures contract</u> .	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. An agreement to exchange one type of pricing for another. Examples include fixed-for-floating futures, locational spread (basis) futures, time spread futures, cross-commodity futures and payment obligation futures. Futures are traded on an Exchange or cleared through a financial clearinghouse.	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 <u>and Futures</u>	Over the counter basis swaps. Swaps are financially settled directly with a counterparty or may be financially cleared through financial clearinghouse. <u>Over-the-counter basis swaps or futures. Swaps are financially settled directly with a counterparty or may be cleared through financial clearinghouse. Futures are traded on an exchange or cleared through a financial clearinghouse.</u>	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. <u>Standardized natural gas forward products including futures contracts, locational spread (basis) futures, time spread futures, cross-commodity futures and swing/index futures (fixed-price or monthly index for daily index). Futures are traded on an Exchange or cleared through a financial clearinghouse.</u>	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 <u>or Futures contract.</u>	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. Based on PG&E's effective January 2012 bundled system average rate of 15.3 cents/kWh,¹³ a 10% risk tolerance factor yields a CRT of 1.53 cents/kWh. 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

¹³ PG&E Advice Letter 3896-E-B "Supplemental Filing – Annual Electric True-Up – Consolidated Changes to PG&E Electric Rates on January 1, 2012"
http://www.pge.com/notes/rates/tariffs/tm2/pdf/ELEC_3896-E-B.pdf



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 swaps¹⁴ 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.

¹⁴ The term Swap, as used in this BPP, is intended to include financial swaps traded on an Exchange, over-the-counter, or cleared through a financial clearinghouse and also includes futures contracts traded on an Exchange or cleared through a financial clearinghouse.



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.¹⁵
- 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.

¹⁵ 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.



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 *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 Aggregation¹⁶ and Direct Access (Table PGE-1, line 7) based on

¹⁶ 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.



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 Efficiency,¹⁷ 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.”¹⁸ 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

¹⁷ *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.

¹⁸ Attachment 1: Standardized Planning Assumptions (Part 1) for System Resources, December 23, 2010, p. 11.



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.

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.¹⁹ 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 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 2011.²⁰

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

¹⁹ RPS contracts that have been terminated or expired are not included in PGE-1 or PGE-2.

²⁰ 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. Since 1976, PG&E and its customers have kept more than 155 million tons of CO₂ out of the atmosphere.²¹ 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.

²¹ 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 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,²² 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

²² For background on the 2010-2012 EE portfolio, see D.09-09-047, at p. 16.



- 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
- 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.²³ 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.

²³ D.11-06-016.



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 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

	Forecast Period(a)	Bundled Revenue Requirement (\$ Million)									
		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**

	Forecast Period(a)	Bundled Rate (¢/kWh)									
		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.²⁴ These standards have subsequently been modified, and two of them have been eliminated.²⁵ 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.

²⁴ D.02-10-062 at pp. 51-52.

²⁵ 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
<p>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.</p>	<p>PG&E's procurement practices and competitive, arms-length solicitations are described in Sections II.A.4 and Appendix I.</p> <p>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.</p>
<p>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.</p>	<p>PG&E's compliance practices are described in Section II.A.1.f.</p>



**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
<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>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.</p> <p>PG&E's dispatch of procurement contracts is described in Section II.A.2.c.</p>
<p>5. The utilities shall not engage in fraud, abuse, negligence, or gross incompetence in negotiating procurement transactions or administering contracts and generation resources.</p>	<p>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.</p> <p>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.</p>



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.²⁶ 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

²⁶ D.02-12-074 at p. 43.



the IOUs to continue to file a monthly ERRR 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).²⁷ 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, 2003.²⁸ 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.²⁹ 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

²⁷ D.02-10-062 at p. 62.

²⁸ D.02-12-074 at p. 42.

²⁹ 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.³⁰ 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.

³⁰ 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 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, 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 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 ERRR 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 ERRR 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	<p>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.</p> <p>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.</p> <p>Contracts that are five years or more in duration by Application.</p> <p>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).</p>
GHG Products	<p>Transactions for GHG Products with vintage years four years or less into the future, Quarterly Compliance Report and the annual ERRA Compliance proceeding.</p> <p>Transactions for GHG Products with vintage years more than four years into the future, Tier 3 Advice Letter.</p>



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 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 Nox, 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 FUTURES – An agreement to exchange one type of pricing for another. Examples include fixed-for-floating futures, locational basis futures, and time basis futures. Futures are traded on an Exchange or cleared through a financial clearinghouse.

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.~~
Over-the-counter basis swaps or futures. Swaps are financially settled directly with a counterparty or may be cleared through financial clearinghouse. Futures are traded on an Exchange or cleared through a 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 ¼ 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 sand 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 through 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:

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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

NARRATIVE, APPENDIX B, APPENDIX J

Decision No. 12-01-033

Issued by
Brian K. Cherry
Vice President
Regulation and Rates

Date Filed December 5, 2012
Effective _____
Resolution No. _____



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 or Futures contract.	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	Electricity Futures (Purchase or Sale)	An agreement to exchange one type of pricing for another. Examples include fixed-for-floating futures, locational spread (basis) futures, time spread futures, cross-commodity futures and payment obligation futures. Futures are traded on an Exchange or cleared through a financial clearinghouse.	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 and Futures	Over-the-counter basis swaps or futures. Swaps are financially settled directly with a counterparty or may be cleared through financial clearinghouse. Futures are traded on an exchange or cleared through a 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 natural gas forward products including futures contracts, locational spread (basis) futures, time spread futures, cross-commodity futures and swing/index futures (fixed-price or monthly index for daily index). Futures are traded on an Exchange or cleared through a financial clearinghouse.	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 or Futures contract.	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. Based on PG&E's effective January 2012 bundled system average rate of 15.3 cents/kWh,¹³ a 10% risk tolerance factor yields a CRT of 1.53 cents/kWh. 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

¹³ PG&E Advice Letter 3896-E-B "Supplemental Filing – Annual Electric True-Up – Consolidated Changes to PG&E Electric Rates on January 1, 2012"
http://www.pge.com/notes/rates/tariffs/tm2/pdf/ELEC_3896-E-B.pdf



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 swaps¹⁴ 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.

¹⁴ The term Swap, as used in this BPP, is intended to include financial swaps traded on an Exchange, over-the-counter, or cleared through a financial clearinghouse and also includes futures contracts traded on an Exchange or cleared through a financial clearinghouse.



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.¹⁵
- 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.

¹⁵ 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.



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 *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 Aggregation¹⁶ and Direct Access (Table PGE-1, line 7) based on

¹⁶ 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.



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 Efficiency,¹⁷ 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.”¹⁸ 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

¹⁷ *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.

¹⁸ Attachment 1: Standardized Planning Assumptions (Part 1) for System Resources, December 23, 2010, p. 11.



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.

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.¹⁹ 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 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 2011.²⁰

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

¹⁹ RPS contracts that have been terminated or expired are not included in PGE-1 or PGE-2.

²⁰ 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. Since 1976, PG&E and its customers have kept more than 155 million tons of CO₂ out of the atmosphere.²¹ 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.

²¹ 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 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,²² 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

²² For background on the 2010-2012 EE portfolio, see D.09-09-047, at p. 16.



- 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
- 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.²³ 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.

²³ D.11-06-016.



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 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

	Forecast Period(a)	Bundled Revenue Requirement (\$ Million)									
		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**

	Forecast Period(a)	Bundled Rate (¢/kWh)									
		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.²⁴ These standards have subsequently been modified, and two of them have been eliminated.²⁵ 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.

²⁴ D.02-10-062 at pp. 51-52.

²⁵ 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
<p>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.</p>	<p>PG&E's procurement practices and competitive, arms-length solicitations are described in Sections II.A.4 and Appendix I.</p> <p>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.</p>
<p>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.</p>	<p>PG&E's compliance practices are described in Section II.A.1.f.</p>



**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
<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>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.</p> <p>PG&E's dispatch of procurement contracts is described in Section II.A.2.c.</p>
<p>5. The utilities shall not engage in fraud, abuse, negligence, or gross incompetence in negotiating procurement transactions or administering contracts and generation resources.</p>	<p>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.</p> <p>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.</p>



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.²⁶ 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

²⁶ 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).²⁷ 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, 2003.²⁸ 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.²⁹ 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

²⁷ D.02-10-062 at p. 62.

²⁸ D.02-12-074 at p. 42.

²⁹ 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.³⁰ 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.

³⁰ 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 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, 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 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 ERRRA 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 ERRRA 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	<p>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.</p> <p>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.</p> <p>Contracts that are five years or more in duration by Application.</p> <p>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).</p>
GHG Products	<p>Transactions for GHG Products with vintage years four years or less into the future, Quarterly Compliance Report and the annual ERRA Compliance proceeding.</p> <p>Transactions for GHG Products with vintage years more than four years into the future, Tier 3 Advice Letter.</p>



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 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 Nox, 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 FUTURES – An agreement to exchange one type of pricing for another. Examples include fixed-for-floating futures, locational basis futures, and time basis futures. Futures are traded on an Exchange or cleared through a financial clearinghouse.

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 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 or futures. Swaps are financially settled directly with a counterparty or may be cleared through financial clearinghouse. Futures are traded on an Exchange or cleared through a 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).

NO_x - 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 ¼ 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 through 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>

**PG&E Gas and Electric
Advice Filing List
General Order 96-B, Section IV**

1st Light Energy	Department of General Services	North America Power Partners
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Consumer Federation of California	Morrison & Foerster LLP	Wellhead Electric Company
Crossborder Energy	NLine Energy, Inc.	Western Manufactured Housing Communities Association (WMA)
Davis Wright Tremaine LLP	NRG West	eMeter Corporation
Day Carter Murphy	NaturEner	
Defense Energy Support Center	Norris & Wong Associates	