STATE OF CALIFORNIA Edmund G. Brown Jr., *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

April 8, 2013

Advice Letters 4119-E/E-A

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: Home Area Network-Demand Response Integration Advice Letter (Phase 3.0) and Supplemental Filing

Dear Mr. Cherry:

Advice Letters 4119-E and 4119-E-A are effective October 31, 2012.

Sincerely,

Edward Randolph

Edward F. Randolph, Director
Energy Division

Brian K. Cherry
Vice President
Regulatory Relations

Pacific Gas and Electric Company
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P.O. Box 770000
San Francisco, CA 94177

Fax: 415.973.7226

October 1, 2012

Advice 4119-E
(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: **Home Area Network-Demand Response Integration Advice Letter**

Pacific Gas and Electric Company ("PG&E") hereby submits to the California Public Utilities Commission ("Commission" or "CPUC") in compliance with Decision 12-04-045 (Ordering Paragraph 65), *Decision Adopting Demand Response Activities and Budgets for 2012 through 2014*, a plan to implement a Home Area Network-Demand Response Integration project.

Purpose

PG&E proposes to build upon the Home Area Network (HAN) infrastructure developed under SmartMeter™ Upgrade Decision 09-03-026 to create and communicate load control signals, such as price signals and DR event notification messages that can expand DR opportunities for residential and small and medium business (SMB) customers. The HAN platform, used in conjunction with third party devices, may help customers effectively manage their response to time-varying electric rates by reducing or shifting load. This effort will initially target customers on existing DR programs for residential and small business customers (i.e., SmartRate and SMB PDP customers). In light of the evolving role of the utility in the DR marketplace, PG&E is prioritizing the implementation of notification and pricing signals to the premise, whereby a customer can program an automated response, over load control signals, where the utility determines the device response, (e.g., switching a device on/off or ramping a device temperature). By implementing signals to the premise, customers can choose manual or automated actions in response to the signals and have full control over how to respond to balance between costs and convenience.

In order to meet the objectives outlined above, PG&E will be implementing an IT platform that i) integrates a new rate application that will determine a customer's rate components and price at a point in time; and ii) integrates with existing DR event notification systems. The rate application will integrate with PG&E's AMI HAN head-end

system and back-end systems. The rate application will provide the ability to determine the tariff that a participating customer is on and the applicable rate components of that tariff (e.g., baseline territory, tier thresholds, TOU time periods, billing cycle start and end date, etc.). This application is needed to provide data for a point in time price and corresponding data necessary to integrate into the HAN-DR systems. The DR event notification platform will integrate existing DR event notification platforms for SmartRate and SMB PDP to send notifications through the AMI HAN head-end system and receive confirmation messages (if applicable) from end-use devices.

IT will approach the implementation of these systems in three main phases.

1) Design and implement the rate application and integration with the DR event notification systems. This work is largely independent of HAN standards (i.e. ZigBee SmartEnergy Profile).

2) PG&E will integrate these systems with communications channels using the utility implemented, approved SEP standard at that point in time so that these systems will be able to communicate to the meter and, ultimately, the in-premise HAN devices. This will likely be the SEP1.X standard.

   Due to the uncertainty in the availability of SEP2.0, PG&E will deploy with SEP1.X in an effort to make price signals and DR event notification messages available to customers in an earlier timeframe.

3) Migrate the HAN platform and systems to SEP2.0.

   PG&E anticipates that SEP2.0 standard will improve the customer experience due, in part, to increased interoperability (with the meter and other networks) and a reduced stranded asset risks for the customers. When SEP2.0 is released, it will take PG&E approximately eighteen months to implement and deploy the new standard. It will take PG&E's AMI network vendor approximately nine months to release their SEP2.0 version, and PG&E will require approximately nine months to test and deploy this version on its systems.

   PG&E currently believes that the SEP2.0 implementation will start in 2014, however the deployment will likely go beyond the 2014 timeframe. Refer to the "Budget and timeframe" section for more details.

Upon successful completion of the enhancements to the IT infrastructure described in items 1 and 2 above, PG&E will use these systems to validate the enhanced HAN capabilities. This pilot evaluation project ("the pilot") will involve up to 2,000 residential

and small business customers with a variety of HAN devices that can be responsive to load control signals. This limited scale roll out will be facilitated through the project's user acceptance testing (UAT) period and will enable PG&E to identify issues, obtain feedback from its customers, and evaluate the effectiveness of the solution before offering these capabilities more broadly to the larger customer base. The feedback and results will be used to enhance the HAN platform before making the load control signals available to all qualifying customers in 2015. The systems developed as part of the HAN-DR Integration project will be scalable to support customer demand for these capabilities beyond the 2014 timeframe.

Background

Over the next few years, many SMB and residential customers will face time-varying pricing in addition to likely rising electric rates over time, which will generate the need for simple and helpful enabling technology options. PG&E proposes to build upon the HAN infrastructure to create and communicate load control signals, such as price signals and DR event notification messages. The HAN platform, used in conjunction with third party devices and/or services, can be used to serve a variety of customer needs, including energy usage and price feedback and remote control or optimization of customer loads, which can help customers effectively manage their response to time-varying electric rates to reduce or shift load. This effort will be initially targeted to SmartRate and SMB PDP customers. An evaluation of this technology will allow PG&E to learn from its customers and determine the most effective coupling of technology and programs to drive behaviors and reduce and/or shift energy usage.

A methodology to test the cost effectiveness of this pilot is premature at this point. Pilots have traditionally not been subject to the cost effectiveness evaluation; however one purpose of the pilot will be to better understand the long term cost effectiveness of the technology.

PG&E intends for the HAN-DR pilot evaluation to perform load impact studies on the effectiveness and persistence of HAN technologies as well as customer feedback on the technology to determine the most effective coupling of technology and programs to drive behaviors and reduce and/or shift energy usage during peak times.

The HAN-DR pilot will concentrate on determining:

- *Customer Response*: Evaluate customers' usage patterns, preferences, behavior, and reactions to HAN devices capable of receiving price and DR messages.

- *Device Response Characteristics*: Evaluate how quickly and in what manner various HAN devices respond to price and event messaging signals and longevity of device use (i.e. how long devices stay connected). Determine the actionably and effectiveness of notification messages for DR events through HAN.

- *Communication Capabilities*: Evaluate the technical capability to provide timely two way communication, such as price and DR messages, to the various HAN devices over the advanced metering infrastructure (AMI) network using national standards. Test and analyze AMI communications and their efficacy to securely deliver near real time information from PG&E's back office systems.

Budget and Schedule

The funding for the HAN infrastructure developed under SmartMeter™ Upgrade Decision 09-03-026, allows for PG&E to register a HAN device and provide near real time energy usage information to its customers. This functionality is being deployed through PG&E's Initial Rollout and Early Adopter phases using SEP1.X technologies. The additional IT infrastructure work to create and communicate load control signals (funded through D-12-04-045, "the Decision") will begin its Plan and Analyze Stages in January 2013, with the build of the solution taking place in the latter part of the year. As described above, this work is largely independent of HAN standards (i.e. ZigBee SmartEnergy Profile). However, as noted in the Decision, the "HAN field is fast-changing in nature," especially as it relates to the technology and related standards. Starting in 2014, PG&E will integrate the systems developed to deliver load control signals with the utility implemented, most appropriate SEP standard at that point in time, so that these systems will be able to communicate to the meter and, ultimately, the in-premise HAN devices. Upon successful completion of the enhancements to the IT infrastructure, PG&E will evaluate these capabilities with up to 2,000 residential and small business customers as an extended user acceptance testing period and to enable PG&E to identify issues, obtain feedback from its customers, and evaluate its effectiveness of the capabilities through surveys/focus groups and load impact studies. This pilot is planned to take place through the 2014 DR season.

The planning work for the migration of the systems to SEP2.0 is anticipated to start in 2014 (assuming SEP2.0 is approved by year end 2012), with an SEP2.0 HAN platform available to customers starting the second half of 2015.

The project is requesting $20.2 million over the course of the implementation cycle.

Table 1: Total Project Cost by Category by Year

Project Total	Cumulative	2013	2014	2015
	$20,188,426	**$6,881,159**	**$9,516,809**	**$3,790,457**
Project Management	$3,047,853	$746,978	$1,568,092	$732,783
Customer Care	$1,354,927	$315,000	$668,147	$371,780
Marketing & Incentives	$1,966,482	$0	$1,966,482	$0
Information Technology	$9,409,859	$2,319,181	$4,967,283	$2,123,394
Hardware & Software	$0	$0	$0	$0
Operations Support	$159,305	$0	$159,305	$0
Vendor Software	$4,250,000	$3,500,000	$187,500	$562,500

Table 2: Release 1 (SEP 1.x) Cost by Category by Year

Release 1 (SEP 1.x)	Cumulative	2013	2014
Total	**$11,940,292**	**$6,881,159**	**$5,059,132**
Project Management	$1,643,352	$746,978	$896,374
Customer Care	$983,147	$315,000	$668,147
Marketing & Incentives	$1,966,482	$0	$1,966,482
Information Technology	$3,688,006	$2,319,181	$1,368,824
Hardware & Software	$0	$0	$0
Operations Support	$159,305	$0	$159,305
Vendor Software	$3,500,000	$3,500,000	$0

Table 3: Release 2 (SEP 2.0) Cost by Category by Year

Release 2 (SEP 2.0)	Cumulative	2014	2015
Total	**$8,248,134**	**$4,457,677**	**$3,790,457**
Project Management	$1,404,501	$671,718	$732,783
Customer Care	$371,780	$0	$371,780
Marketing & Incentives	$0	$0	$0
Information Technology	$5,721,853	$3,598,459	$2,123,394
Hardware & Software	$0	$0	$0
Vendor Software	$750,000	$187,500	$562,500

Table 4: Release 1 (SEP 1.x) Schedule by Major Activity

Id #	Task Name	Start	Finish
1	Develop business and technical definition, project scope, timeline, test requirements and dependencies.	Q1 2013	Q2 2013
2	Create technical and functional design of the solution	Q2 2013	Q2 2013
3	Development and integration of rate service	Q1 2013	Q4 2013
4	Build out technical solution.	Q2 2013	Q4 2013
5	Testing of the technical solution.	Q4 2013	Q1 2014
6	User Acceptance Testing	Q2 2014	Q3 2014
7	Deployment	Q3 2014	Q4 2014

Table 5: Release 2 (SEP 2.0) Schedule by Major Activity

Id #	Task Name	Start	Finish
1	Develop business and technical definition, project scope, timeline, test requirements and dependencies.	Q1 2014	Q1 2014
2	Create technical and functional design of the solution	Q2 2014	Q2 2014
3	Build out technical solution.	Q2 2014	Q4 2014

4	Testing of new meter firmware and interfaces	Q4 2014	Q3 2015
5	Testing of the technical solution.	Q1 2015	Q2 2015
6	User Acceptance Testing	Q3 2015	Q4 2015
7	AMI meter and HAN system updates	Q2 2015	Q4 2015
8	Deployment	Q4 2015	Q4 2015

Standards and Metrics

PG&E will benchmark relevant programs by other utilities and program administrators on their HAN efforts. PG&E will keep track of the following as it relates to this initiative:

- Performance of HAN resources versus expected response.
- Customer satisfaction with the different types of HAN capabilities and device types.
- Enabling technologies evaluated and deployed.
- Load response and speed of response

As the evaluation project progresses, new standards and metrics may be developed and the proposed metrics may not be relevant.

A methodology to test the cost effectiveness of this pilot is premature at this point. Pilots have traditionally not been subject to the cost effectiveness evaluation; however an objective of the pilot is to better understand the long term cost effectiveness of the technology.

PG&E will work with DRMEC to properly prepare and implement a plan to evaluate the pilot. The base evaluation will identify and include, but not limited to, the following:

- A thorough evaluation of customer impact and satisfaction must be undertaken to evaluate future programs.

- Evaluate SmartMeter™ data from each of the customers that participates in the pilot and assess the load reduction.

- Any emerging technologies (ET) used for this HAN-DR Pilot will be coordinated alongside PG&E DR's ET group.

PG&E is involved in several forums in which they can identify and disseminate best practices and lessons learned to the CPUC and other California IOUs.

- PG&E will conduct quarterly meetings with the Energy Division throughout the pilot period. The meetings will include current work, budgets, and foreseeable next steps to ensure parties are well informed. Any changes to the objectives, approach, or metrics identified above will be communicated and discussed with the Energy Division at that time. The ILP report will contain a page on the HAN-DR Integration project status.

  At the conclusion of the pilot, PG&E will provide the Energy Division a report highlighting the lessons learned from this pilot. Any key lessons that can be extracted from this pilot will be used to enhance existing or new DR programs in the 2015 – 2017 DR Program and Budget Application.

  This report will be published and be made publicly available on a designated public internet site by PG&E.

- PG&E meets quarterly with the other IOUs regarding HAN topics. PG&E will share its lessons learned in this forum and work with the Commission, its staff, and other utilities to standardize, when appropriate, on best practices for HAN implementations across CA.

- Additionally, PG&E is involved in national HAN standards making bodies, which share best practices and incorporate new or updated requirements in an effort to continuously improve test plans for certified HAN products. These national standards-making bodies bring together utilities, product and chip manufacturers, academia, and others to develop standards that will result in interoperable, plug and play devices.

Protests

Anyone wishing to protest this filing may do so by letter sent via U.S. mail, by facsimile or electronically, any of which must be received no later than **October 22, 2012**, which is 21[1] days after the date of this filing. Protests should be mailed to:

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

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

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

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

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

Effective Date

PG&E requests that this Tier 2 advice filing become effective on regular notice, **October 31, 2012**, which is 30 calendar days after the date of filing.

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 A.11-03-001 and R.07-01-041. Address changes to the General

[1] The 20-day protest period concludes on a weekend, therefore, PG&E is moving this date to the following business day.

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 filings can also be accessed electronically at: http://www.pge.com/tariffs

Brian Cherry /IG

Vice President, Regulatory Relations

cc: Service List A.11-03-001 and R.07-01-041.

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:	Contact Person: Igor Grinberg
☑ ELC ☐ GAS	Phone #: 415-973-8580
☐ PLC ☐ HEAT ☐ WATER	E-mail: ixg8@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) #: **4119-E** **Tier:** 2

Subject of AL: **Home Area Network-Demand Response Integration Advice Letter**

Keywords (choose from CPUC listing): Compliance and Demand Side Management

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

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: D.12-04-045

Summarize differences between the AL and the prior withdrawn or rejected AL: N/A

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: N/A

Confidential information will be made available to those who have executed a nondisclosure agreement: N/A

Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information: N/A

Resolution Required? ☐ Yes ☑ No

Requested effective date: **October 31, 2012** No. of tariff sheets: N/A

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

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

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

Tariff schedules affected: N/A

Service affected and changes proposed: N/A

Protests, dispositions, and all other correspondence regarding this AL are due no later than 21[1] days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Tariff Files, Room 4005
DMS Branch
505 Van Ness Ave., San Francisco, CA 94102
EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company
Attn: Brian K. Cherry, Vice President, Regulatory Relations
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177
E-mail: PGETariffs@pge.com

[1] The 20-day protest period concludes on a weekend, therefore, PG&E is moving this date to the following business day.

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

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Sierra Pacific Power Company
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Verizon
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Western Manufactured Housing Communities Association (WMA)
eMeter Corporation