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**PROPOSED DECISION**

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Decision PROPOSED DECISION OF ALJ HYMES (Mailed 2/15/2013)

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

In the Matter of the Application of Pacific Gas and Electric Company for Adoption of its Smart Grid Pilot Deployment Project (U39E).

Application 11-11-017  
(Filed November 21, 2011)

**DECISION GRANTING, IN PART, AND DENYING, IN PART,  
PACIFIC GAS AND ELECTRIC COMPANY'S APPLICATION  
FOR SMART GRID PILOT DEPLOYMENT PROJECT**

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**DECISION GRANTING, IN PART, AND DENYING, IN PART,  
PACIFIC GAS AND ELECTRIC COMPANY'S APPLICATION  
FOR SMART GRID PILOT DEPLOYMENT PROJECT**

**1. Summary**

This decision approves, in part, and denies, in part, the application of Pacific Gas and Electric Company (Applicant) for approval of six Smart Grid deployment pilot projects. The Commission approves three Distribution Projects including a Line Sensor pilot, a voltage and reactive power optimization pilot, and a detect and locate outages and faulted circuits pilot, as well as a short-term forecasting pilot. The Commission finds the potential outcome from these four pilots to be valuable, but requires the Applicant to provide a Pilot Implementation Plan (Plan) for each of the approved pilots that contains additional information regarding scheduling details and evaluation, measurement and validation processes, as described herein. Each Plan must be submitted via a Tier 2 Advice Letter within 75 days of the issuance of this decision. The Commission also requires the Applicant to provide status reports at the end of each pilot phase so that the Commission may be apprised of the status of each pilot in a timely fashion. The status reports shall also be submitted via a Tier 2 Advice Letter. The Commission denies two other pilots, a customer outreach and education pilot and a technology evaluation, and standards and testing pilot due to a lack of information to justify these two projects. We authorize a total budget of \$80.08 million for the four pilots. This proceeding is closed.

## **2. Background**

### **2.1. The Commission's Smart Grid Proceeding and National and State Smart Grid Policies**

On December 18, 2008, the Commission opened Rulemaking (R.) 08-12-009 pursuant to the Energy Independence and Security Act of 2007<sup>1</sup> (EISA) as well as on its own motion to consider policies for California investor-owned utilities<sup>2</sup> (Utilities) to enhance the ability of the electric grid to support relevant policy goals. Those policy goals are the reduction of greenhouse gas emissions, the increase of energy efficiency and demand response programs, the expansion of renewable energy, and the improvement of reliability. The purpose of the Commission's Smart Grid proceeding is to establish policies, standards and protocols to guide the development of a smart grid system and facilitate integration of new technologies such as distributed generation, storage, demand-side technologies, and electric vehicles. Over the course of the past five years, the Commission has moved forward in establishing these policies, standards and protocols.

In September 2009, the Commission approved Decision (D.) 09-09-029, establishing processes to be used in the review of projects and investments of the Utilities seeking federal funding through the American Recovery and Reinvestment Act of 2009 (Recovery Act).<sup>3</sup> Simultaneously, D.09-09-029 developed Smart Grid policies to advance California's energy policy goals as

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<sup>1</sup> H.R. 6, 110th Congress.

<sup>2</sup> The Utilities are Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company, and Southern California Edison Company.

<sup>3</sup> The United States Department of Energy issued Funding Opportunity Announcements establishing a Smart Grid Investment Grant Program and a Smart Grid Demonstrations program to provide funds in support of proposed projects.

established in the Energy Action Plan<sup>4</sup> and state law, including Assembly Bill (AB) 32.<sup>5</sup>

A few months later, the Commission adopted D.09-12-046 approving policies to fulfill the regulatory obligations imposed on states by the EISA amendments to the Public Utilities Regulatory Policies Act.<sup>6</sup> Of particular importance to this proceeding is that D.09-12-046 also adopted policies for the Utilities concerning consumer access to usage data that will be available through California's Smart Grid infrastructure and is consistent with Senate Bill (SB) 17 (Padilla).<sup>7</sup>

SB 17 established that California would increase the use of cost-effective digital information and control technology to improve reliability, security, and efficiency of the electric grid.<sup>8</sup> SB 17 required the Commission "to determine the requirements for a smart grid deployment plan consistent with the policies set forth in the bill and federal law."<sup>9</sup>

In compliance with SB 17, the Commission adopted D.10-06-047, which established the requirements for the Smart Grid Deployment Plans, the

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<sup>4</sup> The 2003 Energy Action Plan and the 2005 Energy Action Plan II define the California Loading Order Policy. Both were adopted by the Commission and the California Energy Commission.

<sup>5</sup> Also known as the California Global Warming Solutions Act of 2006, AB 32 is California's roadmap to reach the greenhouse gas reduction of 1990 levels.

<sup>6</sup> 16 U.S.C. § 2621(d).

<sup>7</sup> Chapter 327, Statutes of 2009.

<sup>8</sup> Pub. Util. Code § 8360(a).

<sup>9</sup> Chapter 327, Statutes of 2009, effective January 1, 2010.

information that the deployment plans must provide, and how the deployment plans must link to the policies set forth in SB 17 and related federal law.

Most relevant to this proceeding, D.10-06-047 explained that “subsequent utility requests to make specific Smart Grid-related investments, however, would occur in utility-specific proceedings where the reasonableness of particular Smart Grid investments can be determined.”<sup>10</sup> D.10-06-047 provides the Utilities the option to seek approval of Smart Grid investments through individual applications or General Rate Cases (GRCs).

## **2.2. Procedural History**

On November 21, 2011, Pacific Gas and Electric Company (PG&E) filed Application (A.) 11-11-017 (Application) seeking approval of its Smart Grid Pilot Deployment Project. Parties filed timely protests to the Application on December 21 and 23, 2011.<sup>11</sup>

On February 3, 2012, the assigned Administrative Law Judge (ALJ) held a Pre-hearing Conference to determine the parties, scope, and schedule as well as other procedural matters. The assigned Commissioner and ALJ jointly issued a Ruling and Scoping Memo on February 13, 2012 (Scoping Memo) establishing the scope and schedule for the proceeding.

Parties to the proceeding participated in evidentiary hearings from July 10, 2012 through, and including, July 12, 2012. During hearings, the assigned ALJ and parties discussed Exhibit PGE-04, which is PG&E’s July 6, 2012 response to a

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<sup>10</sup> D.10-06-047 at 5.

<sup>11</sup> The Utility Reform Network (TURN), Greenlining Institute, and Marin Energy Authority filed protests on December 21, 2011 and Direct Access Coalition and Alliance for Retail Energy Markets (jointly, DACC/AREM) and the Division of Ratepayer Advocates (DRA) filed protests on December 23, 2011.

staff data request regarding pilot criteria used in energy efficiency and demand response program analyses. In testimony, PG&E had suggested that these criteria could be used to consistently analyze each of the pilots. In the data request, staff asked PG&E to describe how each of the six proposed pilot projects illustrates the following nine pilot plan criteria:

1. New and innovative program design, concepts or technology that have not yet been tested or employed;
2. A specific statement of the concern, gap, or problem that the pilot seeks to address and the likelihood that the issue can be addressed cost-effectively through utility programs;
3. How the pilot matches the characteristics for Smart Grid technologies enumerated in SB 17;
4. Specific objectives and goals for the pilot;
5. A clear budget and timeframe to complete the pilot and obtain results;
6. Information on relevant standards or metrics or a plan to develop a standard against which the pilot outcomes can be measured;
7. Where appropriate, propose methodologies to test the cost-effectiveness of the pilot;
8. A proposed Evaluation, Measurement and Verification (EM&V) plan; and
9. A concrete strategy to identify and disseminate best practices and lessons learned from the pilot to all California utilities, and to transfer those practices to resource programs, as well as a schedule and plan to expand the pilot to utility and hopefully statewide usage.

The assigned ALJ provided parties an opportunity to comment on whether the information provided in the July 6, 2012 response was additive or more than a clarification to the prior testimony; no party filed comments. On July 23, 2012, the assigned ALJ issued a Ruling providing briefing guidance to the parties. The

guidance document combined the issues in the Scoping Memo and the pilot criteria identified above. This decision aligns with the guidance document.

On August 20, 2012, parties filed opening briefs, followed by reply briefs on September 10, 2012. The assigned ALJ submitted the record of this proceeding on September 10, 2012. On October 23, 2012, the assigned ALJ issued a Ruling setting aside submission of the record and reopening the record to take responses from PG&E to three questions regarding the full deployment monetary benefits and the soft benefits of the pilots. PG&E filed its response to the questions as late-filed exhibit, PGE-09. Through e-mails to the service list, several parties commented on the late-filed exhibit. As a result, the assigned ALJ issued a Ruling identifying and entering into the record a small portion of the late-filed exhibit, PGE-09.<sup>12</sup> The assigned ALJ resubmitted the record of this proceeding on February 12, 2013.

### **3. Issues before the Commission**

The issues to be addressed in this proceeding are, as follows, from the Scoping Memo:

- Review of Proposed Pilots:
  - Compliance with SB 17 and Commission decisions including D.10-06-047;
  - Reasonableness of the proposed pilots in terms of need and costs;
  - Alignment with other Smart Grid projects and full deployment of proposed functionality;
  - Ensuring no duplication of previous pilots or studies;
  - Ensuring cost-effectiveness and cost-benefit analyses;

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<sup>12</sup> ALJ Ruling, October 23, 2012.

- Potential for alternate funding sources;
- Performance metrics;
- Milestones for both pilot implementation and deployment;  
and
- On and off-ramps
- Pilot Specifics:
  - Line Sensor Specifics;
  - Telecommunications Specifics; and
  - Supervisory Control and Data Acquisition System (SCADA) versus volt/Voltage Ampere Reactive (VAR): Specifics and Comparison
- General Issues:
  - Role of Third Party Providers;
  - General Order 156 Compliance; and
  - Cost Recovery Issues:
    - Cost Allocation; and
    - Balancing vs. Memorandum Account

As discussed above, PG&E introduced the option of using the same pilot criteria as that used in demand response and energy efficiency to review the pilots requested in this application.

In the following sections, each pilot will be addressed individually. An overview and outcome of each pilot will be presented followed by a discussion of the analysis to determine whether the pilot meets the pilot criteria and addresses the issues presented in the Scoping Memo. Finally, cost recovery issues will be addressed.

#### 4. Overview of the Application

In its Application, PG&E requests approval of six projects:

- Three Distribution Project pilots. (Line Sensor pilot, Voltage and Reactive Power Optimization (Volt/VAR) pilot, Detect & Locate Distribution Line Outages and Faulted Circuit Conditions (Detect & Locate) pilot;);
- A Short Term Demand Forecasting pilot;
- A Technology Evaluation, Standards and Testing (TEST) project; and
- A Smart Grid Customer Outreach project.

The Smart Grid Pilot Deployment project is PG&E's first implementation of specific Smart Grid projects identified in its proposed Smart Grid Deployment plan submitted to the Commission in June 2011.<sup>13</sup>

PG&E asserts that the three proposed Distribution Project pilots (all six pilots are described below in further detail) will demonstrate Smart Grid technologies that can be used to increase reliability, reduce costs, reduce environmental impacts of electric system operation, and more effectively integrate distributed renewable generation on PG&E's distribution system. The Short-Term Demand Forecasting pilot will evaluate whether more granular sources of data can be used to improve accuracy of demand forecasts.

The TEST and Customer Outreach projects are not pilots but, rather, "foundational processes and programs intended to enable PG&E to continuously develop, monitor, evaluate and calibrate with its customers and other

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<sup>13</sup> The Commission has not approved PG&E's proposed Deployment Plan as of the date of this decision.

stakeholders on “best practices” in testing, piloting and deploying new Smart Grid technologies.”<sup>14</sup>

## **5. Discussion of Review Methodologies**

### **5.1. Analysis Methodologies**

As discussed above, PG&E presented its rebuttal testimony using the pilot criteria that the Commission had used in approving demand response and energy efficiency pilots.<sup>15</sup> Both DRA and TURN recommend alternate methods to analyze the six proposed Smart Grid pilots.

DRA contends that the Commission should use Public Utilities Code Section 740.1<sup>16</sup> as a standard of review for the pilots in this application as opposed to the pilot criteria.<sup>17</sup> DRA states that Section 740.1 is more narrowly tailored to research, development, and demonstration (RD&D) programs similar to those in this application. Furthermore, DRA claims that the six projects proposed by PG&E are not mature enough to be considered pilots.

DRA bases its contention on D.12-05-037 where the Commission affirmed its authority and the state’s energy RD&D policy position in the Electric Program

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<sup>14</sup> PG&E Opening Brief at 6.

<sup>15</sup> PGE-02 at 1-8 to 1-9.

<sup>16</sup> Pub. Util. Code § 740.1 requires the Commission to consider the following in utility-proposed evaluation research, development, and demonstration projects: a) a reasonable probability of providing benefits to ratepayers; b) minimal expenditures for projects with a low probability of success; c) consistency with the utility’s resource plan; d) non-duplicative; e) support environmental improvement, public and employee safety, conservation, and the development of new resources or processes; and f) improve operating efficiency and reliability or reduce operating costs.

<sup>17</sup> TR Vol. 1 at 8 to 14, and DRA Opening Brief at 4 to 5.

Investment Charge (EPIC).<sup>18</sup> DRA explains that in that decision, “the Commission concluded that the public interest was best served when the majority of public funds were supervised and administered by state agencies.”<sup>19</sup> DRA deduces that, for RD&D activities, the Commission should apply the standards in Public Utilities Code Section 740.1 and D.12-05-037 and, because PG&E did not show that the proposed pilots meet these standards, the Commission should not approve any of the pilots recommended by PG&E.

In response to DRA, PG&E referenced D.12-05-037, whereby the Commission clarifies that the EPIC process is intended to replace future GRC RD&D proposals, but does not affect any funding decisions already made by the Commission or any preexisting proceedings, even if a decision has not yet been reached.<sup>20</sup>

TURN recommends that the Commission analyze the six PG&E Smart Grid pilots by considering the possible benefits and cost comprehensively and in concert to reduce ratepayer risk.<sup>21</sup> TURN contends that PG&E has conducted no such analysis. In response, PG&E argues that its testimony and work papers provide extensive quantitative and qualitative estimates of benefits and cost and provides examples of cost and benefits for each of the pilots.<sup>22</sup>

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<sup>18</sup> The Commission established EPIC in D.11-12-035 as a successor program to the Public Benefits Goods Charge funding mechanism previously administered by the California Energy Commission.

<sup>19</sup> DRA Opening Brief at 4.

<sup>20</sup> PG&E Reply Brief at 2 referencing D.12-05-037 at 29 to 30.

<sup>21</sup> TURN Opening Brief at 3.

<sup>22</sup> PG&E Opening Brief at 5 to 6.

We first clarify that we consider the projects requested in this application to be pilots. We disagree with DRA that the projects are not mature enough to be pilots and should therefore be reviewed using the standards in Section 740.1. In D.12-04-045, we defined the purpose of a pilot as a test of a new concept or program design intended to address a concern or gap. We explained that the difference between demonstration projects and pilots is that while both test a new concept or program design, pilots address a specific area of concern.<sup>23</sup>

We find that D.12-05-037 clearly exempts these pilots from the EPIC process because the application for the pilots had been filed prior to the issuance of D.12-05-037. We also find that the EPIC process elements, cited by DRA as appropriate criteria, are intended for an overall investment plan under EPIC not for individual pilots as proposed in this application.

The nine pilot criteria used previously in the Demand Response and Energy Efficiency programs are appropriate for our analysis of the pilots in this application. The five criteria listed in Pub. Util. Code Section 740.1 are more appropriate for research and development projects. In comparison, the nine criteria adopted by the Commission to analyze pilots in both demand response and energy efficiency programs are not only well-established, but they provide more specificity to analyze the pilots in this application. For example, the pilot criteria are relevant to the subject matter at hand with specific reference to Smart Grid policies enunciated in SB 17.

TURN recommends that the Commission analyze the six PG&E Smart Grid pilots by considering the possible benefits and cost comprehensively and in

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<sup>23</sup> D.12-04-045 at 181-182.

concert to reduce ratepayer risk.<sup>24</sup> TURN contends that PG&E has conducted no such analysis. In response, PG&E argues that its testimony and work papers provide extensive quantitative and qualitative estimates of benefits and cost and provides examples of cost and benefits for each of the pilots.<sup>25</sup>

We agree with TURN that the costs and benefits of the pilots should be considered. We note that, because these projects are pilots, the costs and benefits are estimates. Furthermore, consideration of costs and benefits is just one of the criteria we should use to analyze the six proposed Smart Grid pilots. However, we clarify that the pilot criteria only requires methodologies to test the cost-effectiveness of the pilot, where appropriate.

Aside from the pilot criteria adopted in D.12-04-045, we also analyze the pilots with regard to other relevant decisions and statutes. As is the case with GRCs and other applications, we perform a cost reasonableness review taking into consideration that these projects are pilots and not full deployment projects.

## **5.2. Reasonableness Methodology**

TURN expresses concern that the Commission's sole opportunity to address the reasonableness of these pilot activities and associated spending levels is in this proceeding. Stating that there would be no formal Commission review once a decision in this proceeding is approved, TURN recommends that funding approval should require an after-the-fact reasonableness review.<sup>26</sup>

Claiming that costs subject to cost-of-service ratemaking are routinely forecasted thus requiring a relatively accurate cost estimate, TURN contends that

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<sup>24</sup> TURN Opening Brief at 3.

<sup>25</sup> PG&E Opening Brief at 5 to 6.

<sup>26</sup> TURN Opening Brief at 4.

the costs provided by PG&E contain several unspecified amounts associated with “analysis and high level design of foundational infrastructure to support the full scale deployments.”<sup>27</sup>

PG&E disagrees with TURN’s recommendation for an after-the-fact reasonableness review. PG&E argues that this is contrary to the Commission’s traditional cost-of-service ratemaking where the Commission reviews the reasonableness of a proposal’s costs, and grants or denies the proposal based on its merits.<sup>28</sup> PG&E adds that approval is not subject to refund, memorandum account treatment, or an after-the-fact reasonableness review. PG&E also claims that a utility is at risk for costs above the approved funding and is subject to audit and reporting to the Commission.<sup>29</sup>

The Commission’s normal practice is to review proposals and if the proposal is approved, approve an appropriate budget for that proposal. We continue this practice in this application. We review each proposed pilot and, if that pilot is approved, we will authorize an appropriate budget for that pilot. Furthermore, the Commission has the authority to conduct a full review of the results of the pilots prior to approving full deployment, which would occur through a separate application process.

### **5.3. Reporting Methodology**

TURN expresses concern that there will be no formal Commission input regarding the next steps of the pilots including whether to advance to the next

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<sup>27</sup> TURN Opening Brief at 5 quoting PGE-01 at 1-6.

<sup>28</sup> PG&E Reply Brief at 7 to 8.

<sup>29</sup> PG&E Reply Brief at 8.

phase of a pilot or which pilots to pursue as full deployment.<sup>30</sup> PG&E states that at each phase of each pilot, PG&E will evaluate and determine whether the pilot has progressed sufficiently to justify moving to the next milestone, and will stop the project if there is not sufficient information.<sup>31</sup> PG&E also proposes to update the Commission on the status of the pilots through its annual Smart Grid progress report required by SB 17.<sup>32</sup>

TURN argues that the Commission, not PG&E, should make the determination regarding whether a pilot should move forward. TURN quotes a PG&E witness, "at a single stage of the project the utility would make a report to its management regarding the appropriateness of proceeding to further development."<sup>33</sup> DRA recommends that instead of approving each of the pilots in total, the Commission should take an approach similar to that taken in D.08-02-009.<sup>34</sup> In that settlement agreement, the Commission approved a program with a significantly reduced budget and period of initial program approval. The Commission also required the utility involved to submit an updated application proposing refinements that reflect outcomes from the initial program approval. DRA considers this approach to be sensible considering the uncertainty of the technologies proposed in this application.

PG&E disagrees with DRA's recommended approach stating that it is impractical and inconsistent with the Commission's approval process for RD&D

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<sup>30</sup> TURN Opening Brief at 4.

<sup>31</sup> PG&E Opening Brief at 15.

<sup>32</sup> PGE-01 at 2-12

<sup>33</sup> TURN Opening Brief at 15.

<sup>34</sup> DRA-01 at 1-6 to 1-7.

projects. PG&E contends that DRA's recommendation to include an additional Commission approval to proceed with the pilot step for each project will result in multiple separate applications and will introduce significant and severe time delays into the piloting process.<sup>35</sup> PG&E claims that its proposed process to report on the results of each step of its two-step approach in the annual Smart Grid report as well as inform Commission and Commission staff of the progress of each individual step provides transparency and sufficient information.<sup>36</sup>

We find no validity in TURN's concern that the Commission will not have the ability to determine which pilots should achieve full deployment. If PG&E considers any of the approved pilots worthy of full deployment, the utility would be required to file an application requesting approval of the project and associated budget. At that point, the Commission would have full authority to review such an application and make a determination on its approval.

We agree that the Commission should have more involvement in the progress of these pilots than that proposed by PG&E. However, we also want to ensure that the pilots progress in a timely and efficient manner. We find the annual report insufficient to provide up-to-date information on the projects. We also find PG&E's commitment to "keep the Commission and Commission staff informed of the progress of each pilot" to be insufficient.

While, we see value in DRA's proposal, multiple applications for each stage of each pilot would be administratively burdensome and costly. Instead, we require status reports filed via a Tier 2 Advice Letter at the end of each phase of each pilot. Each status report must include 1) details of the activities occurring

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<sup>35</sup> PGE-02 at 1-3 to 1-4.

<sup>36</sup> *Id.* at 1-4.

in the phase; 2) a detailed breakdown of the costs of those activities; 3) the results of the phase including evaluation and measurements of pre-selected metrics to portray the success or failure of the pilot phase; and 4) based on that evaluation, a rational explanation of whether the pilot should advance to the next phase. Funding for subsequent phases, although approved in this decision, shall not be spent by PG&E until the Advice Letter is approved. PG&E should ensure that status reports are detailed, both quantitatively and qualitatively. In its review of the Advice Letter, Staff should consider the completeness of the report as it pertains to the requirements above. Any concerns by Staff should result in a suspension of the Advice Letter to allow for Commission review.

Our goal for the status reports is to provide the adequate oversight and transparency of an approved pilot project, as required of the Commission by statute, while simultaneously ensuring the timeliness of the projects. Parties expressed concern that a Tier 1 Advice Letter is not sufficient for subsequent review and assessments of the approved pilot projects.<sup>37</sup> We agree that a Tier 1 Advice Letter does not provide the appropriate level of transparency and oversight for these reports. However, we clarify that this proceeding and decision is the approval process for the pilot projects, whereas the Advice Letter reporting requirements provides timely status report to confirm that the approved pilots are moving forward as anticipated by PG&E in its application. We require the post phase status reports to be submitted via a Tier 2 Advice Letter. Should staff or any party be concerned that a) the contents of any one of the Advice Letters do not approximate the expectations stated by PG&E in this

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<sup>37</sup> DRA Opening Comments at 12 through 13 and TURN Opening Comments at 7 through 9.

application; b) the information provided in the Advice Letters does not include the features required as described in the previous paragraph; or c) the explanation provided by PG&E regarding the continuation of the pilot to the next phase does not comport with the details provided in the Advice Letter, Commission process requires a more formal review of the Advice Letter by the Commission through the resolution process.<sup>38</sup>

## **6. Discussion of Six Pilots**

### **6.1. Smart Grid Line Sensors Pilot Overview and Analysis Result**

One of three Distribution Project pilots, PG&E proposes that the Line Sensor pilot will entail installing line sensors on up to 30 distribution feeders to evaluate the line sensors' impact on reducing outage response time, improving outage location accuracy and providing line loading information at the installation locations. Line sensors have the ability to provide normal current loading or to detect faults. The purpose of the Line Sensor pilot is to provide granular, location-specific information. PG&E contends that the Line Sensor pilot will allow operators to more quickly direct patrols to find damaged equipment that cause a fault and will provide more accurate information than currently provided by Smart Meter outage reporting. The work for the Line Sensor pilot will be done in phases: startup, analysis, lab testing, and field testing.

Upon analysis, we see value in PG&E's Smart Grid Line Sensor pilot. The following sections explain that while the pilot did not fully meet three of the nine

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<sup>38</sup> General Order 96-B Industry Rule 7.3.4 allows a Tier 2 Advice Letter to be effective 30 days after submittal, unless a party protests or industry staff suspends the Advice Letter. See also Rules 7.4.2(2) and 7.5.2.

previously described pilot criteria, PG&E presents valid arguments that lead us to approve the pilot. However, we have concerns regarding the level of details in the schedule and Evaluation, Measurement and Verification processes and require further specifics in a Tier 2 Advice Letter as described below.

We approve PG&E's Line Sensor pilot conditionally, as described below, and authorize \$16.768 million to fund the pilot minus one-quarter of the 20 percent contingency amount for Information Technology costs. As discussed in Section 5.3 of this decision, PG&E shall not spend any funds beyond the current phase of the pilot until the Commission has approved the Tier 2 Advice Letter for that phase.

#### **6.1.1. Line Sensor Pilot Meeting the Pilot Criteria**

PG&E submits that the Line Sensor pilot meets the criteria for pilots. Contending that the Line Sensor technology is one that PG&E has not previously tested or deployed, PG&E explains that the pilot will improve reliability by reducing the area to be patrolled in the event of an outage. PG&E states that it has provided a schedule for the pilot and that the schedule has milestones and on-off ramps as required by the pilot criteria. While not including an EM&V plan or well-defined methodologies toward a cost-benefit analysis, PG&E listed metrics it contends will be used to evaluate the results of the Line Sensor pilot.

TURN argues that the Line Sensor pilot does not meet the pilot criteria in that the pilot does not address a specific concern warranting spending nearly \$17 million, is duplicative of current programs such as the Targeted Circuit

Initiative,<sup>39</sup> and does not have clear objectives or goals, milestones or off-ramps, cost-benefit analyses or performance metrics.<sup>40</sup>

According to TURN, the current improvements in SAIDI, SAIFI and CAIDI<sup>41</sup> measurements – indicators the Commission has relied upon to assess reliability – show that reliability has improved, and thus negates any need for the Line Sensor pilot.<sup>42</sup> Referencing prior investments in PG&E’s 2010 Distribution Reliability Improvement Program, and the 2009-2014 Targeted Circuit Initiative, TURN warns that “the Commission should be hesitant to approve further spending of ratepayer funds toward improving reliability performance because PG&E has failed to determine the ultimate effect of its spending to date.”<sup>43</sup> TURN argues that prior investments have provided “no estimate of the reliability improvement achieved”, and thus the Commission should require PG&E to better assess the advantages and improvements of prior investments before approving an additional \$16.9 million in the Line Sensor pilot.<sup>44</sup>

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<sup>39</sup> The Targeted Circuit Initiative, approved for years 2008 to 2013, identifies worst-performing circuits and endeavors to installing new fuses reclosers, interrupters, fault indicators and animal and bird guards, reframing poles to increase phase separation, repairing or replacing existing equipment, reconductoring deteriorated conductor and completing previously identified tags and tree trimming. (See TRN-07 at 18.)

<sup>40</sup> TURN is the only party to provide testimony in response to PG&E’s Line Sensor pilot.

<sup>41</sup> Respectively, System Average Interruption Duration Index, System Average Interruption Frequency Index, and Customer Average Interruption Duration Index.

<sup>42</sup> TURN Opening Brief at 14 referencing TRN-07 at 20.

<sup>43</sup> TURN Opening Brief at 12 to 13.

<sup>44</sup> TURN Opening Brief at 13 referencing TRN-06 at 19.

PG&E disagrees with TURN's view that reliability does not need improvement, and points to the 2011 Annual Reliability Report that states that PG&E lags behind other California utilities when it comes to the duration of service outages.<sup>45</sup> In conveying the need to improve reliability, PG&E explains that it currently uses non-communicating sensors, resulting in longer service outages. Alternatively, the Line Sensor pilot will use communicating line sensors. Thus, PG&E contends this pilot is not duplicative of the other current projects that use non-communicating sensors and should lead to decreases in the duration of service outages.<sup>46</sup>

We agree with TURN that PG&E did not fully meet all of the required pilot criteria. But we find that the Line Sensor pilot met at least six of the nine criteria. Furthermore we see value in pursuing the Line Sensor pilot because of the specific need to improve reliability by decreasing service outages. Since this pilot focuses on the use of communicating line sensors, we do not find it duplicative of projects using older and outdated non-communicating line sensors.

As discussed above, TURN claims that PG&E provides no cost-benefit analysis for any of the pilots, including the Line Sensor pilot. First, we clarify that the pilot criteria do not require a full cost benefit analysis. The language of the criteria only requires, that "where appropriate, propose methodologies to test the cost-effectiveness of the pilot." However, PG&E provided estimated costs for the pilot and estimated costs and benefits at full deployment.<sup>47</sup> Thus, we

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<sup>45</sup> PG&E Opening Brief at 11 referencing the Commission's 2011 Annual Reliability Report.

<sup>46</sup> PG&E Opening Brief at 12 referencing PGE-02.

<sup>47</sup> PGE-03 at WP1-2 and PG&E's Smart Grid Deployment Plan at Table 7-4.

considered them in our analysis. We note that if viewed alone, the costs for the Line Sensor pilot outweigh the benefits. However, if reviewed with the other two Distribution Project pilots, we find the benefits at full deployment compare favorably with the overall costs. We address this issue in greater detail in the discussion on reasonableness.

We find that the Line Sensor pilot schedule lacks dates for off-ramps. PG&E describes a timetable of two years for analysis and lab testing, and two years for a real or simulated environment test but no specifics in terms of weeks or months.<sup>48</sup> TURN expresses a concern regarding the lack of off-ramps — opportunities for a pilot to be terminated when it has been determined that success is not obtainable. As we alluded to previously, the Commission should be informed, in a timely fashion, whether or not a pilot will be continued once these off-ramps are reached. Thus we need to know approximately when to anticipate the off-ramps so that we can anticipate a report on whether PG&E will proceed to the next phase of a pilot.

Furthermore, PG&E must be ready to evaluate, measure and validate the findings from the pilot once an off-ramp is reached. PG&E states that it will evaluate the results of the Line Sensor pilot by evaluating the avoided operations and management costs, SAIDI and CAIDI.<sup>49</sup> However, PG&E does not have a plan for evaluating, measuring and validating these metrics. PG&E only provides that methodologies to test the pilot cost-effectiveness will capture the metrics and costs and “any [evaluation, measurement and validation] plan that

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<sup>48</sup> PGE-01 at 2-11.

<sup>49</sup> PG&E Opening Brief at 16 referencing PGE-01 at 2-12, PGE-03 at WP1-1 and WP1-2, and PGE-04 at 8.

PG&E develops will be focused on the metrics provided,” and that “PG&E will incorporate experience from other utilities and industry best practices.”<sup>50</sup> We find this to be insufficient detail regarding the evaluation, measurement and validation processes.

To remedy the shortcomings of the Line Sensor pilot, we require PG&E to:

- 1) Within 45 days of the issuance of this decision, meet with Commission staff to discuss and develop details regarding:
  - a) Specific methodologies for the evaluation, measurement, and validation and cost-benefit processes for this pilot;
  - b) An updated schedule with detailed milestones and estimated dates of the end of each phase in the pilot; and
  - c) Expectations regarding the end of phase status reports.
- 2) Within 30 days following the meeting with staff, submit a Tier 2 Advice Letter providing a revised Pilot Implementation Plan that includes the final metrics and methodologies for the evaluation, measurement and validation, cost-benefit processes, and the updated schedule with estimated dates of off-ramps; and
- 3) Within 14 days after the end of each phase, submit a status report via a Tier 2 Advice Letter to Commission Staff as described previously in Section 5.3 of this decision.

PG&E shall not continue to a subsequent phase of the Line Sensor pilot until receiving approval of the Tier 2 Advice Letter.

#### **6.1.2. Line Sensor Pilot: Compliance with SB 17 and D.10-06-047**

PG&E contends that the Line Sensor pilot complies with SB 17 and D.10-06-047 in that it is consistent with the potential for increased use of digital

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<sup>50</sup> PG&E Opening Brief at 16 to 17 referencing PGE-04 at 8.

information to improve the reliability and efficiency of the grid characteristics required by the statute and decision. For example, PG&E states that the Line Sensor pilot will help create a smart grid that:

- Is self-healing and resilient through its ability to detect and communicate outage conditions to operations personnel;
- Can resist attack by evaluating and testing interfaces to ensure security controls are in place;
- Can accommodate all generation and storage options by assisting in anticipating and planning the requirements for increased penetration of intermittent power generation sources, storage and rooftop solar photo-voltaic systems;
- Can run more efficiently by optimizing existing distribution system loading and reducing costs by using more granular loading information; and
- Can significantly reduce the environmental footprint by reducing the distance PG&E personnel have to cover to identify and address problems on the distribution system.<sup>51</sup>

TURN alleges that PG&E has not provided sufficient evidence that the Line Sensor pilot complies with SB 17 and D.10-06-047. TURN focuses its allegations on the absence of cost-effectiveness or cost-benefit analyses. While TURN concedes that a pilot project may require a different type of cost-effectiveness showing than that required for a full scale deployment project, TURN claims that PG&E has made no cost-effectiveness showing at all.

SB 17 and D.10-06-047 focus on deployment plans and the requirements for the overarching Smart Grid. We turn to a discussion of the relevant sections of these two documents.

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<sup>51</sup> PGE-04 at 9 to 12.

The sections of D.10-06-047 directly associated with this proceeding discuss the topics of future investments. D.10-06-047 makes two requirements of future investments: 1) Requests for future Smart Grid investments must be made through either a GRC or an application; and 2) Utilities must file an annual report that describes their current initiatives in regards to Smart Grid deployments and investments. We find that, by filing an application for the Line Sensor pilot and by making the annual report part of the pilot activities, PG&E has complied with the aforementioned requirements of D.10-06-047. We reiterate, however, that the annual reports are insufficient for the purposes of updating the Commission on the progress of the Line Sensor pilot and, therefore, require reporting following the end of each phase of this pilot via a Tier 2 Advice Letter. We also clarify that PG&E should include a discussion of the Line Sensor pilot and all other approved pilots in this application in its annual report.

Indirectly, D.10-06-047 also required the Utilities to address in the vision statement of their deployment plans how the grid can achieve the policies contained in SB 17, including:

- a. Be self-healing and resilient;
- b. Empower consumers to actively participate in the operations of the grid;
- c. Resist attack;
- d. Provide higher quality of power and avoid outages;
- e. Accommodate all generation and energy storage options;
- f. Enable electricity markets to flourish;
- g. Run the grid more efficiently;
- h. Enable penetration of intermittent power generation sources;
- i. Create a platform for deployment of a wide range of energy technologies and management services;

- j. Enable and support the sale of demand response, energy efficiency, distributed generation, and storage into wholesale energy markets as a resource, on equal footing with traditional generation resources; and
- k. Significantly reduce the total environmental footprint of the current electric generation and delivery system in California.

We reiterate that these 11 items are requirements for the deployment plan vision statement, not requirements for future investments such as the pilots in this application. That being said, PG&E provided testimony describing how the Line Sensor pilot meets several of these smart grid policy characteristics.

SB 17, while focused on smart grid deployment plans, requires “that the smart grid improve overall efficiency, reliability, and cost-effectiveness of electrical system operations, planning and maintenance.”<sup>52</sup> Furthermore, SB 17 created a new section to the Public Utilities Code Section 8360, establishing a state policy to modernize the state’s electrical transmission and distribution system to maintain safe, reliable, efficient and secure electrical service.

Section 8360 requires that the state has electrical infrastructure to meet future growth in demand and achieve all of the following, which characterize a smart grid:

- (a) Increased use of cost-effective digital information and control technology to improve reliability, security, and efficiency of the electric grid;
- (b) Dynamic optimization of grid operations and resources, including appropriate consideration for asset management and utilization of related grid operations and resources, with cost-effective full cyber security;

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<sup>52</sup> SB 17, Chapter 327 signed by the Governor on October 11, 2009.

- (c) Deployment and integration of cost-effective distributed resources and generation, including renewable resources.
- (d) Development and incorporation of cost-effective demand response, demand-side resources, and energy-efficient resources;
- (e) Deployment of cost-effective smart technologies, including real time, automated, interactive technologies that optimize the physical operation of appliances and consumer devices for metering, communications concerning grid operations and status, and distribution automation;
- (f) Integration of cost-effective smart appliances and consumer devices;
- (g) Deployment and integration of cost-effective advanced electricity storage and peak-shaving technologies; including plug-in electric and hybrid electric vehicles, and thermal-storage air-conditioning;
- (h) Provide consumers with timely information and control options;
- (i) Develop standards for communication and interoperability of appliances and equipment connected to the electric grid, including the infrastructure serving the grid; and
- (j) Identification and lowering of unreasonable or unnecessary barriers to adoption of smart grid technologies, practices, and services.

While TURN alleges that the Line Sensor pilot fails to meet all of these criteria, and should therefore be denied funding, we find that a proposed pilot or program is not required to meet the criteria of D.10-06-047, but rather contribute to ensuring that the entire smart grid meets each and every one of the criteria. Thus, we find that the Line Sensor pilot, as a proposed part of the smart grid, meets the criteria of increased use of cost-effective digital control technology to improve reliability and efficiency of the electric grid, and is therefore compliant with SB 17.

### **6.1.3. Line Sensor Pilot: Alignment with Other Smart Grid Projects and the Smart Grid Deployment Plan**

PG&E contends that the Line Sensor pilot aligns with its other Smart Grid projects. PG&E explains that its Smart Grid priorities for its Transmission and Distribution systems are to improve safety and reliability, reduce costs for customers, improve infrastructure efficiency, and integrate higher levels of renewables. PG&E's current system limits its ability to achieve these priorities because of a) its limited ability to precisely and quickly detect fault locations and b) a lack of more accurate voltage field data, especially between customer meters and substations. PG&E proposes that the Line Sensor pilot, as one of the three Distribution Pilot projects, will address these barriers to attaining the Smart Grid priorities for Transmission and Distribution Systems.<sup>53</sup> PG&E also states that its Line Sensor pilot supports the pursuit of Smart Grid technologies with the highest potential for improving safety and reliability, reducing costs, improving customer satisfaction, and reducing environmental impacts on PG&E's distribution System.<sup>54</sup>

TURN contends that PG&E places an overemphasis on the need to improve reliability and not enough emphasis on cost-effectiveness and, therefore, the Line Sensor pilot should not be approved based on a lack of detail in the cost-effectiveness analysis.<sup>55</sup> PG&E responds that reliability, especially the duration of service outages, is an area where PG&E needs improvement, as

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<sup>53</sup> PG&E Opening Brief at 19 to 20.

<sup>54</sup> *Id.*

<sup>55</sup> TURN Opening Brief at 11 to 16.

shown in the 2011 Reliability Reports submitted by PG&E.<sup>56</sup> Further, PG&E contends that it provided extensive quantitative and qualitative estimates of the potential benefits and cost-effectiveness of the Line Sensor pilot. Specifically, PG&E points to its work papers containing costs and benefits for each of its pilot.<sup>57</sup>

It is the duty of the Commission to ensure safe and reliable electric service for California.<sup>58</sup> The Commission is also committed to improving reliability in a cost-effective manner. We find that PG&E provided adequate estimated costs and benefits to begin the Line Sensor pilot. In order to ensure that we are not expending unnecessary funds, we require PG&E to submit reports, as described above, at the end of each phase of this pilot. This will assist in ensuring that we are not spending ratepayer funds on technology that does not prove to be successful.

#### **6.1.4. Line Sensor Pilot: Reasonableness of Costs and Benefits**

PG&E proposes a four-year budget (2013 through 2016) of \$16.768 million to fund the Line Sensor pilot.<sup>59</sup> This includes approximately \$15.3 million for capital and \$1.5 million for expenses during the pilot.<sup>60</sup> PG&E estimates total benefits of \$35.9 million in avoided Operations and Maintenance costs

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<sup>56</sup> PG&E Reply Brief at 11 referencing the 2011 Reliability Report which can be found at <http://www.cpuc.ca.gov/PUC/energy/ElectricSR/Reliability/annualreports/2011.htm>.

<sup>57</sup> PG&E Reply Brief at 6 citing WP1-1 through WP1-6.

<sup>58</sup> See Publ. Util. Code §§ 399(b), 399.2(a) and 399.8(a).

<sup>59</sup> PGE-03 at 2 to 13

<sup>60</sup> *Ibid.*

distributed across years 2017 through 2030.<sup>61</sup> The avoided costs represent the costs of first responder outage investigation for circuits affected by line sensor installation. PG&E anticipates a 10% improvement in SAIDI and CAIDI measurements. Other potential benefits not calculated in this estimate include improvements in system safety and improved customer awareness.<sup>62</sup>

As previously discussed, TURN contends that PG&E did not provide a sufficient costs and benefits analysis for the Line Sensor pilot. TURN explains that while PG&E estimates a cost of nearly \$17 million for the Line Sensor pilot, this is the cost for 30 sensors to be installed. The benefits of \$35.9 million in avoided costs are for 2400 sensors to be installed at full deployment. TURN argues that because PG&E has not provided the costs for full deployment, the Commission should not approve the pilot.<sup>63</sup> However, PG&E provided an estimated cost of \$98 million to \$131 million for the Line Sensor full deployment.<sup>64</sup>

PG&E estimates the benefits for the Line Sensor pilot at full deployment to equal approximately \$35.9 million.<sup>65</sup> We do not consider a full deployment program that costs \$98 million to \$131 million<sup>66</sup> to be cost-effective when the benefits are only \$35.9 million. However, these costs and benefits for full

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<sup>61</sup> PG&E provided a low and high case estimate of benefits ranging from \$28.7 million to \$43.1 million. (See PGE-03 at WP1-2.)

<sup>62</sup> PGE-03 at WP1-2.

<sup>63</sup> TURN Opening Brief at 17.

<sup>64</sup> PG&E Opening Brief at 14 referencing A.11-06-029, PG&E Smart Grid Deployment Plan 2011-2020, Table 7-4 at 163, June 30, 2011.

<sup>65</sup> PGE-03 at WP 1-2.

<sup>66</sup> Smart Grid Deployment Plan at Table 7-4.

deployment are estimates and may change overtime. Furthermore, we recognize that this project is not a stand-alone project, but is one of three pilots comprising the Distribution Project, the other two pilots being the Volt/VAR and Detect & Locate pilots. Thus, we discuss the reasonableness of costs and benefits of these three pilots together in Section 6.3.4 of this decision.

## **6.2. Volt/VAR Optimization Pilot: Overview and Analysis Result**

The second of the three Distribution Projects, the Volt/VAR Optimization pilot test algorithms and control systems on up to 12 distribution feeders in three PG&E divisions in order to control one or all of the following Volt/VAR regulating devices on PG&E's distribution system:

- 1) Substation load tap changers, bus or feeder voltage regulators;
- 2) Distribution line regulators; and
- 3) Distribution line capacitors to achieve electricity demand and energy use reductions, voltage profile improvements, and power system reductions.

The optimization algorithms and control systems will use voltage measurements from Smart Meters and other substation and line equipment with voltage sensing information to adjust the distribution system voltage levels. Like the Line Sensor pilot, activities for the Volt/VAR pilot will be conducted in phases: startup, analysis, lab testing, and field testing.

Upon analysis, we find value in PG&E's Volt/VAR Optimization pilot. The following sections explain that while the pilot did not fully meet all of the pilot criteria, PG&E presents valid arguments for approval of the pilot. As with the Line Sensor pilot, we have concerns regarding the details in the proposal. Thus, we direct PG&E to provide the same Advice Letters as we require for the Line Sensor pilot:

We approve PG&E's Volt/VAR pilot conditionally, as described above, and authorize \$38.49 million to fund the pilot, minus one-quarter of the 20 percent contingency amount for Information Technology. However, as is the case with the Line Sensor pilot, PG&E shall not spend any funds beyond the current phase of the Volt/VAR Pilot until the Commission has approved the status report for that phase.

### **6.2.1. Volt/VAR Pilot: Meeting the Pilot Criteria**

PG&E submits that the Volt/VAR Pilot meets the criteria outlined above for pilots. Describing the Volt/VAR Pilot as innovative technology, PG&E explains that the pilot will demonstrate the potential to deliver energy cost savings to customers and reduced utility system losses that then reduce energy procurement cost for customers. PG&E states that it has provided a schedule for the pilot, and that the schedule has milestones and on-off ramps as required by the pilot criteria. As is the case with the Line Sensor pilot, PG&E did not provide an EM&V plan or well-defined methodologies toward a cost-benefit analysis. However, PG&E listed metrics they contend will be used to evaluate the results of the Volt/VAR pilot.

TURN argues that, similar to the Line Sensor pilot, the Volt/VAR pilot does not meet the pilot criteria in that the pilot does not address a specific concern, is duplicative, and does not have clear objectives or goals, milestones or off-ramps, cost-benefit analyses, or performance metrics.<sup>67</sup>

According to TURN, PG&E already has a Volt/VAR power regulating system, although it is a manually controlled system. TURN contends that PG&E

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<sup>67</sup> TURN is the only party to provide testimony in response to PG&E's Volt/VAR pilot.

has provided “no reasonable means to assess its claims that such a system might provide benefits beyond those achieved through its existing system.”<sup>68</sup> TURN references PG&E’s claims that “distributed renewable generation penetration can likely be reliably increased by using the Volt/VAR Optimization system to maintain the distribution primary voltage within desired operating range.”<sup>69</sup> TURN disagrees with these claims, stating that PG&E’s work papers indicate that full deployment depends upon whether voltage reduction and line loss improvement are appreciable, or if energy and capacity values are lower than expected.<sup>70</sup> Further, TURN points out that if natural gas prices continue to decline, this may negate the benefits of this pilot.

PG&E disputes TURN’s criticisms of the Volt/VAR Pilot, stating that it provided estimates based on recent studies that show that new Volt/VAR technologies significantly improve voltage and VAR regulation compared to existing manual technologies.<sup>71</sup> Furthermore, in its work papers, PG&E explains that “the Volt/VAR Optimization application automatically controls a system that has historically been manually set to operate within the desired range at peak load and minimum load, but sub-optimally the rest of the time because the technology has not been readily available.”<sup>72</sup>

PG&E also challenges TURN’s claim that declines in natural gas prices may reduce pilot benefits. PG&E contends that, instead, the uncertainty of

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<sup>68</sup> TURN Opening Brief at 21 referencing TRN-07 at 34.

<sup>69</sup> TURN Opening Brief at 21 referencing PGE-01 at 2-19.

<sup>70</sup> TURN Opening Brief at 21 referencing TRN 07 at 36 to 37.

<sup>71</sup> PG&E Reply Brief at 15 referencing PGE-02 at 2-7, 2B-1 through 2B-3.

<sup>72</sup> PGE-03 at 2-16.

future natural gas prices supports the pilot because the pilot studies the range of likely costs and benefits, including the interaction of renewable penetration and natural gas costs.<sup>73</sup>

Similar to the Line Sensor pilot, TURN claims that PG&E provides no cost-benefit analysis for the Volt/VAR Pilot. As described in the Line Sensor discussion, the cost-benefit analysis is not as detailed as that in a traditional application, but PG&E references the estimated benefits for each pilot at full deployment.<sup>74</sup> PG&E provided adequate costs for the pilot and the full deployment project, as well as the benefits at full deployment. We address the issue of the costs and benefits in a subsequent discussion below.

As was the case with the Line Sensor pilot, we find that the Volt/VAR pilot does not meet all the pilot criteria, but we see value in pursuing the pilot because of the potential to deliver energy cost savings to customers and provide reduced system losses to the Utility thus reducing procurement costs to customers. Because the Volt/VAR Optimization pilot focuses on automatically controlling these systems, we do not find it duplicative of the manual system.

We agree with TURN that PG&E did not fully meet all of the required pilot criteria. As with the Line Sensor pilot, there are no off-ramp dates provided in the schedule. While we approve the Volt/VAR Optimization pilot, we do so with the same reporting conditions as described in Sections 5.3 and 6.1.1 of this decision.

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<sup>73</sup> PG&E Reply Brief at 15 referencing PGE-02 at 2-18 to 2-19.

<sup>74</sup> PGE-03 at WP1-2.

### **6.2.2. Volt/VAR Pilot: Compliance with SB 17 and D.10-06-047**

PG&E contends that the Volt/VAR pilot complies with SB 17 and D.10-06-047 in that it is consistent with the potential for increased use of digital information to improve the reliability and efficiency of the grid characteristics required by the statute and decision. For example, PG&E states that the Volt/VAR pilot will help create a smart grid that:

- Can resist attack by evaluating and testing interfaces to ensure security controls are in place;
- Can provide higher quality power by optimizing the distribution of primary and secondary voltage;
- Can accommodate all generation and storage options by reliably and cost-effectively integrating and managing the variations in voltage associated with intermittent distributed generation, especially solar photo-voltaic generation; and
- Can run more efficiently by managing the distribution circuit voltage to assist customers in reducing energy usage.

TURN again alleges that PG&E has not provided sufficient evidence that the Volt/VAR pilot complies with SB 17 and D.10-06-047 because of an absence of cost-effectiveness or cost-benefit analyses.

We find that, despite not being a requirement for these pilot projects, the Volt/VAR pilot meets several characteristics outlined in D.10-06-047. Furthermore, the Volt/VAR Pilot, as a proposed part of the smart grid, looks to increase the use of cost-effective digital control technology to improve reliability and efficiency of the electric grid. We find that PG&E's Volt/VAR pilot is in compliance with the aforementioned requirements of D.10-06-047 and SB 17.

### **6.2.3. Volt/VAR Pilot: Alignment with Other Smart Grid Projects and the Smart Grid Deployment Plan**

PG&E claims that the Volt/VAR pilot aligns with its other Smart Grid projects. PG&E explains that the Volt/VAR pilot, along with the Line Sensor and Detect & Locate pilots, support the pursuit of Smart Grid technologies with the highest potential for improving safety and reliability, reducing Operations and Management costs, enhancing customer satisfaction, and reducing environmental impacts on PG&E distribution system.<sup>75</sup> TURN raises the same concerns stated in its discussion regarding the Line Sensor pilot.

Our analysis of the Volt/VAR pilot and its alignment with other PG&E Smart Grid projects leads us to approximately the same conclusions as the Line Sensor pilot: the Volt/VAR pilot is valuable for reducing system or localized area demand by reducing system voltage. But again, we require PG&E to provide the additional information that we required for the Line Sensor pilot via Advice Letters.

### **6.2.4. Volt/VAR Pilot: Reasonableness of Costs and Benefits**

PG&E proposes a four-year budget (2013 through 2016) of \$38.4 million to fund the Volt/VAR Pilot.<sup>76</sup> This includes \$36 million for capital and \$2 million for expenses during the pilot.<sup>77</sup> PG&E estimates total benefits ranging from a low of \$536 million to a high of \$1.07 billion in avoided Energy Procurement costs

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<sup>75</sup> PG&E Opening Brief referencing PGE-01 at 2-5 to 2-7, and PG&E Smart Grid Deployment Plan, 2011-2020, June 30, 2011.

<sup>76</sup> PGE-03 at 2-20.

<sup>77</sup> *Ibid.*

distributed across years 2017 through 2030.<sup>78</sup> Other potential benefits not calculated in this estimate include reduced voltage violations, failed equipment notification, remote control of voltage and reactive power management saving transmission labor, and possible improved power quality.

As previously discussed, TURN contends that PG&E did not provide a sufficient cost and benefits analysis for the Volt/VAR pilot in that PG&E provided no sensitivity analysis to understand the impact of early obsolescence.<sup>79</sup> TURN states that because PG&E has not provided any cost and benefit test or cost-effectiveness analysis, it thus has not performed the sensitivity analysis and, therefore, the Commission should not approve the pilot.

PG&E disagrees with TURN's contention that PG&E did not provide any cost and benefits for the Volt/VAR pilot. PG&E again points to testimony and work papers that provide costs for pilot and full deployment, as well as estimated benefits for full deployment.<sup>80</sup> Additionally, PG&E notes that the Volt/VAR pilot also provides the soft benefits of reduced voltage violations and remote control of voltage and reactive power management saving labor costs. The estimated direct costs of up to \$276 million and direct benefits of up to \$1 billion at full deployment compare favorably. However, we further discuss the reasonableness of costs and benefits of the Line Sensor, Volt/VAR and Detect & Locate pilots together in Section 6.3.4 of this decision.

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<sup>78</sup> PGE-03 at WP1-3.

<sup>79</sup> TURN Opening Brief at 2 referencing TRN-07 at 9 to 10.

<sup>80</sup> PG&E Opening Brief at 5 to 6 and footnotes 9 to 11.

### **6.3. Detect & Locate Pilot: Overview and Analysis Result**

For the third pilot of the Distribution Projects, PG&E proposes that the Detect & Locate pilot test system analysis tools to more precisely locate outages and faulted circuit conditions caused by damaged equipment. The pilot will use input from a variety of sensors including digital protective relays, fault current sensors, Smart Meter voltage measurements and Smart Grid line sensors.<sup>81</sup> PG&E plans to install fault-finding software systems and telecommunications systems on up to 15 distribution feeders in two of PG&E divisions. Like the other two Distribution Project pilots, activities for the Detect & Locate pilot will be conducted in phases: startup, analysis, lab testing, and field testing.

Upon analysis, we find value in PG&E's Detect & Locate pilot. The following sections explain that while the pilot did not meet all of the pilot criteria, PG&E presents valid arguments for approval of the Detect & Locate pilot. As with the other two Distribution Project pilots, we have concerns regarding a lack of details in the proposal. Thus, we direct PG&E to provide the same Advice Letters as we require for the other two Distribution Project pilots:

We approve PG&E's Detect & Locate pilot conditionally, as described above, and authorize \$12.9 million to fund the pilot, minus one-quarter of the 20 percent contingency amount for Information Technology. However, as is the case with the other two Distribution Project pilots, PG&E may not spend any funds beyond the current phase for the Volt/VAR Pilot until the Advice Letter has been approved for that phase.

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<sup>81</sup> PGE-03 at 1-7.

### **6.3.1. Detect & Locate Pilot: Meeting the Pilot Criteria**

PG&E submits that the Detect & Locate pilot meets the criteria outlined above for pilots. PG&E explains that the pilot will assist in more precisely locating failed equipment that caused an outage and will determine if there are benefits to providing a more accurate location to outage first responders. The emphasis for this project will be on testing software that uses real-time data from embedded sensor to more precisely identify locations of damaged equipment. PG&E provides a schedule for the pilot, and states that the schedule has milestones and on-off ramps as required by the pilot criteria. As is the case with the other two Distribution Project pilots, PG&E did not provide an EM&V plan or well-defined methodologies toward a cost-benefit analysis. However, PG&E listed metrics they contend will be used to evaluate the results of the Detect & Locate pilot.

TURN argues that, similar to both the Line Sensor and Volt/VAR pilots, the Detect & Locate pilot does not meet the pilot criteria in that it does not address a specific concern, is duplicative, and does not have clear objectives or goals, milestones or off-ramps, cost-benefit analyses, or performance metrics.<sup>82</sup>

According to TURN, PG&E justifies its Detect & Locate pilot based on improvements to reliability. As with the Line Sensor pilot, TURN argues that PG&E is placing too much emphasis on improving reliability when, in fact, the measurements have shown that improvements in reliability have already occurred, and thus there is no specific concern, gap or problem warranting this

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<sup>82</sup> TURN is the only party to provide testimony in response to PG&E's Volt/VAR pilot.

pilot.<sup>83</sup> TURN also contends that the identification of high impedance faults should not be considered a specific concern or gap for the purposes of meeting the pilot criteria.<sup>84</sup> TURN points out that high impedance faults have occurred on PG&E's system throughout the history of the utility and yet PG&E has never had a program to reduce the number of high impedance faults, to alert the utility that such a fault has occurred, or to better identify its location.<sup>85</sup>

PG&E argues that TURN's criticism of the Detect & Locate pilot is not supportable, and explains that it is proposing the pilot "because PG&E has not been able to incorporate reporting of high impedance faults."<sup>86</sup>

Similar to the other two Distribution Project pilots, TURN claims that PG&E provides no cost-benefit analysis for the Detect & Locate Pilot. As noted in both the Line Sensor and Volt/VAR pilot discussions, the cost-benefit analysis is not as detailed as that in a traditional application but PG&E references the estimated benefits for this pilot at full deployment.<sup>87</sup> We find that PG&E provided adequate cost estimates for the pilot and the full deployment project, as well as the benefits at full deployment. However, we address the reasonableness of the costs and benefits in a subsequent discussion below.

As was the case with the Line Sensor and Volt/VAR pilots, we find that the Detect & Locate pilot does not fully meet all the pilot criteria, but we see value in pursuing the pilot because of the potential to reduce operations and

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<sup>83</sup> TURN Opening Brief at 26.

<sup>84</sup> TURN Opening Brief at 27.

<sup>85</sup> TURN Opening Brief at 27 referencing PGE-02.

<sup>86</sup> PG&E Opening Brief at 4.

<sup>87</sup> PGE-03 at WP1-5.

maintenance costs and to improve system safety. We also find that that Detect & Locate pilot is not duplicative in that this pilot relies upon the centralized fault-finding software application; whereas previous reliability projects are not centralized and integrated into PG&E's overall outage management system.<sup>88</sup>

As with the Line Sensor and Volt/VAR pilots, there are insufficient details provided for in the schedule and evaluation, measurement and validation processes. While we approve the Detect & Locate pilot, we do so with the same reporting conditions that we place on the other two Distribution Project pilots.

### **6.3.2. Detect & Locate Pilot: Compliance with SB 17 and D.10-06-047**

PG&E contends that the Detect & Locate pilot complies with SB 17 and D.10-06-047 in that it is consistent with the potential for increased use of digital information to improve the reliability and efficiency of the grid characteristics required by the statute and decision. For example, PG&E states that the Detect & Locate pilot will help create a smart grid that:

- Is self-healing and resilient in that it can precisely identify actual locations of damaged equipment;
- Can resist attack by ensuring security controls are in place; and
- Can provide high quality power to save money in that future versions may assist in stopping outages prior to equipment failure or stopping power quality issues that affect customers.

TURN again alleges that PG&E has not provided sufficient evidence that the Detect & Locate pilot complies with SB 17 and D.10-06-047 because of an absence of cost-effectiveness or cost-benefit analyses. We find that, similar to the

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<sup>88</sup> PG&E Reply Brief at 12.

other two Distribution Project pilots, PG&E has complied with the aforementioned requirements of D.10-06-047 for its Detect & Locate pilot. We also find that the Detect & Locate Pilot, as a proposed part of the smart grid, meets the required criteria of increased use of cost-effective digital control technology to improve reliability and efficiency of the electric grid.

### **6.3.3. Detect & Locate Pilot: Alignment with Other Smart Grid Projects and the Deployment Plan**

PG&E submits that the Detect & Locate pilot aligns with its other Smart Grid projects. PG&E explains that the Detect & Locate pilot, along with the Line Sensor and Volt/VAR pilots, support the pursuit of Smart Grid technologies with the highest potential for improving safety and reliability, reducing Operations and Management costs, enhancing customer satisfaction, and reducing environmental impacts on PG&E distribution system.<sup>89</sup> TURN raises the same concerns stated in its discussion regarding the Line Sensor and Volt/VAR pilots.

Our analysis of the Detect & Locate pilot and its alignment with other PG&E Smart Grid projects leads us to approximately the same conclusions as the other two Distribution Project pilots: the Detect & Locate pilot is valuable for more rapidly and accurately detecting, analyzing and responding to distribution system outages. However, once again, PG&E did not provide complete information that would lead us to approve all three phases of this project. We require PG&E to provide the same information that we require for the Line Sensor and Volt/VAR pilots via Advice Letters.

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<sup>89</sup> PG&E Opening Brief referencing PGE-01 at 2-5 to 2-7 and PG&E Smart Grid Deployment Plan, 2011-2020, June 30, 2011.

#### **6.3.4. Detect & Locate Pilot: Reasonableness of Costs and Benefits**

PG&E proposes a four-year budget (2013 through 2016) of \$12.9 million to fund the Volt/VAR Pilot.<sup>90</sup> This includes \$12.3 million for capital and \$0.6 million for expenses during the pilot.<sup>91</sup> PG&E estimates total benefits ranging from a low of \$51.3 million to a high of \$62.7 million in avoided Operations and Maintenance across years 2017 through 2030.<sup>92</sup> Other potential benefits not calculated in this estimate include avoided incidents related to high impedance faults, minimized duration of drops in power quality, and avoided distribution capacity investments.

As previously discussed, TURN contends that PG&E did not provide a sufficient cost and benefits analysis for the Detect & Locate pilot in that PG&E provided no sensitivity analysis to understand the impact of early obsolescence.<sup>93</sup> TURN states that because PG&E has not provided any cost and benefit test or cost-effectiveness analysis, it thus has not performed the sensitivity analysis and, therefore, the Commission should not approve the pilot.

PG&E disagrees with TURN's contention that PG&E did not provide any cost and benefits for the Detect & Locate pilot. PG&E again points to testimony and work papers that provide costs for pilot and full deployment, as well as

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<sup>90</sup> PGE-03 at 2-24.

<sup>91</sup> *Ibid.*

<sup>92</sup> PGE-03 at WP1-5.

<sup>93</sup> TURN Opening Brief at 2 referencing TRN-07 at 9 to 10.

estimated benefits for full deployment.<sup>94</sup> Additionally, PG&E notes that the Detect & Locate pilot also provides some soft benefits as listed above.

We discuss the reasonableness of costs and benefits of the Line Sensor, Volt/VAR, and Detect and Locate pilots together. In comments, DRA and TURN argue against reviewing the costs and benefits of the Distribution projects together.<sup>95</sup> TURN contends that there is no evidence to support a review of the Distribution Projects as one.<sup>96</sup> We disagree. PG&E's testimony describes a "complex" interweaving of the Information Technology of these pilots including the "complexity of interactions between the systems."<sup>97</sup>

The following table provides estimated costs and benefits for the three Distribution Project pilots:

Pilot	Cost of Pilot	Cost of Full Deployment <sup>98</sup>	Benefits at Full Deployment <sup>99</sup>
Line Sensors	\$16.7	\$98 - \$131	\$35.9
Volt/VAR	\$38.4	\$200 - \$276	\$536 - \$1,070
Detect & Locate	\$12.9	\$74 - \$103	\$51.3 - \$62.7
Totals	\$68.0	\$372 - \$410	\$611.2 - \$1,132.7

<sup>94</sup> PG&E Opening Brief at 5 to 6 and footnotes 9 to 11.

<sup>95</sup> TURN Opening Comments at 3 to 5 and DRA Opening Comments at 7 to 10.

<sup>96</sup> TURN Opening Comments at 4.

<sup>97</sup> PGE-01 at 2-28. See also PGE-01 at 2-29, lines 12 to 15 and 2-30, lines 29 to 31.

<sup>98</sup> Smart Grid Deployment Plan at Table 7.4.

<sup>99</sup> PGE-03 at WP1-2, WP1-3, and WP1-5.

We find that the estimated costs and benefits of full deployment, without including any monetary value for the soft benefits, compare favorably when looking at the three Distribution Project pilots together. Again, we reiterate that a cost-benefit analysis is not required when approving the implementation of a pilot. However, we find that the estimated costs of the Line Sensor, Volt/VAR and Detect & Locate pilots are reasonable in comparison with the total estimated benefits of the three pilots. We approve all three Distribution Project pilots with the required reporting restrictions as previously discussed. PG&E shall not proceed to a subsequent phase of any of these projects until approval of the Advice Letter reporting on the current phase.

#### **6.4. Short-Term Demand Forecasting Pilot: Overview and Analysis Result**

PG&E proposes that the Short Term Demand Forecasting pilot will evaluate whether more granular sources of data can be acquired and used to improve the accuracy of short-term electricity demand forecasts for PG&E's bundled electricity customers. Sources of data to be evaluated include Smart Meters, transmission and distribution network devices, and demand response programs. The purpose of the Short Term Demand Forecasting pilot is to improve the accuracy of demand forecasts given the micro-climates within PG&E service territory.<sup>100</sup> PG&E contends that the current top-down approach of using an overall service area forecast and then adjusting may produce reasonable demand forecasts but does not directly capture the specific impacts of micro-climates.

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<sup>100</sup> PGE-01 at 4-3.

Upon analysis, we find value in PG&E's Short Term Demand Forecasting pilot. The following sections explain that while the pilot did not fully meet all of the pilot criteria, PG&E presents valid arguments that lead us to approve the pilot. With respect to the reasonableness of the costs compared to the benefits of this pilot, we have found that the estimated benefits, although conservatively low, could outweigh the estimated costs especially if unquantifiable benefits pan out. In the end, we find the financial risks to ratepayers are low. However, we, once again, have concerns regarding a lack of details in the proposal.

We approve PG&E's Short Term Demand Forecasting pilot conditionally, with the reporting requirements as described below, and authorize \$13.4 million to fund the pilot. As discussed in Section 4.1.3 of this decision, PG&E shall not spend any funds beyond the current phase of the pilot until the Commission has approved the report on that phase.

#### **6.4.1. Short Term Demand Forecasting Pilot: Meeting the Pilot Criteria**

PG&E submits that the Short Term Demand Forecasting pilot meets the criteria for pilots. Contending that the Short Term Demand Forecasting pilot is an innovative program that relies on more granular sources of data, PG&E explains that the pilot will improve accuracy by capturing the specific impacts of micro-climates within PG&E's service territory. PG&E provides a schedule for the pilot, and states that the schedule has milestones and on-off ramps as required by the pilot criteria. While not including an EM&V, plan or well-defined methodologies toward a cost-benefit analysis, PG&E provided metrics that can be used to evaluate the results of the Demand Forecasting pilot.

TURN argues that the Short Term Demand Forecasting pilot does not meet the pilot criteria in that the pilot does not address a specific concern, and does

not have clear objectives or goals, budget, off-ramps, cost-benefit analyses or performance metrics.<sup>101</sup>

According to TURN, PG&E does not claim that there is any particular problem with the current approach to forecasting, which PG&E also claims has produced reasonable results.<sup>102</sup> TURN expresses concern that, in addition to not pinpointing a particular problem, PG&E does not know whether it might achieve greater accuracy through this pilot. PG&E disagrees with TURN's view that the Short Term Demand Forecasting pilot does not address a specific concern. PG&E points to several benefits including reducing exposure to procuring energy in the real-time market, reducing uncertainty of the load, increasing system reliability, and improving accounting.<sup>103</sup>

TURN further argues that while improved forecast accuracy might be an objective or goal of this pilot, it is not reasonable unless the pilot is cost-effective. TURN explains that if the cost of improved accuracy is millions of dollars but the benefits are measured only in the thousands of dollars, approving the pilot is not reasonable.<sup>104</sup> PG&E explains that the Short Term Demand Forecasting pilot focuses on software model development "that will be incorporated into PG&E's existing energy procurement forecasting IT systems... and, if cost-effective, will

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<sup>101</sup> TURN is the only party to provide testimony in response to PG&E's Short Term Demand Forecasting pilot.

<sup>102</sup> TURN Opening Brief at 31 referencing PGE-01 at 4-3.

<sup>103</sup> PG&E Reply Brief at 17.

<sup>104</sup> TURN Opening Brief at 32.

defray the ultimate costs for full deployment and use in PG&E's energy forecasting systems."<sup>105</sup>

TURN expresses concern with PG&E's statement that complexities in the Demand Forecasting pilot may increase the cost of performing this budget.<sup>106</sup> PG&E responded that PG&E, not ratepayers will be at risk for costs of the pilot that exceed PG&E's approved revenue requirements in this proceeding. PG&E adds that it included a contingency factor to account for the complexities and potential increases in budget.<sup>107</sup>

We agree with TURN that PG&E did not fully meet the required pilot criteria. However, we see value in pursuing the pilot because of the potential benefits, including leveraging with past projects. We describe our rationale in the following section regarding compliance with SB 17.

As has been the case with the previously discussed pilots, the Demand Forecasting pilot schedule lacks dates for off-ramps. We also find insufficient details regarding the processes for evaluation, measurement and validation. To remedy these shortcomings, we direct PG&E to comply with the same reporting requirements we give for the other approved pilots. The same funding restrictions also apply.

#### **6.4.2. Short Term Demand Forecasting Pilot: Compliance with SB 17 and D.10-06-047**

PG&E contends that the Short Term Demand Forecasting pilot complies with SB 17 and D.10-06-047 in that it is consistent with the potential for increased

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<sup>105</sup> PG&E Reply Brief at 17.

<sup>106</sup> TURN Opening Brief at 33 referencing PGE-01 at 4-11.

<sup>107</sup> PG&E Reply Brief at 18.

use of digital information to improve the reliability and efficiency of the grid characteristics required by the statute and decision. For example, PG&E states that the Demand Forecasting pilot will help create a smart grid that:

- Can resist attack by evaluating and testing interfaces to ensure security controls are in place;
- Can accommodate all generation and storage options by influencing the types of resources that are available and used to meet demand; and
- Can run more efficiently by using the additional sources of digital information to ensure that sufficient resources are matched and available to meet demand.<sup>108</sup>

TURN alleges that PG&E has not provided sufficient evidence that the Short Term Demand Forecasting pilot complies with SB 17 and D.10-06-047 because of an absence of cost-effectiveness or cost-benefit analyses.

We see this pilot as a new approach to linking data from Smart Meters and SCADA with other data derived from weather and customer photo-voltaic and electric vehicle penetration in order to more accurately predict customer load at a more granular level. PG&E has described the benefits in terms of improvements to short-term forecasting, but we see a potential for substantive savings related to ancillary services and longer-term projections of need for distribution upgrades and ability of utilities to process interconnection requests. We also see potential impacts on regional reliability.

PG&E alludes to a potential relationship with photo-voltaic and electric vehicle penetration. Currently, there is a great deal of uncertainty in forecasting for these needs. The Short Term Demand Forecasting pilot could improve data

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<sup>108</sup> PG&E Opening Brief at 50 referencing PGE-04 at 30 to 32.

analysis related to localized load impacts from greater photo-voltaic and electric vehicle usage.

Similar to the Distribution Projects, we find that the Short Term Demand Forecasting project increases the use of cost-effective digital information and control technology to improve reliability, security, and efficiency of the electric grid. Additionally, this pilot also may identify or lower barriers to the adoption of such technologies as photo-voltaic and electric vehicles by improving the forecasting of these uses, another legislatively-required characteristic of a smart grid.

We conclude that the Short Term Demand Forecasting pilot addresses at least seven of the eleven characteristics of D.10-06-047. The characteristics include providing higher quality power that will save money wasted from outages, accommodating all generation and storage options, enabling energy markets to flourish, enabling the penetration of intermittent power generation sources, supporting the sale of demand response, energy efficiency, distributed generation and storage, and reducing the total environmental footprint. We also find that PG&E has complied with the aforementioned requirements of D.10-06-047 for its Short Term Demand Forecasting pilot.

We find that the Short Term Demand Forecasting pilot, as a proposed part of the smart grid, complies with the requirements of both SB 17 and D.10-06-047.

#### **6.4.3. Short Term Demand Forecasting Pilot: Alignment with Other Smart Grid Projects and the Deployment Plan**

PG&E states that the Short Term Demand Forecasting pilot “is fully aligned and consistent with PG&E’s Smart Grid Plan and other Smart Grid priorities and policies, including the Commission’s “loading order” for energy procurement and other policies emphasizing cost-effective energy procurement

planning.”<sup>109</sup> No party provided comment as to whether or not this pilot aligns with other PG&E smart grid projects.

In our review, we find nothing in the record of this proceeding that would lead us to conclude that this pilot does not align with other smart grid projects and the deployment plan. The integration of this pilot in locations that have previously deployed Smart Meters not only leverages existing baseline investments in the smart grid, but should eventually provide the data needed to calibrate the selected regional demand to the bundled customer demand.

PG&E emphasizes that this pilot supports the Commission’s Smart Energy Markets priority for the Smart Grid. In D.10-06-047, the Commission stated that the “Smart Market that emerges from the Smart Grid should be transparent and provide, price, tariff, and usage information sufficient to facilitate, among other things, demand response and distributed generation.”<sup>110</sup> In its proposed deployment plan, PG&E states that it proposes projects that directly improve energy procurement and efficiency at the system and California Independent System Operator level. Furthermore, the deployment plan discusses taking a traditionally top-down energy procurement approach but adding a bottom’s-up forecasting capability.<sup>111</sup> Our review finds that this is also the approach of the Short Term Demand Forecasting Budget.

We find that the Short Term Demand Forecasting pilot aligns with other smart grid projects and the proposed PG&E deployment plan.

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<sup>109</sup> PG&E Opening Brief at 50 referencing PGE-01 at 1-8.

<sup>110</sup> D.10-06-047 at 35.

<sup>111</sup> PG&E Smart Grid Deployment Plan at 131.

#### **6.4.4. Short Term Demand Forecasting Pilot: Reasonableness of Costs and Benefits**

PG&E proposes a four-year budget (2013 through 2016) of \$13.4 million to fund the Short Term Demand Forecasting pilot.<sup>112</sup> This includes approximately \$12 million for information technology (IT) costs and \$2 million for energy procurement costs during the pilot.<sup>113</sup> PG&E describes the energy procurement costs as additional labor for two full time employees and configuration costs and subscription fees for two forecast models.<sup>114</sup>

PG&E estimates total benefits at full deployment ranging from a low of \$3.2 million to a high of \$47.6 million in energy procurement cost savings through 2030.<sup>115</sup> Other potential benefits not calculated in this estimate include reducing the amount of uncertainty of the load that is seen by the California Independent System Operators, and potentially decreasing the procurement of ancillary services to manage that uncertainty; increasing system reliability by ensuring sufficient resources are matched and available to meet demand; and improving accounting for unaccounted energy and associated costs.<sup>116</sup>

TURN notes that the cost of the project at full deployment is anticipated to equal approximately \$19 million to \$27 million, and warns that the Commission should be skeptical of a proposed pilot program where the costs for the pilot represent 34-43% of the estimated costs of full deployment.<sup>117</sup> PG&E responds

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<sup>112</sup> PGE-03 at 2-24.

<sup>113</sup> *Ibid.*

<sup>114</sup> PGE-01 at 4-8 to 4-9.

<sup>115</sup> PGE-03 at WP1-1 and WP1-6.

<sup>116</sup> PGE-02 at 4-1 to 4-2.

<sup>117</sup> TURN Opening Brief at 30 to 31.

that this pilot is primarily focused on the development of a software model to be incorporated into PG&E's existing forecasting IT systems. If deemed cost-effective, the costs of the pilot will defray the costs of full deployment.

TURN also cautions the Commission that, as stated by PG&E, the anticipated IT costs of this pilot could prove too low due to "complexities in both IT and in business implementation" that increase the costs of the pilot.<sup>118</sup> In response, PG&E explains that it is PG&E stakeholders, not ratepayers, who are at risk to pay for costs that exceed the anticipated costs of this pilot.<sup>119</sup> PG&E adds that it "included an appropriate, reasonable contingency factor in the cost estimates" to address potential cost overruns.<sup>120</sup>

However, there is a potential for substantive savings related to ancillary services, distribution upgrades and processing interconnection requests. The record of this proceeding includes no specific value to these potential benefits.

In looking at the direct costs to ratepayers, we look to the revenue requirement for this pilot, which equals \$1.56 million.<sup>121</sup> PG&E explains that in developing the rate base for this pilot, certain deductions are made including one for the accumulated deferred taxes associated with assets.<sup>122</sup> Further, all acquired software is capitalized for tax depreciation, and therefore generates tax depreciation and deferred tax expense when booked as an expense.<sup>123</sup> Because

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<sup>118</sup> TURN Opening Brief at 31 referencing PGE-01 at 4-11.

<sup>119</sup> PG&E Opening Brief at 18.

<sup>120</sup> *Id.*

<sup>121</sup> PGE-08 at 2, Table 6-1 (Revised).

<sup>122</sup> PGE-03 at 6-4.

<sup>123</sup> *Id.* at 6-5.

over 85% of the total costs of this pilot are IT costs, the tax depreciation and deferred tax expense result in a pilot that cost ratepayers only \$1.56 million. We conclude that because the actual costs to ratepayers are far less than the benefits, the risks to the ratepayers for this pilot very low.

#### **6.5. Technology Evaluation, Standards and Testing (TEST): Overview and Analysis Result**

PG&E proposes that the TEST initiative will identify and evaluate promising new Smart Grid technologies, enable and facilitate the adoption of emerging Smart Grid technology standards and verify the performance of emerging Smart Grid technologies in controlled environments to prove the feasibility of Smart Grid projects prior to large-scale deployment.<sup>124</sup> PG&E explains that the purpose of the initiative is to provide technology development capability that PG&E needs to achieve the goals of its Smart Grid Deployment Plan.<sup>125</sup> The TEST initiative will provide a centralized organization for the Smart Grid technology evaluation and innovation activities at PG&E. The TEST Initiative has five components: 1) technology identification; 2) data leveraging; 3) external research application; 4) standards development engagement; and 5) risk reduction. The bulk of funding for this initiative, \$9.78 million, will cover the salaries, etc., for an annual average of 7.25 employees and \$2.68 million, which will cover equipment and external research costs.

We deny the request to approve and fund this initiative. Lack of detailed information leads us to be concerned about which projects will be carried out in this initiative and whether these projects are cost-effective or even necessary.

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<sup>124</sup> PGE-01 at 3-1.

<sup>125</sup> PGE-04 at 27.

Similar to our reasoning in the first four pilot projects, the Commission cannot pre-approve funding for projects that the Commission has no information on.

#### **6.5.1. TEST: Meeting the Pilot Criteria**

PG&E states that the TEST initiative is not a pilot like the three Distribution or the Short Term Demand Forecasting pilots. Rather the TEST initiative proposes a set of new activities to enhance PG&E's Smart Grid technology development capabilities.<sup>126</sup> As such, PG&E recommends that the Commission evaluate the initiative by using the emerging technologies criteria adopted in D.08-06-027.<sup>127</sup> That being said, PG&E provided no material to address how the TEST initiative meets the pilot criteria.

PG&E states that the TEST initiative will fill a specific gap in Smart Grid technology coordination, project development, external research review, standards development and compliance testing, and lab-based technology testing.<sup>128</sup> PG&E contends that TEST is non-duplicative and will employ an integrated and cross-cutting approach to technology development, including collaboration with PG&E IT and PG&E's San Ramon Technology Center.<sup>129</sup> Furthermore, PG&E submits that the goal of TEST is to create a Smart Grid technology development capability that will facilitate the integration and testing of new Smart Grid technologies, evaluation of standards, and improve PG&E understanding of technologies through benchmarking.<sup>130</sup> PG&E provides a

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<sup>126</sup> PG&E Opening Brief at 52 referencing PGE-01 at 3-1 to 3-3.

<sup>127</sup> PG&E Opening Brief at 52.

<sup>128</sup> PG&E Opening Brief at 53.

<sup>129</sup> PG&E Opening Brief at 54 referencing PGE-04 at 20.

<sup>130</sup> PG&E Opening Brief at 55 referencing PGE-01 at 1-8.

budget for the project and a timeline; the timeline has two activities: staff up in year one and full implementation over years two through four. PG&E contends that because the TEST initiative is not a pilot, the outcomes will be evaluated in the broad context of the Deployment Plan goals.<sup>131</sup> PG&E provides no cost-benefit analysis, no clear performance metrics or EM&V plan, stating that no plan is necessary given that this is not a pilot.<sup>132</sup>

DRA argues that the TEST initiative does not meet the pilot criteria; takes away the Commission's discretionary authority; should instead be within the scope of the EPIC Program; and, therefore, should not be approved by the Commission. Arguing that the TEST Initiative does not meet any specific concerns, DRA states that in the TEST Initiative, PG&E "mischaracterizes the modernization of the electrical grid into a "smart grid" as a specific problem it wants to address."<sup>133</sup> DRA contends that PG&E's listing of specific problems that TEST will address may actually not be addressed at all. DRA also argues that the initiative is duplicative, does not have clear objectives and goals, has neither a clear budget nor timeline, and provides no cost-benefit analysis or EM&V plans.

DRA expresses concern that because PG&E's response to a data request reveals that the proposed staff for this initiative will not be dedicated to specific project areas, there is no guarantee of what projects this initiative will test and evaluate. DRA concludes that "the proposed TEST Initiative would provide

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<sup>131</sup> PG&E Opening Brief at 57.

<sup>132</sup> PG&E Opening Brief at 59.

<sup>133</sup> DRA Opening Brief at 12.

PG&E decision making autonomy with effectively minimal or no Commission oversight.”<sup>134</sup>

We have already determined that the requests made in this proceeding, including the TEST Initiative, have correctly been filed as an application and that they do not fall under the confines of the EPIC program. We will not readdress that issue here.

We now turn our attention to whether the TEST Initiative meets the pilot criteria. First, we see no clear picture of how this Initiative meets a specific need, except to hire additional employees “to evaluate and test new products and systems for their potential to integrate with PG&E’s devices and systems.”<sup>135</sup> PG&E anticipates that the areas the new employees will most likely address will be the integration of increased penetration of distributed renewable resources, distributed storage and advanced distribution automation, and electric vehicles into grid operations, as well as coordinating communication and control equipment development and specifications, and meeting cyber security requirements.<sup>136</sup> We agree with DRA that these outlined areas are very broad – too broad for the Commission to make a determination as to whether this project is reasonable.

We further find that there is no clear budget for the TEST initiative. PG&E states that the installation process and bill of materials are not known at the point when lab work begins and, therefore, costs cannot be forecast with precision. PG&E notes, “it will develop technology pilots with a better sense of the required

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<sup>134</sup> *Id.* at 13. See also *Id.* at 23 to 26.

<sup>135</sup> DRA-02 at Bates Stamp DRA0094.

<sup>136</sup> DRA-02 at Bates Stamp DRA0095.

costs for installation (labor) and equipment.”<sup>137</sup> Furthermore, PG&E states that in the Reducing Risk component of the Initiative, “each small project is estimated to require up to \$50,000 to purchase equipment or devices.”<sup>138</sup> But PG&E provides no estimation of how many small projects it anticipates. Thus, we conclude that the budget PG&E has provided for the TEST initiative is not complete and, therefore, inadequate.

PG&E provides two activities for the initiative’s timetable: hire employees in year one and implement project in years two through four. We find the timetable and its list of activities to be insufficient. While this Initiative differs from a pilot, the Commission must have more details in order to determine whether a project is reasonable.

Lastly, we find that this project lacks any detail to determine how a cost-benefit analysis will be implemented, except that “the outcomes of the initiative will be evaluated in the broad context of the Deployment Plan goals.”<sup>139</sup> Furthermore, PG&E states, “cost-effectiveness will be shown through reports on the Initiative’s activities over time, rather than through specific milestones or metrics.”<sup>140</sup> As we have previously discussed, we find the annual reports to be insufficient for monitoring the progress of these projects.

We find that the TEST Initiative does not meet the requirements of the pilot criteria. While PG&E has argued that the Test Initiative is not a pilot and should be treated as a project, we find that the information provided in this

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<sup>137</sup> PGE-01 at 3-23.

<sup>138</sup> PGE-01 at 3-15.

<sup>139</sup> PG&E Opening Brief at 57.

<sup>140</sup> *Id.* at 58.

application also lacks the detail necessary to determine the reasonableness of the costs and benefits as a project. As such, we find it unnecessary to discuss the merits of whether TEST is compliant with SB 17 and D.10-06-047, or whether it is aligned with other Smart Grid projects. The approval of and funding for PG&E's TEST Initiative is denied.

#### **6.6. Smart Grid Customer Outreach and Education Project: Overview and Analysis Result**

PG&E proposes that the Customer Outreach and Education pilot will create a foundational understanding of the Smart Grid and what its future deployment could yield for customers. PG&E explains that this will frame the conversation with customers as specific Smart Grid projects and benefits become available.<sup>141</sup> PG&E proposes that the pilot will develop messages to establish a baseline customer understanding of the Smart Grid; communicate factual information about the other five pilots in this application; determine the facts, benefits and costs most effecting customers; and address customer questions, problems and concerns.<sup>142</sup> The objectives of this pilot is to test new messaging; use customer feedback to determine how best to communicate; identify areas of customer question, concern or confusion; and develop a scalable Smart Grid communication strategy. PG&E proposes that, during 2014, it will conduct research in order to develop and test messaging and positioning, followed by developing messaging and outreach materials.<sup>143</sup> Then, in 2016, PG&E will begin to move from pilot to large scale implementation of Smart Grid education and

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<sup>141</sup> PGE-01 at 5-4.

<sup>142</sup> PGE-01 at 5-3.

<sup>143</sup> PGE-01 at 5-7.

outreach.<sup>144</sup> Also during 2016, PG&E proposes to train and prepare all customer facing employees to respond to inquiries and requests for information.<sup>145</sup> PG&E clarifies that the Customer Outreach and Education project is not a pilot in the traditional sense, but rather a foundational process and program intended to enable PG&E to continuously develop, monitor, evaluate and calibrate with its customers and other external stakeholders on best practices in testing, piloting, and deployment new Smart Grid technology.<sup>146</sup>

We deny approval of and funding for the Smart Grid Customer Outreach and Education pilot based on a lack of specificity and justification by PG&E.

#### **6.6.1. Customer Outreach and Education: Meeting the Pilot Criteria**

As stated above, PG&E does not consider the Customer Outreach and Education project to be a pilot. Nevertheless, it provided material to make the case that this project meets the pilot criteria. PG&E contends that the Outreach project, with a goal of using a locally-targeted approach to test customer response and increase customer understanding, closes a problematic gap between customer interest and understanding of the facts, benefits, and costs related to the Smart Grid.<sup>147</sup> PG&E explains that findings from earlier research show that PG&E customers are largely ignorant regarding the Smart Grid, but gain interest with additional information.<sup>148</sup> PG&E assures the Commission that

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<sup>144</sup> *Ibid.*

<sup>145</sup> *Ibid.*

<sup>146</sup> PG&E Opening Brief at 6.

<sup>147</sup> PG&E Opening Brief at 65 and 67.

<sup>148</sup> *Id.* at 65.

the Outreach project is unique in that it relies on customer research and message testing.<sup>149</sup> Describing three components of the project, PG&E states it has provided a detailed timetable for the Outreach project as well as a budget.<sup>150</sup> Finally, PG&E contends that at the end of the pilot, it will develop the following metrics: 1) A better understanding of customers' interest; 2) The appropriate targeting of messages; 3) Educate targeted customers objectively about Smart Grid; 4) Identify areas of concern; 5) Refine an outreach strategy; and 6) Gain additional knowledge about customer interest. The EM&V plan to evaluate the results of the project would use similar criteria from other outreach PG&E activities.

DRA concludes that PG&E's Outreach project fails to meet the pilot criteria. DRA claims that the Outreach project does not address a specific gap or concern, is not a new or innovative design, does not have clear objectives or budget, and fails to provide any clear performance metrics with a plan for EM&V. Stating that the Outreach project is overbroad and lacks clarity, DRA contends that PG&E should not overwhelm customers with excessive material and messaging as it relates to Smart Grid technologies but rather the messaging should be direct, purposeful and calculated.<sup>151</sup>

TURN agrees with DRA's recommendation that the Commission not approve the Outreach project. TURN recommends that outreach be delayed until identifiable programs and functions can be promoted based on verifiable costs and benefits. TURN also agrees with DRA that the Outreach project does

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<sup>149</sup> *Ibid.*

<sup>150</sup> PGE-01 at 5-9, Table 5-2.

<sup>151</sup> DRA Opening Brief at 38.

not address a specific concern, is duplicative of other outreach programs, does not have clear objectives or goals, does not have a clear budget, and does not provide anything that constitutes a metric.<sup>152</sup>

Joint Parties recommend approval of the Outreach project with refinements to cure significant deficiencies.<sup>153</sup> Joint Parties contend that the single greatest reason that the Outreach pilot should be funded is to implement effective messaging for the ratepayers, including low-income minority and new immigrant customers.<sup>154</sup> Joint Parties base their contention on PG&E experience with Smart Meter messaging and outreach.<sup>155</sup> Joint Parties caution that without proper foundational education, customers may begin to have concerns regarding the impact of the Smart Grid on health, electricity costs, and customer privacy.<sup>156</sup> Joint Parties conclude that without this Outreach project, there is no way to ensure that the correct information is deployed to the right people in order to avoid the Smart Grid experience.

We first address the comparison of the PG&E Customer Outreach and Education project approach with the utility's experience with Smart Meter outreach. Both PG&E and Joint Parties point to the prior experience with Smart

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<sup>152</sup> TURN Opening Brief at 37 to 48.

<sup>153</sup> Joint Parties contend that given the high percentage of minorities in the PG&E service area, the Outreach project should focus on reaching minorities through third party entities, including community-based organizations and ethnic media. *See* Joint Parties Opening Brief at 10 to 11 and 22 to 24.

<sup>154</sup> Joint Parties Opening Brief at 6.

<sup>155</sup> According to PG&E, during its initial Smart Meters deployment, customers were also indirectly impacted by higher prices. PG&E customers began to incorrectly associate the higher prices with the Smart Meters. *See* PGE-07 at 9.

<sup>156</sup> Joint Parties Opening Brief at 9.

Meter outreach as a cautionary tale to the Commission that customers should be educated on the Smart Grid so that customers will react more favorably to the Smart Grid and Smart Grid technology. PG&E contends that as learned from the Smart Meter approach, “it is critical that PG&E understand early areas for potential customer interest, question or concern and that PG&E conduct foundational outreach regarding new technology, and related project and service offerings.”<sup>157</sup> In response to DRA and TURN’s opposition to the Outreach project, PG&E explains that the key lesson learned from Smart Meter experience is that “[b]efore Smart Grid technologies are deployed...it is vital that customer be provided with foundational information and messaging on the new technologies that is accurate, clear, precise and relevant so that they can make choices on how to use the new technologies.”<sup>158</sup>

While both PG&E and the Joint Parties express a concern about not repeating the same mistakes that were made with the Smart Grid customer outreach, we should be cautious not to make new mistakes. Our experience with Smart Meter outreach has taught us the importance of education prior to deployment. However, we cannot directly compare the service area wide deployment of Smart Meters with the piloting of technology that may never see the lab testing phase. Instead, we review PG&E’s proposed Outreach project through the same approach we used to review the other pilots in this application. Thus, we now turn to a discussion of whether the Outreach project meets the pilot criteria discussed in Section 5 of this decision.

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<sup>157</sup> PG&E Opening Brief at 66.

<sup>158</sup> PG&E Reply Brief at 24.

Referencing responses to its own customer surveys on the Smart Grid, PG&E claims that the Outreach project proposes to close a gap between the level of customer interest and customer knowledge of the facts, benefits and costs related to the Smart Grid.<sup>159</sup> DRA argues that the Outreach project does not address a specific gap or concern. DRA, along with TURN and California Large Energy Consumers Association (CLECA), all agree that customer education and outreach must be purposeful, with direct messaging that contains factual information about specific issues or programs relevant to a customer's electricity use.<sup>160</sup>

PG&E responds to DRA and TURN stating it is the "consensus view of experts...that all retail service providers need to conduct foundational education ...in advance of offering new technologies."<sup>161</sup> PG&E describes a 2011 Smart Grid Policy Statement from the New York Public Service Commission discussing customer engagement. In the policy statement, the New York Commission concludes that customer education "must begin with basic information -- what is the smart grid, why is it important, and what are the customer benefits."<sup>162</sup> Furthermore, the New York Commission stated that "before commencing with large customer-centered smart grid programs, utilities must lay the groundwork with comprehensive customer education programs."<sup>163</sup> Thus, we find that PG&E

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<sup>159</sup> PG&E Opening Brief at 65 referencing Exhibit PGE-02 at 5-11

<sup>160</sup> See DRA Opening Brief at 39, TURN Opening Brief at 36 and Reply Brief at 23, and CLECA Opening Brief at 8 to 9.

<sup>161</sup> PG&E Reply Brief at 24 referencing PGE-02 at 5-5 to 5-8.

<sup>162</sup> New York Public Service Commission, (Case 11-E-0285), Smart Grid Policy Statement issued on August 18, 2011 at 46.

<sup>163</sup> *Ibid.*

has met the criteria of pinpointing a specific concern, gap, or program that needs to be addressed. However, PG&E does not adequately describe how the Outreach project will address this gap, except that PG&E will conduct additional customer research and studies, develop messaging, and train employees. We next discuss how this fails to meet the pilot criteria.

PG&E contends that the Outreach project is unique in that it “more heavily relies on customer research and message testing to guide the pilot outreach.”<sup>164</sup> PG&E explains that during the first year it will geographically target customer awareness as it develops and tests messaging and outreach to provide a foundation for large scale implementation. PG&E further explains that customer research will be conducted to gain an understanding of a customer’s perception of the Smart Grid. This will be followed by developing messaging and outreach materials to be deployed among key customer groups. Finally, as PG&E moves to large scale implementation there will be a need to train employees. The Commission finds nothing in this pilot that we can consider unique or non-duplicative of approaches in other outreach efforts such as the Smart Meter or low income Energy Savings Assistance Program or research by organizations like the Smart Grid Consumer Collaboration.

PG&E states that its Outreach project has clear objectives and goals. PG&E describes its goal as integrating Smart Grid messaging with energy education campaigns and increasing customer understanding on the facts, benefits and costs associated with the implementation of Smart Grid technologies.<sup>165</sup> PG&E lists four objectives: test new Smart Grid messaging; determine how to

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<sup>164</sup> PG&E Opening Brief at 66.

<sup>165</sup> PG&E Opening Brief at 67.

communicate information to customers; identify customer questions, concerns, or confusion; and develop a scalable communication strategy for longer-term objectives.<sup>166</sup> DRA calls these objectives vague, ambiguous, and overbroad. Despite supporting the project, even Joint Parties point to the “absence of concrete details...stiffl[ing] the ability of the Commission...to ensure that the messaging used will be effective.”<sup>167</sup> We agree that there is a lack of description to justify approval. The objectives described above could be the objectives for any of PG&E’s other outreach projects. As we have previously determined, PG&E fails to describe how this Outreach project is different from other current Outreach projects.

PG&E states that the budget for this four-year Outreach project is \$13.48 million. In its testimony, PG&E provides a year-by-year budget breakdown.<sup>168</sup> DRA and TURN state that this budget does not meet the pilot criteria. DRA contends that the lack of specificity in the description of the Outreach project lends to an inability to substantiate the proposed costs in the budget breakdown. TURN argues that the budget breakdown demonstrates that PG&E’s testimony “claiming different emphases in different periods is largely baseless.”<sup>169</sup> In reviewing PG&E’s proposed Outreach project budget, we agree with TURN that the budget does not justify many statements made by PG&E including, “a locally-targeted approach,” and “test and refine methodology.” While the budget does equate the proposed additional employee training with

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<sup>166</sup> PGE-03 at 5-2.

<sup>167</sup> Joint Parties Opening Brief at 24.

<sup>168</sup> PGE-01 at 5-9, Table 5-2.

<sup>169</sup> TURN Opening Brief at 45.

an increase of \$500,000 during the final year of the project, we see very little change in this budget throughout the four-year timeline. We find that because the project is flawed in its lack of specificity, the proposed budget is also flawed in its lack of specificity. Furthermore, because there are insufficient details in the costs and activities for the Outreach project, we cannot weigh the likelihood of the cost-effectiveness for this project.

As stated above, PG&E describes the timeline for the Outreach project as conducting research to develop and test messaging in 2014, following by developing messaging and outreach materials with large scale implementation and employee training in 2016.<sup>170</sup> CLECA,<sup>171</sup> TURN<sup>172</sup> and DRA<sup>173</sup> all agree that this schedule provides neither milestones nor off-ramps. We find that because of the lack of milestones, off-ramps, or specific activities the Outreach project fails to provide an adequate timetable.

PG&E contends that at the end of the Outreach project, it will develop six metrics to evaluate the outcomes of the project:

- 1) A better understanding of customers' interest;
- 2) The appropriate targeting of messages;
- 3) Educate targeted customers objectively about Smart Grid;
- 4) Identify areas of concern;
- 5) Refine an outreach strategy; and

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<sup>170</sup> PGE-01 at 5-2 and 5-4.

<sup>171</sup> CLECA Opening Brief at 10.

<sup>172</sup> TURN Opening Brief at 47.

<sup>173</sup> DRA Opening Brief at 47.

- 6) Gain additional knowledge about customer interest.<sup>174</sup>  
TURN contends that these six items are not metrics and therefore not measurable.<sup>175</sup>

We agree with TURN, metrics must be measurable. PG&E's Outreach project fails to provide metrics or an EM&V plan to determine the success of this project.

We find that the Customer Education and Outreach project does not meet the requirements of the pilot criteria. While PG&E argued that the Outreach project is not a pilot and should be treated as a project, we further find that, similar to the TEST Initiative, the information provided in this application for the Outreach project lacks the detail necessary to determine its reasonableness as a project. As such, we find it unnecessary to discuss the merits of whether the Outreach project is compliant with SB 17 and D.10-06-047, or whether it is aligned with other Smart Grid projects. The Customer Education and Outreach project and its proposed funding are denied.

## **7. Pilot Budgets, Cost Recovery, and Allocation Issues**

We consider there to be one outstanding issue regarding the budgets of the approved pilots; that of contingency costs. PG&E requests contingency amounts in its forecasts of the pilot program costs equaling approximately \$6.61 million for the three distribution projects and \$2.1 million for the Shorter Term Demand Forecasting program.<sup>176</sup> TURN argues that PG&E provides no evidence to support these contingency amounts, (10 percent for Transmission and

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<sup>174</sup> PG&E Opening Brief at 71 referencing PGE-02 at 5-7 and PGE-04 at 37 to 38.

<sup>175</sup> TURN Opening Brief at 48.

<sup>176</sup> TURN Opening Brief at 8-9 referencing PGE-03 at WP 2-8 and WP 4-2 to 4-3.

Distribution Facilities and 20 percent for Information Technology).<sup>177</sup> In response, PG&E contends “reliance on experts with past experience to determine contingency levels is a proven and accepted methodology.”<sup>178</sup> PG&E also points out that the Commission has approved comparable levels of contingency costs in PG&E’s Smart Meter filings.<sup>179</sup>

As we have done in prior decisions, we adopt a 10 percent contingency amount for Transmission and Distribution aspects of the approved pilots in this decision.<sup>180</sup> However, PG&E has not met its burden of proof regarding the 20 percent contingency for Information Technology. PG&E’s reliance on AACE recommended practices and Smart Meter decisions is not appropriate when compared to these “pilot” projects. However, we consider TURN’s recommended contingency of 5 percent to be invalid given that the Commission has, in the past, allowed much higher contingencies for Information Technology deployment projects.<sup>181</sup> Instead, we allow PG&E a 15 percent contingency for Information Technology.

PG&E requests a cost recovery methodology where the Commission approves forecasted costs, and recovery of the costs through a one-way balancing account in which revenue requirements are set not to exceed the cost cap and the revenue requirements are trued-up to actual costs if lower than

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<sup>177</sup> Id at 9.

<sup>178</sup><sup>178</sup> PG&E Reply Brief at 10, footnote 28 referencing the AACE International recommended practice no. 40-R-08 regarding contingency estimating.

<sup>179</sup> PG&E Reply Brief at 11 referencing D.06-07-027 and D.-09-03-026.

<sup>180</sup> See for example, D.12-11-051, SCE 2009 GRC at 247, as referenced by TURN in its Opening Brief at footnote 41.

<sup>181</sup> D.06-07-027 and D.09-03-026.

forecasted.<sup>182</sup> We have already determined that this is the appropriate reasonableness test. We therefore approve PG&E's cost recovery methodology for the four Smart Grid pilots approved in this decision.

PG&E requests that "the costs of the Smart Grid Pilot Deployment project be allocated to all customers in PG&E's Distribution Revenue Adjustment account."<sup>183</sup> DACC/AReM contend that because the Short Term Demand Forecasting and Volt/VAR Optimization pilots provide benefits solely to bundled customers, they should be recovered through generation rates. Further, because the Smart Grid Line Sensor and Detect & Locate pilots provide general distribution benefits, the costs should be recovered through distribution rates.<sup>184</sup> CLECA differs slightly in its opinion; the costs of the three Distribution pilots should be recovered in distribution rates and the Short Term Forecasting pilot costs recovered in generation rates.<sup>185</sup>

PG&E responds that the three Distribution Projects are "Smart Grid projects...directed at the grid-related goals and policies adopted by the Legislature in SB 17 and should be allocated among all distribution customers, including Direct Access and Community Choice Aggregation customers."<sup>186</sup> Furthermore, PG&E agrees that the Short Term Demand Forecasting pilot may be more accurately assigned to the generation function to reflect the functionality

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<sup>182</sup> PGE-01 at 7-2, 7-4, and 7-6.

<sup>183</sup> PGE-01 at 7-2.

<sup>184</sup> DACC/AReM Opening Brief at 7.

<sup>185</sup> CLECA Reply Brief at 2.

<sup>186</sup> PG&E Reply Brief at 31 referencing PGE-01 at 7-2 and PGE-02 at 7-3 and 7-4.

of the project and thus recommends that half the costs of the project be allocated to generation and half to distribution.<sup>187</sup>

We agree that the Distribution Projects should be recovered through distribution rates. While DACC/AReM contends that only bundled customers will benefit from the Volt/VAR Optimization pilot, we disagree and find that all customers will benefit from the Volt/VAR pilot because the project “reduces utility system losses by managing the distribution voltage from the substation to the customer’s service point.”<sup>188</sup>

The Short Term Demand Forecasting pilot is a project that currently holds benefits solely for bundled customers, and, thus, should only be recovered through generation rates.

## **8. Future Smart Grid Applications**

While we were able to review the pilots requested in this application, we found PG&E did not always provide sufficient details. In order to improve the quality of future applications, we direct PG&E to present future Smart Grid proposals to staff and other stakeholders and receive feedback prior to filing an application. We also direct PG&E to ensure that future proposals include more details on schedules, the EM&V processes, and cost and benefit estimates as discussed in this decision. While there are many unknowns when embarking upon a pilot for a new technology, we balance that with our responsibility to ratepayers and to California to pursue new technologies in an efficient and cost-effective manner that is likely to be cost-effective, pursuant to SB 17.

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<sup>187</sup> PG&E Reply Brief at 32.

<sup>188</sup> PGE-01 at 2-13. See also PGE-01 at 2-19.

## **9. Comments on Proposed Decision**

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on March 7, 2013 by AReM/DACC, Clean Coalition, CLECA, DRA, Marin Energy Authority, National Asian American Coalition/Black Economic Council/Latino Business Chamber of Greater Los Angeles, PG&E, and TURN. Reply comments were filed on March 12, 2013 by AReM/DACC, Clean Coalition, CLECA, DRA, Marin Energy Authority, PG&E, and TURN.. We have made clarifications and corrections in the final decision in response to the comments received.

## **10. Assignment of Proceeding**

Michael R. Peevey is the assigned Commissioner and Kelly A. Hymes is the assigned ALJ in this proceeding. ALJ Hymes is the Presiding Officer.

### **Findings of Fact**

1. The projects requested in this application are pilots.
2. Pilots test a new concept or program design intended to address a concern or gap.
3. Demonstration projects and pilots tests new concepts or program designs, but pilots address a specific area of concern.
4. D.12-05-037 exempts the pilots in this application from the EPIC process because this application had been filed prior to the issuance of D.12-05-037.
5. The criteria elements listed in the EPIC decision are intended for an overall investment plan under the EPIC process, not for individual pilots as proposed in this application.

6. The criteria listed in Pub. Util. Code §740.1 are general in nature compared to the nine pilot criteria approved for pilots in Demand Response and Energy Efficiency programs.

7. The criteria adopted by the Commission to analyze pilots in demand response and energy efficiency programs are well established and relevant to the subject matter at hand with specific reference to Smart Grid policies enunciated in SB 17.

8. A review of costs and benefits is just one of the criteria we use to analyze the six Smart Grid pilots.

9. The Commission's normal practice is to first review proposals, and then approve an appropriate budget for that proposal.

10. The Commission wants to ensure that the Smart Grid pilots progress in a timely and efficient manner.

11. The annual report proposed by PG&E is insufficient to provide up-to-date information on the Smart Grid pilots.

12. PG&E's commitment to "keep the Commission and Commission staff informed of the progress of each pilot" is insufficient.

13. There is value in the approval process taken in D.08-02-009.

14. Requiring multiple applications for each stage of each pilot requested in this application would be administratively burdensome and costly.

15. The Line Sensor pilot does not fully meet all of the required pilot criteria.

16. There is value in pursuing the Line Sensor pilot because of the specific need to improve reliability by decreasing service outages.

17. The Line Sensor pilot focuses on the use of communicating line sensors and is not duplicative of projects using older and outdated non-communicating line sensors.

18. The cost-benefit analysis for the Line Sensor pilot is not as detailed as that in a non-pilot application.

19. PG&E complied with the pilot criteria by providing estimated costs for the Line Sensor pilot and the project at full deployment, as well as the estimated benefits of the project at full deployment.

20. If viewed alone, the costs for the Line Sensor pilot outweigh the benefits.

21. The schedule for the Line Sensor pilot lacks dates for off-ramps.

22. In order to determine whether an approved pilot has been successful, the Commission requires data to evaluate, measure, and validate the findings from the completed phase of the pilot.

23. In order to be prepared to review a completed phase of the pilot, the Commission requires the date of the anticipated off-ramp.

24. D.10-06-047 makes two requirements of future investments:

- a) Requests for future Smart Grid investments must be made through either a GRC or an application; and
- b) Utilities must file an annual report that describes their current initiatives in regards to Smart Grid deployments and investments.

25. The eleven items listed in SB 17 are requirements for the deployment plan vision statement, not for future investments such as the pilots in this application.

26. A proposed pilot is not required to meet all of the criteria listed in Pub. Util. Code § 8360 but, rather, should contribute to ensuring that the entire smart grid meets each and every one of the criteria.

27. The Lines Sensor pilot meets the criteria of increased use of cost-effective digital control technology to improve reliability and efficiency of the electric grid.

28. It is the duty of the Commission to ensure safe and reliable electric service for California.

29. The Commission is committed to improving reliability in a cost-effective manner.

30. PG&E provided adequate estimated costs and benefits for the Line Sensor pilot.

31. A full deployment program estimated cost between \$98 million to \$131 million, but with estimated benefits of only \$35.9 million is not cost-effective.

32. The record of this proceeding does not include monetary values to assign to the soft benefits of the Line Sensor pilot.

33. The Line Sensor pilot is not a stand-alone pilot, but one of three pilots (including the Volt/VAR Optimization and Detect & Locate pilots) comprising the Distribution Project.

34. The pilot criteria do not require a utility to perform cost-benefits analysis, but rather, where appropriate, propose methodologies to test the cost-effectiveness of the pilot.

35. The Volt/VAR pilot's cost-benefit analysis is not as detailed as that in a traditional application.

36. PG&E provided adequate estimated costs for the Volt/VAR pilot and the full deployment project, as well as the estimated benefits for the project at full deployment.

37. The Volt/VAR pilot focuses on automatically controlling the power regulating system and thus is not duplicative of the manual system.

38. PG&E's schedule for its Volt/VAR pilot did not include dates for off-ramps.

39. The Volt/VAR pilot potentially delivers energy cost savings to customers and provides reduced system losses to the utility, thus reducing procurement costs to customers.

40. PG&E did not fully meet all of the required pilot criteria for the Volt/VAR pilot.

41. There is potential value in pursuing the Volt/VAR pilot.

42. The Volt/VAR pilot meets several characteristics outlined in D.10-06-047.

43. The Volt/VAR pilot increases the use of cost-effective digital control technology to improve reliability and efficiency of the electric grid.

44. The Volt/VAR pilot is valuable for reducing system or localized area demand by reducing system voltage.

45. PG&E did not provide a sufficient amount of information to lead us to approve all three phases of the Volt/VAR pilot.

46. The estimated direct costs of up to \$276 million and direct benefits of up to \$1 billion at full deployment for the Volt/VAR pilot compare favorably.

47. The cost-benefit analysis for the Detect & Locate pilot is not as detailed as that in a traditional application.

48. PG&E provided adequate cost estimates for the Detect & Locate pilot and the full deployment project, as well as the benefits for the project at full deployment.

49. The Detect & Locate pilot relies upon the centralized fault-finding software application, whereas previous reliability projects are not centralized or integrated into PG&E's overall outage management system; thus making the pilot non-duplicative.

50. There are insufficient details provided in the schedule and evaluation, measurement and validation processes for the Detect & Locate pilot.

51. The Detect & Locate pilot does not fully meet all of the required pilot criteria.

52. We see value in pursuing the Detect & Locate pilot because of the potential to reduce operations and maintenance costs and to improve system safety.

53. The Detect & Locate pilot improves reliability and efficiency of the electric grid by increasing the use of cost-effective digital control technology.

54. The Detect & Locate pilot is valuable for more rapidly and accurately detecting, analyzing and responding to distribution system outages.

55. PG&E did not provide a sufficient amount of information to lead the Commission to approve all three phases of the Detect & Locate pilot.

56. The estimated costs and benefits of full deployment of the three Distribution Project pilots, without including monetary value for alleged soft benefits, compare favorably.

57. The low-end estimated benefits at full deployment for the three Distribution Projects are greater than the total estimated costs of pilots and full deployment for the three projects.

58. PG&E did not fully meet all of the pilot criteria for the Demand Forecasting pilot.

59. The Demand Forecasting pilot schedule lacks off-ramp dates.

60. PG&E provided insufficient data regarding the evaluation, measurement and validation process for the Demand Forecasting pilot.

61. There is value in pursuing the Demand Forecasting pilot because of its potential benefits including leveraging with past projects.

62. The Demand Forecasting pilot represents a new approach to linking data from Smart Meters and SCAD with other data derived from weather and customer photovoltaic and electric vehicle penetration in order to more accurately predict customer load at a more granular level.

63. The Demand Forecasting pilot represents a potential for substantive savings related to ancillary services and longer-term projections of need for distribution upgrades and ability of utilities to process interconnection requests.

64. The Demand Forecasting pilot could improve data analysis related to localized load impacts from greater photovoltaic and electric vehicle usages.

65. The Short Term Demand Forecasting pilot increases the use of cost-effective digital information and control technology to improve reliability, security, and efficiency of the electric grid.

66. The Short Term Demand Forecasting pilot may identify or lower barriers to the adoption of such technologies as photovoltaic and electric vehicles by improving the forecasting of these usages.

67. The Short Term Demand Forecasting pilot meets seven of the eleven characteristics of D.10-06-047.

68. There is nothing in the record of this proceeding that would lead us to conclude that the Short Term Demand Forecasting pilot does not align with other smart grid projects or the Deployment Plan.

69. The integration of the Short Term Demand Forecasting pilot in locations that have previously deployed Smart Meters not only leverages existing baseline investments in the Smart Grid, but also should eventually provide the data needed to calibrate the selected regional demand to the bundled customer demand.

70. The Short Term Demand Forecasting pilot, similar to the Deployment Plan, takes a traditionally top-down energy procurement approach, but adds a bottom-up forecasting capability.

71. If the resulting benefits fall at the higher-end of the estimations, the Short Term Demand Forecasting pilot covers its costs.

72. The unquantifiable benefits of the Short Term Demand Forecasting pilot could be very valuable and tip the scale in favor of the benefits.

73. The tax depreciation and deferred tax expense in the Short Term Demand Forecasting pilot result in a pilot that cost ratepayers only \$1.56 million during 2013-2016.

74. The Commission finds no clear picture that the TEST Initiative meets a specific need.

75. The areas outlined by PG&E for the new TEST Initiative employees to address are too broad for the Commission to make a determination as to whether the TEST Initiative is reasonable.

76. There is no clear and complete budget for the TEST Initiative.

77. The schedule for the TEST Initiative lacks sufficient details of its activities.

78. The TEST Initiative lacks sufficient details regarding the implementation of a cost-benefit analysis.

79. The TEST Initiative does not meet the requirements of the pilot criteria.

80. The information in this application for the TEST Initiative lacks sufficient detail to review the reasonableness of the costs and benefits as a project.

81. The Commission's experience with Smart Meter outreach has taught us the importance of education prior to deployment.

82. We cannot directly compare the service area wide deployment of Smart Meters with the piloting of technology that may never see the lab-testing phase.

83. PG&E has met the criteria of pinpointing a specific concern, gap or program that the proposed Outreach project will address.

84. PG&E fails to adequately describe how the Outreach project will address the gap between the level of customer interest and the level of customer knowledge of the facts, benefits and costs related to the Smart Grid.

85. The Commission finds nothing in the proposed Outreach project that is unique or non-duplicative of approaches in other outreach efforts conducted by the utilities.

86. There is a lack of description in the proposed objectives of the Outreach project to justify its approval.

87. The objectives listed for the Outreach project could be the objectives for any outreach project.

88. The budget for PG&E's Outreach project does not justify approaches proposed by PG&E, including "locally targeted approach" or "test and refine methodology."

89. The Outreach project is flawed in its lack of specificity, thus making the budget flawed in its lack of specificity.

90. The details for the Outreach project costs and activities are not sufficient to weigh the costs and benefits of the project and determine its reasonableness.

91. The lack of milestones, off-ramps or specific activities leads us to determine that the Outreach project does not have an adequate timetable.

92. Metrics must be measurable.

93. The Outreach project fails to provide metrics or an EM&V plan to determine the success of the project.

94. PG&E's Customer Education and Outreach project does not meet the requirements of the pilot criteria.

95. The information provided in this application for the Outreach project lacks the detail necessary to determine its reasonableness as a project.

96. The Short Term Demand Forecasting pilot holds benefits solely for bundled customers.

97. The lack of details provided by PG&E in this application made its review difficult.

98. The Commission has a responsibility to ratepayers and to California to pursue new technologies in an efficient and cost-effective manner, pursuant to SB 17.

### **Conclusions of Law**

1. The pilot criteria from D.12-04-045 are appropriate for reviewing the Smart Grid pilots in this application.

2. The Commission should also analyze the Smart Grid pilots with regard to relevant decisions and statutes.

3. The Commission should review each proposed Smart Grid pilot and, if that pilot is approved, authorize an appropriate budget for that pilot.

4. The Commission should have more intervention in the progress of the Smart Grid pilots than that proposed by PG&E.

5. The end of phase status reports submitted via Tier 2 Advice Letters should provide the adequate oversight and transparency required of the Commission by statute.

6. PG&E should also include a discussion of these pilots in its annual Smart Grid report.

7. PG&E has complied with the aforementioned requirements of D.10-06-047 in respect to this application.

8. The Line Sensor pilot is compliant with SB 17.

9. PG&E should submit end of phase reports for the Line Sensor pilot to ensure that we are not expending unnecessary funds on technology that does not prove to be successful.

10. The Commission should analyze the costs and benefits of the three Distribution Project pilots (Line Sensor pilot, Volt/VAR pilot and Detect & Locate pilot) together as one pilot.
11. The Commission should conditionally approve the Line Sensor pilot with the end of phase reporting requirements.
12. PG&E's Volt/VAR pilot is in compliance with D.10-06-047 and SB 17.
13. PG&E should provide end of phase reports for the Volt/VAR pilot.
14. The Commission should conditionally approve the Volt/VAR pilot with the end of phase reporting requirements.
15. The Detect & Locate pilot complies with the requirements of D.10-06-047 and SB 17.
16. PG&E should provide end of phase reports for the Detect & Locate pilot.
17. The estimated costs of the Line Sensor, Volt/VAR, and Detect & Locate pilots are reasonable in comparison with the total estimated benefits of the three pilots and should be approved with the required reporting restrictions.
18. The Short Term Demand Forecasting pilot has complied with the aforementioned requirements of D.10-06-047 and SB 17.
19. The Short Term Demand Forecasting pilot aligns with other Smart Grid projects and the proposed PG&E Deployment Plan.
20. PG&E should provide end of phase reports for the Demand Forecasting pilot.
21. Because the actual costs to ratepayers are far less than the benefits, the risks to the ratepayers are very low for the Short Term Demand Forecasting pilot.
22. The costs versus the benefits for the Short Term Demand Forecasting pilot are reasonable.

23. The Commission should approve the Short Term Demand Forecasting pilot with the end of phase reporting requirements.

24. The inability of the Commission to measure the reasonableness of the TEST Initiative makes it unnecessary to discuss the merits of whether the TEST Initiative is compliant with SB 17 and D.10-06-047, or whether it is aligned with other Smart Grid projects.

25. It is not reasonable to approve the TEST Initiative.

26. It is reasonable to review PG&E's Outreach project through the same approach we used to review other Smart Grid related pilots in this application.

27. It is unnecessary to discuss the merits of whether the Outreach project is compliant with SB 17 and D.10-06-047 or whether it is aligned with other Smart Grid projects.

28. It is not reasonable to approve the Outreach project.

29. It is reasonable to adopt a 10 percent contingency amount for Transmission and Distribution facilities in this proceeding.

30. It is reasonable to adopt a 15 percent contingency amount for Information Technology costs in this proceeding.

31. PG&E's cost recovery methodology for the four Smart Grid pilots approved in this decision is reasonable.

32. The costs for the Distribution Projects approved in this decision should be recovered through distribution rates.

33. The Short Term Demand Forecasting pilot costs should be recovered through generation rates.

**O R D E R****IT IS ORDERED** that:

1. Pacific Gas and Electric Company's request to perform its Line Sensor pilot is approved with the reporting conditions described in Ordering Paragraph 9, herein.

2. Pacific Gas and Electric Company (PG&E) is authorized a budget of \$16.76 million minus one-quarter of its 20 percent technology contingency amount to fund the Line Sensor pilot. However, as described in Ordering Paragraph 9, PG&E may not spend any funds beyond the current phase of the pilot until the status report for that phase has been submitted and approved.

3. Pacific Gas and Electric Company's request to perform its Voltage and Reactive Power Optimization pilot is approved with the reporting conditions described in Ordering Paragraph 9.

4. Pacific Gas and Electric Company (PG&E) is authorized a budget of \$38.49 million minus one-quarter of its 20 percent technology contingency amount to fund the Voltage and Reactive Power Optimization pilot. However, as described in Ordering Paragraph 9, herein, PG&E may not spend any funds beyond the current phase of the pilot until the Commission has approved the status report for that phase.

5. Pacific Gas and Electric Company's request to perform its Detect & Locate Distribution Line Outages and Faulted Circuit Conditions pilot is approved with the reporting conditions described in Ordering Paragraph 9.

6. Pacific Gas and Electric Company (PG&E) is authorized a budget of \$12.9 million minus one-quarter of its 20 percent technology contingency amount to fund the Detect and Locate Distribution Line Outages and Faulted Circuit

Conditions pilot. However, as described in Ordering Paragraph 9, herein, PG&E may not spend any funds beyond the current phase of the pilot until the Commission has approved the status report for that phase.

7. Pacific Gas and Electric Company's request to perform its Short Term Demand Forecasting Smart Grid pilot is approved with the reporting conditions described in Ordering Paragraph 9, herein.

8. Pacific Gas and Electric Company (PG&E) is authorized a budget of \$13.45 million minus one-quarter of its 20 percent technology contingency amount to fund the Short Term Demand Forecasting Smart Grid pilot. However, as described in Ordering Paragraph 9, PG&E may not spend any funds beyond the current phase of the pilot until the Commission has approved the status report for that phase.

9. Within 14 days of the completion of each phase of each approved pilot, Pacific Gas and Electric Company's (PG&E) shall submit a status report via a Tier 2 Advice Letter to Commission staff. Each status report must include a) details of the activities occurring in the phase; b) a detailed breakdown of the costs of those activities; c) the results of the phase including evaluation and measurements of pre-selected metrics to portray the success or failure of the pilot phase; and d) a recommendation and rationalization of whether the pilot should advance to its next phase. PG&E should ensure that status reports are detailed, both quantitatively and qualitatively. Funding for subsequent phases, although approved in this decision, may not be spent by PG&E until the Advice Letter for the current phase is submitted and approved.

10. Within 45 days of the issuance of this decision, Pacific Gas and Electric Company (PG&E) must meet with Commission staff to discuss and develop details regarding: a) specific methodologies for the evaluation, measurement,

and validation and cost-benefit processes for each of the approved pilots; b) an updated schedule for each of the approved pilots with detailed milestones and estimated dates for the end of each phase of each pilot; and c) expectations for the end of phase status reports.

11. Within 30 days following the meeting with staff, Pacific Gas and Electric Company must submit a Tier 2 Advice Letter providing a Pilot Implementation Plan for each pilot including final metrics and methodologies for the evaluation, measurement, and validation and cost-benefit processes and the updated schedule with estimated dates for off-ramps.

12. To improve the specificity and details in future proposals, Pacific Gas and Electric Company (PG&E) shall present future Smart Grid proposals to staff and other stakeholders prior to filing an application with the Commission. PG&E shall ensure that future proposals include more details on schedules, the evaluation, measurements and verification process, and cost and benefit estimates.

13. Application 11-11-017 is closed.

This order is effective today.

Dated \_\_\_\_\_, at San Francisco, California.