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**PACIFIC GAS AND ELECTRIC COMPANY**

**ELECTRIC PROGRAM INVESTMENT CHARGE**  
**2013 ANNUAL REPORT**

**FEBRUARY 28, 2014**

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**Pacific Gas and  
Electric Company**<sup>™</sup>

Pacific Gas and Electric Company  
245 Market Street, Mail Code N9G  
San Francisco, CA 94105

February 28, 2014

Mr. Edward Randolph, Director  
California Public Utilities Commission  
505 Van Ness Avenue  
San Francisco, CA 94102

**Re: 2013 Electric Program Investment Charge Program Annual Report**

Dear Mr. Randolph:

Pursuant to Decision (D.)12-05-037 – *Phase 2 Decision Establishing Purposes and Governance for Electric Program Investment Charge (EPIC) and Establishing Funding Collections for 2013-2020*, Pacific Gas and Electric (PG&E) hereby submits the 2013 Annual Report for the Electric Program Investment Charge Program.

In compliance with Ordering Paragraph 16, a copy will also be served on all parties in this proceeding as well as the most recent general rate cases of PG&E, Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E).

If you have any questions, please contact me at (415) 973-6998.

Sincerely,

/s/ Kevin Dasso

Kevin Dasso  
Electric Operations  
Senior Director, Technology & Information Strategy

cc: Damon Franz – CPUC  
Kevin Dasso – PG&E  
Sid Dietz – PG&E  
Amanda Moore – PG&E  
Service Lists – A.12-11-001, A.12-11-002, A.12-11-003, A.12-11-004,  
A.12-11-009, A.13-11-003, A.10-12-005

PACIFIC GAS AND ELECTRIC COMPANY  
ELECTRIC PROGRAM INVESTMENT CHARGE – 2013 ANNUAL REPORT  
FEBRUARY 28, 2014

BASED ON ADOPTED EPIC ADMINISTRATOR ANNUAL REPORT OUTLINE

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# ELECTRIC PROGRAM INVESTMENT CHARGE – 2013 ANNUAL REPORT FEBRUARY 28, 2014

## BASED ON ADOPTED EPIC ADMINISTRATOR ANNUAL REPORT OUTLINE

### 1. Executive Summary

#### a. Overview of Programs/Plan Highlights

Pursuant to the California Public Utilities Commission (CPUC or Commission) Decision 12-05-037, Pacific Gas and Electric (PG&E) and the other administrators of the Electric Program Investment Charge (EPIC) Program were directed to file annual reports each year beginning February 28, 2013 through February 28, 2020 with the Director of the Commission's Energy Division.<sup>1</sup> Annual Reports shall be served on all parties in the most recent EPIC proceeding, all parties to the most recent general rate case of each electric utility and each successful and unsuccessful applicant for an EPIC funding award during the previous calendar year. PG&E filed its first Annual Report on February 28, 2013. In compliance with Ordering Paragraph (OP) 16 of D.12-05-037, and consistent with the Annual Report outline developed collaboratively by the EPIC Administrators and the Office of Ratepayer Advocates (ORA), PG&E submits its second annual report.

#### PG&E's Technology Demonstration and Deployment (TD&D) Program Overview

D.12-05-037 defines TD&D as the installation and operation of pre-commercial technologies or strategies at a scale sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable appraisal of the operational and performance characteristics and the financial risks. PG&E's 2012-2014 Investment Plan (Plan) includes TD&D projects in the areas of: 1) Renewables and Distributed Energy Resource (DER) Integration; 2) Grid Modernization and Optimization; and 3) Customer Service Enablement. There is a fourth category, Cross-Cutting/ Foundational Strategies and Technologies, in which the PG&E Plan does not include any projects. Each of PG&E's TD&D projects were designed to achieve some combination of greater public and employee safety, increased reliability and/or lower costs.

#### PG&E's TD&D Program Highlights

On November 14, 2013, in D.13-11-025, the Commission approved PG&E's first EPIC Investment Plan, with modifications. Due to the timing of the decision, many of the TD&D projects are currently in an initiation or planning phase. PG&E expects to have some projects progress from the initiation or planning phases by the middle of 2014.

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<sup>1</sup> The four EPIC program administrators are PG&E, Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E) and the California Energy Commission (CEC).

## b. Status of Programs

In D.13-11-025, the Commission approved 27 of the 29 projects proposed by PG&E in the Plan since two projects were formally withdrawn by PG&E prior to the issuance of this decision.<sup>2</sup> PG&E has implemented internal governance intended to ensure approved projects within the TD&D program are sufficiently developed and properly reviewed prior to project execution. Before committing funding to a specific EPIC project, governance at the program level requires PG&E to review projects in light of potentially changing marketplaces and evolving technologies, as well as confirm adherence to EPIC guiding principles and requirements. PG&E's TD&D program, which currently consists of 27 projects, includes 19 projects that are in an initiation or planning phase that entails reviewing project viability, benefits, and specific requirements to drive procurements. Of those 19 projects, as of January 31, 2014, 12 projects have committed funding, and seven are not yet funded. Project 20 may potentially be withdrawn as its refined scope does not appear to meet safety, reliability and affordability guiding principles. The remaining seven projects are being internally evaluated to determine whether their benefits are still viable or if these projects are in need of a refined scope or possible withdrawal from PG&E's investment plan.

1. Renewables and DER Integration
<ul style="list-style-type: none"> <li>• 2 Projects (Projects: 1 &amp; 16) Funded as of January 31, 2014.</li> <li>• Total Funding Range: \$4.6 million – \$7.4 million.</li> </ul>
2. Grid Modernization and Optimization
<ul style="list-style-type: none"> <li>• 7 Projects (Projects: 8, 9A, 9B/10B, 9C, 14, 15 &amp; 19) Funded as of January 31, 2014.</li> <li>• Total Funding Range: \$12.6 million – \$18.0 million.</li> </ul>
3. Customer Service and Enablement
<ul style="list-style-type: none"> <li>• 3 Projects (Projects: 18, 22 &amp; 24) Funded as of January 31, 2014.</li> <li>• Total Funding Range: \$4.6 million – \$7.7 million.</li> </ul>
<p>Total Projects Funded: 12            Total Funding: \$21.8 million-\$33.1 million committed</p> <ul style="list-style-type: none"> <li>• <i>Note that because all of the funded projects are just beginning an initiation or planning phase, the range of potential funded amounts represents intrinsic variability in projects. Projects will be refined through a stage-gate approach in order to control committed funding. As funding requirements are better defined, remaining funds will be redirected to other projects, both new and existing, as needed to efficiently utilize customer funds.</i></li> </ul>

<sup>2</sup> PG&E originally proposed 26 projects in the Plan Application (A. 12-11-003). Project 9 was subsequently split into two projects and project 10 was split into three projects resulting in a total of 29 projects. The projects formally withdrawn by PG&E were projects 4 and 7.

## 2. Introduction and Overview

### a. Background on EPIC

Funding authorized in Public Utilities Code Section 399.8, which governed the Public Goods Charge (PGC), expired as of January 1, 2012. The Commission opened an Order Instituting Rulemaking (R.11-10-003) to establish the Electric Program Investment Charge to preserve funding for the public and ratepayer benefits associated with the renewables and research, development, and demonstration (RD&D) activities provided by the electric PGC. The rulemaking included two phases with Phase I to establish the EPIC program on an interim basis in 2012, and Phase II to establish purposes and governance for EPIC to continue from 2013-2020.<sup>3</sup> The EPIC Program administrators include three Investor-Owned Utilities (IOU) PG&E, SCE and SDG&E, and the CEC.

The Commission in its Phase I *Decision Establishing Interim Research, Development and Demonstration and Renewables Program Funding Levels* (D.11-12-035), established 2012 funding at approximately \$142 million and authorized PG&E, SCE, and SDG&E to institute the EPIC Program, effective January 1, 2012, to collect funds for renewables programs, and RD&D programs at the same level authorized in 2011. Additionally, the surcharge was imposed on all distribution customers, based on the existing rate allocation between customer classifications, and collected in the Public Purpose Program (PPP) component of rates.

On May 24, 2012, the Commission issued its Phase II *Decision Establishing Purposes and Governance for Electric Program Investment Charge and Establishing Funding Collections for 2013–2020*. The decision established an annual funding amount of \$162 million annually for the 2013-2014 EPIC Program cycle and set the funding allocations among the three IOUs as 50.1 percent, 41.1 percent and 8.8 percent for PG&E, SCE, and SDG&E, respectively.<sup>4</sup>

The EPIC program is designed to assist the development of pre-commercialized, new and emerging clean energy technologies in California, while providing assistance to commercially viable projects. The goal of the EPIC program is to support projects that help advance new technologies that further safety, reliability, and affordability while advancing California's clean energy goals, including Senate Bill (SB) 17 Smart Grid Goals and PUC section 740.1 goals focused on renewables integration and resource conservation, as well as greenhouse gas emissions reductions, economic development, and low-emission vehicle and transportation support. EPIC supported activities are mapped to the different elements in the electricity system value chain consisting of: Grid Operations/Market Design, Generation, Transmission, Distribution, and Demand Side Management.

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<sup>3</sup> See Phase I D.11-12-035 and Phase II D.12-05-037.

<sup>4</sup> Ordering Paragraph (OP) 7 of D.12-05-037 requires the total collection amount to be adjusted on January 1, 2015 and January 1, 2018 commensurate with the average change in the Consumer Price Index, specifically the Consumer Price Index for Urban Wage Earners and Clerical Workers for the third quarter, for the previous three years.

## b. EPIC Program Components

Decision 12-05-037 authorizes the EPIC Program to fund investments in the following areas: 1) Applied Research and Development (\$55 million/year); 2) Technology Demonstration and Deployment (\$75 million/year); and 3) Market Facilitation, consisting of market research, regulatory permitting and streamlining, and workforce development activities (\$15 million/year). PG&E and the other IOU Administrators were designated to administer EPIC funds only in the area of TD&D. The TD&D portion for PG&E is funded at approximately \$43.3 million as part of the first triennial plan cycle (2012-2014). The CEC was designated to administer funds in all of the remaining areas, including a portion of TD&D.

## c. EPIC Program Regulatory Process

The Phase II decision provides the regulatory process and governance for the EPIC Program. The decision requires EPIC Program Administrators to submit Triennial Investment Plans to cover three-year cycles for 2012-2014, 2015-2017, and 2018-2020. The investment plans must include details about planned investments as well as criteria for selecting and evaluating proposals. Each plan must be evaluated and approved by the Commission prior to program implementation. In addition, Program Administrators are required to file annual reports on February 28, 2013 through February 28, 2020.

## d. Coordination

In order to ensure adequate coordination of the EPIC Program, the EPIC Administrators participate in regular review meetings, conduct joint webinars and workshops, and often collaborate on EPIC-related matters. Starting in June 2012, the IOU EPIC program administrators have met at least biweekly to discuss EPIC and their respective objectives for the program. The administrators work together to leverage consistent approaches, where feasible, for meeting the objectives of the EPIC Program. This collaboration resulted in the development of a common EPIC framework, approved by the Commission in Decision 13-11-025, to guide the individual investment plans.

## e. Transparent and Public Process

The Program Administrators hold stakeholder workshops during the planning and implementation of the EPIC Triennial Investment Plans to ensure stakeholder concerns and feedback are received and properly addressed. In 2013, PG&E and the other administrators held joint webinars in January and December that provided the opportunity for valuable external participant feedback. Notice for these events is provided to a broad range of stakeholders including technology vendors, researchers, academics and energy consultants. As the utilities and the CEC work to develop their second triennial plans, they will

continue to maintain transparency in the process via webinars, workshops, and discussions with the CPUC.

PG&E continues to remain accessible to the interested public; its website includes EPIC Program information and updates.<sup>5</sup> Information regarding relevant EPIC solicitations will be posted on PG&E’s EPIC webpage.

### 3. Budget

#### a. Authorized Budget

2012 – 2014

	Program Budget	Administrative Budget	CPUC Regulatory Oversight Budget
PG&E Program	\$43.3 million (TD&D only)	\$4.9 million	\$1.2 million
CEC Program (portion remitted by PG&E)	\$165.9 million (TD&D, Applied Research and Development, and Market Facilitation)	\$18.5 million	

#### b. Commitments/Encumbrances

- PG&E Commitments: \$21.8 million – \$33.1 million committed as of January 31, 2014. The committed range defined as having been vetted through the internal governance process and begun work on an initiation or planning phase.
- PG&E Encumbrances: \$0 encumbered since “encumbered funds” are monies that are specified within contracts signed during a previous triennial investment plan cycle and associated with specific activities under the contract.
- CEC Remittances:
  - \$6.2 million remitted for Program Administration for calendar year 2013.
  - \$0 remitted for committed projects. The CEC did not request project funds during calendar year 2013.
- CPUC Remittance: \$0.4 million remitted for Program Administration for calendar year 2013.

#### c. Dollars Spent on In-House Activities

- For calendar year 2013, PG&E has spent approximately \$8,400 on in-house TD&D project costs and \$19,000 on in-house Program Administration costs.

<sup>5</sup> <http://www.pge.com/en/about/environment/pge/epic/index.page>.



d. Fund Shifting Above 5% Between Program Areas

- All PG&E projects are within TD&D, thus there has been no fund shifting between program areas.

e. Uncommitted/Unencumbered Funds

- \$10.2 million – \$21.5 million uncommitted/unencumbered as of January 31, 2014. Projects without committed funding are in early scoping and review phases, pending further project and benefits analysis. The range of uncommitted funds is dependent on the range of committed funds from Section 3b.

**4. Projects**

a. Summary of Project Funding

1. Renewables and DER Integration
<ul style="list-style-type: none"><li>• 2 Projects (Projects: 1 &amp; 16) Funded as of January 31, 2014.</li><li>• Total Funding Range: \$4.6 million – \$7.4 million.</li></ul>
2. Grid Modernization and Optimization
<ul style="list-style-type: none"><li>• 7 Projects (Projects: 8, 9A, 9B/10B, 9C, 14, 15 &amp; 19) Funded as of January 31, 2014.</li><li>• Total Funding Range: \$12.6 million – \$18.0 million.</li></ul>
3. Customer Service and Enablement
<ul style="list-style-type: none"><li>• 3 Projects (Projects: 18, 22 &amp; 24) Funded as of January 31, 2014.</li><li>• Total Funding Range: \$4.6 million – \$7.7 million.</li></ul>
Total Projects Funded: 12 Total Funding: \$21.8 million-\$33.1 million committed
<ul style="list-style-type: none"><li>• <i>Note that because all of the funded projects are just beginning an initiation or planning phase, the range of potential funded amounts represents intrinsic variability in projects. Projects will be refined through a stage-gate approach in order to control committed funding. As funding requirements are better defined, remaining funds will be redirected to other projects, both new and existing, as needed to efficiently utilize customer funds.</i></li></ul>

b. Project Status Report (See Appendix A)

- See Project Status Report, Appendix A, with project details as of December 31, 2013. The Project Status Report is based on the format provided in Attachment 6 of D.13-11-025.

c. Description of Projects

- The project descriptions, provided below, are as of December 31, 2013.

## **Project # 01 – Energy Storage for Market Operations**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design.
- iii. Objective
  - Develop strategies for optimized bidding and scheduling of Energy Storage Technologies (EST) in California ISO markets and demonstrate those strategies using PG&E's existing Sodium Sulfur Battery Energy Storage Systems (NaS BESS).
- iv. Scope
  - Develop and test technology with a goal to enable fully automated resource response to the California Independent System Operator Corporation (CAISO) market awards.
  - Quantify the values that battery resources can capture in CAISO markets.
  - Inform Cost Effectiveness Models.
  - Provide Guidance on Regulatory Compliance.
- v. Deliverables
  - Demonstration of automated and remote control application for generic energy storage resources to interface with existing Supervisory Control and Data Acquisition (SCADA) systems.
  - Report that summarizes actual financial performance from participation in CAISO markets.
  - Report that compares actual performance vs. hypothetical performance quoted in industry reports.
  - Comply with regulatory requirements and establish a framework for accounting standards applicable to energy storage.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - Approximately \$1,000.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project #02 – Energy Storage for Distribution Operations**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution and Grid Operation/Market Distribution.
- iii. Objective
  - Determine the situations on PG&E’s distribution grid that Energy Storage Technologies (EST) are well-suited to solve and demonstrate ESTs performing those functions.
- iv. Scope
  - Identify end-uses suitable for storage deployment on the distribution system.
  - Determine the best storage solutions for the identified end-uses.
  - Testing for deployment of technologies and ongoing analysis.
- v. Deliverables
  - Portfolio of end-uses that can be operationalized in future rounds.
  - Operational requirements and protocol to test and interconnect storage technologies.
  - Demonstration of online projects (1.5 megawatts (MW)) performing a diverse set of end-uses.
  - Distribution operations protocol to dispatch and communicate with storage devices.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

### **Project # 03 – Mobile and Stationary Energy Storage Synergies**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design.
- iii. Objective
  - The project aims to reduce existing barriers to deployment of battery energy storage systems by demonstrating whether post-electric vehicle (EV) second life batteries can cost-effectively perform electric distribution services. The project will attempt to demonstrate the potential for reduced energy storage system costs via: a) the development of an integration platform for deploying such batteries (Phase I); and b) the use of lower cost second life batteries in the integrated platform (Phase II).
- iv. Scope
  - Develop a standardized physical enclosure and a means for electrically connecting the batteries.
  - Develop a battery management system specifically tailored for second life batteries to control the charging and discharging of these batteries and to interface with SCADA systems.
  - Develop or acquire necessary power conversion equipment.
  - Conduct phased testing of integration platform.
  - Based on the results of Projects 1 and 2, identify an ideal location to test the integration platform performing identified distribution services, market services, or both.
- v. Deliverables
  - Technical specification sheet for an integration platform.
  - Physical enclosure and integration platform to connect second-life batteries.
  - Demonstration of second-life batteries performing stationary end-uses.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

### **Project # 04 – Expand Test Lab and Pilot Facilities for New Energy Storage Systems**

- Formally Withdrawn. CPUC A.12-11-003, 10/15/2013.

### **Project # 05 – New Forecast Methods for Improved Storm Damage Modeling**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design.
- iii. Objective
  - Project objective has been redirected from original proposed objective. Instead of using new weather technology for renewable prediction, current objective of EPIC Project #5 is to demonstrate whether emerging capabilities in mesoscale modeling can be implemented cost effectively to provide more granular and accurate weather forecasting input to PG&E's storm damage prediction model, and to other PG&E forecasting applications. The goal is more effective damage prediction and therefore more efficient response to storm events.
- iv. Scope
  - Project focus is on development, deployment, and implementation of an operational version of the Weather Research and Forecasting (WRF) mesoscale model to support PG&E's forecasting program.
- v. Deliverables
  - Real-time delivery of mesoscale forecast data into the PG&E damage prediction model.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

**Project # 06 – Demonstrate Communication Systems Allowing the California Independent System Operator Corporation to Utilize Available Renewable Generation Flexibility**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design.
- iii. Objective
  - This project would attempt to demonstrate the use of accepted communications protocols to allow the CAISO to send an operating signal to reduce output under specified conditions, as allowed by contracts.
- iv. Scope
  - Project is inactive and no longer being pursued.
- v. Deliverables
  - N/A.
- vi. Metrics
  - N/A.
- vii. Schedule
  - N/A.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - N/A.
- xv. Status Update
  - N/A.

**Project # 07 – Demonstrate Systems to Ramp Existing Gas-Fired Generation More Quickly to Adapt to Changes in Variable Energy Resources Output**

- Formally Withdrawn. CPUC A.12-11-003.

## **Project # 08 – Distribution System Safety and Reliability Through New Data Analytics Techniques**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Project objective has been redirected from original proposed objective. The broader defined “Distribution system safety and reliability through new data analytics techniques” has narrowed the objective to developing and testing a System Tool for Asset Risk (STAR). STAR plans to utilize data analytics advances in an attempt to improve grid safety and reliability.
- iv. Scope
  - Demonstrate whether the ever-increasing amounts of data can be mined and combined for targeted, cost-effective use. Potential scenarios include risk-based asset management, safety hazard mitigation and proactive outage prediction using self-serve and virtual integration environments. This project proposes to demonstrate innovative technologies related to data analytics including instant data ad-hoc search and correlation, “mash-ups,” visualization, data recognition and other data analytics solutions.
- v. Deliverables
  - Overview of existing applications and data sources.
  - Assessment of existing data source quality.
  - High-level future business processes by functional area.
  - Inventory of asset risk algorithms (formulas or complexity) for “In Scope” asset classes.
  - Consolidated business requirements.
  - RFI document.
  - Vendor scoring and selection.
  - High-level Change Management Approach.
  - Prioritized and phased implementation plan.
  - Cost estimate for full implementation of the STAR project.
  - Proof of concept prototype.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A

- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.



## **Project # 09A – Close Proximity Switching**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution.
- iii. Objective
  - This project explores and seeks to discover effective, new tools to operate underground oil filled switches safely.
- iv. Scope
  - Test new tools and techniques for safely operation of underground oil filled switches. Evaluate alternatives to decrease probability of injury to workers and public. Help design and manufacture a robotic tool to allow remote operation. Develop the necessary parts/ adaptors to be used on various types (manufacturer, brand, age, etc.) of underground switches.
- v. Deliverables
  - A working prototype for the various underground oil filled switching tools.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 09B and 10B – Network Conditioned-Based Maintenance**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution.
- iii. Objective
  - Attempt to provide accurate network component and vault conditions and utilize these conditions to establish improved Condition Based Maintenance/Replacement systems. Project focus is on development, testing, deployment, and implementation of new technologies in support of the existing network Condition Based Maintenance (CBM) System.
- iv. Scope
  - The high-level scope of this project is to investigate the use of new technologies to improve safety and operational performance of the distribution networks located in San Francisco and Oakland.
- v. Deliverables
  - Assess new technologies and feasibility of application on the Distribution Networks. Includes technical and economic assessments and prototypes as appropriate.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project #09C – Discrete Reactors**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission.
- iii. Objective
  - Attempts optimization of transmission line flows resulting in greater transmission line capacity utilization.
- iv. Scope
  - Install Discrete Series Reactors (DSR) as a pilot project at a yet to be determined site and monitor their operation. Install Distributed Flexible Alternating Current (AC) Transmission System (D-FACTS) devices directly mounted on conductors to increase line impedance by injecting a magnetizing inductance. Diverts current from overloaded lines to under-utilized lines.
- v. Deliverables
  - Develop Implementation plan including the sites and number of units to be installed.
  - Complete Pilot Implementation.
  - Perform Pilot Monitoring.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - Approximately \$5,700.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 10A – Dissolved Gas Analysis**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Develop tools and algorithms that substation equipment (distribution and transmission) that tests for dissolved gasses or other precursor data that would assist in understanding the condition of the equipment.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project deliverables being further evaluated – TBD.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - Project schedule being further evaluated – TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.

## **Project # 10C – Underground Cable Analysis**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution.
- iii. Objective
  - Develop tools and algorithms that analyze load and operating characteristic data from underground cables in order to develop an understanding of potential failure points, cable maintenance needs, and cable life expectancy.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project deliverables being further evaluated – TBD.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - Project schedule being further evaluated – TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.

## **Project # 11 – Demonstrate Self-Correcting Tools to Improve System Records and Operations**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Demonstrate tools that identify and register existing assets in an attempt to improve the integration between utility planning and operations. As part of the demonstration, implement self-correcting technologies that identifies plan vs. actual discrepancies and updates system records automatically. High priority use cases include: 1) mapping of transformers to primary phase; (2) mapping of customers to transformers; and (3) precision mapping of PG&Es overhead and underground network.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project deliverables being further evaluated - TBD
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - Project schedule being further evaluated – TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.

**Project # 12 – Demonstrate New Technologies That Improve Wildlife Safety and Protect Assets From Weather-Related Degradation**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Demonstrate new strategies and technologies in an attempt to improve animal and bird protection, reduce outages caused by animals and birds, and protect assets from expensive weather-related degradation such as fog related corrosion.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project deliverables being further evaluated – TBD.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - Project schedule being further evaluated – TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.

**Project # 13 – Demonstrate New Communication Systems to Improve Substation Automation and Interoperability**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Demonstrate new strategies and technologies in an attempt to convert and integrate multiple existing proprietary technologies within the substation environment for more effective operations. Substations are key operational hubs and represent significant investments, which must be further leveraged by engaging with vendors to create the next generation of interoperable substation services and products.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project deliverables being further evaluated – TBD.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - Project schedule being further evaluated – TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.



## **Project # 14 – Next Generation SmartMeter™ Telecom Network Functionalities**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - This project explores and attempts to discover effective, new network applications and devices to leverage and improve the SmartMeter™ communications network.
- iv. Scope
  - Leverage the existing SmartMeter™ network to support additional applications. Inform future uses of the SmartMeter™ network as to message capability, security, latency, and engineering constraints. Specifically focus on:
    - i. Testing new devices to support network functions and capabilities not previously envisioned (e.g., new data streams, faster data collection).
    - ii. Evaluating alternatives to decrease future upgrade, maintenance and/or operational costs.
    - iii. Demonstrating different network applications, each focused on separate use cases.
- v. Deliverables
  - Evaluation of new applications and devices, their associated data traffic impact on the SmartMeter™ network, and a recommendation of which items warrant consideration for full-scale deployment. Evaluation should provide key inputs to a business case for general deployment.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 15 – Grid Operations Situational Intelligence**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - The objective of this pilot is to attempt to develop and pilot a real-time data visualization software platform for use by Electric Distribution Operations end users. If viable, data will be integrated from various data sources and displayed on Distribution Control Center video walls and individual desktop computers, with potential for future scalability to handheld devices.
- iv. Scope
  - Scope includes the integration of data (network model, loading, SmartMeters™, outages, fire, weather, etc.) and a real-time data visualization platform for Distribution Operations. The Distribution Management System (DMS) platform and predictive analytics are not included in the scope.
- v. Deliverables
  - Demonstrate Real-time Data Visualization Platform—with data integration from variety of data sources and a visual interface that include geospatial, list and trending layers.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - Approximately \$5,900.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## Project # 16 – Vehicle-to-Grid Operational Integration

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution.
- iii. Objective
  - Demonstrate whether electric vehicles can be used as a resource that could provide the capability to connect to the distribution grid to improve power quality, reduce the length of customer planned or unplanned outages, reduce feeder congestion, and manage costs associated with increased demand and reliability. A demonstration would include using PG&E's electric vehicle fleet to supply power to individual customers during distribution system repairs.
- iv. Scope
  - Develop approximately 125 kilowatt (kW) exportable power capabilities from an extended range hybrid electric truck. Seek to create the protocols necessary to safely connect the truck to the appropriate grid connection points.
- v. Deliverables
  - Develop operating requirements for the vehicle.
  - Solve engineering challenges with high power export.
  - Develop safety and interconnection protocols to connect the vehicle to the grid.
  - Define and document power requirements for different outage/usage scenarios.
  - Develop operating protocols (when and how the vehicles will be used).
  - Develop emergency protocols.
  - Develop the hardware and software required to connect the vehicle to PG&E's system.
  - Build a limited number of vehicles for field testing.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 17 – Industry Participation to Leverage EPIC Dollars**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Transmission and Distribution.
- iii. Objective
  - Leverage and participate in RD&D industry collaboration efforts.
- iv. Scope
  - Potential programs include EPRI's Intelligrid, Integration of Distributed Renewables, Energy Storage, Risk Mitigation Strategies, and Distribution Grid Modernization programs.
- v. Deliverables
  - N/A.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 18 – Appliance-Level Load Disaggregation**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Demand-Side Management.
- iii. Objective
  - This project focuses on delivering the energy cost by major appliances to customers.
- iv. Scope
  - This project will use the data enabled by the SmartMeter™ platform in an attempt to provide appliance-level itemization of monthly bill charges to customers, without their completing any audit or subscribing to any new service. This project assumes that minute level meter data is available.
- v. Deliverables
  - Results of disaggregation accuracy.
  - Strategy for deployment appliance level billing.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 19 – Enhanced Data Techniques and Capabilities via the SmartMeter™ Platform**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design and Demand-side Management.
- iii. Objective
  - The project is to explore and attempt to discover effective, new data that can be collected and studied for further benefits. Demonstrate the type of additional data that can be collected and/or processed through the SmartMeter™ platform. Evaluate impact of any increased data traffic on the SmartMeter™ network. Focus on new data collection that makes the SmartMeter™ platform more robust for more customers.
- iv. Scope
  - Demonstrate the collection of new data from SmartMeters™. Current working list under consideration includes:
    - i. Highly Granular kWh (e.g., 1 minute).
    - ii. New Data Channels.
    - iii. New meter 'trap' alarm (e.g., when temperature values are exceeded).
    - iv. Alarm: interval usage exceeds customer \*max\*.
    - v. Alarm: interval usage exceeds customer preset limit.
    - vi. Security \*event\* of certain meter conditions.
    - vii. Validate and improve outage messages and logs.
- v. Deliverables
  - Evaluation of new data, their associated data traffic impact on the SmartMeter™ network, and a recommendation of which data warrants consideration for full-scale deployment. Evaluation should provide key inputs to a business case for general deployment.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.

- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

**Project # 20 – Demonstrate the Benefits of Providing the Competitive, Open Market With Automated Access to Customer-Authorized SmartMeter™ Data to Drive Innovation**

- Formally notified CPUC on 10-31-13, project may be terminated as refined scope does not appear to meet safety, reliability and affordability guiding principles for priority R&D.

## **Project # 21 – Automatic Identification of Distributed Photovoltaic Resources**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution and Demand-side Management.
- iii. Objective
  - This project is to validate and attempt to integrate a software platform to identify unauthorized interconnection leveraging SmartMeter™ data collected. The funding from EPIC will focus solely on integration and piloting of a software solution with PG&E's billing and interconnection database.
- iv. Scope
  - Develop partnerships to develop or pilot software.
  - Develop integration and communication platform for auto-ID of Unauthorized Interconnections (UI).
  - Successfully demonstrate ability to automatically integrate software with billing and interconnection.
- v. Deliverables
  - Successful integration of software with PG&E's Advanced Billing System (ABS).
  - Successful tracking of all UIs identified.
  - Successful tracking of communication and conversion of UIs to interconnection.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 3 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.



## **Project # 22 – Electric Vehicle Submetering**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution and Demand-side Management.
- iii. Objective
  - EV submetering pilot to test subtractive metering process and Electric Vehicle Service Providers (EVSP) business models.
- iv. Scope
  - EV submetering pilot will entail EVSPs delivering submeter data to IOU for subtraction from customer's primary meter to create an EV and a house bill. Customer will be responsible for both bills. In Phase 2, EVSP will be responsible for bill.
- v. Deliverables
  - Process to receive EVSP submetered data.
  - Process to subtract EV data from primary meter to create two bills.
  - Inclusion of EV portion of bill on customer's monthly bill.
  - Obtain third-party evaluator for both phases of pilot through an RFP.
  - Incentive payments to EV Meter Data Management Agents (MDMA).
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 23 – Photovoltaic Submetering**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution and Demand-side Management.
- iii. Objective
  - To obtain additional un-netted photovoltaic (PV) data in an attempt to support customer experience and provide additional information to customers.
- iv. Scope
  - Submeter chip to be installed at output of customer owned PV. Data will be used to help customers understand Net Energy Metering (NEM) bills. Additionally, current PV providers with NGOM may submit their data to PG&E for presentation on My Energy.
- v. Deliverables
  - Obtain third party through Requests for Proposals (RFP) to install submeter chips.
  - Develop communication protocol between submeters and PG&E billing system.
  - Develop protocol for PV providers to send Net Generation Output Meter (NGOM) information to PG&E.
  - Display on My Energy.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 24 – Demand-Side Management for Transmission and Distribution Cost Reduction**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design, Transmission, Distribution and Demand-side Management.
- iii. Objective
  - Assess how to best utilize DSM resources to create a “surgical” customer- and location-specific approach to assist with distribution capacity constraints.
- iv. Scope
  - Acquire data and develop the tools, methodology and framework to target, value, acquire and make use of high impact customer load reductions at the distribution feeder level.
- v. Deliverables
  - Deployment of data logging devices on a scientific sample of existing SmartAC Cycling customers to enable load impact analysis at the feeder level;
  - An infrastructure to make real time data available on feeder level load impacts to distribution operations; and
  - A report describing a case study methodology of targeting and valuing customer side peak load reductions at the feeder level. Final deliverables subject to Phase I planning outcomes.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 2.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - Approximately \$1,400.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - Project has begun an initiation or planning phase.

## **Project # 25 – Direct Current Fast Charging Mapping**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Distribution and Demand-side Management.
- iii. Objective
  - Attempt to develop, pilot, and validate approaches that help determine the optimal location of direct current (DC) fast chargers based on traffic patterns and distribution grid infrastructure.
- iv. Scope
  - Acquire travel pattern data and grid infrastructure capability data in an attempt to identify low-cost, high utilization areas in which to integrate DC fast chargers into PG&E's distribution system.
- v. Deliverables
  - Process to identify optimal DC fast charging sites.
  - A map that presents the locations of optimal DC fast charging sites in a meaningful manner to customers.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - 1.5 years.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- i. Funding Mechanism
  - N/A.
- ii. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- iii. Status Update
  - Project has begun an initiation or planning phase.

**Project # 26 – Pilot Measurement and Telemetry Strategies and Technologies That Enable the Cost-Effective Integration of Mass Market Demand Response Resources Into the California Independent System Operator Corporation Wholesale Market**

- i. Investment Plan Period
  - 1st Triennial (2012-2014).
- ii. Assignment to Value Chain
  - Grid Operation/Market Design and Demand-side Management.
- iii. Objective
  - Attempt to develop, pilot and validate approaches and technologies that enable the cost-effective integration (specifically, the measurement and telemetry) of mass market demand response (DR) resources into the CAISO wholesale market. While other DR projects focus on integration of DR resources into various utility and future ISO operational needs, this project intends to test alternative telemetry solutions and technologies to satisfy CAISO operational visibility requirements.
- iv. Scope
  - Project scope being further evaluated – TBD.
- v. Deliverables
  - Project schedule being further evaluated – TBD.
- vi. Metrics
  - To be determined at end of their initiation or planning phase.
- vii. Schedule
  - TBD.
- viii. EPIC Funds Encumbered
  - None.
- ix. EPIC Funds Spent
  - None.
- x. Partners
  - N/A.
- xi. Match Funding
  - N/A.
- xii. Match Funding Split
  - N/A.
- xiii. Funding Mechanism
  - N/A.
- xiv. Treatment of Intellectual Property
  - PG&E has no current patents or licensing agreements signed. Future Intellectual Property is to be determined.
- xv. Status Update
  - N/A.

## **5. Conclusion**

### **a. Key Results – PG&E’s 2013 EPIC Program**

As of January 31, 2014, PG&E’s EPIC program had been operating for just over two months. Current progress includes PG&E’s establishment of a Program Management function, the initial launch of projects following a prioritization and review process, and beginning implementation of compliance items required by the Commission. In addition, PG&E completed a joint webinar in collaboration with the other EPIC administrators, as well as established a PG&E EPIC webpage highlighting the EPIC program. The EPIC webpage guides interested parties to PG&E’s 2012-2014 Investment Plan as well as PG&E’s Bid Opportunities webpage. Furthermore, PG&E has engaged in communications with vendors interested in learning more about the EPIC program and PG&E’s portfolio of projects.

As outlined in the attached Project Status Report, there are currently 19 projects in an initiation or planning phase, 12 of which have committed funding and the other seven are finalizing their initiation requirements through an internal process. There are seven projects that are being internally evaluated to determine whether their benefits are still viable or if these projects are in need of a refined scope or possible withdrawal from PG&E’s investment plan. For calendar year 2013, PG&E spent approximately \$217,400, of which \$14,000 was spent on TD&D and \$203,400 was spent on program administration.

As of February 28, 2014, PG&E has issued a total of zero technology related RFPs through EPIC and is not in the process of negotiating any RFPs. With the EPIC program focus on TD&D, PG&E will focus its future reporting of solicitations on technology related contracts and will not be reporting the procurements for various general planning and support roles. Additionally, PG&E expects the EPIC program to continue through 2020 and is in the process of preparing the filing for its Second Triennial Investment Plan 2015-2017.

### **b. Next Steps for EPIC Investment Plan**

PG&E, in conjunction with the other IOU administrators and the CEC, recently hosted two stakeholder webinars. One webinar took place December 18, 2013 and focused on the launching of the First Triennial Plan. The other webinar, held on February 21, 2014, previewed some preliminary Second Triennial Investment Plan areas. Two additional stakeholder workshops are planned for March to further showcase the Second Triennial Investment Plan and to receive additional stakeholder input prior to filling the plan on May 1, 2014.

In January, PG&E launched an EPIC webpage which provides information and updates about the EPIC program, links to the Investment Plans and other EPIC-related information. Additionally, it will direct vendors to the PG&E Bid Opportunities link where relevant competitive solicitations for EPIC projects are intended for public posting.

### c. Issues That May Have Major Impact on Progress in Projects

Inherent to the RD&D nature of the EPIC program, as projects progress through the phases, it is likely some projects will not be executed exactly as planned. Projects may have their scope/approach refined and some will be stopped or redirected when no longer seen to be in the best interest of customers. PG&E is mitigating some of this risk by managing the EPIC projects and phases with a stage-gated approach, providing an off-ramp for projects if they are deemed to be no longer efficient uses of funds. Some potential reasons that projects may not be successful include: changes in the market place have made the project obsolete (or relatively less attractive); a different technology has emerged that could produce the desired results at a lower cost so the original project is no longer a compelling use of funds; or, as is typical with R&D projects in other industries, the technology may prove to not yet be ready for commercialization. Furthermore, while the more obvious goal of technology demonstration is to help advance the pre-commercial technologies to market, there are related goals, which include determining the clean technology areas that are feasible for additional study and investment versus the areas that should no longer be pursued. In some cases, success may be defined by determining a conclusion about a lack of commercial scalability for the technology prior to spending the entire amount for which the project was budgeted.

**APPENDIX A**  
**ELECTRIC PROGRAM INVESTMENT CHARGE**  
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