

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



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Application of Pacific Gas and Electric Company
for Approval and Recovery of Costs Associated
with its Fuel Cell Project. (U 39 E)

Application 09-02-013
(Filed March 2, 2009)

Application of Southern California Edison
Company (U 338 E) for Authority to Implement and
Recover in Rates the Cost of its Proposed Fuel Cell
Installation Program for State Universities.

Application 09-04-018
(Filed April 17, 2009)

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39-E)
OPENING BRIEF IN SUPPORT OF ITS APPLICATION TO APPROVE AND
RECOVER IN RATES THE COSTS OF ITS FUEL CELL PROJECT**

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I. INTRODUCTION AND SUMMARY OF ARGUMENT

The record in this proceeding strongly supports adoption of Pacific Gas and Electric Company’s (PG&E) proposed Fuel Cell Project as just, reasonable, and in the public interest. The Fuel Cell Project will support and help to advance key state energy policies. Moreover, the Fuel Cell Project is consistent with the California Public Utilities Commission’s (Commission) policies concerning utility-owned generation. The Fuel Cell Project is designed to bring three new and highly visible fuel cell facilities on-line at two California State Universities (CSUs) totaling 3.0 megawatts of electrical capacity in the near-term.

The Fuel Cell Project will advance a number of key goals. These include gathering new information about fuel cell operations, education and outreach, and demonstration of the technology. These installations, together with the well designed education elements, should provide a critical stimulus to the fuel cell industry.

PG&E proposes to use customary cost recovery mechanisms, and the applicability of these mechanisms is largely undisputed in the record. Cost recovery caps ensure that the

Commission is able to contain costs to only those that are just and reasonable, and these caps are based upon competitive bids provided by leading large stationary fuel cell vendors in the industry. Additionally, the Commission should confirm that PG&E may recover stranded costs related to the Fuel Cell Project through a non-bypassable charge consistent with other new world generation.

The intervening parties in this proceeding have pointed out that this generation will cost more than some other supplies. However, as the Fuel Cell Project is designed to maximize benefits while capping costs at a reasonable level, the Commission should approve the Application as proposed.

II. DESCRIPTION AND BACKGROUND OF THE FUEL CELL PROJECT

The objective of PG&E's Fuel Cell Project is to advance the installation of fuel cell technologies in California. This project has been developed in coordination with and with the support of the Governor's Office, the California Department of General Services and the California State University (CSU). The goal of furthering fuel cell development is shared by the State and promoted through the Self-Generation Incentive Program (SGIP) which provides financial incentive payments for the installation of fuel cell technologies.^{1/}

In this application, PG&E proposes to develop, own, and operate three fuel cell electric generating facilities totaling 3.0 megawatts (MW) of capacity on two CSU properties: California State University East Bay (CSU East Bay) and San Francisco State University (SF State). If the CPUC adopts a final decision in this proceeding as currently scheduled in March 2010, all facilities are anticipated to be operational by approximately December 2010. These facilities have an estimated useful life of 10 years. PG&E requests that the Commission authorize capital costs of \$21.5 million, and authorize recovery of actual operations and maintenance costs and fuel costs.^{2/}

^{1/} PG&E Supplemental Testimony, Exh. 2, p. 1-1 (PG&E/Witness Jan Berman).

^{2/} PG&E Supplemental Testimony, Exh. 2, p. 1-1 (PG&E/Witness Jan Berman).

In coordination with the State, PG&E has identified CSU East Bay and SF State as suitable locations to install and operate utility-owned fuel cell facilities that provide clean, reliable and low emission generation. The universities will benefit by utilizing the fuel cell waste heat to serve campus thermal load and by utilizing discharged water for landscape irrigation.^{3/}

PG&E proposes the following three locations:

Location	Capacity	Technology	Output Use
SF State – Building	1.4 MW	Molten Carbonate	Waste Heat/Water
SF State – Courtyard	0.2 MW	Solid Oxide	None
CSU East Bay	1.4 MW	Molten Carbonate	Waste Heat/Water

Fuel cells are a form of distributed generation (DG). Unlike most types of DG in California that serve electric load at the host site, the units in the Fuel Cell Project will deliver their energy to PG&E’s electric system. PG&E will own, operate, and maintain the fuel cell facilities’ contribution to the grid.^{4/}

In addition, PG&E will coordinate with the two universities in developing and implementing educational outreach programs in order to maximize the educational benefits of the fuel cell facilities. These are discussed further below in the discussion of the benefits of this project.

PG&E conducted a formal Request for Proposals (RFP) for the project and an Independent Evaluator (IE) reviewed the results of the competitive solicitation to ensure fairness and transparency in the RFP process. Following selection of the two preferred vendors, PG&E finalized the major terms and conditions of the Engineering, Procurement, and Construction (EPC) contracts with those vendors. Similarly, PG&E has finalized major terms and conditions of the lease agreements with SF State and CSU East Bay. That extensive work was the subject

^{3/} PG&E Supplemental Testimony, Exh. 2, p. 2-1 (PG&E/Witness Scott Loveless).

^{4/} PG&E Supplemental Testimony, Exh. 2, p. 2-1 (PG&E/Witness Scott Loveless).

of detailed discussion, both in Chapter 2 of PG&E's Supplemental Testimony,^{5/} and in the examination of PG&E's witness Scott Loveless at the hearing.^{6/} No pertinent criticism of the quality of that extensive work emerged in the filed testimony or at the hearing.

III. THE FUEL CELL PROPOSAL COMPLEMENTS AND ADVANCES STATE PROGRAMS AND GOALS

A. The Proposal Advances State Goals

Fuel cells generate electricity through an electrochemical process rather than through combustion. Thus, they do not produce particulates or unburned hydrocarbons, and have very low nitrogen oxide and sulfur oxide emissions, both of which are acid rain pollutants that contribute to secondary particulate formation. Fuel cells can play a role in reducing greenhouse gas emissions by utilizing fuels with low or neutral carbon content at high electrical efficiencies. In addition, fuel cells may also use renewable fuels such as biogas.^{7/}

California has encouraged clean forms of electrical generation, such as fuel cells, through legislation. In 2000, the legislature passed Senate Bill 970, which directed the Commission to explore incentives for distributed generation. Subsequently, the Commission adopted the SGIP. Technologies eligible for the SGIP's financial incentive payments previously included fuel cells, solar photovoltaic, wind energy, fossil and renewable-fueled internal combustion engines, micro-turbines and small gas turbines. However, beginning January 1, 2008, the Commission modified the SGIP to conform to the new requirements of Public Utilities Code Section 379.6 which was enacted by Assembly Bill (AB) 2778 (2006). These changes limited SGIP-eligible technologies to fuel cells and wind distributed generation that meet or exceed the California Air Resources Board's applicable emissions standards. Thus, both the legislature and the Commission have recognized the value of fuel cell technologies to advance environmental objectives.^{8/}

^{5/} PG&E Supplemental Testimony, Exh. 2, pp. 2-2 to 2-5 (PG&E/Witness Scott Loveless).

^{6/} The extensive cross examination of Mr. Loveless can be found at Transcript pp. 3-59 and 94-147.

^{7/} PG&E Supplemental Testimony, Exh. 2, p. 1-3 (PG&E/Witness Jan Berman).

^{8/} PG&E Supplemental Testimony, Exh. 2, pp. 1-3 to 1-4 (PG&E/Witness Jan Berman).

B. The Proposal Will Provide Significant Benefits

PG&E's Fuel Cell Project will advance fuel cell technologies in California by allowing PG&E to better understand fuel cell operations and by sharing the benefits of fuel cell technology through community outreach and education.

1. Better Understanding of Fuel Cell Operations and Processes

The Fuel Cell Project will allow the utility to export generation to the distribution grid while allowing the universities to utilize the generation by-products for specific industrial/commercial processes. PG&E will evaluate the benefits of this utility/host partnership from two perspectives. First, PG&E will monitor fuel cell performance in comparison to the performance of conventional power generation plants. Such performance metrics include plant efficiency, cost per unit of energy produced and capacity factor. Monitoring at the point of distribution will assist the utility in developing the right tools as the penetration of distributed generation in urban areas continues to increase. Second, PG&E will evaluate the use of fuel cell by-products by the universities to identify economic efficiencies achieved by the combined generation of electricity and heat along with the utilization of waste heat and discharged water.^{9/}

The proposed fuel cell facilities will interconnect to PG&E's distribution system. As such, the Fuel Cell Project will allow PG&E to monitor and verify the reliability of generation from fuel cell facilities and how electrical output from fuel cell facilities may affect the net load characteristic of the circuits on which they are located. Of particular interest are the impacts of the distributed, baseload fuel cell facilities on local power quality and voltage drop. Based on actual operations, PG&E will evaluate whether regulatory requirements, local and state codes, and best installation practices should be modified to facilitate fuel cell use.^{10/}

2. Community Outreach and Education

PG&E proposes to coordinate with the two universities in implementing a community

^{9/} PG&E Supplemental Testimony, Exh. 2, p. 1-2 (PG&E/Witness Jan Berman).

^{10/} PG&E Supplemental Testimony, Exh. 2, pp. 1-5 to 1-6 (PG&E/Witness Jan Berman).

outreach program in order to maximize the educational benefits of the fuel cell facilities both on campus and in the community as a whole. PG&E plans to install an educational kiosk at each campus that will include information about fuel cell generation: how it works; how large it needs to be to meet average customer energy needs; and the actual operating characteristics of the nearby installation. Each kiosk will have both instant and historical information about the generation at that site. In addition, PG&E will coordinate with the two universities to update signage and educational material, help develop class curriculum, host tours of the facilities and facilitate other educational and community outreach actions.^{11/}

CSU East Bay has drafted a letter and report discussing how the fuel cell facility will support the university's educational and environmental goals. The university plans to develop curriculum and research based learning opportunities utilizing the fuel cell system with a team of faculty from multiple disciplines. Major focus areas of study will include the environmental performance of the fuel cell system relative to other energy sources and ways to improve that performance. This outreach program will leverage prior efforts by the university in improving campus sustainability and will be leveraged by the university's current work to develop a Sustainable Energy Management Certificate program. Similarly, SF State has stated that the Fuel Cell Project will significantly enhance the university's sustainable instructional programs including its Master of Business Administration program in sustainability and its undergraduate/graduate programs in science, engineering and environmental studies.^{12/}

C. The Cost Is a Reasonable Investment of Ratepayer Funds

While the unit cost of fuel cell equipment is higher than the cost of other natural gas powered conventional generation, this project is still a reasonable investment of ratepayer funds. As explained at hearing, the cost is roughly comparable to some of the solar installations recently

^{11/} PG&E Supplemental Testimony, Exh. 2, pp. 2-7 to 2-8 (PG&E/Witness Scott Loveless).

^{12/} PG&E Supplemental Testimony, Exh. 2, pp. 2-7 to 2-8, and Attachments 2A and 2B (PG&E/Witness Scott Loveless).

approved by the CPUC.^{13/} Second, the cost is far less than the range of other investments in alternative technologies the Commission has approved, such as carbon capture and storage research (\$30 million approved by D.09-12-014 for the Hydrogen Energy California project, covering only 20% of the forecast cost of the studies). Similarly, as authorized by the legislature, the Commission is considering a proposed decision approving \$350 million for a solar water heating program, and in 2007, it approved a \$50 million Solar Research, Development, Demonstration, and Deployment program by D.07-09-042.

D. Other Programs Have Not Adequately Advanced Fuel Cell Deployment

Other parties argue that there are alternatives available to advance fuel cell technology, including the SGIP program. This project is not intended to eliminate or displace those programs in any way.^{14/} However, despite DRA's claims to the contrary, fuel cell technologies have not been advanced sufficiently under the SGIP since its inception in 2001. As of June 30, 2009, total fuel cell capacity installed under the SGIP in California is only 13 megawatts (MW). Of over 1,300 completed SGIP projects statewide, only 22 are fuel cell-based. Moreover, only 11 fuel cell projects, comprising 6.1 MW of installed capacity, have been completed in PG&E's service area under SGIP.^{15/}

Second, it is unclear at this time whether the feed-in tariff for combined heat and power (CHP) facilities which is currently under development will accelerate the installation of fuel cells. Under the Waste Heat and Carbon Emission Reduction Act (Assembly Bill 1613)(2007), the CPUC is developing the terms for contracts by which an electrical corporation may be required to purchase excess electricity that is generated and delivered to the grid by a CHP system. The standards for CHP operations under this Act are currently under development by

^{13/} Transcript p. 37, line 25 to p. 38, line 5, p. 38 line 25 to p. 39 line 2 (PG&E/Jan Berman Testimony).

^{14/} Transcript p. 31, lines 18-25 (PG&E/Jan Berman Testimony).

^{15/} PG&E's Rebuttal Testimony, Exh. 4, pages 1-1 to 1-2 (PG&E/Witness Jan Berman).

the Energy Commission.^{16/} On December 17, 2009, the CPUC established certain elements for these contracts, by D.09-12-042. At this time, it is unclear whether these terms will be sufficient to promote development of fuel cell projects. The price to be paid under the AB 1613 contract (Market Price Referent values^{17/} plus adders) appears to be lower than the expected levelized cost of energy from the three fuel cell projects that are the subject of this application.^{18/} In addition, fuel cell projects that generate electricity but do not produce waste heat for utilization will not be eligible for the proposed feed-in tariff as they do not meet the CHP standard.

Finally, the State has been exploring various tools including Purchase Power Agreements (PPAs), Requests for Information (RFIs) and RFPs to develop fuel cell facilities on state properties. However, to date, fuel cell projects have been completed at one university (CSU Northridge) with one proposed at University of California, San Diego. As explained at length at hearing, PG&E previously explored with DGS whether PPAs and SGIP incentives would produce feasible projects at State facilities without tangible results.^{19/} This project will help advance fuel cells and should be approved.

IV. THE PROPOSED COSTS AND RATEMAKING ARE REASONABLE

A. Capital Costs

In its Supplemental Testimony, PG&E presented a projected capital cost of \$21.5 million. The details of how this was calculated, project by project, and category, was presented in a detailed fashion, and PG&E responded to a variety of data requests, providing additional detail on how these costs were calculated.^{20/} There was essentially no cross examination or

^{16/} POG&E Supplemental Testimony, Exhibit 2, page 1-5 (PG&E/Witness Jan Berman).

^{17/} The 2009 Market Price Referent values for use in the 2009 Renewables Portfolio Standard solicitations was established by Resolution E-4298, issued Dec. 17, 2009. The price there for a 10 year contract for a project coming on line in 2010 would be approximately 8.5 cents per kWh (see page 2).

^{18/} TURN Cross-examination exhibit 304-C; DRA Opening testimony Exh. 202, p. 1 (estimating a levelized cost of energy of 30 cents per kWh).

^{19/} Transcript p. 56 to p. 57 (PG&E/Jan Berman testimony).

^{20/} PG&E Supplemental Testimony, Exh. 2, pp. 3-1 to 3-7(PG&E/Witness David Bergmann).

impeachment of PG&E's capital cost witness, David Bergmann.^{21/}

Instead, through its witness Anthony Mazy, DRA argued that the costs presented by PG&E are too high, and that substantial costs should be disallowed. DRA's key categories for proposed disallowance were based on comparison with published estimates, contingency factor, and comparison with Southern California Edison's (SCE) figures. Each proposal should be rejected, and PG&E's proposed capital costs should be approved.

Comparison with Published Estimates. DRA proposed to disallow all capital costs above published price estimates. DRA's estimate of capital costs was not based on competitive proposals provided by the fuel cell manufacturers or even based on discussions with any fuel cell vendors.^{22/} Rather, DRA's capital cost estimates were based on an outdated report prepared by Energy and Environmental Analysis, Inc. (EEAI report). The EEAI Report states that the estimates in the capital cost section are typical budgetary price level (2007 dollars) and "can vary significantly depending on the scope of the plant equipment, geological area, competitive marketing conditions, special site requirements, prevailing labor rates and whether the system is a new or retrofit application."^{23/} DRA had no idea what process was used by the authors of the EEAI report to gather data, and instead relied on the fact that this report was requested by the US Department of Energy.^{24/} However, DRA witness Anthony Mazy, acknowledged that the very first page of the report has a disclaimer that states, "Information about costs, maintenance, operations, or any other performance criteria is by no means representative of agency policies, definitions, or determinations for regulatory for compliance purposes."^{25/}

^{21/} The questions asked when Mr. Bergmann was on the stand did not pertain to proposed capital costs and were largely addressed to PG&E witness Scott Loveless who was on the stand at the same time. See Transcript pp. 93-147.

^{22/} Transcript p. 239 (DRA/Mazy testimony).

^{23/} PG&E Rebuttal Testimony, Exh. 4, p. 3-3 (PG&E/Witness David Bergmann).

^{24/} Transcript pp. 239-240 (DRA/Mazy testimony).

^{25/} Transcript p. 240 (DRA/Mazy testimony).

The EEAI report that DRA relied on didn't even include a capital cost estimate for solid oxide fuel cells (SOFC), one of the fuel cell facilities PG&E proposed to install at the SF State.^{26/} This report is not a reasonable basis for any disallowance.

Contingency Factor. DRA and TURN propose reduced or zero contingency factors for capital costs. However, PG&E's applied contingency factor is appropriate and justifiable for this type of project. The contingency covers items for which PG&E retains risks and uncertainty, including scope modifications that may occur during the development, engineering, construction and start-up of the Project. Installation of electric generation on populous California State University (CSU) campuses increases the risks and uncertainty associated with the project. In addition, any material change in scope of work will require coordination and consent of the host universities.^{27/}

Not one fixed contingency factor was used for the project. Instead, depending on estimated risk and uncertainty, distinct contingencies were used for various elements. These rates are within normal levels for construction projects for which the final scope of the project is not yet totally defined. For example, electric and gas interconnection, a highly variable cost, requires precursor gas and electric studies, which have not been performed to define arrangements, protection and routing. Uncertainties and challenges associated with constructing electric generation at CSU campuses, such as allowable work hours, acceptable noise levels, additional safety measures, and traffic restrictions, all can require multiple mobilizations of construction crews and increase costs, which justify the contingency factors.^{28/}

In addition, if the actual capital cost is less than the forecast, PG&E will true-up revenues to reflect the lower amount. In this way, customers receive the benefit of any savings in capital spending.^{29/} PG&E's requested contingency factor on its capital estimate is not unique in this

^{26/} Transcript pp. 241-242 (DRA/Mazy testimony).

^{27/} PG&E Rebuttal Testimony, Exh. 4, pp. 3-1 to 3-2 (PG&E/Witness David Bergmann).

^{28/} PG&E Rebuttal Testimony, Exh. 4, pp. 3-1 to 3-2 (PG&E/Witness David Bergmann).

^{29/} PG&E Supplemental Testimony, Exh. 2, p. 5-2 (PG&E/Witness Joe O'Flanagan).

application. PG&E requested and received a similar contingency on its capital forecast in its Diablo Canyon Steam Generator Replacement Project (SGRP). SCE also requested and received a similar contingency in its San Onofre Nuclear Generation Station SGRP.^{30/}

Other Disallowance Proposals. DRA recommends disallowing several capital cost items on pages 22 to 26 of its opening testimony. In review of the DRA testimony, the recommended capital disallowances by DRA were not verifiable. Nevertheless, the capital costs presented in the application are reasonable for the type of project being installed and for the challenges associated with installing the fuel cell facilities inside a CSU campus. For example, PG&E identified the following two items disallowed by DRA:^{31/}

- Administrative and General (Proposed disallowed \$45,600). These costs are normal indirect costs placed on PG&E labor and are included in all capital projects.
- Allowance for Funds Used During Construction (AFUDC) (Proposed disallowed \$108,617). AFUDC reflects the cost of funds used to finance the construction of the project, and is based on PG&E's cost of capital authorized by this Commission. The total amount of AFUDC is a function of the duration of the project.^{32/}

Disallowances Based on SCE's Costs. Finally, DRA proposed to disallow any cost element which exceeded a figure from SCE. However, DRA acknowledged that SCE had presented its figures in a different fashion, and that he had "no clue" whether SCE was as far along as PG&E in developing the project.^{33/}

^{30/} PG&E Rebuttal Testimony, Exh. 4, page 3-2 (PG&E/Witness David Bergmann).

^{31/} DRA Second Amended Report, Exh. 202, p. 22. table DRA-4 (DRA/Mazy testimony).

^{32/} PG&E Rebuttal Testimony, Exh. 4, page 3-3 (PG&E/Witness David Bergmann).

^{33/} Transcript p. 246 (DRA/Mazy testimony).

In sum, DRA and TURN did not provide a rational basis for disallowing any capital costs, and PG&E's forecast should be adopted.

B. Operations and Maintenance Costs

1. Summary

PG&E has presented a reasonable estimate of operations and maintenance (O&M) costs for the Fuel Cell Project, and asks the Commission to adopt this estimate in establishing an initial revenue requirement for the facilities. This estimate is supported by the work of experts in power plant operations and by the selected fuel cell manufacturers.

2. Costs Associated with PG&E's Fuel Cell Service Agreements are Reasonable

PG&E's estimate of service agreement costs, the largest single O&M line item, is based on recent competitive proposals provided by the fuel cell manufacturers in response to PG&E's RFP. DRA's forecast of service agreement costs is based on an outdated report that omitted the most costly fuel cell maintenance activity – replacement of the fuel cell stack modules.

DRA's estimate of fuel cell service agreement costs was not based on competitive proposals provided by the fuel cell manufacturers. Rather, they were based on the outdated EEAI report. The O&M estimates presented in the EEAI report weren't even based on estimates from fuel cell manufacturers, but were based on estimates from reciprocating engine manufacturers.^{34/} Surely, fuel cell service agreement costs prepared in a competitive environment by fuel cell vendors represent a much more accurate estimate than simply using interpolations from reciprocating engine manufacturers. Even DRA witness, Anthony Mazy, acknowledged that the most costly fuel cell maintenance activity, the replacement of the fuel cell stack modules, which is appropriately included in PG&E's service agreement estimate, was omitted from his fuel cell O&M estimate.^{35/}

^{34/} PG&E Rebuttal Testimony Exh. 4, p. 4-2, lines 1-17 (PG&E/Witness Greg Bosscawen).

^{35/} Transcript pp. 244-245 (DRA/Mazy testimony).

Without understanding the proposed structure or terms and conditions of PG&E's or SCE's proposed service agreements, DRA arbitrarily capped PG&E's molten carbonate fuel cell (MCFC) service agreement costs at the forecast presented by SCE.^{36/}

PG&E's estimate of service agreement costs, based on recent competitive proposals provided by the fuel cell manufacturers, is reasonable and should be adopted by the Commission.

3. PG&E's O&M Labor Costs are Reasonable

No party disagrees with SCE or PG&E that one incremental full time employee is appropriate for operations and maintenance of the fuel cell facilities. DRA recommends using SCE's forecast of \$104,700 and applies that forecast to PG&E. What DRA didn't seem to understand was that SCE's operations labor estimate was based on direct costs and PG&E's operations labor forecast was based on fully-loaded costs including employee benefits and payroll taxes.^{37/} SCE adds in the employee benefits and payroll taxes when developing the revenue requirement.

PG&E's estimate of O&M labor costs is reasonable and should be adopted by the Commission.

4. PG&E's Other O&M Costs are Reasonable

PG&E explained its methodology in its testimony for developing the incremental increase to materials and contract costs to safely and reliably operate and maintain the fuel cell facilities.^{38/} Without any significant discussion about these cost items, DRA simply zeroed them out and relied completely on the outdated EEAI report even though the EEAI report didn't itemize these types of costs.

Furthermore, the EEAI report used outdated information on the status of fuel cell technology in the 2003-2004 timeframe as the basis for its estimated O&M costs.^{39/} Not only was the forecast DRA

^{36/} Transcript, pp. 245-246 (DRA/Mazy testimony).

^{37/} SCE Testimony, Exh. 100, p. 21, lines 17 and 18 and PG&E Supplemental Testimony, Exh. 1, p. 4-4, lines 3 and 4 (PG&E/Witness Greg Bosscawen).

^{38/} PG&E Supplemental Testimony, Exh. 2, pp. 4-4 through 4-5 (PG&E/Witness Greg Bosscawen).

^{39/} PG&E Rebuttal Testimony, Exh. 4, p. 4-2, lines 5-11 (PG&E/Witness Greg Bosscawen).

relied upon stale, the forecast was stated in 2007 dollars rather than 2010 dollars, the year when the O&M costs would actually begin to be incurred. Putting further doubt in the quality of DRA's O&M forecast, DRA witness, Mazy, acknowledged that the first page of the report has a disclaimer that states, "Information about costs, maintenance, operations, or any other performance criteria is by no means representative of agency policies, definitions, or determinations for regulatory for compliance purposes."^{40/} The EEAI report that DRA relied on didn't even include an O&M estimate for SOFC, one of the fuel cell facilities PG&E proposes to install at the SF State.^{41/}

5. PG&E's Contingency Costs are Reasonable

PG&E's fifteen percent contingency is a reflection of many factors that increase the risk that PG&E's actual costs are greater than estimated costs, including uncertainty about inflation over the ten year life of the facilities, and the fact that the vendor service agreement have not been completely finalized.^{42/} This estimate is based on the expertise of an experienced witness with substantial knowledge, who made clear he was not padding his numbers.^{43/}

DRA has recommended completely eliminating any contingency because "the requested contingency is inappropriate" and because "the numbers were unsubstantiated and would encourage waste of ratepayer funds."^{44/} The requested contingency is appropriate for the reasons stated above. In addition, PG&E requested a similar fifteen percent contingency on its O&M forecast in its Application for Contra Costa 8 and SDG&E requested a ten percent contingency for unplanned maintenance in its Application for Palomar Energy Center. In its Contra Costa 8 decision (D.06-06-035), the Commission adopted a revenue requirement that included an O&M forecast with a 12.5 percent contingency. In addition, PG&E requested a fifteen percent

^{40/} Transcript p. 240 (DRA/Mazy testimony).

^{41/} PG&E Rebuttal Testimony, Exh. 4, p. 4-2, lines 23-26 (PG&E/Witness Greg Bosscawen).

^{42/} PG&E Rebuttal Testimony, Exh. 4, p. 4-3 (PG&E/Witness Greg Bosscawen).

^{43/} PG&E Rebuttal Testimony, Exh. 4, p. 4-3 (PG&E/Witness Greg Bosscawen).

^{44/} See DRA Second Amended Report, Exh. 203C, p. 29, lines 5-8 (DRA/Mazy testimony).

contingency on its O&M forecast in its Application for Colusa and Humboldt Bay Generating Station.^{45/} The Commission decision for Colusa and Humboldt Bay Generating Station, Decision 06-11-048, approved an O&M contingency of fifteen percent and placed it in a one-way balancing account, which PG&E may recover if and when needed.

In addition, PG&E's O&M ratemaking proposal would return any unspent O&M, including any unspent contingency, back to ratepayers. This is similar to the treatment of O&M contingency in the Commission decision for Colusa and Humboldt Bay Generating Stations (Decision 06-11-048). PG&E's proposed contingency would reduce the likelihood that PG&E would have to come back to the Commission for an increase in O&M before the next General Rate Case (GRC) as a result of higher than expected costs such as vendor service agreement costs or higher than expected inflation rates.

PG&E's proposed O&M forecast is reasonable and should be adopted by the Commission.

C. Ratemaking

In Chapter 5 of its Supplemental Testimony, PG&E laid out its proposal for ratemaking for this project.^{46/} PG&E's proposed ratemaking is consistent with traditional ratemaking, and has drawn little attention or opposition.

1. Capital Costs

PG&E requested that the Commission find that the \$21.5 million estimated cost is reasonable and prudent. The Commission has approved the reasonableness of up-front estimates of costs for utility capital projects on a number of recent occasions, including in the Diablo Canyon Steam Generator Replacement Project, the San Onofre Steam Generator

^{45/} PG&E Rebuttal Testimony, Exh. 4, p. 4-4 (PG&E/Witness Greg Bosscawen).

^{46/} PG&E Supplemental Testimony, Exh. 2, pp. 5-1 to 5-10 (PG&E/Witness Joe O'Flanagan).

Replacement Project, PG&E's Gateway, Colusa, and Humboldt Generating Station Projects, and in PG&E's Advanced Metering Infrastructure and SmartMeter™ Programs.^{47/}

PG&E would begin recovery of the capital costs once the project became operational, with an initial revenue requirement, followed by an adjustment based on the actual installed cost. Other than the objection to the capital cost estimate discussed above, there was no objection to this proposed approach to recovery of capital costs.

2. Operations and Maintenance

No party objected to PG&E's proposed ratemaking treatment of the O&M costs. PG&E proposes to establish a memorandum account to track the difference between the target O&M expense and the actual O&M expenses. This amount would be transferred to the Utility Generation Balancing Account (UGBA) upon approval of an Advice Letter. In the event that the O&M expense exceed the target, PG&E can only recover the excess amount after the Commission finds the excess costs were reasonably incurred.^{48/}

3. Fuel Costs and Other Costs

PG&E proposed that fuel costs be recovered through the Energy Resource Recovery Account (ERRA) mechanism, which is used to recover the cost of fuel for other procurement resources.^{49/} There was no objection to this proposal or other ratemaking proposals.

4. PG&E Should Be Allowed To Recover Non-Bypassable Charges On This Generation Like Other New World Generation

PG&E has requested and is entitled to recover stranded costs associated with the Fuel Cell Project through a non-bypassable charge.^{50/} In addition, stranded costs associated with the utility-owned generation (UOG) component can be recovered for each facility installed for a

^{47/} *Id.* at 5-4, lines 18-30 (PG&E/Witness Joe O'Flanagan).

^{48/} PG&E Supplemental Testimony, Exh. 2, pp. 5-2, 5-3 (PG&E/Witness Joe O'Flanagan).

^{49/} PG&E Supplemental Testimony, Exh. 2, p. 5-3 (PG&E/Witness Joe O'Flanagan).

^{50/} PG&E Supplemental Testimony, Exh. 2, p. 5-3 (PG&E/Witness Joe O'Flanagan).

ten-year period following commercial operation of the facility.^{51/} PG&E will implement the non-bypassable charge cost recovery for the Fuel Cell Project consistent with the Commission’s direction in D.08-09-012.^{52/}

Stranded costs resulting from the Fuel Cell Project will be calculated on a portfolio approach basis, as required by D.08-09-12. The average cost of the utility’s portfolio will then be compared against the applicable benchmark to determine the amount, if any, of above-market costs in PG&E’s portfolio that would result in a Cost Responsibility Surcharge applicable to the Direct Access and other non-exempt departing load. This new generation would be treated exactly like other new world generation.^{53/}

V. THE PROJECT IS CONSISTENT WITH CPUC DECISIONS ON UTILITY-OWNED GENERATION

The Western Power Trading Forum claims that PG&E’s proposal should be rejected because it fails to comply with Commission directions on UOG. In fact, this proposal is consistent with prior decisions, and should be approved in the circumstances presented at the hearing.

First, it is not clear that the UOG requirements are applicable in this proceeding. In Decision 07-12-052, the Commission included a general policy discussion of UOG issues, including the rules and eight requirements for developing UOG projects outside of a Request for Offer (RFO). However, at the very beginning of the UOG section in Decision 07-12-052, the Commission indicates that the UOG requirements primarily address “conventional generation resources” and that there may be “additional factors associated with utility-ownership of renewable and other loading order or non-conventional resources that have not been fully vetted in this proceeding.”^{54/} The Commission concluded that “the appropriate treatment of UOG for

^{51/} D.04-12-048, p. 230, Conclusion of Law 16; D.08-09-012 at 2, fn. 1 and 52-55.

^{52/} Transcript p. 166 (PG&E/O’Flanagan).

^{53/} Transcript p. 166 (PG&E/O’Flanagan).

^{54/} D.07-12-052 at 197, n. 233.

accomplishing resource-specific policy goals will be identified within the appropriate proceedings, and the treatment of utility ownership of conventional generation in this LTPP decision does not prejudice those proceedings in any manner.”^{55/} Because fuel cells qualify as a preferred resource in the loading order, the UOG requirements referenced by WPTF do not appear to apply in this proceeding.

Second, even if the UOG requirements cited by WPTF were applicable, they are fully satisfied in this proceeding. In Decision 07-12-052, the Commission ordered that “UOG applications by the IOUs outside of an RFO must fit into a unique circumstance, which are limited to market power mitigation, reliability, preferred resources, expansion of existing facilities, or be a unique opportunity, as described in the decision, and each application will be considered on a case-by-case basis. The IOU is required to make a showing that holding a competitive RFO is infeasible.”^{56/} The PG&E Fuel Cell Project clearly meets the above-stated criteria for UOG. First, PG&E has demonstrated that its Fuel Cell Project fits into a unique circumstance; specifically, fuel cell technology is a preferred resource as defined by the Commission. The Commission defines preferred resources as, in order of preference, energy efficiency, demand response, renewables, distributed generation and clean fossil fuel.^{57/} PG&E’s fuel cell project unquestionably meets the criteria as a preferred resource since fuel cells are a form of distributed generation.

In explaining why preferred resources are exempt from an RFO requirement, the Commission stated “while we continue to rely on markets to deliver efficiently priced products for ratepayers, we see no reason to limit our options and intend to continue to deploy all resources available to us, including utility development and ownership, to meet California’s vital environmental policy objectives.”^{58/}

^{55/} Id.

^{56/} Id. at 306, Paragraph 31.

^{57/} Id. at 211, n. 240.

^{58/} Id. at 211.

PG&E's Fuel Cell Project also meets the Commission's requirement that holding a competitive RFO is infeasible. As a demonstrative project developed in coordination with the State and located on CSU campuses, both the State and our host universities SF State and CSU East Bay have indicated a preference for utility ownership of the facilities.^{59/}

Finally, the Commission stated in Decision 07-12-052 that "in instances in which an IOU submits an application for UOG that falls into one of the above categories (market power mitigation, reliability, preferred resources, expansion of existing facilities, or be a unique opportunity), the IOU must show that a competitive solicitation for a Purchase and Sale Agreement (PSA) is not appropriate and either propose an engineering, procurement, construction or straight utility build project."^{60/} A competitive solicitation for a PSA is not appropriate in this instance as the host universities are not interested in developing a turnkey power plant for purchase and operation by a third party.

Similarly, in its action recently approving SCE's Solar Photovoltaic Program (SPVP), the Commission approved utility-owned generation without requiring that utility first conduct a solicitation as requested by WPTF. In that decision, the Commission noted the "varying risks and rewards for [independent power producer] and UOG projects" and the "particular benefit of UOG" in that it is "dedicated to the ratepayers throughout the useful life of the facility."^{61/} The Commission went on in that decision to state that "[g]iven the importance and urgency California has placed on developing renewable resources, allowing both utility and [independent power producers] to participate in the development of [Edison's SPVP] is a balanced approach at this time."^{62/} Similarly, in these unique circumstances, the Fuel Cell Project should be approved.

^{59/} PG&E Supplemental Testimony, Exh. 2, p. 1-6 (PG&E/Witness Jan Berman), attachment 1 B, and attachment 2A (PG&E/Witness Scott Loveless); PG&E Rebuttal Testimony, Exh. 4, p. 1-4 (PG&E/Witness Jan Berman); and Transcript p. 56 (PG&E Jan Berman testimony).

^{60/} D.07-12-052 at p. 271.

^{61/} D.09-06-049 at 16.

^{62/} *Id.* at 16-17.

VI. OTHER INTERVENOR PROPOSALS SHOULD BE REJECTED

A. TURN's Proposal To Reduce Costs Associated With Community Outreach And Education Should Be Rejected

In its opening testimony, TURN recommended eliminating the costs for community outreach and education associated with the project. This recommendation should be rejected. PG&E proposes to coordinate with SF State and CSU East Bay in developing and implementing a community outreach and education program in order to maximize the educational benefits of the fuel cell facilities both on campus and in their surrounding communities. TURN mistakenly equates the proposed costs associated with this community outreach and education program to PG&E's "Letsgreenthiscity" ad campaign. However, the fuel cell project's community outreach and education program clearly is not an ad campaign. Instead, the purpose of the program includes maintaining the educational kiosks and periodically updating other educational material, coordinating with the two universities in developing class curriculum and hosting tours of the facilities.^{63/}

Indeed, on cross examination, TURN's witness acknowledged that ratepayer-funded education programs are a recognized part of Commission policy programs, and that he is unaware of any evidence of PG&E misusing such funds.^{64/} PG&E's requested costs associated with community outreach and education should be included.

B. TURN's Proposal To Eliminate The Solid Oxide Fuel Cell Facility Should Be Rejected

TURN proposes to eliminate the 0.2 MW solid oxide fuel cell (SOFC) facility at SF State, based on its unit costs that are higher than other fuel cell projects and its lack of cogeneration benefits. This proposal should be rejected.

Based on responses to PG&E's RFP, a vendor utilizing SOFC technology was selected as the preferred bidder for one of two sites proposed at SF State. Unlike MCFC technology, SOFC

^{63/} PG&E Rebuttal Testimony, Ex. 4, page 2-2 (PG&E/Witness Scott Loveless).

^{64/} Transcript p. 256 (TURN/Marcel Hawiger cross-examination).

technology does not produce waste heat for cogeneration; instead, waste heat is recycled to make additional electricity. While the capital cost of the SOFC facility is more than the capital cost for each of the MCFC facilities on a per kilowatt basis, PG&E believes that the demonstrative attributes of the project is greatly enhanced by the installation and operation of two distinct technologies side by side at SF State. In addition, the SOFC vendor is the sole California fuel cell manufacturer with commercially available large scale stationary fuel cell technology. The SOFC vendor employs many CSU student interns and graduates and is helping to train the next generation of clean energy engineers and entrepreneurs in California.^{65/}

C. TURN's Proposal To Modify the Lease Agreements Should Be Rejected

TURN recommends that PG&E renegotiate the significant terms and conditions of the lease agreements with the two universities. This fails to fully understand the balance of risk and cost undertaken by each side and, if accepted, may jeopardize the project from reaching fruition. It should be rejected.

TURN's first recommends that PG&E should be directed to recover the value of the waste heat supplied to each university. However, as PG&E explained in rebuttal testimony, TURN and DRA falsely assume that the only consideration that the host universities are providing is the rental value of the footprint for the fuel cell facilities. Our university partners will be providing many benefits to the project not identified by TURN or DRA have committed to significant financial investments despite the CSU's current budget constraints.^{66/}

Pursuant to terms and conditions of the lease agreements recently finalized with both SF State and CSU East Bay, benefits provided by the host universities include the following:

- Lease Areas: PG&E receives leases for the construction, maintenance and operation of the fuel cell facilities for a ten year period with an option for one five-year extension. The lease area at SF State for the 1.4 MW MCFC facility inside their non-operational

^{65/} PG&E Rebuttal Testimony, Ex. 4, pages 2-1 to 2-2 (PG&E/Witness Scott Loveless).

^{66/} PG&E Rebuttal testimony, Ex. 4, pages 2-2 to 2-4 (PG&E/Witness Scott Loveless).

boiler building and the 0.2 MW SOFC facility in the adjacent courtyard is approximately 5,700 square feet. The lease area at CSU East Bay for the 1.4 MW MCFC facility on land in close proximity to their boiler building is approximately 3,500 square feet.

- Heat Exchange Equipment and Interconnection Costs: PG&E provides for the disposition of waste heat to a point of connection for each fuel cell facility. Contrary to DRA's assertion on page 9 of its testimony, PG&E is not installing and providing heat exchange equipment to use the waste heat. To the contrary, the universities are responsible for the cost of installing and operating the heat exchange equipment necessary to utilize the waste heat for their campuses' thermal load. That cost is not insignificant; CSU East Bay estimates the cost of the heat exchange equipment and other necessary work to interconnect that system into the fuel cell facility at approximately \$600,000.

- Water Use: PG&E has the right to connect to the universities' existing water distribution facilities; more importantly, the universities will supply all water necessary to serve the fuel cell facilities at no cost to PG&E. The water usage for each of the 1.4 MW MCFC facilities is on average approximately 6,500 gallons per day.

- Underground Electric Facilities: PG&E receives non-exclusive right to install and use underground wires, cables and conduits necessary to transport electric energy from the leased areas to the electrical grid systems.

- Telephone and Ethernet: PG&E receives the right to utilize the universities' communication infrastructure including one standard telephone line and one Ethernet connection to serve the fuel cell facilities.

- Site Preparation Inside the SF State Boiler Building: SF State has agreed to remove all existing equipment inside their non-operational boiler building and provide PG&E with an interior that is site ready for installation. The cost of this work is estimated at between \$90,000 and \$140,000.^{67/}

^{67/} PG&E Rebuttal Testimony, Ex. 4, pages 2-3 to 2-4 (PG&E/Witness Scott Loveless).

Finally, PG&E's obligations to the universities in the provision of the waste heat are limited. Under the lease agreements, PG&E has mitigated its liabilities by not guaranteeing the quantity, quality or availability of the waste heat. While difficult to quantify, the value of the waste heat to the universities undoubtedly is reduced as a result of these significant limitations.^{68/}

VII. PG&E GAVE BROAD AND CLEAR NOTICE OF THE FILING OF THIS APPLICATION

DRA complains that the Notices to the Public of the Fuel Cell Application failed to comply with the requirements of Rule 3.2(b) through (d) of the CPUC's Rules of Practice and Procedure. In particular, DRA argues:

- The actual transmittal letter to the government agencies was inadequate for various reasons, including an alleged failure to tell the government customers the monetary consequences of this rate change.
- It claims that the notices by publication had minor errors, such as not stating that the application may be examined in any CPUC or PG&E office and their addresses, and in some circumstances was published on March 3-4, rather than March 2.
- It claims that notices to individual customers failed to comply with the rules because not expressed in both dollar and percentage terms for each customer class.

In fact, the various Notices were given consistent with long-standing Commission practice. In particular, the notices by PG&E were approved by the CPUC's Public Advisor, in the same manner as the form of Notice suggested by the Public Advisor in other Commission rate proceedings.

PG&E filed proof of Rule 3.2(d) compliance on April 8, 2009, attaching the notice sent to customers. Similarly, it filed Proof of Rule 3.2(c) (and (b)) compliance on March 12, 2009, attaching the notices published in newspapers and sent to city, state and county officials.

^{68/} PG&E Rebuttal Testimony, Ex. 4, page 2-4 (PG&E/Witness Scott Loveless).

These Notices all stated that the PG&E was seeking an increase in rates to cover the cost of this program, that the non-fuel costs of owning and operating the proposed fuel cell facilities would increase its electric revenue by \$44.5 million over ten years, that if approved, this application would result in an increase that is less than 1% of PG&E's revenues. The Notices stated that average increase for bundled customers would be 0.05%, compared to current rates, and would not have a significant impact on individual customer rates.^{69/}

This information gave customers, government officials, and the public detailed information on what is being sought and the likely impact on rates, which is very small. In accordance with longstanding tradition with the Public Advisors Office, no rate impact table showing the impact on each customer class was included. The long-standing practice is that no such table is included if the rate increase is less than one percent of total revenue and the rate change will not impact some customer classes more than others.

Any defects with this notice are not material, and were not raised by DRA in a timely and lucid manner.^{70/} Now that the hearing has been concluded, with the public having broad and clear notice of this application, no further notice would be appropriate or reasonable.

VIII. CONCLUSION

PG&E's Fuel Cell Project advances key California and Commission policies by expediting the development of a new source of energy in a cost-effective manner. The record in this proceeding provides substantial evidence in support of the public's interest in Commission approval. In addition, other parties in the proceeding have failed to develop a factual record to support their claims that this project should be rejected. For these and the specific reasons

^{69/} DRA has complained that it has not received the cover letters sent to the various government agencies. However, there were no such cover letters, only the notice which DRA has had for months.

^{70/} This Application was filed in February. In its March 27th Protest, DRA stated only that it was raising an issue of whether the Application was properly served, but did not say what the issue was. At the Prehearing Conference on April 27th, DRA stated that "I am not entirely sure what the issue may or may not be." Transcript of April 27th, page 41. At the prehearing conference on June 22nd, DRA said PG&E may not have met the "proof of compliance" requirement. Transcript of June 22, page 58. Eventually, DRA sent its letter of July 24. However, in that letter and since then, DRA has not identified what relief it now seeks.

discussed in the foregoing sections, PG&E requests that the Commission act expeditiously to approve the Fuel Cell Project as proposed.

Respectfully submitted,

RANDALL J. LITTENEKER

By: _____ /s/
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December 30, 2009

CERTIFICATE OF SERVICE BY ELECTRONIC MAIL

I, the undersigned, state that I am a citizen of the United States and am employed in the City and County of San Francisco; that I am over the age of eighteen (18) years and not a party to the within cause; and that my business address is 77 Beale Street, San Francisco, California 94105.

On December 30, 2009, I served a true copy of:

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39-E)
OPENING BRIEF IN SUPPORT OF ITS APPLICATION TO IMPLEMENT AND
RECOVER IN RATES THE COSTS OF ITS FUEL CELL PROJECT**

- [XX] By Electronic Mail – serving the enclosed via e-mail transmission to each of the parties listed on the official service list for Applications 09-02-013 and 09-04-018 with an e-mail address.
- [XX] By U.S. Mail – by placing the enclosed for collection and mailing, in the course of ordinary business practice, with other correspondence of Pacific Gas and Electric Company, enclosed in a sealed envelope, with postage fully prepaid, addressed to those parties listed on the official service list for Applications 09-02-013 and 09-04-018 without an e-mail address.

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this 30th day of December, 2009, at San Francisco, California.

/s/

PATRICIA KOKASON