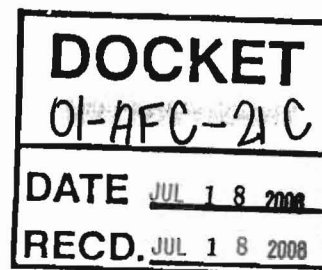


Application No.: 08-07-
(U 39 E)
Exhibit No.: (PG&E-1)
Date: July 18, 2008
Witness: Various



PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION PROJECT
PREPARED TESTIMONY

PUBLIC VERSION



PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION PROJECT

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Michael L. Jones
Brian M. McDonald
Marino Monardi
Joseph F. O'Flanagan
Todd Strauss
Manho Yeung

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 1
POLICY OVERVIEW

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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 1
POLICY OVERVIEW

A. Introduction

In order to ensure reliability for its customers in a cost-effective manner, Pacific Gas and Electric Company (PG&E or the Company) seeks a Certificate of Public Convenience and Necessity (CPCN) for its proposed Tesla Generating Station, a new natural gas-fired combined-cycle generating facility to be located in eastern Alameda County. The Tesla Generating Station has already been licensed by the California Energy Resources Conservation and Development Commission (CEC), and is capable of meeting identified reliability needs beginning in 2012 at a reasonable cost to customers. Although the CEC licensed the Tesla site as a 1,120 megawatt (MW) natural gas-fired combined-cycle generating station consisting of two generating units, PG&E proposes to construct only one of the two generating units at this time, capable of producing approximately 560 MW. This testimony provides an overview of PG&E's Application, and explains why PG&E decided to acquire and now proposes to develop and own the Tesla Generating Station.

B. PG&E's Reliability Strategy to Replace Terminated or At-Risk Contracts From PG&E's 2004 LTRFO

In its 2006 Long-Term Procurement Plan (LTPP) decision, Decision 07-12-052, the California Public Utilities Commission (CPUC or Commission) determined that "if a previously authorized resource is determined unviable during the development process and the associated contract is terminated, the procurement authority for those megawatts remains."^[1] The Tesla Generating Station is needed to replace 913 MW of planned northern California generation projects resulting from PG&E's 2004 Long-Term Request For Offer (LTRFO) that have been terminated by the developers or are at-risk and in need of additional regulatory and permitting approvals in order to be able to proceed with development. As discussed in Chapter 3, the current CEC permitted status of the Tesla site and the very high California Independent

^[1] D.07-12-052 at 105-106.

System Operator Corporation (CAISO) interconnection queue position make the Tesla Generating Station a truly unique opportunity to replace the failed or at risk projects from the 2004 LTRFO.

The current status of the approved 2004 LTRFO projects is discussed in more detail in Chapter 3. Two of the Power Purchase Agreements (PPA) from PG&E's 2004 LTRFO, representing 312 MW of capacity, have terminated. A third project, the Russell City Energy Center (RCEC), a 601 MW combined-cycle facility to be located in Hayward, requires additional regulatory and permitting approvals in order to be able to proceed with development.

PG&E and RCEC have reached agreement in principle on an amendment to the RCEC PPA to revise the pricing and extend the on-line date by two years to June 2012. This agreement in principle is subject to senior management and/or corporate approvals of both companies and is conditioned on Commission approval. If final agreement is reached and internal approvals are obtained, PG&E will submit the application for approval to the Commission as soon as possible within the next 30 to 60 days. RCEC still needs to obtain final permits for the facility and the Commission needs to approve the amended PPA.

There are only two combined cycle projects that could likely be developed in time to replace the failed or at risk 2004 LTRFO projects—the Tesla Generating Station and the RCEC Project under an amended PPA. PG&E considers pursuit of both a contract amendment to the RCEC Project and development of PG&E's Tesla Generating Station as a complementary strategy for replacement of the terminated or at risk 2004 LTRFO projects. Having two projects on track for commercial operations by summer 2012 reduces the risk of supply shortages. If both projects are ultimately approved by the CPUC, PG&E could adjust the 800 MW to 1,200 MW of need adopted by the CPUC for the 2008 LTRFO.

C. The Tesla Generating Station Is Needed to Ensure That Northern California Does Not Fall Below CPUC-Approved Planning Reserve Margins in 2012 and 2013

It is highly likely that there will be insufficient generation in California to maintain an adequate electric supply beginning in 2012 unless PG&E acts now to ensure adequate supply. As described above, three proposed projects from PG&E's 2004 LTRFO have either been terminated or are at-risk. This situation will have a substantial adverse effect on PG&E's ability to meet the current

1 15-17 percent Planning Reserve Margin (PRM). In the 2006 LTPP decision
2 (*i.e.*, D.07-12-052), the Commission approved a 10-year forecast for PG&E's
3 service area, projecting a 20.6 percent PRM in 2012 and a 18 percent PRM in
4 2013.^[2] However, this forecast assumed that all of the projects proposed in the
5 2004 LTRFO would be constructed and operational. Taking into account the
6 terminated or at-risk projects from the 2004 LTRFO, PG&E's PRM drops to
7 16.3 percent in 2012 and 13.7 percent in 2013, as described in more detail in
8 Chapter 3.

9 Moreover, the Decision 07-12-052 forecasts are premised on certain
10 additional new generation resources that will likely not materialize. In particular,
11 the City and County of San Francisco's (CCSF) 180 MW San Francisco
12 Reliability Project (SFRP) is uncertain. Without the SFRP, the 2012 PRM drops
13 to 15.5 percent and the 2013 PRM drops to 13.0 percent. Finally, these
14 numbers assume that all of the other new generation resources approved from
15 PG&E's 2004 LTRFO develop, as well as the significant forecasts of renewable
16 resources included in PG&E's 2006 LTPP. If some of these resources do not
17 develop, as is likely given the experience with the 2004 LTRFO, PG&E's PRM in
18 2012 will drop below the Commission-mandated 15 percent.

19 PG&E's 2012-2013 PRM analysis also assumes the current PRM remains in
20 place. The 2012 PRM-deficiency will only increase if the Commission decides to
21 modify the current PRM in Rulemaking 08-04-012. Based on PG&E's analysis
22 and information obtained from the CAISO, PG&E believes the Commission's
23 currently approved PRM of 15 percent to 17 percent does not meet the industry
24 reliability standard of one-day-in-ten-years. This issue is being explored in
25 Rulemaking 08-04-012. If the Commission ultimately agrees with PG&E in that
26 proceeding, it will need to increase the PRM to meet industry standards. In that
27 case, PG&E's PRM concerns for 2012-2013 will be even more significant as the
28 required PRM will be even higher than 17 percent. A decision in the PRM
29 proceeding is expected in June 2009. However, PG&E and its customers
30 cannot wait until that proceeding concludes to procure needed new generation.
31 Given that new generation resources can take up to seven years to develop,

[2] *Id.* at 116.

1 PG&E needs to begin to plan now to meet its 2012-2013 PRM needs, to satisfy
2 both the current standards and potentially higher standards.

3 Finally, this assessment, while derived from PG&E's most recent long-term
4 procurement plan approved by the Commission, understates the reliability risk in
5 several respects. First, there is uncertainty in the peak load forecast. PG&E
6 has observed an increase in ambient temperature in the past decade.
7 Accounting for a continued trend of higher ambient temperatures consistent with
8 global climate change models would result in a peak load that is about 600 MW
9 higher than previously forecasted in 2012 and 2013. Second, aging plants may
10 retire sooner than expected, further impacting reliability and PG&E's planning
11 reserve margin. In Decision 07-12-052, the Commission assumed about
12 600 MW of retirements per year until all 4,400 MW of aging plants in PG&E's
13 service area are retired in 2015. However, the State Water Resources Control
14 Board recently initiated a rulemaking to consider prohibiting the use of
15 once-through cooling for existing fossil-fueled power plants by 2015. Given
16 these potential requirements, it is possible that plant owners may accelerate
17 their plans to retire these aging units. All of these concerns are discussed in
18 more detail in Chapter 3.

19 **D. It Is Too Risky to Assume That New Projects From the**
20 **2008 LTRFO Could Be On-Line in Time to Meet the Reliability**
21 **Need in 2012 and 2013**

22 Given the current state of the generation market, the Tesla Generating
23 Station is the most viable option to fill the void created by terminated or at-risk
24 contracts from PG&E's 2004 LTRFO. As explained in detail in Chapter 3, capital
25 costs for new generation projects have risen substantially in recent years. Costs
26 for steel and concrete have increased, driven by energy prices and worldwide
27 demand. At the same time, the electric power industry is entering a major
28 capital investment phase which will put further upward pressure on prices. The
29 rapid and volatile increases in construction costs and equipment have led to
30 uncertainty and instability in the market, with generators, vendors and
31 engineering, procurement and construction (EPC) contractors less willing to take
32 financial risks, fix or hold open prices, or accept delays or off-ramps associated
33 with regulatory approvals.

1 Permitting delays also pose challenges for new projects. Permitting
2 uncertainties include a significant backlog at the CEC, and local opposition in the
3 form of challenges to siting and permitting. Such challenges, even if ultimately
4 unsuccessful, can significantly delay a project's on-line date. For projects in
5 northern California, the CEC permitting process has taken on average 14 to 15
6 months recently, and in some cases has stretched out as long as 20 months.
7 Delays in the CEC process, as well as those caused by challenges to permits,
8 have and will continue to result in developers suspending development efforts.
9 The Tesla Generating Station has already overcome these permitting
10 challenges, and received its CEC permit in 2004.

11 Given the market backdrop, it is critical for reliability in northern California to
12 advance a viable, cost-effective project. The fact that a developer signs a PPA
13 does not guarantee that a proposed project will be developed. A developer
14 typically is required to pay damages if it elects to terminate a contract. However,
15 liquidated damages will not ameliorate supply shortages. PG&E cannot rely on
16 contracts resulting from PG&E's 2008 LTRFO, as there is no guarantee such
17 projects will actually materialize. History has shown that projects that result from
18 LTRFO solicitations cannot offer what PG&E can achieve with respect to the
19 Tesla Generating Station—an efficient generator that can be on-line by 2012 at
20 an initial capital cost of \$[REDACTED]. Two PPAs resulting from PG&E's 2004
21 LTRFO have terminated and one is at-risk, based primarily upon permitting
22 delays and substantially rising costs. Moreover, it is highly unlikely that any
23 developer bidding into the 2008 LTRFO can finance, permit and construct a
24 combined-cycle plant by 2012. As explained below in Section G, a combined-
25 cycle facility is the preferred generation resource given PG&E's current needs.

26 A new RFO process would not provide any additional assurance that the
27 projects would ever be built. In fact, were PG&E to roll the entire 913 MW of
28 needed, unmet generation into the 2008 LTRFO process, there are no
29 guarantees that projects approved as a result will actually come on-line by 2012,
30 or that the agreed-upon price will be the ultimate price. PG&E simply cannot risk
31 accepting bids for 913 MW of needed generation that may not come on-line by
32 2012, or at the originally agreed-upon price. What the Tesla Generating Station
33 provides for California consumers is a project that will be on-line not later than
34 2012 at a more certain price.

E. The Tesla Generating Station Is a Cost-Effective Replacement for Terminated and At-Risk Contracts

PG&E's initial estimate for the capital cost of the Tesla Generating Station is \$ [REDACTED]. This estimate was derived from PG&E's experience with the Colusa Generating Station, for which PG&E stepped in for the original developer and received a CPCN from the Commission on June 12, 2008. The costs for Colusa Generating Station have been adjusted to reflect increases in the costs of plant equipment, development and acquisition costs, and increased costs of construction and materials.

PG&E compared the costs and benefits of the Tesla Generating Station to the costs and benefits associated with an offer for a PPA applicable to the Tesla Generating Station project which was submitted by FPL Energy, LLC (FPL) to PG&E at its request and with the amended PPA for the RCEC Project. As demonstrated in Chapter 6, the Tesla Generating Station is shown to have greater market value than these two alternatives. In addition, PG&E compared the Tesla Generating Station to the PPAs/PSAs approved by the Commission in the 2004 LTRFO. Again, the Tesla Generating Station had a greater market value than these agreements. As is discussed in more detail in Chapter 6, the Tesla Generating Station is a cost-effective choice to meet the identified reliability need in 2012 and beyond.

F. Time Is of the Essence

There are two critical regulatory milestones that must be met in order for PG&E to proceed with this project:

1. **Interim Order:** In order to proceed with early capital commitments to secure equipment, PG&E requires an interim order, by no later than September 18, 2008, allowing PG&E to recover equipment-related costs and associated engineering, permitting and procurement-related costs (termination costs) as an abandoned project expense, and that these costs include Allowance for Funds Used During Construction (AFUDC), in the event the Commission ultimately does not authorize PG&E to proceed with the Tesla Generating Station. In Chapter 4, PG&E has included an estimate of the reasonable termination costs through May 2009.
2. **Final Decision:** PG&E seeks final Commission approval of this application and issuance of a CPCN by January 29, 2009. This date is critical to ensure

adequate time to complete the Tesla Generating Station development and construction to commence commercial operations no later than summer 2012 and, in the event the project is not ultimately approved, to keep termination costs below \$50 million.

1. Interim Order by September 18, 2008

In order to preserve the opportunity for the Tesla Generating Station to be completed by no later than 2012 at the initial capital cost proposed in this Application, PG&E is required to enter into certain early commitments for design, permitting, and to acquire major long lead time machinery prior to a final Commission decision on this Application. Making these commitments in advance of Commission approval of the Application is reasonable and in customers' best interests for two reasons. First, the equipment contracts lock-in the price on major components of the Tesla Generating Station. This provides stability in a period of volatile prices and rapid price escalation. For example, the cost of comparable equipment has increased over 20 percent or more from last fall when PG&E priced it in connection with the Colusa Generating Station. Fixed prices for major equipment also provide a firmer basis for PG&E's cost estimate for the Tesla Generating Station and allow PG&E to minimize equipment cost-related contingencies. Second, the contracts ensure supply and timely delivery of the equipment so as to accommodate commercial operations no later than 2012. The typical time for delivery of major power plant equipment is approximately [REDACTED] months from the time of commitment. If PG&E were to wait until after final Commission approval to order the equipment, assuming availability and delivery under the historic schedule, PG&E would be unable to achieve commercial operations by summer 2012.

The equipment contracts that PG&E has entered into contain termination provisions in the event the Commission does not approve this Application. PG&E has requested that the Commission issue the interim order by September 18 because PG&E anticipates that its termination costs as of September 18 will only be about \$5 million. A few days after September 18, PG&E is required to pay an additional \$[REDACTED] to the equipment suppliers. The termination costs continue to ramp up in the following months, reaching approximately \$50 million by January 2009.

1 PG&E requests that the Commission issue an interim order by
2 September 18, 2008 authorizing PG&E to enter into early commitments and,
3 in the event the Commission does not ultimately approve the Tesla
4 Generating Station, to recover fully in rates the actual termination costs it
5 has incurred prior to obtaining a final decision on the Application. PG&E
6 proposes that the cost recovery authorization in the Interim Order would be
7 subject to a review of PG&E's reasonable management and administration
8 of equipment contracts and associated termination costs. PG&E identifies
9 these costs in Chapter 4 through May 2009.

10 **2. Final Order by January 29, 2009**

11 PG&E seeks a final Commission decision in this proceeding by
12 January 29, 2009 in order to achieve an on-line date no later than
13 summer 2012, and to minimize termination costs in the event the
14 Commission does not approve the project. The CEC permit for the Tesla
15 Generating Station prescribes a construction start date no later than
16 June 2009, although this deadline may be extended by the CEC. PG&E
17 must have Commission approval by January 29, 2009 in order to maintain a
18 June 2009 construction start date. Moreover, termination costs will reach
19 \$50 million by January 29, 2009, and will ramp up significantly after that.
20 PG&E's request for a January 29, 2009 Commission decision ensures that
21 PG&E's customers will not be subject to termination costs in excess of
22 \$50 million if the Commission does not approve PG&E's Application.

23 This proceeding can be expedited because many of the key issues, for
24 example, the results of an environmental review and the establishment of
25 need, have already been resolved or determined in advance of this
26 Application.

27 **G. A Combined Cycle Project Is Preferred, Given Current Needs**

28 While time is of the essence, the appropriate type of generation to fill the
29 void left by terminated or at-risk contracts is also a consideration. Although
30 peakers could potentially come on-line by 2012, the current identified need is
31 more appropriately satisfied with a combined-cycle plant. A combined-cycle
32 plant can more effectively integrate and balance intermittent renewable
33 resources, which begin to ramp up deliveries to PG&E in the 2011 to 2014 time

1 frame. The Tesla Generating Station is designed to be operationally flexible,
2 with the capability to meet changing system conditions.

3 The Tesla Generating Station's combined-cycle design is also an efficient
4 and environmentally sound way to generate electric power using natural gas.
5 With its relatively low heat rate of 7,000 British thermal unit/kilowatt-hour
6 (Btu/kWh), it can provide the same services as operationally flexible but older,
7 inefficient and less reliable facilities, further improving the overall electric supply
8 system efficiency to customers. Its operational flexibility will help PG&E
9 integrate intermittent renewable resources, such as wind, much more efficiently
10 than many less efficient natural gas-fired facilities that currently provide these
11 services. The Tesla Generating Station can provide these integration services
12 more reliably and with lower quantity gas burns. In this way, the facility will
13 provide economic benefits while helping to promote the State's energy policies.

14 In addition, the Tesla Generating Station has other environmental benefits.
15 First, the facility will operate at a low heat rate, using less natural gas and
16 producing fewer greenhouse gas emissions per unit of electricity output, than
17 currently operating natural gas facilities. Second, the Tesla Generating Station
18 can replace older generation facilities that rely on once-through cooling
19 technology and help California comply with the Federal Clean Water Act. As
20 described in Chapter 2, the Tesla Generating Station has a lower average heat
21 rate and carbon dioxide (CO₂) emission rate than other existing natural gas-fired
22 units.

23 **H. PG&E's Ratemaking Requests Are Reasonable and Appropriate**

24 PG&E's ratemaking proposal has two key elements: (1) if a CPCN is
25 granted, PG&E proposes that the Commission adopt a reasonable and prudent
26 target of \$ [REDACTED] in initial capital costs; and (2) if the CPCN request is not
27 approved, PG&E requests authority to recover its sunk termination costs as
28 abandoned project costs (as addressed in the Interim Order) and to recover its
29 site acquisition and development costs as Plant Held for Future Use (PHFU), in
30 anticipation that the valuable Tesla site will at some point in the future be used
31 for generation development. In addition, PG&E proposes that the acquisition
32 costs associated with Tesla Phase Two be classified as PHFU, as Phase Two
33 represents a valuable future option for generation.

1. Initial Capital Costs

Similar to the ratemaking adopted for the Gateway and Humboldt Generating Stations, PG&E requests that the Commission find that \$[REDACTED] is a prudent and reasonable estimate of the first unit of the Tesla Generating Station. The basis for the \$[REDACTED] estimate is described in Chapter 4 and was developed using the Colusa Generating Station estimate as a starting point, updated for current costs, and tailored to reflect the unique features of the Tesla Generating Station. As discussed above, PG&E has locked in the costs of major generation equipment through long lead time procurements.

Under PG&E's ratemaking proposal, if the actual cost for the first unit of the Tesla Generating Station is less than or equal to \$[REDACTED], PG&E would be entitled to include its actual cost in rate base, without the need for an after-the-fact reasonableness review. If the actual costs of the facility are in excess of \$[REDACTED], PG&E will be permitted to begin recovery of the full \$[REDACTED] once the Tesla Generating Station becomes operational and PG&E would be entitled to file an application with the Commission for recovery of amounts in excess of the \$[REDACTED] only to the extent:

- (1) the excess costs result from operational enhancements to the project; or
- (2) the excess costs are the result of an action or force that was beyond PG&E's reasonable control. For example, excess costs attributable to permitting delays or changes to the project mandated by regulatory agencies would be eligible for recovery under such an application process.

In addition, similar to the treatment for the Colusa and Humboldt facilities in Decision 06-11-048, PG&E requests that it be able to recover its actual incentive payments to suppliers or contractors (or return any penalties) through an advice filing after the amounts are known. PG&E's ratemaking proposal is described in more detail in Chapter 7.

PG&E's ratemaking proposal is similar to the ratemaking approved by the Commission for the Gateway and Humboldt Generating Stations. In both instances, the Commission found it was reasonable to provide some opportunity for the utility to recover costs in excess of the adopted cost target under limited circumstances, such as operational enhancements or mandated changes to the project. Given (1) the reliability-driven need for

1 the project; (2) the tremendous uncertainty in the market that has led to
2 rapidly increasing costs of equipment and construction; (3) the pattern of
3 regulatory permitting denials and extended delays; and (4) the track record
4 of terminated and at-risk projects from PG&E's 2004 LTRFO, it is
5 reasonable to grant PG&E's ratemaking proposal in order to ensure that the
6 Tesla Generating Station proceeds and becomes operational no later than
7 summer 2012. PG&E's ratemaking proposal provides a powerful incentive
8 for PG&E to contain costs, and allows the Commission to scrutinize costs in
9 excess of the initial requested cost cap of \$ [REDACTED].

10 **2. Operations and Maintenance Costs**

11 PG&E requests that the Commission authorize operations and
12 maintenance (O&M) costs for the period between the Tesla Generating
13 Station's commercial operations date and PG&E's next General Rate Case.
14 These are PG&E's costs to ensure prudent, safe, reliable, efficient, and
15 cost-effective operation of the Tesla Generating Station. PG&E estimates
16 \$ [REDACTED] in First Year O&M costs to operate the facility, and has
17 provided additional years of O&M costs in Chapter 5. PG&E requests that
18 the Commission find that these are prudent and reasonable estimate of
19 PG&E's O&M costs.

20 **3. Cost Recovery if the Project Is Not Approved**

21 If PG&E is not granted a CPCN for the Tesla Generating Station, PG&E
22 requests that it be granted abandoned cost recovery for its termination costs
23 and that it be entitled to "bank" the Tesla site as PHFU. Abandoned project
24 recovery is appropriate in this case because PG&E entered into the
25 equipment contracts and incurred associated costs during a period of great
26 resource uncertainty in order to preserve an option that it reasonably
27 determined was needed to ensure reliable service to its customers. Given
28 the uncertainty in the market, the important resource reliability need, and the
29 customer benefit associated with locking in equipment contract prices in a
30 rapidly escalating market, abandoned cost recovery is warranted and
31 reasonable. It is also appropriate to allow PG&E to treat the Tesla site as
32 PHFU in the event that the Commission does not authorize PG&E to
33 proceed with the Tesla Generating Station. Even if the Commission does

1 not grant PG&E's application, the Tesla site still has value to customers for
2 future development, and thus is appropriately treated as PHFU.

3 **4. Costs Associated With Phase Two of the Tesla Generating** 4 **Station**

5 The Tesla Generating Station's permit authorizes the development of
6 two 560 MW combined cycle facilities. PG&E only proposes to develop
7 Phase One of the Tesla Generating Station. At some point in the future,
8 Phase Two may become needed and appropriate for development as a
9 power plant. Given this potential future value to customers, PG&E proposes
10 to allocate one-half of the site acquisition costs to Phase Two and that such
11 costs be held as PHFU.

12 **5. Non-Bypassable Charge**

13 Consistent with Decision 04-12-048, Conclusion of Law 16, and
14 additional guidance from Decision 06-06-035 approving the Gateway
15 Generating Station, and Decision 06-11-048 approving the Humboldt and
16 Colusa projects, PG&E requests that the Commission authorize PG&E to
17 recover any stranded costs associated with the Tesla Generating Station
18 through a non-bypassable charge for a 10-year period following commercial
19 operation.

20 **I. Conclusion**

21 Given the magnitude of the contract terminations from the 2004 LTRFO, the
22 very limited options for viable and cost-effective replacement, and the potential
23 adverse consequences for reliability if significant new generation is not brought
24 on-line by summer 2012, the Commission can and should grant this Application.
25 By promptly approving this Application, the Commission can assure continued
26 reliability for customers in the most cost-effective manner available.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 2
OVERVIEW OF TESLA TRANSACTION AND PROPOSED
GENERATING STATION

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 2
OVERVIEW OF TESLA TRANSACTION AND PROPOSED
GENERATING STATION

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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 2
OVERVIEW OF TESLA TRANSACTION AND PROPOSED
GENERATING STATION

A. Introduction

This chapter provides an overview of Pacific Gas and Electric Company's (PG&E or the Company) Tesla Generating Station, including a description of the site, the status of permits and applications, the terms and conditions of the site acquisition, the generating station and its transmission facilities. Additionally, this testimony describes how the Tesla Generating Station will provide operational benefits to meet changing system conditions and demands, as well as provide environmental benefits to support California's Renewable Portfolio Standards (RPS), greenhouse gas (GHG) reduction goals, and assist in improving water quality. PG&E believes its Tesla Generating Station is appropriate to fill the void left by terminated and at-risk contracts from PG&E's 2004 Long-Term Request for Offers (LTRFO).

B. Acquisition of the Tesla Site, Development Rights and Permits

On July 16, 2008, PG&E acquired from Midway Power LLC, a wholly-owned subsidiary of ESI Energy LLC, which is itself a wholly-owned subsidiary of the utility holding entity, FPL Energy LLC (FPL),^[1] the development rights to the Tesla Power Plant, a 1,120 megawatt (MW) proposed natural gas-fired combined cycle power plant to be located on undeveloped agricultural land in eastern Alameda County, California, approximately 5 miles west of the city of Tracy in San Joaquin County and approximately 8 miles east of the city of Livermore in Alameda County. The project site is currently owned by FPL and will be transferred to PG&E at closing. The proposed project is bordered by an abandoned railroad right-of-way to the north and Midway Road to the east, and is located approximately 0.5 miles north of PG&E's existing Tesla Substation.

^[1] For purposes of this testimony, these entities will be referred to jointly as "FPL."

1. Permits and Regulatory

The Tesla Power Plant received its original California Energy Resources Conservation and Development Commission (CEC) license on June 16, 2004, and has received other key permits and approvals necessary to commence construction of the project. At this time, PG&E intends to construct and operate the Tesla Generating Station as it is currently permitted by the CEC. PG&E intends to complete all other actions necessary for Authority to Construct prior to the start of construction in 2009.

The Tesla Generating Station enjoys an advanced status in the California Independent System Operator Corporation (CAISO) generation queue. As of July 1, 2008, the total CAISO generation queue consisted of 361 requests for units with approximate cumulative capacity of 105,000 MW.^[2] While the interconnection of the Tesla Generating Station had previously been evaluated, the analyses are being refreshed under the CAISO Large Generation Interconnection Process (LGIP). Under its proposed reform of the LGIP, the CAISO is expediting the interconnection evaluation of "late stage" interconnection requests such as the Tesla Generating Station by focusing its resource on this narrow group of interconnection requests. The CAISO expects these studies to be completed by October 2008.

2. Alameda County Community Benefits Packages

FPL has entered into discussions with Alameda County for a mutually beneficial arrangement (the "Cooperation Agreement") which provides for expedited County processing for Tesla Generating Station related permits and applications. This Cooperation Agreement will also provide funding from FPL supporting road improvements, conservation land easements, agricultural management committees, rural fire protection and enhanced health care operations. PG&E would assume all of the benefits and obligations of the Cooperation Agreement at closing.

^[2] See July 1, 2008 CAISO Memorandum entitled "Decision on Generator Interconnection Process Reform Proposal," page 1. This memorandum can be accessed on the CAISO's website via the following link: <http://www.caiso.com/1ff8/1ff8b4aa283f2.pdf>.

C. Terms and Conditions of the Acquisition of the Tesla Site

1. Due Diligence

PG&E has been investigating and evaluating the opportunity to acquire the Tesla site since late 2007. PG&E conducted thorough due diligence before deciding to pursue site acquisition. PG&E found the project to be highly viable. There are a few issues left to resolve, which PG&E is working towards resolution with FPL, and those issues have become conditions to the close of the transaction. These conditions to close include:

1. Cancellation of Williamson Act Land Conservation Contract – An arrangement must be made with Alameda County to cancel a conservation easement on the parcels hosting the project.
2. Affiliate Easements – FPL must extinguish easements on the parcels hosting the project held by its affiliates or to indemnify PG&E against any harm for any affiliate easements that remain.
3. Title Policy – An Extended Coverage ALTA Owner's Policy of Title Insurance must be issued covering the parcels hosting the project.
4. Discharge of Liens – All liens encumbering the personal property included in the project, real property or interests in the real property must be discharged.
5. Cooperation Agreement – FPL must deliver a fully executed contract with Alameda County, which will establish a cooperative relationship for the expedited development of the facility.
6. Proposed Construction – PG&E must receive a CEC determination that a recently constructed section of the water supply pipeline in Mountain House, California, was authorized.

PG&E expects these conditions to be cleared and the transaction to close by the end of 2008.

2. Transaction Payments

On July 16, 2008, PG&E acquired from FPL all of the interests and development rights associated with the Tesla Power Plant site, subject to the closing conditions referenced above. PG&E agreed with FPL on a price for the Tesla site of \$ [REDACTED]. In addition, if the acquisition closes, PG&E is obligated to reimburse FPL for up to \$ [REDACTED] in costs that FPL

1 may incur prior to closing with respect to the construction of a water supply
2 line to the project.

3 The transaction between PG&E and FPL is divided into three distinct
4 stages and associated payments to FPL. They include:

- 5 1. PG&E is to pay \$ [REDACTED] to FPL on the Closing Date. Closing is
6 defined as extinguishment or waiver of all of the conditions to close.
- 7 2. PG&E is to pay \$ [REDACTED] to FPL within 30 days of final California
8 Public Utilities Commission (CPUC or Commission) approval for the
9 First Power Train.
- 10 3. PG&E is to pay \$ [REDACTED] to FPL within 30 days of final Commission
11 approval for the Second Power Train.

12 **3. Seller Repurchase Option**

13 If by December 31, 2011, PG&E has not: (a) filed an application for
14 Commission approval of one of the Tesla site power trains; or (b) entered
15 into a notice to proceed for power plant equipment specifically for one of the
16 Tesla site power trains, then FPL will have the option, but not an obligation,
17 to repurchase its Tesla site interests for \$ [REDACTED], plus PG&E's
18 reasonable, demonstrable, out-of-pocket costs and expenses (excluding
19 PG&E's internal incurred costs and expenses). The filing of this Application
20 extinguishes FPL's re-purchase option

21 **4. Pre-Closing Project Development**

22 FPL and PG&E have agreed to work together during the period between
23 the signing of the Tesla Purchase and Sale Agreement and Closing to
24 constructively engage with Alameda County to extend the Certificate of
25 Tentative Cancellation of Alameda County Land Conservation Contract for
26 the parcel that the Tesla Generating Station will be constructed upon (per
27 the Williamson Act) and to modify and execute the Cooperation Agreement
28 with Alameda County. In addition, FPL and PG&E will work together to cure
29 other existing easements on this parcel. FPL and PG&E will also work with
30 the City of Tracy to establish a water supply contract. These issues must be
31 resolved to PG&E's satisfaction for closing to occur.

D. PG&E's Tesla Generating Station

1. Project Overview

PG&E intends to construct the Tesla Generating Station in conformance with the CEC 2004 decision and permit,^[3] except that, at this time, PG&E plans to construct only one of the two permitted phases. Each phase would consist of two 7FA class combustion turbine-generators (CTG) provided with evaporative inlet air coolers, two multipressure heat recovery steam generators (HRSG) equipped with duct burners, one reheat condensing steam turbine-generator (STG) and other ancillary facilities.

As permitted, the project's cooling system includes a surface condenser, circulating water system, a plume-abated wet cooling tower system, and a zero liquid discharge (ZLD) system. To control air emissions, the CTGs will be equipped with dry low nitrogen oxide (NO_x) combustors, and the HRSGs will include selective catalytic reduction and oxidation catalysts.

At full load, each CTG will produce approximately 162 MW gross at 97°F ambient temperature. Heat from CTG exhaust is used in the HRSGs to generate steam and to reheat steam. With the CTGs at full load but without the duct burners in operation, the HRSGs produce sufficient steam for the STG to operate at the base load output of 185 MW gross, yielding an overall gross output of approximately 509 MW for each phase. Under the same conditions but with the duct burners in service, the STG will produce additional output. The output of a combined cycle plant will vary with atmospheric conditions due to the nature of combustion turbine performance, the degree of duct firing, and auxiliary power consumption. The net power out of the Tesla Generating Station is nominally 560 MW.

The planned operational life of the power plant is 30 years, although it could be operated for a longer period if the facility remains economically viable.

[3] A complete copy of the CEC's final decision can be found at http://www.energy.ca.gov/sitingcases/tesla/documents/2004-06-22_FINAL.PDF.

2. Water Supply

Cooling water for the Tesla Generating Station will be drawn from Title 22 recycled water supplied by the nearby City of Tracy Wastewater Treatment Plant (TWWTP) using an 11-mile recycled water supply pipeline which would begin at a new pump station located immediately west of existing effluent pumps at the TWWTP. A draft water supply contract has been developed with the City of Tracy. The supply capacity of the TWWTP and the water pipeline is sized to supply both phases, plus some additional capacity margin to allow the City of Tracy to serve additional customers along the pipeline route.

The reclaimed water supply pipeline would be constructed within existing rights-of-way. Along paved roads, the pipeline would be constructed along the shoulder, so as to work within the existing road easement and areas already affected by the road. This would also avoid or minimize disturbance to vehicle travel. Through agricultural fields, the pipeline would be constructed within existing public utility easements or within or along the shoulder of agricultural access roads wherever possible.

The Tesla Generating Station also includes an on-site water storage tank with a capacity of 8.4 million gallons, of which 8.1 million gallons will be dedicated to plant operation. This quantity is sufficient to cover a 48-hour interruption of water supply during summer peak conditions for a single phase; 24-hours for two phases. The balance of 0.3 million gallons will be dedicated to the plant's fire protection water system.

The project has two separate wastewater collection systems. All industrial wastewater, including water discharged from the cooling towers, will be collected for processing in a ZLD system that uses reverse osmosis and a brine concentrator to remove dissolved minerals and transform liquid sludge into solid material for disposal at an appropriate land fill. The ZLD system also returns any remaining distillate for reuse as makeup water in the cooling tower. Domestic wastewater will be discharged into an on-site septic system.

3. Electrical Transmission and Interconnection

Electricity will be generated at 18 kilovolts (kV) by the two CTGs and STG, and then stepped up at the new project switchyard to 230 kV for

1 delivery to the Tesla Substation. A new 0.8-mile, double-circuit, 230-kV
2 transmission line will connect the switchyard to PG&E's Tesla Substation,
3 south of the project site. For a more detailed description, see Chapter 2,
4 Section E, below.

5 **4. Fuel Supply**

6 The Tesla Generating Station will be fueled by natural gas supplied by a
7 PG&E high pressure backbone pipeline south of the intersection of I-580
8 and Patterson Pass Road in San Joaquin County. Natural gas will be
9 continuously delivered to the site via a new 24-inch, 2.8-mile pipeline. This
10 pipeline will be sized to accommodate two power trains at the Tesla
11 Generating Station. There is no provision to store gas onsite or use a
12 backup liquid fuel.

13 **E. Transmission Facilities**

14 **1. Overview of the Interconnection Plan**

15 PG&E proposes to construct a new approximately 0.8 mile long
16 double-circuit 230 kV Transmission Line (Tie-Line) that will connect the
17 Tesla Generating Station to the CAISO controlled grid at PG&E's existing
18 Tesla Substation.

19 The Tie-Line will connect the Tesla Generating Station to the Tesla
20 Substation 230 kV Bus E by building a new double circuit 230 kV
21 transmission line, each circuit to be strung with 2×954 thousand circular mil
22 (kcmil) Aluminum Conductor Steel Supported (ACSS), which would be
23 capable of carrying the full generation output of two power trains of PG&E's
24 Tesla Generating Station. The new transmission Tie-Lines will be routed
25 along PG&E-owned property between the Tesla Generating Station and
26 Tesla Substation. The Tie-Line will run east along the project boundary and
27 then Southeast to a location where it is appropriate for crossing the existing
28 Tesla-Tracy 230 kV line. The Tie-Line then runs parallel to the Tesla-Tracy
29 230 kV line in the existing transmission corridor to Tesla Substation.

1 A map of the regional setting of PG&E's Tesla Generating Station and
2 the proposed Tie-Line route is identified in Figure 3.6.2 of the Tesla Power
3 Project Application for Certification (AFC) filed at the CEC.[4]

4 To accommodate termination of one of the two Tie-Line circuits at the
5 Tesla Substation 230 kV Bus E without an extension of the Tesla Substation
6 fenced area, a spare switch bay with a new breaker would be installed at the
7 end of the Tesla 230 kV Bus E. In addition, minor relocations of the Tesla-
8 Ravenswood 230 kV line termination to the Tesla 230 kV Bus C, and the
9 Tesla-Newark 230 kV line termination on Bus E to the adjacent position
10 CB242 will be made to make termination positions available for the Tie-Line.
11 The spare CB232 at the Tesla Bus E would then be used for termination of
12 the second interconnecting line from the Project switchyard. All
13 modifications to the Substation will be confined within the fenced yard of the
14 Tesla Substation.[5]

15 Potential upgrades to the transmission network are identified in the
16 CAISO-approved interconnection studies and will be designed, permitted,
17 and constructed by PG&E as the transmission owner in accordance with
18 applicable tariffs and laws, and are more fully described in the CEC Final
19 Staff Assessment, Section 5.5.[6]

[4] The AFC is part of CEC Docket No. 01-AFC-21, and can be accessed *via* the CEC's website at <http://www.energy.ca.gov/sitingcases/tesla/index.html>. PG&E incorporates this map by reference into this application.

[5] CEC Commission Decision, p. 120, http://www.energy.ca.gov/sitingcases/tesla/documents/2004-06-22_FINAL.PDF.

[6] http://www.energy.ca.gov/sitingcases/tesla/documents/2003-04-08_TESLA_FSA.PDF.



Public convenience and necessity require construction of the proposed Tie-Line. The proposed Tie-Line will serve California consumers by enabling the Tesla Generating Station to deliver power to the CAISO-controlled grid. Under the CAISO-approved System Impact/Facilities Study, the CEC's final decision and the Federal Energy Regulatory Commission (FERC)-approved Generator Special Facilities Agreement, the interconnection of the project is conditioned on construction of the Tie-Line, without which power from the project cannot be delivered to the CAISO-controlled grid.

The Tesla Generating Station will be a reliable and environmentally responsive source of capacity, energy, and ancillary services. The unit

1 configuration provides a cost-effective, reliable, and efficient source of
2 generation. The Tesla Generating Station will be equipped with two
3 capacity-enhancing technologies to further cost-effectively improve energy
4 output during peak generation periods: evaporative coolers at the inlet to the
5 CTGs and duct burners to increase steam production in the multi-pressure
6 HRSG resulting in increased condensing STG output.

7 The Tesla Generating Station is expected to have an average heat rate, the
8 amount of natural gas per unit of electricity output, of 7,000 British Thermal
9 Units/kilowatt-hour (Btu/kWh) and a corresponding average carbon dioxide
10 (CO₂) emission rate of 0.82 pounds/kWh.

11 The Tesla Generating Station is designed to be operationally flexible, with
12 the capability to start up quickly and frequently, and to rapidly increase or
13 decrease output to meet changing system conditions and demands. The
14 combined-cycle design is an efficient and environmentally sound way to
15 generate electric power using natural gas. With its relatively low heat rate of
16 7,000 Btu/kWh, it can replace generation from older, inefficient facilities, further
17 improving the overall electric supply system efficiency to customers. Moreover,
18 its operational flexibility will help PG&E integrate intermittent renewable
19 resources, such as wind, much more efficiently than many less efficient, boiler
20 only natural gas-fired facilities that currently provide these services. In this way,
21 the facility will provide economic benefits while also helping to promote the
22 State's current and future energy policies.

23 The CEC approved the Tesla Generating Station with conditions to mitigate
24 environmental and community impacts such as the use of state-of-the-art control
25 equipment to minimize air emissions. Air emissions will be controlled through
26 the use of dry NO_x combustion coupled with selective catalytic reduction (SCR)
27 systems. Each HRSG will be equipped with a SCR system to further reduce
28 NO_x, as well as a carbon monoxide (CO) catalyst to control CO emissions. This
29 ensures that the Tesla Generating Station is designed, constructed, and
30 operated in a manner that will protect public health and safety, promote the
31 general welfare, and preserve environmental quality.

32 In addition to preserving environmental quality, the Tesla Generating Station
33 will have other additional environmental benefits. First, because the facility will
34 operate at a low heat rate, it will use less natural gas and produce fewer

1 greenhouse gas emissions per unit of electricity output than many currently
 2 operating natural gas fueled power facilities. Second, as stated above, the
 3 Tesla Generating Station can help integrate intermittent renewable generation
 4 into the power supply system. Third, the Tesla Generating Station can replace
 5 older generation facilities that rely on once-through cooling technology, helping
 6 California achieve further reductions in overall impacts to water quality. The
 7 following table demonstrates that the Tesla Generating Station has a lower
 8 average heat rate and CO₂ emission rate than other older operating units or
 9 planned combustion turbine units.

**TABLE 2-1
PACIFIC GAS AND ELECTRIC COMPANY**

Line No.	Generation Unit	Average Heat Rate (Btu/kWh)(a)	Average CO ₂ Emission Rate (Lbs/kWh)
1	Tesla Generating Station	7,000	0.82
2	Generic Combustion Turbine	9,100	1.06
3	Contra Costa Unit 6	9,500	1.11
4	Contra Costa Unit 7	9,600	1.12
5	Morro Bay Unit 3	9,700	1.13
6	Morro Bay Unit 4	9,500	1.11
7	Moss Landing Unit 6	9,100	1.06
8	Moss Landing Unit 7	8,900	1.04
9	Pittsburg Unit 5	9,700	1.13
10	Pittsburg Unit 6	9,900	1.16
11	Pittsburg Unit 7	9,700	1.13
12	Potrero Unit 3	9,800	1.15

(a) Note: Average heat rate represent heat rate at full load and have been rounded to nearest 100 Btu/KWh. The Generic Combustion Turbine heat rate is based on the heat rate of a GE LM6000 combustion turbine unit. The heat rates of the older operating units were taken from a 1998 CEC study.

10 As described above, the Tesla Generating Station is designed to generate
 11 electric power using natural gas fuel efficiently and in an environmentally
 12 responsible manner. It will also provide additional operational benefits to meet
 13 changing system conditions and demands, as well as providing environmental
 14 benefits to further the California's RPS, greenhouse gas reduction goals, and
 15 assist in improving water quality.

1 **G. Conclusion**

2 Given the status of the CEC license and the terms and conditions of the site
3 acquisition, PG&E's Tesla Generating Station is a viable option to fill the void left
4 by terminated and at-risk contracts. As a combined cycle plant, the Tesla
5 Generating Station has the operational flexibility to start up quickly and
6 frequently, and to rapidly increase and decrease output to meet changing
7 system conditions. With its relatively low heat rate it can provide the same
8 services as operationally flexible but older, inefficient and less reliable facilities,
9 further improving the overall electric supply system efficiency to customers. This
10 operational flexibility will also help PG&E integrate and balance intermittent
11 renewable resources, such as wind and solar, much more efficiently than many
12 existing, older natural gas-fired facilities that currently provide these services.
13 The Tesla Generating Station can provide these integration services more
14 reliably and with lower quantity gas burns. In this way, the facility will provide
15 economic benefits while helping to promote the State's energy policies. The
16 Tesla Generating Station can also replace older generation facilities that rely on
17 once-through cooling technology and help California improve water quality. The
18 Tesla Generating Station will assure continued reliability for customers in the
19 most cost-effective manner available.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
PG&E'S TESLA GENERATING STATION
IS NEEDED FOR RELIABILITY

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
PG&E'S TESLA GENERATING STATION
IS NEEDED FOR RELIABILITY

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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
PG&E'S TESLA GENERATING STATION
IS NEEDED FOR RELIABILITY

A. Introduction

This chapter discusses the uncertainties in the development of new generation facilities in California, and many of the reasons for these uncertainties. Among various challenges, new generation faces permitting uncertainties and rapidly escalating costs. A significant number of new generation projects that were expected to come on-line in the near future have recently been terminated or are at risk of being terminated by developers who have found many of the development challenges insurmountable. This chapter demonstrates that Pacific Gas and Electric Company's (PG&E or the Company) proposed Tesla Generating Station is a project that can meet anticipated reliability needs, and would provide a far superior option to initiating a new competitive bidding process to meet anticipated reliability needs.

B. The Development of New Generation in Northern California Is Uncertain

1. Permitting and Development Challenges Are Impacting New Generation Proposed for Northern California

The development of new generating facilities—including site selection, site control, electric and gas interconnection studies, procurement of emission offsets and water, project design, permitting, and financing—is a time-consuming and capital-intensive effort. In California, the challenges associated with permitting a generating facility can significantly delay or even cause the cancellation of a project. Additionally, the rapid and unprecedented rise in the underlying power plant materials and construction costs has created significant economic pressure on participants who previously offered and committed to deliver a power plant under a fixed price contract.

1 **a. Permitting Uncertainties**

2 **(1) California Energy Commission Backlog**

3 The California Energy Resources Conservation and
4 Development Commission (CEC) is California's lead agency for
5 siting and permitting thermal power plants over 50 megawatts (MW).
6 Under statute, the CEC is required to process a generator's
7 Application for Certification (AFC) within twelve months after the
8 application has been accepted by the CEC. However, because of
9 the state requirement that all Load Serving Entities meet 20 percent
10 of their load with renewable energy by 2010, and the need for new
11 capacity to replace aging facilities and to back up intermittent
12 generation as well as meet load growth, the CEC has been unable
13 to consistently meet the 12-month standard for processing
14 generator applications.

15 Another factor contributing to the delay of processing
16 applications at the CEC is that many projects are seeking permits
17 relating to new technologies for which the Siting Division does not
18 have extensive experience in reviewing, such as reciprocating
19 engines and new solar technologies. It is expected that almost
20 12 different solar projects will file at the CEC within a year.

21 Because of the amount of cases before the CEC, the Siting
22 Division staff has routinely asked for, and received, additional time
23 from the Commissioners in analyzing cases. For projects in
24 northern California, the CEC permitting process has taken an
25 average of 14 to 15 months to complete recently, and in some
26 cases it has stretched out as long as 20 months.

27 **(2) Local Opposition**

28 Power plant developers have also experienced significant local
29 opposition in the form of challenges to permits. Local opponents
30 have the opportunity to take part in CEC hearings, and communities
31 have used local zoning ordinances in attempts to block new power
32 plant development. Some individuals have gone to court to appeal
33 siting decisions, with mixed results. Though these challenges rarely
34 succeed, they frequently result in delays to the project.

Such delays in the AFC process as well as those caused by challenges to the permits have and will continue to result in developers suspending development efforts such as detailed engineering, financing, and purchasing major equipment. This is costly from a timing perspective. Because significant time has passed, previous work is often stale and unusable. Restarting these efforts often means "rewinding" the clock, or restarting projects, which adds to the project cost and pushes the operational date farther out into the future.

(3) The California Independent System Operator Corporation Queue

The California Independent System Operator Corporation (CAISO) has procedures in place for interconnecting large (>20 MW) and small (= <20 MW) generators. These procedures include studying the ability of the transmission system to handle the increased generation that would result from interconnection of new generation facilities. The CAISO maintains an Interconnection Queue of generator interconnection requests. As of July 1, 2008, projects currently in the queue now represent about 105,000 MW of new potential generation capacity.^[1] To put this number into context, the historic peak demand for the CAISO Control Area in July 2006 was 50,270 MW.^[2]

Since the number of generation projects in the CAISO Interconnection Queue far exceeds the amount of generation that can reasonably be expected to be developed, the CAISO has begun an interconnection reform process for clearing the queue and keeping it manageable going forward.^[3] In the meantime, generators currently in the CAISO queue may experience significant

[1] See July 1, 2008 CAISO Memorandum entitled "Decision on Generator Interconnection Process Reform Proposal," p. 1. This memorandum can be accessed on the CAISO's website via the following link: <http://www.caiso.com/1ff8/1ff8b4aa283f2.pdf>.

[2] *Id.*

[3] The CAISO refers to this as its Generation Interconnection Process Reform (GIPR).

delays while the CAISO tries to resolve the number of potentially speculative projects now in the queue.

The CAISO closed the old queue at the end of May, and opened a new queue on June 2, 2008. Under the CAISO's proposed reform process, some projects in the old queue at the time it closed will be studied this year by the CAISO as it works to clear the current queue. Other projects in the old queue may not see completed transmission studies until as late as October 2010. Projects that apply for interconnection as part of the new queue after May 2008 may not see executed interconnection agreements until the first quarter of 2012. The Tesla Generating Station will not experience these delays due to its advanced status in the interconnection process, as explained in Chapter 2.

b. Costs Are Increasing

Capital costs have risen substantially in recent years. Costs of steel and concrete have increased, driven by worldwide demand. Current currency exchange rates and a weak dollar have driven up the relative price of materials imported into the United States. At the same time, heavy national demand for the type of skilled labor needed to construct power plants has increased labor costs significantly. Further exacerbating the problem, the electric power industry is entering a major capital investment phase placing further upward pressure on prices. A recent press release by Cambridge Energy Research Associates describes an index it uses to track the costs of building coal, gas, wind and nuclear power plants, and states that the index indicates that a power plant that cost \$1 billion to construct in 2000 would, on average, cost \$2.31 billion today.^[4]

Under these market conditions, to the extent a developer does not have firm control over costs and schedule certainty, such uncertainty jeopardizes the ability to complete the facility within the contract terms initially agreed to between the developer and the utility.

[4] See <http://www.cera.com/asp/cda/public1/news/pressReleases/pressReleaseDetails.aspx?CID=9505>.

2. Contracts for Two New Generation Facilities From PG&E's 2004 LTRFO Have Been Terminated and a Third Is At Risk and in Need of Additional Regulatory and Permitting Approvals

PG&E's 2004 Long Term Request for Offer (LTRFO) resulted in contracts for seven new generating facilities to be constructed in northern California, for a total of 2,250 MW. When PG&E filed its April 2006 application seeking California Public Utilities Commission (CPUC or Commission) approval of these contracts, it included the following information in its application.^[5]

**TABLE 1-1
PACIFIC GAS AND ELECTRIC COMPANY
FINAL CONTRACTS**

Line No.	Facility	Size (MW)	Purpose	Contract Type	Operational Date	Plant Type	Term
1	Calpine Hayward	601	Long-Term Need	PPA	June 2010	Combined Cycle	10
2	EIF Firebaugh	399	Long-Term Need	PPA	August 2009	Combustion Turbine	20
3	EIF Fresno	196	Long-Term Need	PPA	September 2009	Combustion Turbine	20
4	Starwood Firebaugh	118	Long-Term Need	PPA	May 2009	Combustion Turbine	15
5	Tierra Energy Hayward	116	Long-Term Need	PPA	May 2009	Reciprocating Engine	20
6	E&L Westcoast Colusa	657	Long-Term Need	PSA	May 2010	Combined Cycle	Life of Asset
7	Long-Term Need	2,087					
8	Wartsila Humboldt	163	Humboldt	EPC	May 2009	Reciprocating Engine	Life of Asset
9	Total	2,250					

Since April 2006, two of the projects, Bullard Energy Center and Tierra Energy Hayward (also referred to as the Eastshore Energy Center), have encountered obstacles which have led to contract terminations. As described in Chapter 1, PG&E and Russell City Energy Center, LLC (RCEC)

^[5] At the time of PG&E's application, Tierra Energy Hayward was referred to as Identity Confidential, and the developer was identified as Tierra Energy shortly thereafter.

1 have recently agreed in principle on an amendment to the RCEC PPA to
2 revise the pricing and extend the on-line date by two years, to June 2012.
3 RCEC still needs to obtain final permits for the facility and the Commission
4 needs to approve the amended PPA. These three projects represent
5 913 MW of the capacity contracted for in the 2004 LTRFO. The details
6 relating to these specific projects are discussed below.

7 **a. Bullard Energy Center (EIF Fresno)**

8 The Bullard Energy Center submitted an AFC with the CEC on
9 November 6, 2006, to permit and construct a 196-MW power plant. The
10 developer, Bullard Energy Center, LLC, originally planned to start
11 construction in 2008, and begin commercial operation in the
12 summer 2009. On January 30, 2007, the Acting Director of the City of
13 Fresno Planning and Development Department notified the Bullard
14 project manager by letter that the proposed project was not consistent
15 with the Fresno Zoning Ordinance and the policies of the Fresno 2025
16 General Plan.

17 The letter detailed how the proposed project was not consistent with
18 the M-1 light manufacturing zoning by right or by a conditional use
19 permit. CEC staff met with the Acting Director of the Planning and
20 Development Department, the City Planning Manager, the Supervising
21 Planner, and the Deputy City Attorney to discuss the zoning issue. At
22 this meeting the city addressed the fact that it approved a less than
23 50 MW power plant at the Bullard site in 2000. The City Planning
24 Manager explained that although a peaker plant was approved by the
25 city at that site, the code section by which the city granted the
26 conditional use permit was intended for public utilities, and not for a
27 merchant plant like the one that had been approved or the Bullard
28 Project.

29 Given the opposition by the City, Bullard Energy Center, LLC
30 notified PG&E by letter dated January 28, 2008, that Bullard would not
31 receive all governmental approvals necessary to proceed with the
32 project by the permitting milestone date defined in the PPA, and that
33 therefore it was electing to terminate its PPA.

b. Eastshore Energy Center (Tierra Energy Hayward)

The Eastshore project has faced significant public opposition and obstacles. The most significant issues surrounding the Eastshore project are the findings by the City of Hayward that Eastshore is inconsistent with the City of Hayward's Zoning Ordinance, and the potential effect of the Eastshore thermal plume on airborne traffic around the local Hayward Executive Airport.

The CEC staff undertook detailed alternatives analysis, which took into account other, alternative locations in which the Eastshore project could be located. As part of its investigation, CEC staff identified a significant impact in its analysis of the Eastshore project. CEC staff believes the thermal plume generated by Eastshore would present an aviation hazard to inbound and outbound airborne traffic from the Hayward Executive Airport. Staff also believes that a Notice to Airmen (NOTAM) instructing pilots to not fly over the Eastshore project would further constrain the airspace, thereby causing another significant impact.

Furthermore, the City of Hayward has argued the project does not conform to city ordinances, zoning classifications and the city's General Plan. Public opposition, as well as a potential significant impact to aircraft significantly delayed the CEC's analysis and decision on Eastshore.

Eastshore Energy, LLC notified PG&E by letter dated May 16, 2008, that Eastshore would not receive a timely decision on its plant siting permit, and that therefore it was electing to terminate its PPA. On June 20, 2008, a committee designated by the CEC to review Eastshore released its Presiding Member's Proposed Decision (PMPD), which recommended against licensing the 116 MW peaker power facility and recommended that Eastshore's AFC be denied because the project is inconsistent with applicable laws, ordinances, regulations, and standards, and also because it creates unmitigable impacts under the California Environmental Quality Act (CEQA).

1 **c. Russell City Energy Center**

2 During the permitting process, RCEC ran into certain obstacles
3 raised by the CEC staff.

4 In particular, during the RCEC Project's license amendment
5 proceeding, the CEC staff identified a potential significant issue
6 concerning the Hayward Executive Airport, air traffic, and the thermal
7 plume for RCEC Project. RCEC put forth extensive evidence at
8 evidentiary hearings to prove to the CEC the thermal plume did not
9 present an aviation hazard. The Federal Aviation Administration (FAA)
10 also made a determination that the RCEC Project did not present a
11 hazard to aviation. Ultimately, the CEC held there was no impact to the
12 Hayward Executive Airport and any potential impact could be mitigated
13 by supplying all pilots with a NOTAM to avoid flying over the RCEC
14 Project site.

15 RCEC received its CEC license amendment in October 2007,
16 subject to appeals. The Bay Area Air Quality Management District
17 approved RCEC's air permit in November 2007 but an appeal of this
18 permit is currently awaiting decision by the Environmental Appeals
19 Board of the Environmental Protection Agency (EAB). Until the EAB
20 issues a final decision on this appeal, RCEC cannot initiate construction
21 on its Project. In addition, RCEC has applied for a two year extension of
22 its CEC license for the project, which, if granted, would require
23 construction to begin by September 2010. The challenge to the PSD
24 permit, in conjunction with the extended CEC process, has resulted in
25 significant delays for the RCEC Project.

26 RCEC and PG&E initiated negotiations and have reached
27 agreement in principle to amend the RCEC PPA to revise the pricing
28 terms and extend the on-line date by two years. The amendment is
29 conditioned on senior management or corporate approvals of both
30 companies and CPUC approval, and will be submitted to the CPUC for
31 consideration within the next 30 to 60 days.

32 **C. There Is a Need for New Generation to Be On-Line by 2012**

33 In addition to describing development challenges, this chapter also
34 addresses the need for new generation resources to be on-line in PG&E's

1 service area by summer 2012 to ensure continued, reliable electric service for
2 northern California. In particular, this section discusses the impact to reliability
3 due to the termination or risk of termination of three generation resources from
4 PG&E's 2004 LTRFO (discussed above), and the need for additional new
5 generation to be on line by 2012 to replace these terminated or at-risk contracts.
6 In addition, there is uncertainty associated with: (1) the development of other
7 new generating facilities in northern California; (2) levels of future demand;
8 (3) the potential for existing aging plant retirement; and (4) the level of Planning
9 Reserve Margin (PRM) needed to provide reliable service to customers. These
10 uncertainties further support the need for additional new generation to be on-line
11 by 2012.

12 **1. Approved Need for Generation in PG&E's Service Area**

13 In Decision 04-12-048, the Commission adopted a long-term
14 procurement plan through 2014 and established the need for 2,200 MW of
15 new generation in northern California by 2010. Subsequently, in
16 Decision 06-11-048, the Commission approved, among other things,
17 PG&E's PPAs with the Bullard Energy Center (196 MW), Eastshore Energy
18 Center (116 MW), and RCEC Project (601 MW).

19 In Decision 07-12-052, the Commission adopted a long-term
20 procurement plan for PG&E for the 10-year period 2007 through 2016. The
21 Commission calculated the 2012 PRM to be 20.6 percent, assuming
22 resources resulting from PG&E's 2004 LTRFO are placed in service as
23 scheduled. This 20.6 percent PRM is above the Commission's current
24 approved upper PRM range of 17 percent, and therefore represents a
25 surplus.

26 **2. Resource Development Cancellations Create Supply Shortfall**

27 Since the issuance of Decision 07-12-052, though, several
28 developments occurred that significantly impacted the availability of
29 projected resources to serve need within PG&E's service area. As
30 described in Chapter 3.A, above, three of PG&E's 2004 LTRFO projects,
31 Bullard, Eastshore and RCEC, representing 913 MW, have encountered
32 obstacles which led to contract terminations for two PPAs and delays for
33 RCEC. While the parties have reached agreement in principle on an

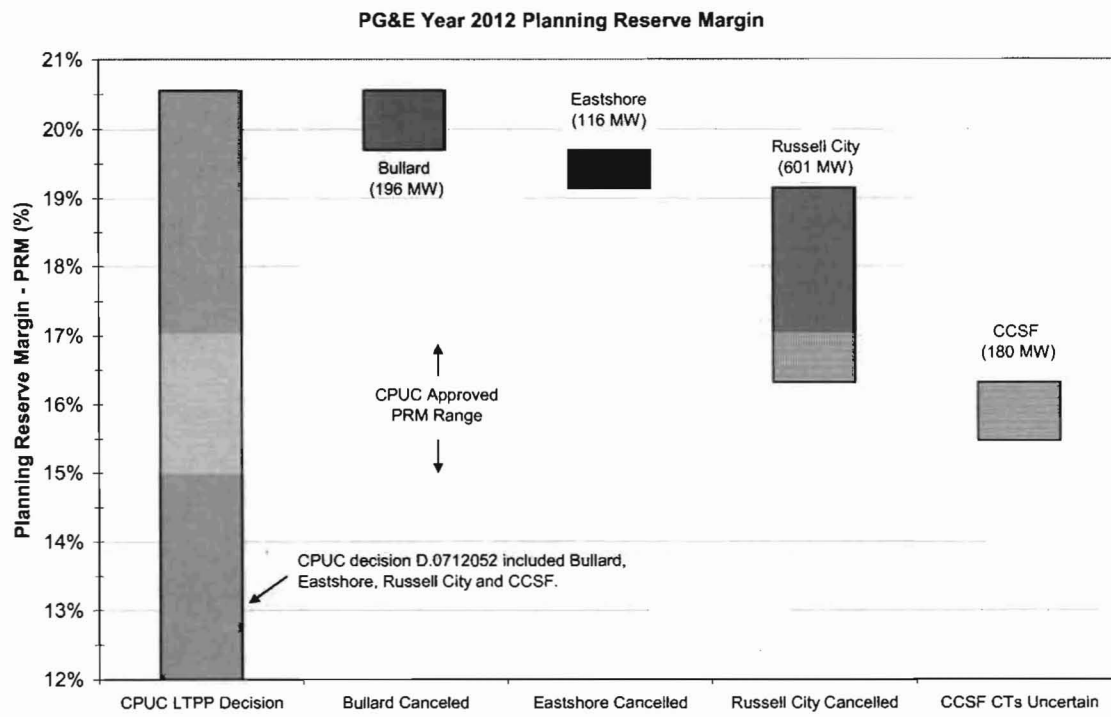
1 amendment to the RCEC PPA, the amendment has not been approved by
 2 the CPUC, nor has RCEC received final permits for development of the
 3 facility. Given these risks, and assuming the 913 MW of new planned
 4 generation does not come on-line as anticipated in Decision 07-12-052,
 5 PG&E's 2012 PRM would be reduced by 4.3 percent, or from 20.6 percent
 6 to 16.3 percent. Similarly, PG&E's 2013 PRM would be reduced from
 7 18.0 percent to 13.7 percent, which is below the minimum of 15 percent
 8 currently established by the CPUC.^[6]

9 There was one other planned addition included in Decision 07-12-052 in
 10 PG&E's Long-Term Procurement Plan (LTPP)—the City and County of
 11 San Francisco's (CCSF) 180 MW San Francisco Reliability Project (SFRP).
 12 The SFRP is experiencing development uncertainties. In July 2008, almost
 13 two years after obtaining a certification from the CEC (in October 2006),
 14 CCSF is now considering supporting a retrofit of Mirant's Potrero Unit
 15 Nos. 4, 5 and 6, and not proceeding with its SFRP. Without the SFRP, the
 16 2012 and 2013 PRM would be further reduced to 15.5 percent and
 17 13.0 percent, respectively.

18 Figures 3.B-1 and 3.B-2 show the impact of these resource changes to
 19 planning reserve margin for the years 2012 and 2013, respectively.

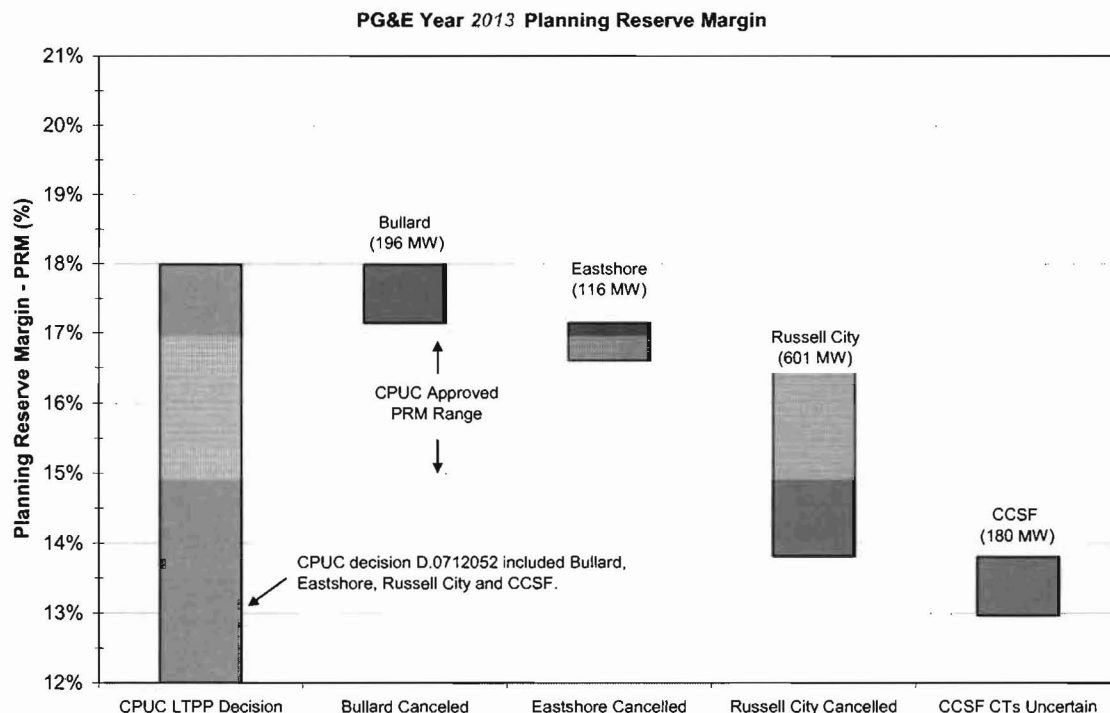
[6] In the 2006 LTPP proceeding, PG&E argued that the current PRM was not sufficient to ensure reliable service consistent with current industry standards, and recommended procuring additional resources to satisfy industry standards. The Commission rejected PG&E's argument in that proceeding (see D.07-12-052 at 98-100), but subsequently initiated a separate rulemaking to evaluate the appropriate PRM. See Rulemaking 08-04-012. By referring to the current Commission-approved PRM standards in this Application, PG&E is not endorsing these standards or changing its position that the current PRM needs to be higher.

**FIGURE 3.B-1
PACIFIC GAS AND ELECTRIC COMPANY
YEAR 2012 PLANNING RESERVE MARGIN**



Note: PRM calculations in chart above start with load forecast and resource (existing and projected) assumptions adopted by the CPUC in the 2006 LTPP decision

**FIGURE 3.B-2
PACIFIC GAS AND ELECTRIC COMPANY
YEAR 2013 PLANNING RESERVE MARGIN**



Note: PRM calculations in chart above start with load forecast and resource (existing and projected) assumptions adopted by the CPUC in the 2006 LTPP decision.

3. Other Uncertainties Could Further Deplete Supply Margin

As described above, cancellations and uncertainty in planned generation facilities will reduce the 2012 PRM. New generation is needed to be on-line by 2012 to ensure continued, reliable electric service for northern California. The need for new additional generation by 2012 is further supported by the additional uncertainties described below.

a. Peak Load Uncertainty

In reviewing historical data, PG&E has observed an increase in ambient temperature in the past decade. Accounting for a continued trend of higher ambient temperatures consistent with global climate

1 change models^[7] would result in a peak load that is about 600 MW
2 higher than the previous forecast included in the Commission's
3 Decision 07-12-052. This higher peak load would reduce the planning
4 reserve by about 3.2 percent for the year 2012.

5 **b. Once-Through Cooling Uncertainty**

6 As observed by the Commission, predicting when aging plants will
7 retire introduces substantial additional uncertainty and presents a
8 significant challenge to capacity planning.

9 In March 2008, the State Water Resources Control Board (SWRCB)
10 released a scoping document and is proceeding with a rulemaking
11 process to consider prohibiting the use of once-through cooling for
12 certain power plants by 2015. The SWRCB also is considering enacting
13 rules and measures beginning in 2010 to mitigate and minimize
14 environmental impacts from the use of once-through cooling.

15 In Decision 07-12-052, the Commission adopted a measured
16 retirement approach that assumed 600 MW of retirements per year
17 starting in 2009 until all 4,400 MW of aging units in PG&E's service area
18 are retired by 2015. Of the 4,400 MW of aging fossil units, 3,680 MW of
19 aging fossil units in PG&E's service area utilize a once-through cooling
20 process. Given the potential requirements that the SWRCB is
21 considering, it is likely that the plant owners may consider accelerating
22 their plans to retire these aging units. If the amount of retirements by
23 the year 2012 increases by 600 MW, the planning reserve will
24 correspondingly decrease by about 2.8 percent

25 **c. PRM Uncertainty**

26 In April 2008, the Commission opened a Rulemaking 08-04-012 to
27 review, and modify to the extent found to be appropriate, the PRM used
28 for purposes of the LTPP and Resource Adequacy (RA) programs.

[7] CEC-500-2007-023: CEC Pier Project Report, Climate Change, Extreme Heat, and Electricity Demand in California, dated August 2007. CEC-500-2005-186-SF: A Report from California Climate Change Center, Scenarios of Climate Change in California: An Overview, dated February 2006.

1 Based on PG&E's analysis and information obtained from the CAISO,[8]
2 PG&E believes the Commission's currently approved PRM of
3 15 to 17 percent does not meet the industry reliability standard of
4 1-day-in-10 years. It is possible that the Commission may find that a
5 higher PRM is more appropriate. Obviously, additional resources would
6 be needed to meet a higher PRM.

7 **D. The Tesla Project Is One of the Only Facilities That Can Meet the**
8 **Need By 2012**

9 As discussed in Section A of this chapter, given the permitting and
10 development challenges associated with bringing new generation to northern
11 California and the need to replace 913 MW of the terminated or at-risk projects
12 from the 2004 LTRFO, the Tesla Generating Station is one of the few projects
13 available that can be developed and on-line in PG&E's service area by
14 summer 2012. As discussed below in Section E of this chapter, resources that
15 result from PG&E's recently issued 2008 LTRFO cannot fill this need since these
16 projects are very unlikely to go on line before summer 2012. The Tesla
17 Generating Station remains one of the only large-scale generation projects
18 available to ensure continued reliable and cost-effective energy supply to
19 northern California.

20 The amendment to the RCEC PPA may result in the RCEC Project being
21 able to achieve commercial operations in by summer 2012. However, there
22 remains uncertainty as to whether and when the RCEC Project will obtain its
23 final permits and whether the amended PPA will be approved by the CPUC.
24 PG&E considers pursuit of both a contract amendment to the RCEC Project and
25 development of PG&E's Tesla Generating Station as a complementary strategy
26 for replacement of the terminated or at risk 2004 LTRFO projects. In light of the
27 recent track record of failed project development in California, having
28 two projects on track for commercial operation by summer 2012 reduces the risk
29 of supply shortages and ensures that if one project is delayed, there will still be
30 sufficient new generation resources to satisfy customer demand. Moreover,
31 there is still a need to replace the 312 MW of generation associated with the

[8] CAISO's "Old Thermal Generation Phase 1 Report" dated February 29, 2008, and "2007 Summer Loads and Resources Operations Assessment" dated March 8, 2007.

1 terminated Bullard and Eastshore projects. Finally, if both projects (*i.e.*, the
2 Tesla Generating Station and RCEC) are ultimately approved by the CPUC,
3 PG&E could adjust the 800 MW to 1,200 MW of need adopted by the CPUC for
4 the 2008 LTRFO.

5 **1. PG&E's Tesla Project May Be On-Line by Fall 2011**

6 If the Commission expedites consideration of the accompanying
7 Application, PG&E believes it can complete the Tesla Generating Station by
8 fall 2011. In any event, the Tesla Generating Station would be completed in
9 advance of summer 2012, when it will be needed. As discussed in
10 Chapter 2 of this Application, PG&E's Tesla Generating Station has already
11 completed several key milestones, including obtaining its CEC license on
12 June 16, 2004 and receiving other key permits and approvals necessary to
13 commence construction of the project. A schedule of upcoming milestones
14 appears in Chapter 4. The Tesla Generating Station is well positioned to be
15 developed by summer 2012 to ensure continued reliable and cost-effective
16 energy supply to northern California.

17 **2. The Tesla Generating Station Is Viable**

18 The Commission recently recognized the significant amount of time
19 needed to develop new generation resources, the risk associated with new
20 generation development, and the corresponding need to find viable projects
21 that will actually be developed. In Decision 07-12-052, the Commission
22 stated that developing a new generation facility, from initial contract
23 development to commercial operation, can take up to seven years. Even
24 after a contract is executed, developers face significant hurdles permitting
25 and constructing new facilities, as describe above, in Section A. In
26 Decision 07-12-052, the Commission also urged utilities to consider viability
27 and the status of permitting when considering new generation proposals,
28 given the significant uncertainty in development, and the reliability risk that a
29 proposed new generation facility will never actually develop.

30 Given the short time until summer 2012, and the substantial amount of
31 time needed to develop a new combined-cycle plant, a new generation
32 resource would need to have its CEC license now in order to meet the
33 summer 2012 need. Currently, there are only six available sites that have

1 received a CEC license and could potentially provide the generation
2 necessary to ensure reliability starting in 2012: Tesla, RCEC, East
3 Altamont, Los Esteros, San Joaquin and the San Francisco Peakers Project
4 (SFPP). East Altamont, Los Esteros and San Joaquin are all owned by
5 Calpine, but PG&E has not been presented with a proposal to purchase
6 power from these facilities since the close of its 2004 LTRFO. As a result,
7 PG&E has no basis to evaluate whether they could be viable replacement
8 alternatives. In addition, neither East Altamont nor San Joaquin have
9 existing CAISO transmission queue positions for interconnection and thus
10 are unlikely to be available to meet CAISO loads by summer 2012.
11 Los Esteros is a combined-cycle upgrade to the Calpine peakers and only
12 represents 140 MW of incremental capacity. As noted previously,
13 development of the SFPP is in doubt. In contrast, the Tesla Generating
14 Station received its CEC permit in June 2004, and currently has an
15 advanced status in the CAISO generation queue.

16 **E. A Competitive RFO to Meet a Summer 2012 On-Line Date Is Not**
17 **Feasible or Practical**

18 A competitive Request for Offer (RFO) is a fluid and dynamic process
19 requiring a substantial amount of work and time by PG&E and participating
20 bidders. Key steps include: pre-planning; releasing the RFO; holding bidders
21 conferences; initiating transmission studies; obtaining financing; submitting
22 Notice of Intent (NOI); submitting initial offers; submitting final offers,
23 negotiating and executing contracts; obtaining Commission approval; and
24 commencing the development of a new generation resource. Given the track
25 record of past competitive RFOs, PG&E does not believe that holding a
26 competitive RFO could bring new generation resources on line by summer 2012
27 to replace the 913 MW of terminated or at-risk contracts.

28 PG&E's 2004 LTRFO is an example of how long a competitive RFO process
29 can take. PG&E issued an original LTRFO on November 2, 2004, and later
30 issued a revised LTRFO on March 18, 2005. It was slightly over a year from the
31 issuance of the revised LTRFO that PG&E filed for Commission approval of the
32 executed contracts. The Commission issued its decision on November 30,
33 2006, approving the generation with the earliest on-line date of May 2009.

1 Similarly, Southern California Edison (SCE) issued its Standard Track RFO
2 on August 14, 2006, for resources expected to be on-line beginning on August 1,
3 2013. Thus, the time from the date the RFO was issued to the earliest on-line
4 date for approved generation totaled seven years.

5 SCE also issued its Fast Track RFO on August 14, 2006, for resources
6 expected to be on-line beginning August 1, 2010. The time from the date the
7 RFO was issued to the earliest on-line date for approved generation therefore
8 totaled four years.

9 In Decision 07-12-052, the Commission recognized that the typical RFO
10 process for new generation can require up to seven years. PG&E's customers
11 cannot afford to wait that long to develop new generation resources that are
12 needed by 2012. PG&E has a unique opportunity to acquire a site that is
13 already permitted by the CEC and in the advanced stages of receiving other
14 necessary permits, develop it at a reasonable cost, and bring it on-line in the fall
15 of 2011—in time to meet 2012 reliability needs.

16 PG&E recently issued its 2008 LTRFO on April 1, 2008, requesting new
17 generation facilities with an on-line date no later than May 2015, and stating its
18 preference for resources to come on line sooner rather than later. It would not
19 be prudent, from a cost and reliability standpoint, for PG&E to put the entire
20 913 MW out for bid in its 2008 LTRFO. There is no guarantee that a winning
21 RFO bid intended to be developed by 2012, if there are any, will actually be
22 developed by 2012. Of the five PPAs resulting from PG&E's 2004 LTRFO,
23 two have terminated due to permitting delays and/or substantially increased
24 costs, and one has been delayed and renegotiated. Effectively, 60 percent of
25 the new generation PPA resources and 64 percent of the total PPA MWs are
26 either terminated or delayed.

27 Also, as discussed in Section A of this chapter, the CAISO queue process
28 can cause delays in power plant development. Projects that apply for
29 interconnection after May 2008, and therefore are in the new queue cluster are
30 not scheduled to have completed transmission studies and executed
31 Interconnection Agreements until late 2011. Given all the uncertainties
32 surrounding a competitive RFO process, PG&E believes a competitive RFO is
33 unlikely to replace the 913 MW of terminated or at-risk contracts in a timely
34 manner.

1 **F. Conclusion**

2 Given the uncertainties new generation facilities face such as permitting and
3 escalating costs, PG&E's believes its Tesla Generating Station is a
4 cost-effective and viable means of replacing the 913 MW of new northern
5 California generation projects, resulting from PG&E's 2004 LTRFO, that have
6 been terminated or delayed. PG&E's Tesla Generating Station can meet
7 anticipated reliability needs, and would provide a far superior option to initiating
8 a new competitive bidding round to meet anticipated reliability needs.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 4
THE CAPITAL COST FOR PG&E'S
TESLA GENERATING STATION

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 4
THE CAPITAL COST FOR PG&E'S TESLA GENERATING STATION

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CHAPTER 4
THE CAPITAL COST FOR PG&E'S TESLA GENERATING STATION

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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 4
THE CAPITAL COST FOR PG&E'S TESLA GENERATING STATION

A. Introduction

The purpose of this chapter is to set forth Pacific Gas and Electric Company's (PG&E or the Company) estimate of the capital costs necessary to construct and commission^[1] the Tesla Generating Station. In addition, this chapter describes: (1) the project implementation plan detailing how the Tesla Generating Station will be contracted and constructed; (2) a timetable identifying the design, construction, and operation dates for each phase of the project; and (3) a design and construction management plan that describes the contractual responsibilities and interrelationships between PG&E's management and other major parties involved in the project.

PG&E currently intends to commence commercial operation of the Tesla Generating Station in fall 2011. However, as with any large, new generation resource development, there may be some delays. The scheduled fall 2011 commercial operation date (COD) allows for unexpected delays while ensuring that the project is available to meet summer 2012 reliability needs. The costs and milestones shown in this chapter are based on a projected November 1, 2011 COD.

PG&E requests that the California Public Utilities Commission (CPUC or Commission) authorize recovery from customers of PG&E's reasonable and prudent capital cost estimate described in this chapter. The specific revenue requirement and ratemaking for the recovery of capital costs is detailed in Chapter 7.

B. Background

Chapter 2 provides an overview of the Tesla Generating Station and a description of the scope of the project. Chapter 2, Section D, describes the operating and design characteristics of the Tesla Generating Station, which

[1] Commissioning relates to the start-up and operation of equipment and systems after construction is complete. The commissioning period ends after final plant operational and performance testing is complete.

determine the capital costs required to successfully permit, construct, and commission it. This chapter describes the project implementation plan, schedule and design, construction management and cost controls, and capital costs necessary to provide a safe, reliable, efficient, and cost-effective electric generating facility.

C. Cost and Schedule Basis

As described in Chapter 2, PG&E recently acquired the rights to the Tesla site and is seeking approval in this Application to construct a 560 megawatt (MW) natural gas-fired combined-cycle generating facility on the site. At this time, PG&E plans to construct the project "as permitted" under the California Energy Resources Conservation and Development Commission (CEC) decision, adopted by the CEC on June 16, 2004, which will serve as the basis for the project cost and schedule used in the accompanying application. The project will be constructed with Building and Construction Trades labor under a Project Labor Agreement (PLA) and major maintenance activities will similarly be performed by Building and Construction Trades labor under a Maintenance Agreement (MA). The specific project costs are described below in detail in Sections E and F of this chapter.

As of the filing of this Application, the wastewater supply agreement for the Tesla Generating Station has not been finalized. Should PG&E be unable to secure an acceptable recycled wastewater supply agreement, or should permitting prevent the use of recycled wastewater as the cooling medium for the project, PG&E will need to seek changes to the CEC permit to implement dry cooling, as has been implemented at PG&E's Gateway and Colusa Generating Stations.

D. Project Implementation Plan

PG&E has formed project execution teams that include a Development Management Team and Construction Management Team, and will construct this project in a manner similar to how it is constructing Gateway and Colusa Generating Stations.

The Development Team will take responsibility for compliance with all permitting requirements and other development activities, including CEC licensing, and coordinating all project activities with the local communities and

1 stakeholders. The Development Team will also be responsible for the execution
 2 of commercial agreements for the fuel, water and electrical interconnection
 3 facilities. The Construction Management Team will include home office
 4 personnel,^[2] and a full-time field staff located at the site. This team will provide
 5 technical support to the Development Team, and will manage the Engineering,
 6 Procurement and Construction (EPC) contractor and turbine manufacturer.
 7 They will also communicate and coordinate their activities with the operations
 8 staff (discussed more fully in Chapter 5) during the entire project to achieve a
 9 smooth transition into the operations phase. The field staff will be on the site
 10 beginning with the mobilization of the EPC contractor, and terminating at
 11 Substantial Completion,^[3] when PG&E operations staff will take full care,
 12 custody and control of the facility. Both the Development Team and
 13 Construction Management Team will be comprised of PG&E internal staff and
 14 third-party support.

15 Table 4-1 provides the major milestone dates that are estimated for the
 16 Tesla Generating Station at this time. Meeting the targets in this schedule will
 17 be coordinated by the Development Management and Construction
 18 Management Teams, and is only achievable with timely Commission approval of
 19 this Application. To ensure the EPC contractor maintains the project schedule,
 20 the EPC contractor will be required to submit monthly detailed progress reports
 21 and progress schedules. The Construction Management Team will monitor the
 22 progress on a daily basis, and will confirm work has been completed before
 23 payments are made to the EPC contractor.

[2] Home office support includes mid-level management, budgeting, accounting, environmental, and other internal resources that contribute directly to the project, on a part-time basis.

[3] Substantial Completion is defined as the date when the EPC and equipment contractors have completed all performance testing (including a reliability test), met the minimum performance guarantees, and performed all of the work other than uncompleted minor items of work on the punch list. When Substantial Completion is achieved, the facility is ready to be dispatched for commercial operation by PG&E.

TABLE 4-1
PACIFIC GAS AND ELECTRIC COMPANY
PROJECT IMPLEMENTATION MILESTONE SCHEDULE

Line No.	Milestone	Date
1	<u>Development Phase</u>	
2	Issue Interim Notice to Proceed for Equipment	July 2008
3	File Certificate of Public Convenience and Necessity (CPCN) Application	July 2008
4	Begin Engineering and Permitting	July 2008
5	Receive Interim Order	September 2008
6	Begin Issuing Final Notice to Proceed for Equipment	September 2008
7	Execute EPC Contract	February 2009
8	<u>Construction Phase</u>	
9	Mobilize Site	June 2009
10	Begin Receiving Turbine Equipment	May 2010
11	First Fire Combustion Turbines	July 2011
12	Commercial Operation	November 2011

E. Turbine and EPC Contract Costs

In order to stabilize long lead time equipment price and delivery, PG&E has entered into an interim notice to proceed with the turbine manufacturer for supply of two combustion turbine generators (CTG) and a steam turbine generator (STG). The turbine manufacturer was selected through a competitive process and will provide the turbine equipment under a fixed price agreement with progress payments and termination provisions. PG&E will execute an initial payment for the turbine equipment for \$ [REDACTED] and will be responsible for an additional payment of \$ [REDACTED] in August 2008. PG&E expects to provide the turbine manufacturer the final notice to proceed on or about September 22, 2008, resulting in ongoing monthly payment obligations for the manufacture and delivery of the turbine equipment. The September notice to proceed and associated payment for that month is scheduled to occur after the interim order PG&E has requested of the Commission. PG&E must pay the turbine manufacturer \$ [REDACTED] in September, and agreed to amounts of additional progress payments in the following months. PG&E retains its rights to terminate the equipment purchase. The termination right for the turbine equipment contract may be exercised either before or after final notice to proceed. The termination fee is established as an amount that is less than or

1 equal to PG&E's cumulative progress payments according to a payment and
2 termination schedule.

3 PG&E will select the EPC contractor through a competitive process. While
4 the EPC scope and contract have not been finalized, PG&E expects the EPC
5 contract will be structured similarly to the EPC contracts for the Gateway and
6 Colusa Generating Stations. The EPC contractor will be engaged under a cost-
7 reimbursable, target price, risk sharing agreement for the balance of plant (BOP)
8 EPC scope of work. The EPC contractor will design, engineer, and construct the
9 plant. The EPC contractor will provide all materials not procured by PG&E,
10 including labor and other services and items required to deliver to PG&E a fully
11 assembled ready-to-test facility in time to complete the commissioning of the
12 facility.

13 PG&E will be responsible for site preparation, turbine procurement, design
14 and construction of linear facilities (gas, water and electric interconnections) and
15 permits needed to construct the facility. PG&E may be responsible for
16 purchasing the heat recovery steam generators (HRSG); however, that will be
17 dependent upon PG&E's negotiation on scope of the EPC contract. PG&E must
18 provide a Notice to Proceed (NTP) to the EPC contractor by no later than
19 February 2009 to achieve the target substantial completion date. If the NTP is
20 not provided to the EPC contractor by that date, the substantial completion date
21 may be delayed.

22 The following sections describe typical contract terms and conditions that
23 PG&E would expect to implement in its EPC and turbine contracts.

24 **1. EPC Contract Payment Terms**

25 The payment terms of the EPC contract have not been finalized at this
26 time. PG&E expects that terms will be established similarly to the way they
27 were established for Gateway and Colusa Generating Stations by
28 developing a detailed scope of work document (scope book) to establish the
29 target price for the project. The target price may be adjusted due to change
30 orders resulting from the impact of schedule delay caused by others or other
31 work not contemplated at the time the scope of work was agreed.

32 An EPC contractor fee will be negotiated. PG&E anticipates the EPC
33 contractor fee arrangement will contain a base fee and an at-risk fee that
34 allows the EPC contractor to share the risks or benefits of project cost

1 under-runs and over-runs, thereby providing an incentive to the EPC
2 contractor to keep the project at or below the target price.

3 Payments to the EPC contractor will be based on costs incurred and
4 work completed under the contract, starting at an Initial NTP with long-lead
5 procurement and engineering, and continuing until Substantial Completion.
6 The base fee will be prorated and paid on a monthly basis throughout the
7 duration of the project. At Substantial Completion, depending on the
8 outcome of the project, PG&E will pay the at-risk fee except for an amount
9 retained to cover the value of punch list items (minor items of work to
10 complete). At Substantial Completion, PG&E will take care, custody, and
11 control of the facility and dispatch the facility as a firm generation resource.

12 **2. Turbine Manufacturer and EPC Late Completion Damages**

13 Both the turbine manufacturer and EPC contractor would be required to
14 pay liquidated damages for failing to meet the scheduled substantial
15 completion date. The contracts would allow for an extension of the
16 completion date in the event of issues involving another contractor's
17 performance, permitting or development issues, force majeure, change
18 orders, or other changes in the scope of work.

19 **3. Guarantees and Incentives**

20 Air emissions, noise emissions and turbine component performance will
21 be guaranteed by the turbine manufacturer. The EPC contract would
22 contain guarantees by the EPC contractor to ensure an efficient plant design
23 that minimizes the auxiliary power consumption of the plant. PG&E's initial
24 capital cost estimate does not include any performance incentives or
25 penalties associated with the EPC contract or equipment suppliers. Capital
26 recovery for incentives is addressed in Chapter 7, Section B.1.

27 **a. Turbine Manufacturer Net Electrical Output Guarantee and Incentive**

28 The net electrical output guarantee establishes the capacity that
29 PG&E expects to use for future planning and electrical resource
30 management. The turbine contract would establish penalties if the
31 guarantee is not achieved and incentives if output exceeds guarantee.
32 This mitigates the cost of obtaining incremental capacity from other

sources to replace the capacity and energy shortfall if the plant does not meet its net electrical output guarantee.

The guaranteed output and liquidated damages amounts for the Tesla Generating Station will be established at the time the turbine equipment is purchased. Liquidated damages and incentives are a negotiated item and will be established based on market rates.

b. Turbine Manufacturer Heat Rate Guarantee and Incentive

The guaranteed heat rate for the turbine equipment will be established at the time the turbine equipment is purchased. If the tested heat rate is greater, the turbine manufacturer will pay liquidated damages. If the tested heat rate is below guaranteed, the turbine manufacturer will receive a performance incentive payment. The performance incentive will be capped.

c. Turbine Manufacturer Minimum Performance Guarantee

The turbine equipment will be required to meet a minimum performance guarantee for the output, heat rate, and air emissions. The minimum performance guarantees will be absolute, and cannot be offset with liquidated damages or other penalties—the manufacturer must take whatever actions are necessary to make the equipment perform as guaranteed.

d. Turbine Manufacturer and EPC Reliability and Emissions Guarantees

Both the turbine and EPC contracts would provide guarantees that, upon completion of the reliability tests, the Tesla Generating Station will achieve a high level of availability. The turbine contract will also provide air emissions and noise emissions guarantees which PG&E will use as the basis for the permitting and licensing of the facility. The reliability, air emissions, and noise emissions guarantees will be absolute, and can not be offset with liquidated damages or other penalties.

e. EPC Contractor Auxiliary Load Guarantees

Lower auxiliary load improves overall plant performance, thereby mitigating the cost of obtaining incremental capacity from other sources. The EPC contract would provide guarantees that the auxiliary loads at the plant—base auxiliary load, HRSGs, and air cooled condenser (if

applicable)—do not exceed certain specified levels. Subject to negotiations, the EPC contractor would be entitled to incentive payments if the auxiliary loads are lower than the guaranteed amount and be required to pay liquidated damages if the auxiliary loads exceed the guaranteed amount.

4. EPC Contract Cost Control Mechanisms

The EPC contract will contain cost control mechanisms providing the EPC contractor incentives to construct the Tesla Generating Station at or under the target price. The contract would be cost reimbursable which provides for added transparency of the cost of the work activities in the scope book. Price adjustments would primarily be due to a scope change^[4] and would be implemented through change orders. Change orders could be needed due to a requested scope change by PG&E, or due to a scope change caused by changing conditions that are PG&E's responsibility.

EPC contractor responsibilities include:

1. Overall plant engineering and design;
2. Construction of all foundations and structures;
3. Assembly and erection of all equipment including PG&E provided equipment;
4. Coordination and interface to linear facilities provided by others;
5. Design and implementation of control systems;
6. Systems testing and turn over to operations; and
7. Closing out final punch list items.

PG&E's responsibilities include:

1. Management of the turbine manufacturer;
2. Site soil and subsurface conditions;
3. Site access and preparation (removal of existing structures, etc.);
4. Permitting and licensing conditions and requirements;
5. Commission and CEC permit authorization dates;
6. Electrical, water, and fuel interconnections scope and schedule;
7. Providing operating personnel during commissioning; and

^[4] Scope change means a material addition to, deletion from, or modification to the quality, function, or intent of requirements of the contract.

1 8. Providing fuel and dispatch power during the commissioning.

2 In order to mitigate the potential for scope changes, PG&E would
3 include the scope book in the contract. The scope book includes
4 performance-based and detailed component specifications as well as
5 operational criteria. It also includes utility and site interface terminal point
6 location and descriptions. The scope book for the Colusa Generating
7 Station was developed over several months and will be modified to reflect
8 the Tesla Generating Station design with the input from PG&E's and the
9 EPC contractors' experienced power plant engineers and the turbine
10 manufacturer's technical staff. The scope of work delineated in the contract
11 will also include site specific CEC conditions of certification that impact the
12 EPC contractor's detailed engineering, procurement, construction, and
13 commissioning scope.

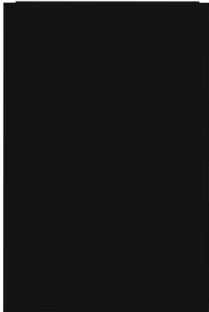
14 The EPC contract will have detailed change order requirements that
15 focus on timely notification, descriptions of what constitutes an acceptable
16 change order, and detailed procedures on the execution of a change order.

17 **F. Capital Costs**

18 Capital costs for the Tesla Generating Station are presented in Table 4-2.
19 PG&E estimated the capital costs based on PG&E's Gateway and Colusa
20 Generating Stations and updated using site specific estimates collected from
21 FPL Energy, LLC (FPL). The cost estimates utilize standard engineering
22 estimating principles and are based on the target schedule in Table 4-1.

23 Table 4-2 provides a cost breakdown of PG&E's estimate of the cost to
24 construct the project.

TABLE 4-2
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION CAPITAL COST SUMMARY
(NOMINAL THOUSAND DOLLARS)

Line No.	Description	Cost to Construct
1	Site Acquisition	
2	Advance Engineering, Procurement and Permitting	
3	PG&E Construction Management	
4	Core Power Block Engineering, Procurement, Construction	
5	Linear Facilities	
6	Commissioning	
7	Contingency	
8	A&G and AFUDC	
9	Total Tesla Generating Station Capital Expenditures	

1. Site Acquisition and Advance Engineering Procurement and Permitting

PG&E's acquisition cost is described in Chapter 2, Section C.2. The allocation of those acquisition costs to the first and second power trains is discussed in Chapter 7, Section D.

PG&E will incur near term costs performing design, engineering, and procurement work activities to support advance equipment and material purchases in advance of a Commission final decision and in support of the project completion date. Additionally, PG&E has assumed responsibility for the final development activities of this project which include finalizing gas, water and electrical connections and transfer of the CEC license.

Advance Engineering and Procurement activities directly support advance equipment and material purchases. These activities will take place prior to establishment of a final EPC contract. This work is critical in shaping the design requirements for the EPC scope book concerning construction methods, interconnections, and land related investigative activities which also supports the final permitting efforts. The work scope will focus on development of the EPC scope book and specification of long lead time equipment and materials such as HRSGs, transformers and alloy piping. Permitting includes the costs required to finalize all project permits and associated compliance plans in order to ensure the Tesla Generating Station can begin construction in a timely fashion.

In addition to advance engineering, procurement, and permitting activities, PG&E plans to enter into equipment and material purchases in advance of a Commission final decision. As described in the Application, PG&E is seeking an interim order from the Commission approving the recovery of termination costs if the Commission ultimately denies PG&E's application. The termination costs would include costs associated with advance engineering, procurement, and permitting activity costs, as well as termination fees associated with canceling advance equipment and material purchases. PG&E is also seeking to recover AFUDC on the termination costs. The termination costs would not include the costs associated with acquiring the Tesla site. The table below provides PG&E's estimate of the termination costs required to support the Tesla Generating Station through May 2009.

TABLE 4-3
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION TERMINATION COST SUMMARY
(MILLIONS OF DOLLARS)

Line No.		July 2008	Aug. 2008	Sept. 2008	Oct. 2008	Nov. 2008	Dec. 2008	Jan. 2009	Feb. 2009	March 2009	April 2009	May 2009
1	Monthly Termination Costs	3	2	10	6	5	6	17	10	6	10	24
2	Cumulative Total	3	5	15	21	26	32	49	59	65	75	99

2. PG&E Construction Management

The Construction Management Team will include PG&E internal staff and third party support as described in Section D of this chapter. A monthly manpower loading chart was developed as the basis for the Construction Management Team cost estimate. Staffing levels are based on on-going efforts at the Gateway and Colusa Generating Stations and vary throughout various phases of the Tesla Generating Station. In the case of home office personnel, the resources responsible for construction management were shared over the anticipated work load of all the PG&E's new generation projects. During the execution of the project, PG&E will utilize several third party consultant companies and individuals to support the Construction Management activities. Third parties will be considered based on

1 specialized experience requirements, duration of assignments, and
2 availability of internal resources.

3 Third party resources that have been considered for supporting the
4 Construction Management activities include:

- 5 1. Technical engineering experienced in power plant design for design and
6 procurement documents review;
- 7 2. Specialized field inspection support, including welding, coatings, and
8 material testing;
- 9 3. Equipment shop inspection services;
- 10 4. Quality assurance professionals experienced in similar projects; and
- 11 5. Performance testing oversight support.

12 There are other costs related to facilities and supplies that are required
13 to support the Construction Management Team in execution of the project,
14 including:

- 15 1. Construction site facilities including furniture, supplies, office equipment,
16 safety equipment, and other incidentals;
- 17 2. Utilities for site facilities including telephone, water, sanitary services,
18 and other monthly fees;
- 19 3. Business travel for equipment shop inspections, trips to engineer and
20 contractor offices, permitting agency meetings, and other business
21 related travel and living; and
- 22 4. Public meetings.

23 **3. Core Power Block Engineering, Procurement, Construction and** 24 **Testing**

25 Core Power block work includes the scope of work previously described
26 in Section E.4 above. The core Power Block work is focused on securing
27 and assembling the basic components of the combined cycle generating
28 facility that includes structural steel, reinforced concrete, HRSGs, turbines,
29 generators, transformers, switchyard, valves, pumps, Piping, Condenser,
30 Instrumentation, controls, heat exchangers, safety systems, water treatment
31 system, Zero Liquid Discharge (ZLD) systems, tanks and paving.

4. Linear Facilities

The linear facilities include interconnections for a natural gas pipe, transmission tie-line to the transmission system, and a recycled wastewater pipeline and associated facilities.

PG&E will finalize the natural gas interconnection agreement, based on standard tariff requirements. The fuel interconnection cost provided by PG&E's natural gas pipeline department for this project is based on estimating principles typically used for all customers.

A water supply agreement will be finalized for the use of recycled wastewater from the Tracy water treatment facility. In order to access this water, an 11-mile pipeline with a pumping facility must be built to connect the water treatment facility to the project site. As mentioned previously, as of the time of this application, the water supply agreement has not been signed. Should PG&E be unable to obtain an acceptable recycled wastewater supply agreement, or should permitting prevent the use of recycled wastewater as the cooling medium for the project, PG&E may need to seek changes to the CEC permit to implement dry cooling, as has been implemented at the Gateway and Colusa Generating Stations.

A new 0.8-mile, double circuit, 230-kV transmission line will connect the switchyard to PG&E's Tesla Substation south of the project site. The California Independent System Operator Corporation (CAISO) interconnection process will ultimately result in PG&E executing a Large Generator Interconnection Agreement with the CAISO.

a. Commissioning Labor

As described in Chapter 5, PG&E will provide operations staff for the initial start-up and performance testing of the facility. The EPC contractor will be required to provide training to plant operating staff. The contractor will be responsible for directing the initial operations activities up to Substantial Completion. Capital costs for commissioning are included in Chapter 5, Section D, and Table 5-5.

b. Non-Labor Start Up

As described in Chapter 5, non-labor start-up costs provide basic tools, equipment, and inventory to begin commercial operation of the facility.

5. Owner's Contingency

Included in PG&E's capital cost estimate is an owner's contingency. This represents 4.4 percent of the total project cost. This is reasonable for the project where the EPC contractor will engineer and build a plant for PG&E on cost-reimbursable, target price, risk sharing agreement where PG&E is accepting a large portion of the risk of the project cost. The contingency is included to cover items for which PG&E retains risks and uncertainty, and other potential minor scope adjustments resulting from development, engineering, and construction changed conditions. This contingency does not cover permit changes or extreme events such as extended force majeure events, changes in laws or regulations that impact the project.

a. Owner Risks and Uncertainty

PG&E is subject to some risk and uncertainty in connection with the Tesla Generating Station. At the time of this filing, PG&E does not have firm prices for all of the costs required to build the project. PG&E is seeking the interim decision from the Commission in order to allow it to secure long lead time equipment and materials to aide in firming up the project costs, and to be able to keep the project viable.

EPC-related risks include:

1. PG&E could incur increased project and construction management costs due to events which cause more resources to be allocated to the project. These events could be related to contractor-caused construction issues requiring significant additional PG&E oversight.
2. PG&E could incur increased owner's costs associated with EPC contractor's schedule, delays in equipment manufacture or delivery or in engineering and construction, or force majeure events.

PG&E's development-related risks include:

1. Any delays or changes from permitting, and
2. The gas, water, and electrical interconnection estimates are rough estimates that could change significantly once the final scope of interconnection facility are defined in more detail.

Based on a limited geotechnical evaluation of the project site, site preparation has been estimated to be minor in scope. There is a risk

that unexpected soil conditions are discovered during preparation that may result in soil removal and replacement with compacted fill. The capital estimate does not include costs to cover this risk.

6. Administrative and General Expenses and Allowance for Funds Used During Construction

a. Administrative and General Expenses

Administrative and general expenses (A&G) costs include the payment and expenses of general office and A&G expenses applicable to construction work as well as property taxes. PG&E's standard A&G rate applied to the PG&E labor costs is 15.5 percent. When this percentage was applied to the PG&E labor costs, it resulted in an A&G allocation of \$ [REDACTED]

b. Allowance for Funds Used During Construction

The Allowance for Funds Used During Construction (AFUDC) amount capitalized is developed by multiplying PG&E's authorized weighted average cost of capital rate of 8.79 percent, by the applicable average asset under construction. The AFUDC included in the cost estimate assumes the development schedule presented in this chapter and assumes the Tesla Generating Station assets are operational and are placed into ratebase in fall 2011. The resultant AFUDC estimate is \$ [REDACTED]

G. Operational Enhancements

PG&E has made every effort to provide a detailed scope of work and operating and maintenance criteria for the design and procurement of equipment for a highly reliable and efficient power plant. Because of the fast track nature of this project, it is planned for implementation with equipment that is readily available in the market place. New technology concepts are frequently being introduced, but may be uncertain as to availability, effectiveness, and value as of the time of this filing. During the detailed engineering and procurement phases, there will likely be options that would improve the operations and maintenance (O&M) and other life cycle costs of the facility, which may not be within the EPC contractor's scope or this estimate. Based on an economic evaluation, PG&E may elect to request an enhancement be added in the EPC contractor's scope.

1 In the event PG&E identified and requested an operational enhancement, PG&E
2 would request an increase in the capital cost.

3 **H. Conclusion**

4 The capital cost estimate of \$ [REDACTED] in Table 4-2 to construct the
5 Tesla Generating Station is reasonable and prudent, and PG&E requests that
6 the Commission authorize recovery of these costs as set forth in Chapter 7.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 5
COMMISSIONING AND OPERATION AND MAINTENANCE
COSTS OF PG&E'S TESLA GENERATING STATION

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 5
COMMISSIONING AND OPERATION AND MAINTENANCE COSTS OF PG&E'S
TESLA GENERATING STATION

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PACIFIC GAS AND ELECTRIC COMPANY
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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 5
COMMISSIONING AND OPERATION AND MAINTENANCE COSTS
OF PG&E'S TESLA GENERATING STATION

A. Introduction

The purpose of this chapter is to describe the commissioning^[1] costs that occur prior to the commercial operation date (pre-COD) and non-fuel operations and maintenance (O&M) costs that occur after the commercial operation date (post-COD) for Pacific Gas and Electric Company's (PG&E or the Company) Tesla Generating Station.

PG&E currently intends to commence commercial operation of the Tesla Generating Station in fall 2011. However, as with any large, new generation resource development, there may be some delays. The scheduled fall 2011 commercial operation date (COD) allows for unexpected delays while ensuring that the project is available to meet summer 2012 reliability needs. The costs and milestones shown in this chapter are based on a projected November 1, 2011 COD. Should the construction schedule dictate a later COD, these costs will increase due to escalation. Escalated values for these costs associated with a later COD (*i.e.*, summer 2012) are also presented in a summary fashion in this chapter.

Chapter 2, Section D, describes the operating and design characteristics of the project, which determine commissioning costs and subsequent O&M expenditure requirements for the project. This chapter describes the components of the commissioning and fixed and variable O&M cost streams and how they support the ongoing safe, compliant, reliable, efficient, and cost-effective operation of the Tesla Generating Station.

[1] Capitalized commissioning costs consist of PG&E staffing and materials utilized to start up the plant systems in coordination with the construction team which ultimately leads to completion of the start up phase and establishment of plant commercial operations. Additional commissioning costs include the use of natural gas to test fire and tune the plant equipment and demonstrate performance. As explained in Chapter 7, the net fuel expense used to commission the Tesla Generating Station will be charged to the Energy Resource Recovery Account (ERRA), as was done for Gateway Generating Station, and will not be capitalized.

O&M expenses for the first three years following COD are used in the development of the initial revenue requirement presented in Chapter 7.

B. Summary

The O&M expenditures presented in this chapter directly support the prudent, safe, compliant, reliable, efficient, and cost-effective commissioning and operation of the Tesla Generating Station. These expenditures ensure the project will be an efficient and reliable source of energy, capacity, and ancillary services providing system benefits to meet the needs of PG&E's customers.

Commissioning costs for the project include the labor and non-labor start-up costs required to start up the facility and are presented in Table 5-1 below.

TABLE 5-1
PACIFIC GAS AND ELECTRIC COMPANY
COMMISSIONING COSTS, FALL 2011 COD
(NOMINAL THOUSAND DOLLARS)

Line No.	Time Period	2010	2011	Total
1	Commissioning Labor			
2	Non-Labor Start-Up			
3	Total			

Project completion delays can occur due to a variety of factors. For this project, delays may result from permitting activities and long lead time equipment and materials purchases. In general, PG&E has assumed it will have sufficient visibility and advance notice of these types of project delay drivers and can delay staffing the commissioning team accordingly. However, delay in the COD will still result in some escalation of costs. Table 5-2 presents the commissioning costs should the project COD be delayed to summer 2012.

TABLE 5-2
PACIFIC GAS AND ELECTRIC COMPANY
COMMISSIONING COSTS, SUMMER 2012 COD
(NOMINAL THOUSAND DOLLARS)

Line No.	Time Period	2011	2012	Total
1	Commissioning Labor			
2	Non-Labor Start-Up			
3	Total			

After the plant achieves commercial operation, fixed and variable O&M will be required to ensure safe, compliant, reliable, efficient and cost-effective operation. PG&E's estimates for the fixed and variable O&M costs and contingency for the first four years of operation are summarized in Table 5-3 below.

TABLE 5-3
PACIFIC GAS AND ELECTRIC COMPANY
FIXED AND VARIABLE O&M COSTS INCLUDING CONTINGENCY, FALL 2011 COD
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Fixed and Variable O&M Including Contingency				

Project completion delays result in cost estimates higher than those presented in Table 5-3. Consequently, the estimate for fixed and variable O&M costs for a summer 2012 COD have been escalated from the values in Table 5-3. Table 5-4 presents PG&E's estimate of the fixed and variable O&M costs and contingency for the first four years of operation should the project COD be delayed to summer 2012.

TABLE 5-4
PACIFIC GAS AND ELECTRIC COMPANY
FIXED AND VARIABLE O&M COSTS INCLUDING CONTINGENCY, SUMMER 2012 COD
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Fixed and Variable O&M Including Contingency				

1 C. Basis of Design

2 Chapter 2, Section D, describes the Tesla Generating Station operating
3 and design characteristics, which determine commissioning costs and
4 subsequent O&M expenditure requirements for the project.

5 D. Pre-COD: Commissioning Costs

6 Commissioning costs are detailed in this section. Capitalized
7 commissioning costs refer to PG&E's staffing requirements and materials for
8 starting and operating the facility prior to establishing commercial operation.
9 These costs are divided into two categories: Commissioning labor and
10 non-labor start-up costs, which are included in PG&E's capital estimate
11 presented in Chapter 4, and are summarized below in Table 5-5.

TABLE 5-5
PACIFIC GAS AND ELECTRIC COMPANY
COMMISSIONING COSTS
(NOMINAL THOUSAND DOLLARS)

Line No.	Time Period	2010	2011	Total
1	Commissioning Labor			
2	Non-Labor Start-Up			
3	Total			

12 The total staffing levels are based on past benchmarking activities, industry
13 knowledge, and PG&E's plans for staffing its Gateway and Colusa Generating
14 Stations. The O&M staffing plan provides adequately trained personnel in time
15 to begin commissioning of the separate systems as they become available in
16 the construction timeline and ultimately resulting in the start-up and
17 commissioning of the generating facility.

18 Staffing is added to the facility in an orderly fashion such that employees
19 receive their mandatory safety, environmental, and technical training
20 sufficiently in advance of when they need to apply those skills for the start up of
21 the various support systems as well as the generating facility as a unit.
22 Approximately 18 months in advance of commercial operation, the plant
23 manager is hired. The plant engineer and operation and maintenance
24 supervisors are hired approximately four months later. The plant manager,
25 plant engineer, and O&M supervisors will finalize the staffing details including

1 screening and interviewing potential candidates and hiring new employees.

2 [REDACTED], the Power Plant Technicians,
3 Maintenance Planner, Chemist and Power Plant Assistant are hired. This team
4 will become familiar with the design details and the construction activities of the
5 Tesla Generating Station. [REDACTED], the
6 Environmental Specialist will be hired in order to establish the day-to-day
7 compliance management needs for the facility.

8 PG&E will provide new tools, maintenance equipment, and furnishings for
9 the new facility. These items will include administrative work stations,
10 computers, conference room furnishings, shop equipment, and tool sets. The
11 cost estimate was based on PG&E's current plans for this same scope of work
12 at the Gateway and Colusa Generating Stations.

13 PG&E will require and will provide an initial inventory of spare parts to
14 quickly make non-routine repairs and replacements, which support maintaining
15 a high level of facility availability. The cost was established by selecting parts
16 in light of PG&E's other two combined cycle facilities of similar design.

17 **E. Post-COD: O&M Costs**

18 Following establishment of commercial operations, PG&E will incur
19 ongoing O&M costs for the operation of the project consisting of fixed and
20 variable O&M costs. Table 5-6 provides a summary of the fixed and variable
21 O&M costs.

TABLE 5-6
PACIFIC GAS AND ELECTRIC COMPANY
FIXED AND VARIABLE O&M COSTS INCLUDING CONTINGENCY, EMPLOYEE BENEFITS
AND PAYROLL TAXES
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Fixed O&M	[REDACTED]			
2	Variable O&M				
3	Total O&M				

22 Table 5-7 provides further detail by displaying employee benefits and
23 payroll taxes associated with the direct labor costs for easier comparison with
24 the revenue requirements calculations shown in Chapter 7.

TABLE 5-7
PACIFIC GAS AND ELECTRIC COMPANY
FIXED AND VARIABLE O&M COSTS INCLUDING CONTINGENCY, EMPLOYEE BENEFITS,
AND PAYROLL TAXES
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Fixed O&M Excluding Employee Benefits and Payroll Taxes				
2	Variable O&M				
3	Subtotal				
4	Employee Benefits				
5	Payroll Taxes				
6	Subtotal				
7	Total O&M				

1. Fixed O&M Costs

Fixed O&M consists of labor, materials and contracts required to support the routine O&M of the facility and are shown in Table 5-8.

TABLE 5-8
PACIFIC GAS AND ELECTRIC COMPANY
FIXED O&M COST SUMMARY
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Labor				
2	Condition Assessment, Monitoring and Corrective Maintenance				
3	Safety/Security/Compliance				
4	Contract Services, Minor Consumables and Infrastructure				
5	Major Maintenance				
6	Public Benefits				
7	Contingency				
8	Total Fixed O&M				

2. Labor

PG&E's staffing plan is based on benchmarking activities and industry knowledge of similarly designed and operated facilities and PG&E's plans for staffing the Gateway and Colusa Generating Stations. Plant staffing is

established with a focus on day-to-day routine O&M and takes into account plant design differences that influence plant staffing decisions. A plant like the Tesla Generating Station should be staffed with [REDACTED] people, depending on plant configuration, load profile, union labor work rules, and degree of self-sufficiency of facility operations. PG&E has assumed the plant will be staffed by [REDACTED] PG&E employees consisting of management employees and bargaining unit employees represented by the International Brotherhood of Electrical Workers Local 1245 (IBEW) and the Engineers and Scientists of California Local 20 (ESC).

This staffing plan has not assumed any staff cost savings resulting from the operation of the Gateway and Colusa Generating Stations. Each facility is staffed on a stand-alone basis for day-to-day operations resulting with very little excess staffing capacity to support other facilities. All major maintenance activities are performed by contract personnel who may rotate among the facilities as major maintenance activities are planned and executed.

Preventive Maintenance: Plant personnel perform the routine day-to-day O&M activities at the plant which includes preventive maintenance activities such as lubrication and inspection of equipment. Additionally, periodic calibration of instrumentation and controls and tuning will also be required to ensure the plant performs at consistently high levels of availability and efficiency. These assumptions are the basis for the staffing costs shown in Table 5-9.

TABLE 5-9
PACIFIC GAS AND ELECTRIC COMPANY
O&M LABOR COST ESTIMATE
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Direct Cost	[REDACTED]			
2	Employee Benefits				
3	Payroll Tax				
4	Total Tesla Generating Station Staffing Cost				

Employee Benefits cost is estimated at 29.65 percent times labor cost.

Payroll taxes are estimated at 10.2 percent times labor cost.

1 This staffing plan is designed to operate the project as it has been
2 permitted—wet cooled with a large water treatment and Zero Liquid
3 Discharge (ZLD) systems. In this configuration, the Tesla Generating
4 Station requires a significant portion of on-site personnel to manage the
5 water treatment operations associated with recycled water supply, cooling
6 tower, expanded water treatment system and ZLD.

7 Condition Assessment, Monitoring, Analysis, and Corrective Maintenance

8 Condition assessment, monitoring, analysis and corrective
9 maintenance activities represent periodic O&M of the facility that is not
10 covered in the turbine manufacturer's Contractual Services Agreement
11 (CSA). As discussed later in this chapter, the turbine manufacturer's CSA
12 provides monitoring, maintenance planning, and major maintenance
13 execution for the equipment provided by the turbine manufacturer. The
14 remainder of the plant is not covered by this agreement.

15 In order to minimize the potential for unplanned outages, several work
16 activities will be performed to monitor the operating condition of critical
17 plant equipment. Periodic condition assessment activities ensure that
18 critical systems are monitored to identify abnormal operating conditions
19 that contribute to in-service failure. Early detection allows for corrective
20 actions to be performed in a scheduled and timely fashion thus minimizing
21 damage and repair costs associated with in-service failures.

22 The different types of condition assessment, monitoring, analysis and
23 corrective maintenance actions PG&E plans to use at the Tesla Generating
24 Station include the following:

25 **a. Oil Sample and Analysis**

26 Purpose: Establish baseline equipment condition and ongoing
27 early detection of deteriorating conditions to avoid substantial
28 consequential damage.

29 Description: Trouble-free operation of nearly every piece of
30 rotating machinery in the plant depends on maintaining the quality of
31 lubricating oils. For rotating equipment, oil analysis can assess the oil
32 for contaminants like water and dirt as well as identify failing bearings
33 prior to catastrophic failure, thereby minimizing repair costs. Electrical
34 equipment containing insulating oils also requires periodic oil samples

1 and analysis. This analysis detects contaminants and dissolved
2 gasses that are indicators of electrical faults and facilitates early
3 intervention thus preventing catastrophic failure.

4 **b. Vibration Monitoring and Analysis**

5 Purpose: Diagnosis of changes in plant baseline operations and
6 early detection of deteriorating conditions that can lead to reduced
7 reliability and increased repair costs by avoiding substantial
8 consequential damage.

9 Description: The combustion turbine generators (CTG) and steam
10 turbine generator (STG) are continuously monitored for vibration
11 through the control system and the CSA provided by the turbine
12 manufacturer. Funding in this category is for periodic vibration
13 monitoring on the balance of plant equipment or troubleshooting
14 support for the CTGs, steam turbine, or generators. Periodic
15 calibration of critical instruments and relays ensure that important data
16 collected is accurate and useful for equipment condition assessment.

17 **c. Condenser Monitoring and Analysis**

18 Purpose: Condenser performance monitoring and periodic
19 inspections will help detect thermal performance changes that indicate
20 failed or failing components in that equipment.

21 Description: These activities identify thermal performance
22 degradation that can be repaired to restore plant efficiency.

23 **d. Infrared Monitoring**

24 Purpose: identify equipment and connections that are operating
25 above design temperatures in order to allow for early intervention and
26 preventing catastrophic failure.

27 Description: Infrared monitoring uses infrared technology to
28 observe equipment "hot spots" that are indicators of failing components
29 prior to failure. Hot spots could be generated by excessive friction,
30 insulation failure, steam leaks, electrical overload, or loose electrical
31 connections.

1 **e. Balance of Plant Monitoring**

2 Purpose: Periodic surveys of plant equipment and structures
3 ensure employee and public safety and long equipment life and reduce
4 the risk of substantial future expenditure if left unabated.

5 Description: Balance of plant monitoring refers to items like
6 grounding grid integrity testing, gas pipeline and condenser cathodic
7 protection testing, and foundation, structure, and roadway settlement
8 monitoring.

9 **f. Insulation and Coatings Reviews**

10 Purpose: Insulation and coatings inspections and repairs ensure
11 employee and public safety and long equipment life and reduce the risk
12 of substantial future expenditure if left unabated.

13 Description: Periodic review and repair of insulation and
14 equipment and structure coatings to ensure the plant is well protected,
15 preventing undue thermal stresses and erosion/corrosion that can lead
16 to premature failure.

17 **g. High Energy Piping and Support Systems Monitoring and Analysis**

18 Purpose: Routine inspection, monitoring, and assessment of the
19 critical piping and support systems for the heat recovery steam
20 generators (HRSG), steam turbine, and other system piping are
21 performed to ensure the piping systems are properly aligned and
22 performing as expected.

23 Description: Routine High Energy Piping (HEP) inspections
24 include measurement and tracking of hot and cold pipe hanger
25 settings, inspection of operating records for temperature transients,
26 non-destructive examination of critical welds and supports, and review
27 and inspection of steam trap and drain systems to ensure proper
28 operation. These activities ensure employee and public safety and
29 long equipment life and reduce the risk of substantial future
30 expenditure if left unabated.

31 **h. Corrective Maintenance**

32 The manufacturer of the combustion turbines (CT), steam turbine
33 (ST), and generators requires periodic maintenance that is not covered
34 in the CSA. This work consists of materials and contract costs

required to perform instrumentation and controls systems repairs and replacements due to component failures.

HRSG and Balance of Plant (BOP) corrective maintenance includes the material and contract costs associated with maintaining all plant equipment with the exception of the equipment covered under the CSA. This includes the HRSG components such as valves, pipe, tubes, hangers, burners, vanes, dampers, ducts, instrumentation, and electrical components. This estimate also includes BOP equipment such as water treatment system, ZLD, pumps, motors, air compressors, tanks, and fans.

Table 5-10 provides a multi-year estimate of the Tesla Generating Station condition assessment, monitoring, and corrective maintenance costs.

TABLE 5-10
PACIFIC GAS AND ELECTRIC COMPANY
O&M CONDITION ASSESSMENT, MONITORING AND CORRECTIVE MAINTENANCE
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Condition Assessment and Monitoring				
2	Corrective Maintenance				
3	Total Condition Assessment, Monitoring and Corrective Maintenance				

3. Safety, Security and Compliance

The Tesla Generating Station will be operated in a safe, secure and compliant fashion consistent with the laws, rules, and regulations that govern the operation of the facility.

a. Safety

An effective safety program must be adequately funded to ensure a safe and compliant workplace. Safety supplies, equipment and training are estimated to cost \$ [REDACTED] in the first year of operation.

1 **b. Security**

2 Similarly, PG&E has enacted security measures at its critical
3 facilities and continues to monitor and evaluate those controls. An
4 estimate of the first year cost of these activities is \$ [REDACTED].

5 **c. Compliance**

6 Compliance covers a broad range of activities required to ensure
7 the project is operated and maintained consistent with all the
8 requirements of the many and varied regulations that govern the
9 operation of the facility. The facility requires funding for on-going
10 environmental compliance support after establishing commercial
11 operation. This support is necessary in order to assure that PG&E
12 operates the plant in accordance with all regulatory requirements
13 including air quality compliance, water quality compliance, and
14 hazardous materials/hazardous waste management. The compliance
15 activities include:

- 16 1. California Public Utilities Commission (CPUC or Commission)
17 Operating and Maintenance standards;
- 18 2. Air and water quality compliance;
- 19 3. Hazardous materials/hazardous waste compliance;
- 20 4. Oily water separator cleaning and repairs;
- 21 5. Contracted technical consultants;
- 22 6. Training and travel for plant personnel; and
- 23 7. California Energy Commission (CEC) Compliance and Mitigation
24 Tracking.

25 The CPUC compliance cost estimate includes costs PG&E expects
26 to incur in order to comply with the CPUC's Fossil Power Plant
27 Operating and Maintenance Standards and reporting requirements.

28 Examples of air quality compliance activities include Title IV
29 Continuous Emission Monitoring System (CEMS) compliance and
30 reporting; Assembly Bill (AB) 2588 Air Toxics Inventory; AB 2588 Risk
31 Assessment; Selective Catalytic Reduction (SCR) Catalyst
32 Management Plan; California Air Resources Risk Management Plan;
33 Toxic Release Inventory Recordkeeping; Volatile Organic Compounds

1 Recordkeeping; Above Ground Tank fees; and air quality monitoring,
2 reporting, annual testing and payment of fees.

3 Examples of water quality compliance activities include storm
4 water sampling and Spill Prevention Control and Countermeasure
5 (SPCC) Plan management and reporting.

6 Examples of hazardous materials handling and hazardous waste
7 costs include manifest fees, hazardous materials inspections and
8 business plan fees, and shipping and disposal of hazardous materials.

9 The oily water separator cost estimate includes the annual cost of
10 cleaning and repairs necessary to ensure compliance of the water
11 leaving the separator.

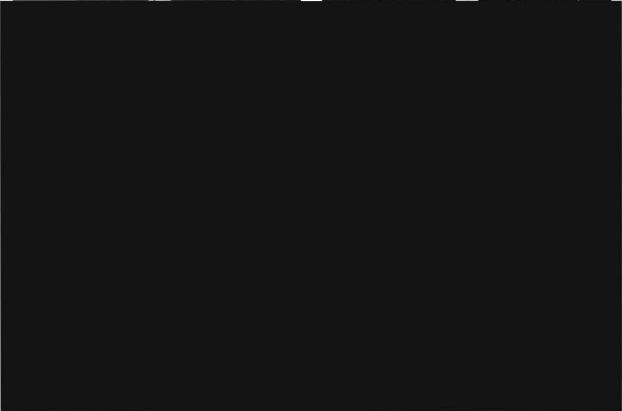
12 PG&E expects to utilize contracted technical and engineering
13 consultants on an as needed basis to help troubleshoot plant operating
14 and maintenance problems that cannot be resolved by plant or
15 in-house expertise.

16 The training and travel cost estimate includes the annual costs
17 required to ensure plant personnel maintain proficiency with current
18 and new compliance requirements for the facility.

19 PG&E will be responsible for certain ongoing CEC permitting and
20 compliance/mitigation costs for the project after it achieves commercial
21 operations. The provisions of the CEC permit which allows for the
22 construction and operation of the facility are numerous. Additional
23 provisions may be added as the project is further developed. The
24 ongoing tracking and management of these provisions is critical to
25 ensure the project can continue to operate.

26 PG&E's estimate of the Safety, Security, and Compliance costs of
27 the Tesla Generating Station are included in Table 5-11.

TABLE 5-11
PACIFIC GAS AND ELECTRIC COMPANY
O&M SAFETY/SECURITY/COMPLIANCE
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Commercial Operation	1st Year	2nd Year	3rd Year	4th Year
1	Safety Supplies Equipment				
2	Security				
3	CPUC O&M Standards Compliance				
4	Air and Water Quality Compliance				
5	Hazardous Materials/Hazardous Waste Management				
6	Oily Water Separator				
7	Tech and Legal Consultants				
8	Training and Travel				
9	CEC Permit Compliance Mitigation/Tracking/Fees				
10	Total Safety/Security/Compliance				

4. Contract Services, Minor Consumables and Infrastructure

There are certain maintenance activities performed infrequently on the plant infrastructure that are best performed by contractors that possess the necessary expertise, but do not warrant a full time dedicated staff position to perform. Such contract services include: Heating, Ventilation and Air Conditioning (HVAC) systems, fire protection system, air compressors, pest control, computer and controls system support, crane certification, ammonia tank inspection, and process water lab analysis. Additionally, turbine manufacturer's CSAs are generally used in the industry as a way to provide high reliability and efficiency of a combined cycle power plant. They are prudent to use in that they provide reliability and efficiency benefits while also providing predictable cost streams. The CSA costs are divided between fixed and variable.

Minor consumables include miscellaneous hardware (nuts/bolts, etc.), lab reagents/supplies/lube oils/gases, and CEMS calibration gases.

Infrastructure support costs include vehicles, miscellaneous rental equipment, building and grounds maintenance, office supplies, postage, subscriptions and fees, telephone and communications, and computer costs (software and hardware upgrades)

TABLE 5-12
PACIFIC GAS AND ELECTRIC COMPANY
O&M CONTRACT SERVICES, MINOR CONSUMABLES AND INFRASTRUCTURE
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Commercial Operation	1st Year	2nd Year	3rd Year	4th Year
1	Contract Services				
2	Minor Consumables				
3	Infrastructure				
4	Total				

5. Major Maintenance

Major maintenance activities are generally performed during scheduled outages in periods of low demand on an annual basis in order to ensure excellent plant performance throughout the year, but particularly during periods of peak demand. The scope of work performed in these periods, and estimated below, is focused on equipment that is not readily available during normal operations and is not covered by a CSA.

The Tesla Generating Station will be equipped with two kinds of emissions control catalysts, one for Nitrogen Oxide (NO_x) reduction and other for Carbon Monoxide (CO). The expected service life for catalyst materials is five years. Consequently, these costs are distributed over the 5-year operating window for replacement based on a 5-year replacement interval. The first year annual cost to replace the NO_x catalyst is \$ [REDACTED], while the first year annual cost to replace the CO catalyst is \$ [REDACTED].

As a generating facility ages, additional expenditures may be required during major maintenance periods to restore or replace equipment damaged from use. These costs are characterized as undefined major projects. PG&E has estimated these costs to be \$ [REDACTED] per year (in 2008 dollars), beginning in year six of commercial operation.

1 Additionally, the HRSGs, ZLD, water treatment system and other
 2 balance of plant equipment are all inspected and restorative maintenance
 3 is performed.

TABLE 5-13
PACIFIC GAS AND ELECTRIC COMPANY
O&M MAJOR MAINTENANCE
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Commercial Operation	1st Year	2nd Year	3rd Year	4th Year
1	CO Catalyst				
2	NOx Catalyst				
3	Undefined Major Projects				
4	HRSG/Other				
5	Balance of Plant and ZLD				
6	Total				

4 **6. Public Benefits Payments**

5 Public benefits payments are those payments that are required by the
 6 CEC as a permit condition of constructing and operating the facility. PG&E
 7 has estimated the public benefits payments for this project consistent with
 8 the yet unsigned cooperation agreement between the project developer
 9 and Alameda County. PG&E expects to assume the obligations of this
 10 agreement upon completion of the acquisition transaction. Portions of
 11 these payments have been included in the capital estimate as they are
 12 scheduled to occur prior to COD. The portions of these payments that
 13 occur following COD have been included in the O&M estimate and are
 14 shown in Table 5-14.

TABLE 5-14
PACIFIC GAS AND ELECTRIC COMPANY
O&M PUBLIC BENEFITS PAYMENTS
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Commercial Operation	1st Year	2nd Year	3rd Year	4th Year
1	Public Benefits Payments				

F. Variable O&M Costs

Variable O&M includes costs that are associated with the CSA and Major Consumables. PG&E's estimate of the project variable O&M costs are provided in Table 5-15.

**TABLE 5-15
PACIFIC GAS AND ELECTRIC COMPANY
VARIABLE O&M COST SUMMARY
(NOMINAL THOUSAND DOLLARS)**

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	CSA				
2	Major Consumables				
3	Contingency ()				
4	Variable O&M Cost Summary				

1. Contractual Services Agreement

The CSA cost estimates provided in this section are derived from commercially sensitive vendor quotes received in connection with other PG&E generation projects. The CSA covers all the equipment provided by the turbine manufacturer, primarily the Combustion Turbines and Generators, Steam Turbine and Generator, and Control System. The CSA provides an effective cost control measure for Covered Maintenance which includes the major planned maintenance and most unplanned maintenance events. The CSA also provides risk mitigation by providing partial coverage for collateral damage due to a forced outage. The prices for the CSA to be performed by GE are established in the proposal and will be only subject to escalation. The CSA covers the cost associated with Covered Maintenance, Repair of Collateral Damage, Warranty and other related maintenance activities. The manufacturer performs planned maintenance inspections and repairs over the term of the CSA according to the schedule as shown in Table 5-16.

TABLE 5-16
PACIFIC GAS AND ELECTRIC COMPANY
O&M CSA MAINTENANCE SCHEDULE

Line No.	Type of Maintenance	Factored Fired Hours	Factored Starts
1	Combustion Inspection	12,000	450
2	Hot Gas Path Inspection	24,000	900
3	Major Inspection	48,000	2,400

These three types of planned inspections are designed and performed at the CT operating intervals shown in Table 5-16. The scope of work covered in the combustion inspection, hot gas path inspection, and major inspection is described in substantial detail in GE's published document entitled Heavy Duty Gas Turbine Operating and Maintenance Considerations, GER 3620K.

The combustion inspection is a relatively short duration shutdown and minor disassembly where the fuel nozzles, combustion liners, transition pieces, crossfire tubes and retainers, spark plug assemblies, flame detectors and combustor flow sleeves are inspected and repaired or replaced as needed. Steam turbine valve inspections may be performed in this same outage window if both CTs are being inspected at the same time.

The hot gas path inspection includes the full scope of the combustion inspection and additionally includes an examination of those parts exposed to high temperatures from the hot gases discharged from the combustion process such as turbine nozzles, stationary stator shrouds and turbine buckets. Steam turbine valve inspection, minor steam turbine inspection, and minor generator inspections will be performed in conjunction with the hot gas path inspections.

Finally, the major inspection includes the full scope of the combustion and hot gas path inspections as well as an examination of all of the internal rotating and stationary components from the CT inlet through the exhaust. Additionally, the major generator inspection and major steam turbine inspection will also be performed in conjunction with the CT major inspection.

The term of the contract is for a defined number of factored fired hours of operation or factored starts, whichever comes first. Factored hours and

1 factored starts recognize that there are varying degrees of impact on the
2 condition of the CTG depending upon the type of service.

3 Maintenance intervals (the period of time between planned
4 maintenance) are determined either by the number of hours operated or
5 the number of starts experienced by the CTGs. The shorter the interval,
6 the more expensive the maintenance cost will be over a period of time.

7 The hours based maintenance interval for CTGs is determined by the
8 Maintenance Factor. For hours based maintenance, the Maintenance
9 Factor is the ratio of the factored hours to the actual hours operated. To
10 calculate the factored hours, various factors are applied to the actual hours
11 as multipliers depending on the operation of the CTG. Fuel quality, steam
12 injection, and peak operating temperature all impact the factored hours
13 calculation. Poor fuel quality or increased operating hours with steam
14 injection or high firing temperatures all increase factored hours and thus
15 reduce the maintenance interval resulting in increased maintenance costs.

16 The starts based maintenance interval for CTGs is determined by a
17 different Maintenance Factor. For starts based maintenance, the
18 Maintenance Factor is the ratio of the factored starts to the actual starts.
19 To calculate the factored starts, various factors are applied to the actual
20 starts as multipliers depending on the operation of the CTG. Rapid starting
21 rates and trips from high load increase factored starts and thus reduce the
22 maintenance interval resulting in increased maintenance costs.

23 Planned maintenance will be performed on each CT within the contract
24 period, the timing of which will be governed by the operation of the
25 equipment as described above. The turbine manufacturer will provide
26 parts, labor, supervision, tools and technical expertise to perform all
27 planned inspections and repairs for the term of the contract. GE will
28 perform all of the Combustion Inspections, Hot Gas Path Inspections, and
29 Major Inspections for each CTG. Additionally, the turbine manufacturer will
30 perform all Generator Inspections, Steam Turbine Inspections, and
31 maintenance on other control systems.

32 PG&E expects to operate the project as a load-shaping resource.

33 As a shaping resource, the planned maintenance intervals are very
34 likely to be governed by the factored hours based calculations. If the

1 project is operated in a substantially different mode, maintenance intervals
2 may be shortened, resulting in increased CSA costs.

3 The CSA consists of variable payments that are accrual payments to
4 GE to provide for the costs of combustion inspections, major maintenance
5 inspections and overhauls. Variable payments are periodic payments that
6 are calculated based upon the operating profile of the plant. An additional
7 payment for the first hot gas path inspection is included the year that the
8 first hot gas path inspection is required. With the load profile PG&E
9 assumed for the Project, the first combustion inspection is scheduled to
10 occur in the fourth year of operation. This is the driver for the increase in
11 costs in the fourth year as shown in Table 5-15.

12 A monthly fee for each CTG is calculated as the product of the variable
13 fee multiplied by the operating hours. The fee is a sliding scale based on
14 the ratio of the factored operating hours to the factored starts (FH/FS ratio).
15 The variable fee is reduced as the FH/FS ratio is increased, representing a
16 larger number of operating hours for each start. If the Project were
17 operated in a fashion that is more cyclical, the FH/FS ratio would be
18 reduced and would result in a higher variable fee and the need for a hot
19 gas path inspection to be brought forward in time. In addition, the hot gas
20 path inspection fee would be payable in the third year after COD rather
21 than the fourth year, adding \$ [REDACTED] to the third-year O&M.

22 **2. Major Consumables**

23 Other variable costs include water treatment system chemicals for
24 boiler quality water and ammonia for use in emissions control. These costs
25 are described as Major Consumables. PG&E has estimated these costs
26 assuming the Tesla Generating Station operates as a load shaping
27 resource. If the actual load profile changes from the forecast, the
28 consumption of these major consumables (and therefore the cost) will
29 change accordingly.

30 Aqueous ammonia is injected into the flue gas of each HRSG
31 upstream of the NOx catalyst for control of NOx. The Tesla Generating
32 Station requires approximately [REDACTED]
33 [REDACTED]. With the forecast load profile and
34 operating hours used for the project, and a unit cost of ammonia estimated

to be [REDACTED] ammonia and escalated to the year of COD, the first year annual cost of ammonia is estimated to be \$ [REDACTED].

The project will make its own high quality water for use in the steam cycle and evaporative coolers at the inlet to the CTGs. The project has been permitted with a wet surface condenser and cooling tower. Water supply for the substantial amount of project water is to be provided from a wastewater treatment plant located in the city of Tracy. The estimated water treatment related cost is \$ [REDACTED] for the first year of operation. Table 5-17 provides an estimate of the project's Major Consumables.

TABLE 5-17
PACIFIC GAS AND ELECTRIC COMPANY
O&M MAJOR CONSUMABLES
(NOMINAL THOUSAND DOLLARS)

Line No.	Year of Operation	1st Year	2nd Year	3rd Year	4th Year
1	Ammonia	[REDACTED]			
2	HRSG Chemicals				
3	CTG Chemicals/Water Wash				
4	Hydrogen/Other Gases				
5	ZLD solids disposal				
6	Water Chemical Cost				
7	Water Supply Cost				
8	Total Major Consumables	[REDACTED]			

G. Contingency

PG&E's estimate of commissioning costs is based on the project's start up costs as permitted. As described below, the use of recycled wastewater in a water-cooled facility poses many challenges. Even when using prudent engineering and designs for the project, significant start-up and operational challenges can emerge given the variability of the characteristics of the water supply.

PG&E's estimate of ongoing O&M expenditures is based upon the operation of the Tesla Generating Station based on its permitted design. The final design details for the project are not complete and there is uncertainty as to how the final project design will drive O&M costs. As mentioned above, it is

1 typical that costs will emerge as the performance of the water treatment and
2 ZLD systems are better known given the variability of the quality of the recycled
3 wastewater supply. The typical cost drivers that occur due to water quality
4 alone consist of increases in personnel staffing and overtime, chemical usage,
5 solids disposal, and water treatment experts and contractors.

6 Additionally, the O&M estimates are based upon reliable plant operation
7 with no unplanned outage or curtailment related repair costs. The expected
8 forced outage rate for this plant configuration is approximately 3.6 percent per
9 year;^[2] therefore some additional reliability related costs are expected to occur
10 every year.

11 In addition, the O&M estimates for the project have been escalated by
12 using the Global Insight 2007 long-term forecast for annual wages for
13 Alameda County. Because the commercial operation date for the project is
14 forecast to occur in November 2011, there is uncertainty that the O&M costs
15 estimated today may be substantially different than the forecast due solely to
16 inflation being different than the assumed rate. This specific uncertainty has
17 been borne out in recent years as the cost of materials, chemicals, fuels, and
18 goods and services have dramatically risen above typical historical escalation
19 rates.

20 PG&E has sought to provide a transparent estimate of the commissioning
21 and O&M costs for the Tesla Generating Station. PG&E chose not to use
22 estimates at the high end of the range for each commodity, material, service,
23 wage rate or inflation factor when preparing its estimate. PG&E could have
24 created the O&M estimates consistently using the highest possible values for
25 those factors, and then applied a reduced contingency value. That approach
26 would have favorable optics, but would have been less transparent. Provided
27 PG&E's approach to estimating, and the uncertainties identified in the ongoing
28 operation of the project, a [REDACTED] contingency has been applied to the
29 fixed and variable O&M expenditures following COD.

[2] While individual pieces of equipment, may perform with a lower- or higher-forced outage rate on an annual basis, the plant as a whole consists of many integrated components all of which contribute to the overall plant forced outage rate.

1 H. Construction Delay

2 As discussed in Section B above, PG&E's commissioning and O&M
 3 estimates included in this chapter assumes the Tesla Generating Station has
 4 achieved commercial operations date by November 1, 2011. Should the plant
 5 not achieve commercial operation as assumed, the timing of the
 6 commissioning and O&M cost streams will delay month for month and costs
 7 will escalate accordingly. Table 5-18 shows PG&E's commissioning cost
 8 estimate if the project COD is delayed until July 2012.

TABLE 5-18
PACIFIC GAS AND ELECTRIC COMPANY
COMMISSIONING EXPENDITURES
(NOMINAL THOUSAND DOLLARS)

Line No.	Description	Year 1
1	No Delay	
2	Delay	
3	Increase Caused by Delay	
4	Months Delay	
5	Monthly Increase (L3/L4)	

9 Table 5-19 shows PG&E's O&M cost estimate if the project COD is
 10 delayed until July 2012.

TABLE 5-19
PACIFIC GAS AND ELECTRIC COMPANY
O&M EXPENSES
(NOMINAL THOUSAND DOLLARS)

Line No.	Description	Year 1
1	No Delay	
2	Delay	
3	Increase Caused by Delay	
4	Months Delay	
5	Monthly Increase (L3/L4)	

11 I. Conclusion

12 This chapter has provided a reasonable estimate of the costs of
 13 commissioning, operating and maintaining the Tesla Generating Station, and
 14 should be used in the development of the revenue requirement presented in
 15 Chapter 7.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 6
THE ECONOMIC ANALYSIS OF PG&E'S
TESLA GENERATING STATION

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 6
THE ECONOMIC ANALYSIS OF PG&E'S
TESLA GENERATING STATION

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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 6
THE ECONOMIC ANALYSIS OF PG&E'S
TESLA GENERATING STATION

A. Introduction

This chapter demonstrates that Pacific Gas and Electric Company's (PG&E or the Company) proposed Tesla Generating Station is cost-effective for customers. The costs and benefits of the Tesla Generating Station are compared to the costs and benefits associated with two viable alternatives: (1) an agreement in principle to amend the Power Purchase Agreement (PPA) with RCEC regarding the Russell City Project (RCEC Amended PPA); and (2) an offer for a PPA for the Tesla Power Plant which was submitted to PG&E by FPL Energy, LLC (FPL) at PG&E's request prior to PG&E's decision to acquire the Tesla site (FPL Tesla PPA offer). The comparison shows that the Tesla Generating Station has greater market value than each of these two alternatives and is a cost-effective choice to meet the reliability needs described in Chapter 3. As stated in Chapter 1, PG&E proposes to pursue both the Tesla Generating Station and the RCEC Project under an amended PPA.

In addition, as a supplemental analysis that further underscores the cost-effectiveness of the Tesla Generating Station, the currently-prevailing market value of the Tesla Generating Station is compared with the then-prevailing market values of the PPA or Purchase and Sales Agreement (PSA) contracts PG&E executed in spring 2006 under PG&E's 2004 Long-Term Request for Offers (LTRFO), and approved by the California Public Utilities Commission (CPUC or Commission) in Decision 06-11-048. The June 24, 2008 market value of the Tesla Generating Station exceeds the February 13, 2006 market value of each of the 2004 LTRFO contracts. This result suggests that the Tesla Generating Station is a valuable, cost-effective resource.

B. Valuation Approach

The valuation approach used here is similar to the approach PG&E used previously in the 2004 LTRFO. The analysis calculates the market value of the benefits and costs of a resource. Benefits include energy, capacity and ancillary services. Costs encompass fixed costs and variable costs. An option model is

used to estimate energy gross margin. Energy gross margin is the market value of the energy produced (what would be energy revenues for a stand-alone generating unit selling into a spot market) minus variable costs for fuel and variable operations and maintenance (O&M). The option model represents market prices probabilistically, and thus benefits and costs are included in the model probabilistically. Market value is estimated as the mean of benefits minus costs, that is, energy gross margin plus capacity benefit plus ancillary service benefit minus fixed costs. Market value is measured in levelized dollars per kilowatt-year (kW-year) of generating unit capacity. The higher the estimated market value for a resource, the more attractive is the resource from the perspective of customers, all else being equal. More details on the valuation approach may be found in Section B.1.a of Chapter 3 of the testimony supporting PG&E's 2004 LTRFO application (*i.e.*, A.06-04-012).^[1]

As described in Section B.3 of that same testimony,^[2] this evaluation methodology facilitates direct comparison of PPA and utility ownership. Inputs to the option model are in the same format, regardless of PPA or utility ownership. Cost inputs for a PPA include an annual capacity payment stream, in dollars per kW-year. Cost inputs for utility ownership include an analogous annual stream, in dollars per kW-year, based on the projected capital cost revenue requirement. From the perspective of market valuation and the option model, the annual capital revenue requirement for utility ownership and annual capacity payment for a PPA are treated in the same way. Cost inputs for fixed O&M and variable O&M are in the same format for PPA and utility ownership. Energy gross margins are computed in the same way for PPA and utility ownership. Using this approach, the market value for PPAs and utility ownership may be directly compared.

C. Costs and Operating Characteristics

For the Tesla Generating Station, a detailed description of capital costs is included in Chapter 4. A description of the fixed O&M costs and variable O&M costs is included in Chapter 5. The annual capital revenue requirement for the Tesla Generating Station is described in Chapter 7. Aspects of the operating

^[1] Application 06-04-012, Exhibit 1, pp. 3-2 to 3-4.

^[2] *Ibid.* at 3-19 to 3-21.

characteristics of the Tesla Generating Station are described in Chapters 2 and 5.

For the RCEC Amended PPA and the FPL Tesla PPA offer, costs and operating characteristics may be found in the workpapers supporting Chapter 6.

D. Market Inputs

Market valuation is based on market price information as of June 24, 2008. Market price information includes forward price curves, volatility curves and correlation curves, for electrical energy and natural gas. Market price information also includes PG&E's estimate of the capacity (resource adequacy (RA)) price curve.

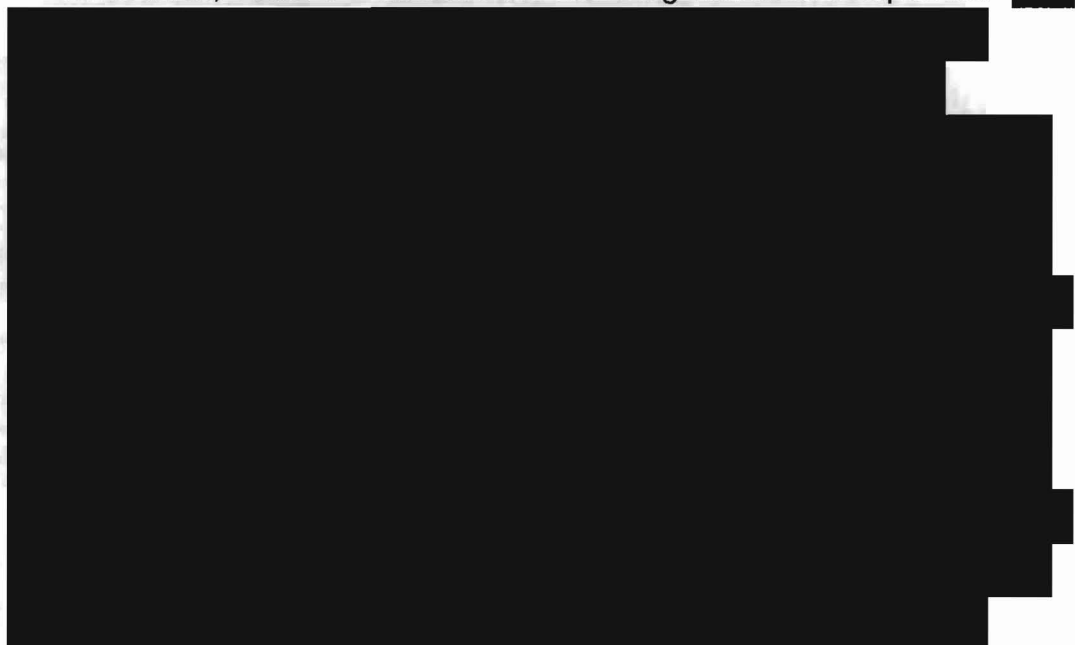
E. Valuation Results

1. Market Valuations for Viable Alternatives

This section discusses the results of the market valuation for the Tesla Generating Station, the RCEC Amended PPA, and the FPL Tesla PPA offer.

Table 6-1 reports benefits, costs, and market value. Benefits reported numerically are energy gross margins and capacity benefit. Ancillary service benefits, as an increment of value to the energy gross margins, are estimated to be small and roughly equal for the three alternatives, and so are not reported.

In addition, Table 6-1 includes the following valuation component.



Costs include capital revenue requirements and fixed O&M for the Tesla Generating Station, and capacity payments and fixed O&M payments for the RCEC Amended PPA and the FPL Tesla PPA offer. The market value for the Tesla Generating Station is \$ [REDACTED] per kW-year, which is substantially greater than the market values for the RCEC Amended PPA and for the FPL Tesla PPA offer.

TABLE 6-1
PACIFIC GAS AND ELECTRIC COMPANY
VALUATION RESULTS FOR VIABLE ALTERNATIVES
(DOLLARS PER KW-YEAR, LEVELIZED)

Line No.	Item	Tesla Generating Station	RCEC Amended PPA	FPL Tesla PPA Offer
1	<u>Benefits</u>			
2	Energy Gross Margins	[REDACTED]	[REDACTED]	[REDACTED]
3	Capacity Benefit			
4	[REDACTED]			
5	Total Benefits			
6	<u>Costs</u>			
7	Annual Capital Revenue Requirement (RRQ) or Contract Capacity Payments	[REDACTED]	[REDACTED]	[REDACTED]
8	Fixed O&M			
9	Total Costs			
10	Market Value			

2. Market Valuation for the Tesla Generating Station Compared to Contracts Executed in 2004 LTRFO

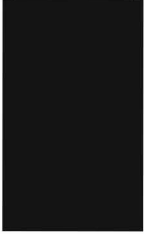
As a supplemental analysis, the market value of the Tesla Generating Station is compared with the market values of the six PPAs and PSAs that PG&E executed in March/April 2006 for its long-term need under the 2004 LTRFO. Market conditions that prevail today are very different from market conditions that prevailed at the time of the 2004 LTRFO. Differences in market conditions are evident when comparing costs for contracts executed then with costs for contracts executed now, and when comparing market forward prices then with market forward prices now. Comparing market values then for contracts executed then, with market values now for contracts executed now, controls somewhat for the different market

conditions—including prices for construction labor and raw materials, as well as wholesale energy commodity prices—prevailing then and now.

The market values for the 2004 LTRFO PPAs and PSAs are reported in Table 6-2. The market values for these six contracts were originally reported in Table D in the workpapers supporting Chapter 3 of the testimony supporting PG&E's previous LTRFO Application, and estimated based on market price information as of February 13, 2006.^[3] The market value for the Tesla Generating Station is estimated based on market price information as of June 24, 2008.

As seen from Table 6-2, the June 24, 2008 market value of the Tesla Generating Station is greater than the February 13, 2006 market value of each of the six PPAs/PSAs executed in the 2004 LTRFO. This result suggests that the Tesla Generating Station is a valuable, cost-effective resource.

TABLE 6-2
PACIFIC GAS AND ELECTRIC COMPANY
VALUATION RESULTS FOR EXECUTED CONTRACTS
(DOLLARS PER KW-YEAR, LEVELIZED)

Line No.	Facility	Market Value
1	Starwood Power	
2	Eastshore Energy Center	
3	Panoche Energy Center	
4	Bullard Energy Center	
5	Colusa Generating Station	
6	Russell City Energy Center	
7	Tesla Generating Station	

F. Conclusion

Based on the analysis in this chapter, the Tesla Generating Station is a valuable, cost-effective new generation resource that will benefit PG&E's customers.

^[3] *Id.*, at 3-26.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
REVENUE REQUIREMENT AND RATEMAKING FOR PG&E'S
TESLA GENERATING STATION

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
REVENUE REQUIREMENT AND RATEMAKING FOR PG&E'S TESLA
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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
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PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
REVENUE REQUIREMENT AND RATEMAKING FOR PG&E'S TESLA
GENERATING STATION

A. Introduction

The purpose of this chapter is to present Pacific Gas and Electric Company's (PG&E or the Company) proposal for recovering the cost of developing and operating the Tesla Generating Station. Adoption of PG&E's ratemaking proposal will assure timely recovery of the reasonable cost of completing, owning and operating the facility as of the date of commercial operation, while providing PG&E a strong incentive to develop and build the facility at or below the reasonable and prudent cost determined by the California Public Utilities Commission (CPUC or Commission).

B. Ratemaking Proposal for Development of the First Unit of the Tesla Generating Station

1. Recovery of Initial Capital Costs

In this application, PG&E is seeking a Certificate of Public Convenience and Necessity (CPCN) to develop and construct a 560 megawatt (MW) natural gas-fired combined-cycle generating facility in eastern Alameda County on the Tesla site. PG&E estimates the cost to complete this project to be \$ [REDACTED]. PG&E requests the Commission find that the \$ [REDACTED] estimate is reasonable and prudent.

PG&E requests revenue recovery of the initial \$ [REDACTED] capital cost once the Tesla Generating Station becomes operational. In the event that the actual capital cost of the Tesla Generating Station exceeds \$ [REDACTED], PG&E would be permitted to begin recovery of the approved \$ [REDACTED] when the facility commences operation without an after-the-fact reasonableness review. In addition, PG&E would be entitled to file an application with the CPUC for recovery of amounts in excess of \$ [REDACTED] to the extent: (1) the excess costs result from operational enhancements to the project; or (2) the excess costs are the result of an action or force that was beyond PG&E's reasonable control. For example,

1 excess costs attributable to permitting delays or changes in the Tesla
2 Generating Station mandated by regulatory agencies would be eligible for
3 recovery through such an application process. In the event that the actual
4 costs of the Tesla Generating Station are below the initial capital cost
5 estimate, PG&E requests recovery of only its actual capital costs, thereby
6 giving the benefit of the lower cost to customers.

7 The \$ [REDACTED] initial capital cost estimate does not include any
8 performance incentives or penalties associated with the engineering,
9 procurement and construction (EPC) contract or equipment suppliers.
10 These incentives and penalties are described in Chapter 4. Similar to the
11 treatment adopted in Decision 06-11-048 for the Colusa and Humboldt
12 facilities, PG&E requests that it be able to recover its actual incentive
13 payments (or return any penalties) through an advice filing after the amounts
14 are known.

15 2. Initial Revenue Requirement

16 To allow for recovery of the non-fuel costs of owning and operating the
17 Tesla Generating Station, PG&E requests that the Commission adopt an
18 estimated initial annual revenue requirement of \$ [REDACTED] in this
19 proceeding. This amount is based on an initial capital cost of
20 \$ [REDACTED]. See Section E, below, for the development of the initial
21 revenue requirement. This revenue requirement will be recorded in the
22 Utility Generation Balancing Account (UGBA) as of the date of commercial
23 operation of the Tesla Generating Station, for recovery in rates on January 1
24 of the following year. This initial revenue requirement will remain in effect
25 until superseded by the rates that will be established in PG&E's next
26 General Rate Case (GRC), following commercial operation of the facility.

27 If the cost of the Tesla Generating Station exceeds the \$ [REDACTED],
28 PG&E will record the revenue requirement for the amount in excess of
29 \$ [REDACTED] in a sub-account of the UGBA. This revenue requirement will
30 only be recovered upon a finding that the costs above \$ [REDACTED] were
31 reasonably incurred.

32 Revenues for the Tesla Generating Station will be collected in
33 generation rates. New rates to recover the project costs will be designed

1 based upon the then-current adopted methods for setting electric rates for
2 generation revenue requirement changes.

3 **3. Adjustments to Initial Revenue Requirement**

4 Before commercial operation, PG&E will file an advice letter to update
5 the initial revenue requirement to reflect the then-current cost of capital,
6 franchise and uncollectibles factors, and property tax factors. In the first
7 GRC following commercial operation, PG&E will update its revenue
8 requirement retroactively to reflect the actual capital costs of the project.
9 Revenue requirements will also be updated retroactively to reflect the annual
10 operations and maintenance (O&M) costs estimates shown in Table 5-3.

11 As discussed in Chapter 5, if plant operations change from that
12 assumed in this Application, the hot gas path inspection fee would be
13 payable in the third year after the Commercial Operation Date (COD) rather
14 than the fourth year, adding \$ [REDACTED] to the third-year O&M. If this
15 happens, PG&E requests that it be able to adjust its proposed O&M
16 expense accordingly. PG&E would file an advice letter demonstrating that
17 start-based criteria has triggered higher than anticipated CSA costs and
18 would collect only the additional payments made under the CSA in this
19 event.

20 **4. Non-Bypassable Charge**

21 Consistent with Decision 04-12-048, Conclusion of Law 16, and
22 additional guidance from Decision 06-06-035 approving the Gateway
23 Generating Station, and Decision 06-11-048 approving the Humboldt and
24 Colusa Generating Stations, PG&E requests that the Commission authorize
25 PG&E to recover any stranded costs associated with the Tesla Generating
26 Station through a non-bypassable charge for a 10-year period following
27 commercial operation.

28 **5. Fuel Cost Recovery**

29 The initial revenue requirement above does not include the fuel costs of
30 commissioning or operating the Tesla Generating Station. PG&E proposes
31 to recover fuel costs, including commissioning fuel cost, associated with the
32 facility through the Energy Resources Recovery Account (ERRA)
33 mechanism. The ERRA was established to record the authorized ERRA

revenue requirement and ERRA actual power costs to determine the recovery of PG&E's procurement plan power costs, excluding costs associated with the California Department of Water Resources (CDWR) power contracts. PG&E's power costs include, as defined in Decision 02-10-062 and modified by Decision 02-12-074, utility retained generation (URG) fuels, Qualifying Facility (QF) contracts, inter-utility contracts, California Independent System Operator (CAISO) charges, irrigation district contracts and other power purchase agreements (PPA), bilateral contracts, forward hedges, pre-payments and collateral requirements associated with procurement, and ancillary services, along with other related power procurement costs. Therefore, ERRA is the appropriate mechanism for recovery of the fuel costs associated with the Tesla Generating Station.

C. Cost Recovery if a CPCN Is Not Granted for the Tesla Generating Station

As described in Chapter 1, PG&E requests that the Commission issue an interim order that would provide PG&E the ability to recover the costs necessary to secure long lead-time equipment that are incurred prior to the issuance of a final decision, as well as associated engineering, permitting and procurement-related costs. PG&E requests that the equipment-related costs and associated engineering, permitting and procurement-related costs (termination costs) be recoverable as an abandoned project expense, and that these costs include Allowance for Funds Used During Construction (AFUDC). The interim order would allow recovery of the termination costs if the Commission issues a final decision denying the CPCN for the Tesla Generating Station. The revenue requirement associated with the abandoned project recovery will be recorded in the Utility Generation Balancing Account (UGBA) and included in rates on January 1 of the following year.

Additionally, PG&E requests that, if the Commission issues a final decision denying PG&E's requested CPCN, all reasonably incurred acquisition costs, including AFUDC, be treated as Plant Held for Future Use (PHFU). For property acquired in advance for future utility use, the Commission may allow the utility to earn a cash return on the cost of the property, without any depreciation expense, until the time that the property is placed in service. The estimated annual

1 revenue requirement for PHFU treatment of the \$ [REDACTED] of the acquisition
2 costs is \$ [REDACTED]. See Table 7-3. PG&E proposes to record this revenue
3 requirement in UGBA as of the date of a decision denying the CPCN for the
4 Tesla Generating Station for recovery in rates on January 1 of the following year,
5 subject to true-up to the actual final amount.

6 **D. Ratemaking Proposal for Development of the Second Unit of the** 7 **Tesla Generating Station**

8 As discussed in Chapter 1, the Tesla Generating Station was licensed by the
9 California Energy Resources Conservation and Development Commission
10 (CEC) in 2004 as a 1,120 MW natural gas-fired combined-cycle generating
11 station consisting of two generating units. PG&E proposes to construct only
12 one of the two generating units at this time, capable of producing 560 MW.
13 Therefore, PG&E requests acquisition costs associated with the possible second
14 unit at the Tesla Generating Station be included in PHFU until such time as a
15 CPCN is granted for the second unit.

16 PG&E estimates that as of December 31, 2008, acquisition costs associated
17 with the second unit, including AFUDC, will be \$ [REDACTED]. Upon issuance
18 of a final decision approving a CPCN for Unit 1 of Tesla Generating Station,
19 PG&E will incur an additional \$ [REDACTED] in payment obligations to FPL
20 Energy, LLC (FPL) that will be associated with the second unit. Therefore, with
21 a January 2009 decision, PG&E estimates the total amount of PHFU associated
22 with the second unit to be \$ [REDACTED]. The estimated annual revenue
23 requirement for PHFU treatment of the \$ [REDACTED] is \$ [REDACTED]. See
24 Table 7-4.

25 In the event that the Commission does not grant a CPCN for Unit 1, the
26 additional \$ [REDACTED] payment will not be incurred. In that event, PG&E
27 proposes that the \$ [REDACTED] of acquisition costs mentioned above be
28 included in PHFU. The estimated annual revenue requirement for PHFU
29 treatment of the [REDACTED]. See Table 7-5.

30 PG&E proposes that the PHFU-related revenue requirement begin accruing
31 in UGBA as of the date of the decision on the Unit 1 CPCN, for recovery in rates
32 on January 1 of the following year, subject to true-up to the actual final PHFU
33 balance.

E. Development of Initial Revenue Requirements

**1. Tesla Generating Station Initial Revenue Requirement if CPCN
Granted**

The estimated non-fuel revenue requirement for the first year of the Tesla Generating Station commercial operation is shown in Table 7-1. PG&E proposes that the first year revenue requirement of \$ [REDACTED] be adopted as the initial revenue requirement in this proceeding and not be adjusted, except for the advice filing discussed above, until the GRC following commercial operation of the facility.

TABLE 7-1
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION
COMPONENTS OF INITIAL REVENUE REQUIREMENT

Line No.	Item	Year 1(a)	Year 2(b)	Year 3(c)	Year 4(d)
1	Operating Revenue				
2	<u>Operating Expense</u>				
3	O&M				
4	Administrative and General				
5	Employee Benefits				
6	Insurance				
7	Subtotal				
8	Uncollectibles				
9	Franchise Requirements				
10	Subtotal Operating Expenses				
11	<u>Taxes</u>				
12	Property				
13	Payroll				
14	State Corporation Franchise				
15	Federal Income				
16	Subtotal Taxes				
17	Depreciation				
18	Decommissioning Accrual				
19	Total Operating Expenses				
20	Net For Return				
21	Weighted Average Rate Base				
22	<u>Rate of Return</u>				
23	On Rate Base				
24	On Equity				

(a) Year 1 11/1/2011 – 10/31/2012.

(b) Year 2 11/1/2012 – 10/31/2013.

(c) Year 3 11/1/2013 – 10/31/2014.

(d) Year 4 11/1/2014 – 10/31/2015.

- 1 Below is a description of the substantive components of the initial
2 revenue requirement shown in Table 7-1.

1 **a. Operation and Maintenance**

2 The O&M expense shown on line 3 of Table 7-1 is the estimated
3 non-fuel cost of operating and maintaining the Tesla Generating Station.
4 The development of these costs is presented in Chapter 5.

5 **b. Administrative and General Expense**

6 Line 4 of Table 7-1 is an estimate of the incremental administrative
7 and general (A&G) expense (incremental employee benefits) associated
8 with the labor included in the O&M expenses above.

9 Also included in line 4 is an estimate of the incremental cost of
10 property insurance for the Tesla Generating Station. The coverage,
11 which is part of a blanket policy for PG&E, includes a \$250 million limit
12 with a \$25 million deductible for property and a \$10 million deductible for
13 boiler machinery.

14 In GRCs, generation revenues are allocated a share of A&G
15 expenses and common and general plant costs that can not be directly
16 assigned to a line of business. The cost of salaries for the Corporate
17 Accounting Department is an example of an A&G expense that is
18 allocated to lines of business in a GRC. The cost of the investment in
19 PG&E's General Office building is an example of common plant that is
20 allocated. The initial revenue requirement presented in this proceeding
21 does not include any allocation of A&G and common and general plant
22 costs. These costs are not expected to change substantially, if at all, as
23 a result of the Tesla Generating Station. If an allocation of these costs
24 were included in the initial rates for the Tesla Generating Station, there
25 would also need to be a reallocation of costs from other lines of
26 business at the time of commercial operation of the facility, which would
27 require changing all of the revenue requirements amounts in effect at
28 that time. Instead, in order to avoid double counting, PG&E proposes to
29 allocate A&G and common and general plant costs in the GRC, where
30 updating of these allocations normally occur, following commercial
31 operation.

32 **c. Uncollectibles and Franchise Expense**

33 Uncollectible accounts expenses and franchise fees are shown on
34 lines 8 and 9, respectively. These amounts are a function of revenue

requirements and are developed using historical factors. The initial revenue requirement will be adjusted to reflect the then current franchise and uncollectibles factors by advice letter as discussed above.

d. Property Taxes

Line 12 of Table 7-1 is the estimated property tax for the project. Property taxes are calculated based on the value of plant as of the property tax lien date multiplied by a property tax factor based in the historical relationship of property tax assessments to recorded plant balances. The initial revenue requirement will be adjusted to reflect the then-current property tax factor by advice letter as discussed above.

e. Payroll and Other Taxes

Line 13 of Table 7-1 is PG&E's estimate of payroll and taxes other than income and property taxes. The estimate is derived as a percentage of O&M labor expenses. This amount includes taxes such as Federal Insurance Contribution Act (FICA), Federal Unemployment Insurance (FUI), and State Unemployment Insurance (SUI).

f. State and Federal Income Tax

Estimated California Corporation Franchise Tax (CCFT) and Federal Income Tax (FIT) are shown on lines 14 and 15, respectively. CCFT and FIT expenses are estimated based on net operating income before income taxes. Current tax law has been utilized to compute income taxes for the facility.

FIT expense, including deferred income tax, is calculated by multiplying the currently effective corporate FIT rate of 35 percent by applicable federal taxable income. Similarly, state income tax expense is calculated by multiplying the statutory rate of 8.84 percent of state taxable income. Following established Commission policy, FITs are computed on a normalized basis. Deferred FITs are calculated as the difference between book depreciation and federal tax depreciation times the federal tax rate. The Accumulated Deferred FIT is included as a credit to rate base. Federal tax depreciation is based on the 20-year Modified Accelerated Cost Recovery Schedule (MACRs).

As a result of the Jobs Act, PG&E is eligible to receive an additional FIT deduction (as of the date of this filing, California has not conformed

to this act). The Jobs Act of 2004 includes a provision that allows a tax deduction for goods manufactured and produced in the United States. The deduction is computed as a percentage of the net taxable income of a taxpayer derived from the manufacture or production of such goods.^[1] The rate is phased in beginning at 3 percent for 2005 increasing to 9 percent beginning in 2010. Production of electricity qualifies for the deduction; the transmission and distribution of electricity does not. The initial revenue requirement calculation reflects the appropriate tax savings associated with the Act.

State income taxes are calculated on a flow-through basis. State tax depreciation is based on a Double Declining Balance (DDB) method over 28 years.

g. Depreciation Expense

Depreciation expense (line 17) is determined by dividing the plant balance by the 30-year expected life of the facility. This simplified method ignores the cost of net salvage (salvage value less cost of removal) and interim replacement of plant components, which would normally be determined in a depreciation study. In order to avoid complicating this proceeding, PG&E proposes that the initial revenue requirement be based on this simplified depreciation calculation, and that a detailed study of depreciation parameters be included in the GRC following commercial operation.

h. Decommissioning Accrual

The initial revenue requirement contains a provision for the ultimate decommissioning of the Tesla Generating Station at the end of its service life (line 18). PG&E estimates the cost to decommission the Tesla Generating Station at \$20 million. Similar to depreciation, PG&E

^[1] The Internal Revenue Code section uses the term qualified production activities income and defines that as gross receipts, reduced by the sum of: (1) cost of goods sold that are allocable to the receipts; (2) other deductions, expenses, or losses that are directly allocable to such receipts; and (3) a proper share of other deductions, expenses, and losses that are not directly allocable to such receipts or another class of income. Internal Revenue Code §199(c)(1).

proposes to include a Tesla Generating Station-specific decommissioning study in the GRC following commercial operation.

i. Return on Rate Base

Return on rate base (line 20) is calculated by multiplying the estimated rate base (line 21) by the currently authorized rate of return of 8.79 percent adopted in Decision 07-12-049 for 2008. The return on rate base will be adjusted to reflect the currently authorized rate of return in effect at the time of the advice filing prior to commercial operation. The initial revenue requirement will be adjusted to reflect the then-current authorized rate of return by advice letter as discussed above.

2. Tesla Generating Station Rate Base if CPCN Granted

Table 7-2 shows estimated weighted average rate base for the Tesla Generating Station for the first year of commercial operation.

TABLE 7-2
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION
RATE BASE
(THOUSANDS OF NOMINAL DOLLARS)

Line No.		Year 1(a)	Year 2(b)	Year 3(c)	Year 4(d)
1	Plant				
2	Inventories				
3	Working Cash				
4	Subtotal				
5	<u>Less</u>				
6	Accumulative Deferred Taxes				
7	Accumulated Decommissioning				
8	Accumulated Depreciation				
9	Weighted Average Rate Base				

(a) Year 1 11/1/2011 – 10/31/2012.

(b) Year 2 11/1/2012 – 10/31/2013.

(c) Year 3 11/1/2013 – 10/31/2014.

(d) Year 4 11/1/2014 – 10/31/2015.

1 A discussion of the substantive components of rate base shown in
2 Table 7-2 follows:

3 **a. Plant**

4 Line 1 is the estimated weighted average plant balance reflecting
5 the initial capital cost of the project presented in Chapter 4. As
6 explained in that chapter, the initial capital cost includes the cost of
7 placing the Tesla Generating Station in service, including commissioning
8 labor costs incurred prior to commercial operation.

9 **b. Working Cash Allowance**

10 The Working Cash requirement (line 3) is computed by multiplying
11 total estimated annual O&M expenses by one-eighth. The resulting
12 amount represents approximately 45 days of O&M expenses. This
13 simplified calculation method, which is accepted by the Federal Energy
14 Regulatory Commission (FERC), is used for purposes of this filing only.
15 A detailed analysis of generation working cash, including the Tesla

1 Generating Station, will be included in the first GRC following
2 commercial operation.

3 **c. Accumulated Deferred Taxes**

4 Accumulated Deferred Federal Taxes are shown as a deduction
5 from rate base in line 6. This is calculated according to the income tax
6 normalization provision of the Economic Recovery Tax Act, and is
7 consistent with the calculation of FIT expense described above.

8 **d. Accumulated Decommissioning and Depreciation**

9 The estimated accumulated decommissioning and depreciation is
10 deducted from rate base as shown on lines 7 and 8, respectively.

11 **3. Tesla Generating Station Revenue Requirement if PHFU**
12 **Treatment Granted**

13 Table 7-3 shows the development of the estimated revenue requirement
14 for the Tesla Generating Station if the CPCN for Unit 1 is not granted, but
15 PHFU treatment is approved for the acquisition costs.

TABLE 7-3
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION UNIT 1
PHFU REVENUE REQUIREMENT
(THOUSANDS OF NOMINAL DOLLARS)

Line No.		Year 1
1	Operating Revenue	
2	<u>Operating Expense</u>	
3	Uncollectibles	
4	Franchise Requirements	
5	Insurance	
6	Subtotal Operating Expenses	
7	<u>Taxes</u>	
8	Property	
9	State Corporation Franchise	
10	Federal Income	
11	Subtotal Taxes	
12	Net For Return	
13	Weighted Average Rate Base	
14	<u>Rate of Return</u>	
15	On Rate Base	
16	On Equity	

4. Unit 2 PHFU Revenue Requirement

Table 7-4 shows the development of the estimated PHFU revenue requirement for a potential second unit at the Tesla site, assuming the Unit 1 CPCN is approved.

TABLE 7-4
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION UNIT 2
PHFU REVENUE REQUIREMENT
UNIT 1 CPCN APPROVED
(THOUSANDS OF NOMINAL DOLLARS)

Line No.		Year 1
1	Operating Revenue	
2	<u>Operating Expense</u>	
3	Uncollectibles	
4	Franchise Requirements	
5	Insurance	
6	Subtotal Operating Expenses	
7	<u>Taxes</u>	
8	Property	
9	State Corporation Franchise	
10	Federal Income	
11	Subtotal Taxes	
12	Net For Return	
13	Weighted Average Rate Base	
14	<u>Rate of Return</u>	
15	On Rate Base	
16	On Equity	

1 Table 7-5 shows the development of the estimated PHFU revenue
2 requirement for a potential second unit at the Tesla site, assuming the Unit 1
3 CPCN is not approved.

TABLE 7-5
PACIFIC GAS AND ELECTRIC COMPANY
TESLA GENERATING STATION UNIT 2
PHFU REVENUE REQUIREMENT
UNIT 1 CPCN NOT APPROVED
(THOUSANDS OF NOMINAL DOLLARS)

Line No.		Year 1
1	Operating Revenue	
2	<u>Operating Expense</u>	
3	Uncollectibles	
4	Franchise Requirements	
5	Insurance	
6	Subtotal Operating Expenses	
7	<u>Taxes</u>	
8	Property	
9	State Corporation Franchise	
10	Federal Income	
11	Subtotal Taxes	
12	Net For Return	
13	Weighted Average Rate Base	
14	<u>Rate of Return</u>	
15	On Rate Base	
16	On Equity	

1 F. Conclusion

2 PG&E believes the Commission should adopt its ratemaking proposal for the
3 Tesla Generating Station as it is fair to PG&E customers and will assure PG&E
4 of timely cost recovery of the reasonable cost of completing, owning and
5 operating the project as of the date of commercial operation. It also provides
6 PG&E a strong incentive to develop and build the facility at or below the prudent
7 and reasonable cost determined by the Commission, and avoids the need for an
8 after-the-fact reasonableness review in the event of all but major cost overruns.

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX A
STATEMENTS OF QUALIFICATIONS

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF ROBERT T. JENKINS

Q 1 Please state your name and business address.

A 1 My name is Robert T. Jenkins, and my business address is Pacific Gas and Electric Company 245 Market Street, San Francisco, California

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I am a principal in Energy Procurement. I am actively engaged in advising on new resource procurement activities concerning electric transmission and generation interconnection matters.

Q 3 Please summarize your educational and professional background.

A 3 I received a Bachelor of Science degree in Electrical Engineering from North Carolina State University in 1980 and a Master of Engineering degree in Electric Power Engineering from Rensselaer Polytechnic Institute in 1981. I am a registered Electrical Engineer in the state of California and a Senior Member of the Institute of Electrical and Electronic Engineers. I have 27 years of experience in the electric industry and am the Past-Chairman of the Western Electricity Coordinating Council Planning Coordination Committee. Prior to starting with PG&E in 2005, I was a Transmission Support Principal at Mirant Corporation working in matters related to transmission open access and merchant power plant interconnection issues. Prior to my work at Mirant, I held various positions in the transmission planning and system operation groups at PG&E culminating as the manager of Strategic and Technical Services responsible for Extra High Voltage transmission planning and regional coordination.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station Project Application:

- Exhibit (PG&E-1), "Tesla Generating Station Project Prepared Testimony":
 - Chapter 2, "Overview of the Tesla Transaction and Proposed Generating Station," Section D.

- 1 Q 5 Does this conclude your statement of qualifications?
- 2 A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF MICHAEL L. JONES

Q 1 Please state your name and business address.

A 1 My name is Michael L. Jones, and my business address is Pacific Gas and Electric Company, 245 Market Street, San Francisco, California

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I am the director of Generation Development, responsible for developing new generation project opportunities for utility owned generation.

Q 3 Please summarize your educational and professional background.

A 3 I received a Bachelor of Science degree in Mechanical Engineering from Washington State University in 1983 and a Master of Business Administration degree from John F. Kennedy University in 1993. I am a registered Mechanical Engineer in the State of California.

In 1983, I joined PG&E as a power production engineer at one of the company's fossil power plants. From 1983 to 1995, I progressed in both management and technical areas of fossil power plant management, staffing, engineering, operations, maintenance, design, construction, and project management throughout the company's fossil fleet. I trained and guided plant personnel in technical fields such as instrumentation, controls and tuning, vibration and balancing, efficiency testing and evaluation, boiler and turbine design, troubleshooting and root cause analysis. I ultimately became the plant engineer for the Pittsburg and Contra Costa Power Plants.

From 1995 to 1998 I worked for PG&E Enterprises, PG&E's unregulated affiliate, in a variety of areas including oversight of our unregulated domestic and international generating investments. Additionally, I supported acquisition efforts of electric distribution companies in Australia and South America and power plant acquisition and development efforts in Australia. Work activities included the bid process, due diligence, and development of acquisition transition plans to cover all aspects of the operation of the business including capital investment, operations and maintenance, staffing, industrial relations, and environmental management.

1 From 1998 to 1999, I returned to the utility as director, Generation Asset
2 Divestiture and was assigned the task to sell Pittsburg, Contra Costa, and
3 Potrero Power Plants and the Geysers geothermal generating facility as part
4 of PG&E's asset divestiture requirements.

5 From 1999 to 2001, I was the director and plant manager of
6 Hunters Point Power Plant, a 423 MW conventional fossil and combustion
7 turbine power plant located in San Francisco, California.

8 As director, Business Projects from 2001 to 2002, I lead a diverse team
9 consisting of operating, inside and outside legal, regulatory, government,
10 corporate and financial personnel in the company's bankruptcy Plan of
11 Reorganization transaction effort for the Generation business.

12 As Hydro Operations and Maintenance (O&M) director from 2002 to
13 2006, my duties were to lead the O&M organization consisting of 330 people
14 focused on day-to-day safe, reliable, excellent operation of nearly 3,900 MW
15 of hydroelectric generating facilities organized as 110 generators located in
16 68 powerhouses in central and northern California. In 2006 to 2007, I
17 worked on the Company's Business Transformation efforts. In my current
18 assignment as director of New Generation Projects, my duties are to
19 develop conventional fossil and hydro power project opportunities for utility
20 investment.

21 Q 4 What is the purpose of your testimony?

22 A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station
23 Project Application:

- 24 • Exhibit (PG&E-1), "Tesla Generating Station Project Prepared
25 Testimony":
 - 26 – Chapter 2, "Overview of the Tesla Transaction and Proposed
27 Generating Station," Section C;
 - 28 – Chapter 4, "The Capital Costs of PG&E's Tesla Generating Station;"
29 and
 - 30 – Chapter 5, "Commissioning and Operation and Maintenance Costs
31 of PG&E's Tesla Generating Station."

32 Q 5 Does this conclude your statement of qualifications?

33 A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF BRIAN M. McDONALD

Q 1 Please state your name and business address.

A 1 My name is Brian M. McDonald, and my business address is Pacific Gas and Electric Company, 245 Market Street, San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I am a director in the Energy Supply organization and am responsible for various development matters.

Q 3 Please summarize your educational and professional background.

A 3 I received a Master of Business Administration degree from St. Mary's College of California and a Bachelor of Science degree in Mechanical Engineering from California State University, Sacramento. I am a registered Professional Engineer in the state of California.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station Project Application:

- Exhibit (PG&E-1), "Tesla Generating Station Project Prepared Testimony":
 - Chapter 2, "Overview of the Tesla Transaction and Proposed Generating Station," Sections A and B.

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF MARINO MONARDI

Q 1 Please state your name and business address.

A 1 My name is Marino Monardi, and my business address is 245 Market Street,
San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company
(PG&E or the Company).

A 2 I am a director in the Energy Supply organization and responsible for
structuring long term purchase power transactions.

Q 3 Please summarize your educational and professional background.

A 3 I have more than 23 years of experience working in the electric and gas
utility industry predominantly in the areas of structured transactions,
planning, trading and operations. I joined PG&E in 2004 where I have had
leading roles in several Request for Offers (RFOs) as well as structuring a
number of long-term power purchase transactions. Prior to PG&E I worked
at Puget Sound Energy as a Director in the Energy Portfolio Management
Division. There my responsibilities included overseeing the development
and implementation of hedging and optimization strategies and programs to
manage power and gas portfolio costs and risk, the structuring and
transacting of derivatives to manage price and volumetric risks, and the
analysis of power and gas markets and the portfolio to support such hedging
activities. I have also worked for the Sacramento Municipal Utility District
and the Illinois Department of Energy and Natural Resources. I attended
the University of Wisconsin/Parkside and Indiana University where I
received a Masters in Public Affairs degree with a specialization in Energy
Economics.

Q 4 What is the purpose of your testimony?

A 4 I am co-sponsoring the following testimony in this proceeding:

- Chapter 3, "PG&E's Tesla Generating Station Is Needed for Reliability."

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF JOSEPH F. O'FLANAGAN

Q 1 Please state your name and business address.

A 1 My name is Joseph F. O'Flanagan, and my business address is Pacific Gas and Electric Company, 77 Beale Street, San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I am a director in the Senior Vice President – Generation organization and am responsible for various regulatory matters.

Q 3 Please summarize your educational and professional background.

A 3 I received a Bachelor of Science degree in Marine Engineering from the United States Merchant Marine Academy at Kings Point, New York, in 1975. I also attended the Harvard Graduate School of Business Administration, where I was a candidate for a Masters degree in Business Administration.

Prior to joining PG&E in 1979, I served as an engineering officer on ocean-going merchant vessels. Prior to assuming my present position at PG&E, I held the positions of rate economist in the Rates Department, senior valuation engineer in the Valuation Department, supervisor in the Revenue Requirements Department, manager in the Rates, Market Planning and Research, and Revenue Requirements Departments, and director of the Budget, Tax, and Capital Accounting Departments.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station Project Application:

- Exhibit (PG&E-1), "Tesla Generating Station Project Prepared Testimony":
 - Chapter 7, "Revenue Requirement and Ratemaking for PG&E's Tesla Generating Station."

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF TODD STRAUSS

Q 1 Please state your name and business address.

A 1 My name is Todd Strauss, and my business address is Pacific Gas and Electric Company, 245 Market Street, San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I hold the position of senior director of Energy Policy, Planning, and Analysis. I support energy procurement activities by leading policy formulation, and providing guidance and oversight for long-term planning, valuation analysis and portfolio analysis.

Q 3 Please summarize your educational and professional background.

A 3 I received my Bachelor of Science degree in Mathematics from the Massachusetts Institute of Technology. I hold a Ph.D. in Industrial Engineering and Operations Research from the University of California at Berkeley.

I have worked as an Assistant Professor at the Yale School of Management, a principal at the consulting firm PHB Hagler Bailly, and director of Quantitative Analysis at an affiliate company of PG&E.

In 2003, I joined PG&E as director of Quantitative Analysis. I was appointed to my current position in 2006.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station Project Application:

- Exhibit (PG&E-1), "Tesla Generating Station Project Prepared Testimony":
 - Chapter 6, "The Economic Analysis of PG&E's Tesla Generating Station."

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF FONG WAN

Q 1 Please state your name and business address.

A 1 My name is Fong Wan, and my business address is Pacific Gas and Electric Company, 245 Market Street, San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 I am a Vice President, Energy Procurement. In this position I am responsible for gas and electric supply planning and policies, market assessment and quantitative analysis, supply development, procurement and settlement.

Q 3 Please summarize your educational and professional background.

A 3 I graduated from Columbia University in 1984 with a Bachelor of Science degree in Chemical Engineering and from University of Michigan in 1986 with a Master of Business Administration degree.

From 1986 to 1988, I worked as a business analyst with Exxon U.S.A. I began work with PG&E in 1988 as a financial analyst in the financial planning and analysis area. I was promoted to senior financial analyst in 1989 and to manager in 1991. In this area, I worked on recommendations involving capital structure and dividend policies, as well as various capital, acquisition, and divestiture analyses.

From 1992-1993, I was on a special assignment working on the decontracting of Canadian gas supply contracts. In this capacity, I oversaw financial and economic analyses and participated in contract negotiations with suppliers.

In 1994, I joined the Product and Sales Department in California Gas Transmission. I was promoted to director of the department in 1995, where I was responsible for the sales of interstate and intrastate gas transmission capacity and gas storage-related services. I also participated in the development of Gas Accord.

In 1996, I transferred as director to the Power Market Planning Department and the Energy Trading Department. Here, I participated in

1 market structure activities involving the California ISO and PX and oversaw
2 electric supply planning and trading activities.

3 In 1997, I left PG&E and joined PG&E Corporation's Energy Trading
4 subsidiary of the National Energy Group, in Bethesda Maryland. I was
5 promoted to Vice President of Structured Trading in 1999 and my
6 responsibilities encompassed all complex, structured transactions at Energy
7 Trading.

8 In 1999, I joined AltaGas Inc., in Calgary, Alberta. At AltaGas, I was
9 Senior Vice President and Chief Operating Officer, overseeing all trading,
10 acquisition, strategy and planning, operations, and engineering activities for
11 this mid-stream gas company.

12 In 2000, I rejoined PG&E Corporation as Vice President of Risk
13 Initiative, in San Francisco. I participated in PG&E's Plan of Reorganization
14 and advised on power procurement issues.

15 In 2004, I rejoined PG&E as Vice President of Power Contracts and
16 Electric Resource Development. I oversaw all existing power contracts,
17 including qualifying facility, renewable generation, and irrigation district
18 contracts. In addition, I was also responsible for acquiring all long-term
19 supply needs via contracts or generation ownership.

20 In 2006, I assumed my current position as Vice President of Energy
21 Procurement.

22 Q 4 What is the purpose of your testimony?

23 A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station
24 Project Application:

- 25 • Exhibit (PG&E-1), "Tesla Generating Station Project Prepared
26 Testimony":
 - 27 – Chapter 1, "Policy Overview."

28 Q 5 Does this conclude your statement of qualifications?

29 A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF MANHO YEUNG

Q 1 Please state your name and business address.

A 1 My name is Manho Yeung, and my business address is Pacific Gas and Electric Company, 77 Beale Street, San Francisco, California.

Q 2 Briefly describe your responsibilities at Pacific Gas and Electric Company (PG&E or the Company).

A 2 My current position at PG&E is director of Integrated Resource Planning. In this capacity, I am responsible for PG&E's long term energy procurement plan and resource planning matters.

Q 3 Please summarize your educational and professional background.

A 3 I received a Bachelor of Science degree in Electrical Engineering from the Georgia Institute of Technology in 1980, and a Master of Science degree in Electrical Engineering from the Santa Clara University in 1986. I have been employed by PG&E since 1980 and have over 28 years of energy policy, electric power system planning and engineering experience.

I started my career with PG&E in 1980 and worked in PG&E's Electric Transmission Planning Department between 1980 and 1987 as a transmission planning engineer responsible for local transmission expansion projects. Between 1988 and 1992, I worked in PG&E's Electric Generation Planning Department as a senior electric generation planner. In that position, I managed PG&E's participation and testified for PG&E as its principle generation planner in the California Energy Commission's 1988 and 1990 Electricity Report Proceedings, and the Biennial Resource Plan Update Proceedings at the California Public Utilities Commission.

In 1993, I worked as the administrative assistant to the Senior Vice President and General Manager of PG&E's Electric Supply Business Unit. Between 1993 and 1997, I was the director of Engineering in PG&E's Grid Maintenance and Construction Department. In that position, I was responsible for the engineering and design of PG&E's electric transmission lines, electric substations and system protection equipment. Between 1997 and 2006, I was PG&E's Manager-Electric Transmission Planning in the Electric Transmission and Distribution Engineering Department. In that

1 position, I was responsible for PG&E's electric transmission grid expansion
2 plan, electric transmission capacity project implementation and electric
3 transmission interconnection planning matters.

4 Between 2006 and 2007, I was director of System Integration Policy and
5 Planning in PG&E's Energy Procurement organization. In that position, I
6 was responsible for PG&E's wholesale electric market issues related to the
7 California Independent System Operator's market redesign and technology
8 upgrade initiative. I was also responsible for integrating supply-side,
9 demand-side and transmission resources into PG&E's long-term
10 procurement planning process. In April 2007, I started my current
11 assignment as PG&E's director of Integrated Resource Planning.

12 Q 4 What is the purpose of your testimony?

13 A 4 I am sponsoring the following testimony in PG&E's Tesla Generating Station
14 Project Application:

- 15 • Exhibit (PG&E-1), "Tesla Generating Station Project Prepared
16 Testimony":
 - 17 – Chapter 2, "Overview of the Tesla Transaction and Proposed
18 Generating Station," Section E; and
 - 19 – Chapter 3, "PG&E's Tesla Project Is Needed for Reliability,"
20 co-sponsored with Marino Monardi.

21 Q 5 Does this conclude your statement of qualifications?

22 A 5 Yes, it does.