

## DOCKETED

<b>Docket Number:</b>	15-IEPR-01
<b>Project Title:</b>	General/Scope
<b>TN #:</b>	206578
<b>Document Title:</b>	Pacific Gas and Electric Company Comments on the Draft 2015 Integrated Energy Policy Report
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	Pacific Gas and Electric Company/Nathan Bengtsson
<b>Submitter Role:</b>	Public
<b>Submission Date:</b>	11/10/2015 4:24:25 PM
<b>Docketed Date:</b>	11/10/2015

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*Submitted On: 11/10/2015*

*Docket Number: 15-IEPR-01*

**Pacific Gas and Electric Company Comments on the Draft 2015 IEPR**

*Additional submitted attachment is included below.*

November 10, 2015

**VIA ELECTRONIC DOCKET 15-  
IEPR-01**California Energy Commission  
Dockets Office, MS-4  
Docket No. 15-IEPR-01  
1516 Ninth Street  
Sacramento, CA 95814-5512Re: Docket 15-IEPR-01: Pacific Gas and Electric Company Comments on the Draft 2015  
Integrated Energy Policy Report**I. INTRODUCTION**

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the California Energy Commission's (CEC, Commission, or Energy Commission) 2015 Draft Integrated Energy Policy Report (IEPR or Report),<sup>1</sup> which was discussed at a CEC Workshop on October 20.<sup>2</sup> The IEPR is the leading energy policy report for the State of California and impacts energy policy discussions among elected officials, public agencies, stakeholders, and the public.

PG&E broadly supports the findings and recommendations of the 2015 Draft IEPR, which appropriately puts Governor Brown's greenhouse gas (GHG) emission reduction goals at the center of the energy policy discussion. In partnership with industry stakeholders like PG&E, California has made remarkable strides in recent years toward achieving ambitious climate goals to prevent and mitigate the effects of climate change. However, with Californians already experiencing severe drought, intense wildfires, extreme weather, and other climate change-related impacts, PG&E stands with the Governor, the Legislature, and the CEC in agreement that more must be done across all sectors to decarbonize California's economy.

The recent passage of SB 350, California's Clean Energy and Pollution Reduction Act of 2015, establishes renewable energy procurement and energy efficiency targets that set the course for the energy sector to help achieve Governor Brown's goal of reducing GHG emissions 40 percent below 1990 levels by 2030. The 2015 Draft IEPR recognizes that meeting the targets of SB 350 and the Governor's emission reduction goals will require addressing many challenges, including

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<sup>1</sup> California Energy Commission. 2015. *Draft 2015 Integrated Energy Policy Report*. Publication Number: CEC-100-2015-001-CMD. Retrieved from [http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-01/TN206330\\_20151012T134153\\_2015\\_Draft\\_Integrated\\_Energy\\_Policy\\_Report.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-01/TN206330_20151012T134153_2015_Draft_Integrated_Energy_Policy_Report.pdf)

<sup>2</sup> Docket 15-IEPR-01: [Workshop on the Draft 2015 Integrated Energy Policy Report](#), October 8, 2015

addressing the grid impacts of high levels of renewables, determining the need for new transmission capacity, utilizing innovative methods to increase gas and electric energy efficiency, and increasing electrification and gasification of the transportation sector, among other things. PG&E is committed to achieving California's climate goals and will work to do so while continuing to meet customer energy needs safely, reliably and affordably.

In addition to these introductory comments, PG&E offers detailed comments on the 2015 Draft IEPR in Sections II through VIII below. The following summarizes PG&E's key points:

### **Energy Efficiency (Chapter 1):**

- PG&E applauds the IEPR's recognition of the untapped energy efficiency potential in the existing building stock, and agrees that improving existing building energy efficiency is imperative to reaching the State's climate goals. PG&E lists a number of suggestions related to achieving improved existing building energy efficiency, and is well positioned to make progress on this goal.
- PG&E generally supports the discussion of zero-net energy (ZNE) in the IEPR, and maintains that ZNE must be achieved at least cost. PG&E appreciates the CEC's recognition of the importance of "setting proper expectations that a ZNE Code Building cannot guarantee a zero-energy bill."<sup>3</sup> PG&E also offers suggestions on updating Time Dependent Value (TDV) metrics and the definition of ZNE for solar photo voltaic (PV) installations.
- PG&E supports the CEC's planned update of the commercial end-use survey (CEUS), and encourages an update to the residential surveys (RASS). Many important planning functions depend on data from these surveys and will benefit from the availability of more current data.
- PG&E offers for CEC consideration specific changes to clarify the "rolling portfolio" language in Chapter 1 and to the sections on ZNE and fuel switching.

### **Renewable Energy and Transmission Resources (Chapter 2 and Chapter 3)**

- PG&E supports the provisions of SB 350 and is committed to achieving the 50 percent Renewables Portfolio Standard (RPS) requirement by 2030. While SB 350 is mentioned in the discussion section of Chapter 2 and some of the Chapter's recommendations seem to be based on the bill, the requirements of SB 350 should be explicitly expressed in the recommendations of this section now that the bill is law.
- The CEC should make it clear that achieving California's emission reduction goals will require an integrated approach that achieves emission reductions at the least cost to customers, and that flexibility in the range of technologies utilized by utilities to

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<sup>3</sup> 2015 Draft IEPR, p. 48

meet the RPS requirement should be preserved. The second recommendation in Chapter 2 should be revised to reflect that incremental renewable generation becomes less effective at reducing GHG emissions at high levels of renewable penetration.

- PG&E supports collaborative statewide transmission planning initiatives in pursuit of integrating renewables and achieving California's carbon reduction goals. Additionally, PG&E supports increased regional coordination for transmission planning as encouraged by the provisions of SB 350 related to potential expansion of the California Independent System Operator (CAISO). PG&E recommends the report detail the transmission planning and regional coordination efforts now being undertaken by the CAISO, as well as the Renewable Energy Transmission Initiative (RETI) 2.0 proceeding, to inform stakeholders and facilitate participation.

#### **Nuclear Issues (Chapter 7)**

- The Draft 2015 IEPR contains factual and legal errors regarding the relicensing of Diablo Canyon Power Plant (DCPP) and DCPP seismic and tsunami studies. PG&E suggests a number of modifications to the IEPR text to ensure the section concerning DCPP is complete and accurate, and offers additional comments regarding the IEPR's discussion of once-through cooling, the role of DCPP in the CAISO system, and nuclear waste storage. The 2015 Draft IEPR must be accurate with regard to California's largest single source of GHG-free electricity.

#### **Drought and Climate Adaptation (Chapter 8 and Chapter 9)**

- PG&E appreciates the CEC's consideration of the current drought in the IEPR. PG&E has a proven track record of successfully implementing water and energy efficiency programs of the variety discussed in Chapter 8, and has a strong interest in collaborating with the CEC on these programs going forward. PG&E urges the Commission to expedite authorization of funding for the proposed water appliance rebate program.
- As discussed in PG&E's comments on the July 27, 2015 Joint Agency Workshop on Climate Adaptation Opportunities for the Energy Sector, PG&E is actively working to address the challenges of climate change in a way that will sustain and improve the company's ability to provide safe, reliable, affordable, and clean energy to customers.<sup>4</sup>

#### **Transportation (Chapter 4)**

- PG&E agrees that transportation electrification is a key strategy for meeting California's climate goals, and is committed to working with state agencies to accelerate electric vehicle (EV) infrastructure deployment and customer education

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<sup>4</sup> Docket 15-IEPR-11: [PG&E Comments on Climate Adaptation in the Energy Sector](#), August 10, 2015

programs in support of Governor Brown's goals to have enough infrastructure to support 1 million zero emission vehicles (ZEVs) by 2020 and to have 1.5 million on the road by 2025.

- PG&E applauds the state in implementing Assembly Bill (AB) 118-related funding to encourage research and development of alternative fuels, including electricity, natural gas, biofuels, and hydrogen. A continued emphasis on such programs is critical to develop a diverse fuel portfolio for the transportation sector.
- PG&E supports the continued growth of natural gas as a transportation fuel, especially for transportation applications that are difficult to electrify, as in the heavy-duty and maritime sectors. The State can greatly reduce the carbon intensity of the transportation sector not only by developing new technology but also by increasing the adoption of existing technology.

#### **Electric Demand Forecast (Chapter 5)**

- PG&E previously provided detailed comments on the Preliminary Electricity Demand Forecast presented in Chapter 5 of the IEPR.<sup>5</sup> PG&E appreciates the CEC's work, utilizing the Demand Analysis Working Group (DAWG), to address issues raised by PG&E and other stakeholders. However, PG&E also recommends that future preliminary forecasts should include impacts of Additional Achievable Energy Efficiency (AAEE), and that the Preliminary Forecast should be released earlier to facilitate better alignment of planning assumptions with stakeholders.

#### **Natural Gas Strategy and Outlook (Chapter 6)**

- PG&E supports the gas efficiency goals set by SB 350 as well as the use of state funds to incent research and development of alternative fuels like natural gas. With a low carbon intensity relative to other fossil fuels, increased use of natural gas stands to significantly decrease emissions from the transportation sector. Increasing research efforts and developing an incentive-based market for renewable natural gas and biofuels will have both environmental and societal benefits.
- As PG&E noted in recent comments on the AB1257 Natural Gas Act Report (AB 1257 Report), more research is needed to definitively determine the methane emissions from the natural gas pipeline system.<sup>6</sup> To accurately represent the full range of current research, the IEPR should be modified to include a recent study that concluded that leakage is lower, not higher, than previously estimated.

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<sup>5</sup> Docket 15-IEPR-03: [Comments of Pacific Gas and Electric Company on the California Energy Demand 2016-2026, Preliminary Electricity Forecast](#), July 21, 2015

<sup>6</sup> Docket 15-IEPR-04: [Comments of Pacific Gas and Electric Company on the AB 1257 Natural Gas Act Report](#), October 1, 2015

- PG&E supports the Draft 2015 IEPR’s discussion of exploring innovative and renewable-fueled applications for combined heat and power (CHP) to help achieve the state’s energy goals. However, PG&E suggests that the Chapter 6 recommendation regarding CHP be revised to align with CHP’s treatment elsewhere in the IEPR as well as in the AB 1257 Report, as the current recommendation is inconsistent.
- PG&E offers some technical notes on the Preliminary Natural Gas Outlook.

## **II. PG&E IS WELL POSITIONED TO HELP DOUBLE EXISTING BUILDING ENERGY EFFICIENCY BY 2030 IN CONCURRENCE WITH SB 350**

Chapter 1, “Energy Efficiency,” of the Draft 2015 IEPR discusses the importance of energy efficiency in achieving the state’s climate goals and focuses on the need to improve energy efficiency in the existing building stock. Chapter 1 also addresses progress in advancing the state’s ZNE goals.

PG&E is a strong proponent of energy efficiency, the first resource in the state’s loading order, and has long supported the requirement to pursue all cost-effective energy efficiency. From 2010 to 2014, PG&E’s energy efficiency programs helped customers avoid the release of more than 2,000,000 metric tons of carbon dioxide (CO<sub>2</sub>), which is equal to the annual GHG emissions from nearly 460,000 passenger cars or more than 1,400,000 homes in PG&E’s service territory.<sup>7</sup>

With an energy efficiency portfolio that includes a robust suite of rebates, incentives, services and tools to help customers reduce energy usage and save money, PG&E is well positioned to achieve the goal of doubling energy efficiency in existing buildings as required by SB 350 in pursuit of the Governor’s climate goals. PG&E appreciates the IEPR’s discussion of energy efficiency issues, and offers specific input below.

### **A. Existing Buildings Represents a Significant Source of Untapped Energy Efficiency Potential**

As a proponent of energy efficiency, PG&E supports the CEC’s Existing Buildings Action Plan (Action Plan), and AB 758, and welcomed the CEC’s invitation to participate in the AB 758 Workshop Series in early 2015.<sup>8</sup> PG&E also supports SB 350 and AB 802.<sup>9</sup>

PG&E applauds the CEC’s focus on the existing building stock and agrees that there is a large amount of untapped energy efficiency potential in the state’s existing buildings. PG&E agrees with the comment that “new efforts must activate efficiency markets that truly compete with

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<sup>7</sup> PG&E Internal Data from Customer Data Warehouse, 2010-2014 inclusive.

<sup>8</sup> Skinner, Chapter 470, Statutes of 2009

<sup>9</sup> Williams, 2015

other energy supplies.”<sup>10</sup> Stakeholders from across the state will need to utilize a wide array of tools and multiple pathways to achieve meaningful energy savings in the existing building stock. As mentioned above, PG&E’s current portfolio of program offerings is well positioned to support achievement of the goals of the Action Plan and SB 350, and PG&E looks forward to continued collaboration with the many stakeholders involved.

i. Local Government Leadership for Energy Efficiency Should Be Further Facilitated

In addition to long-standing local government partnership programs, PG&E supports numerous local government action and community-based campaigns to increase existing building energy efficiency. However, PG&E agrees with the Commission that there are vast opportunities for improvement in the current level of engagement of local governments with their constituents and communities. Toward this end, PG&E reiterates its interest in being a participant in the planning task force for the Local Government Challenge Program and endorses the CEC’s plan to supplement this grant program, building on its success.

PG&E maintains, as noted in comments submitted on the Action Plan, that the energy data provided for local government planning efforts be paired with a state-approved calculator like that of the Statewide Energy Efficiency Collaborative (SEEC) ClearPath California tool developed by the International Council for Local Environmental Initiatives (ICLEI), so that local governments can determine which portion of the overall energy efficiency opportunity is indeed within their regulatory control outside of general advocacy and outreach.<sup>11</sup>

ii. PG&E Continues to Develop and Improve Data Tools for Improved Customer Energy Efficiency Decision-making While Considering Privacy and Security

Many of PG&E’s energy programs, including building benchmarking and energy efficiency programs, give customers access to extensive data to help them drive their energy efficiency decisions. PG&E agrees with the CEC that customers make energy decisions based upon the information available to them, so having useful, actionable data through PG&E’s data access tools allows customers to make choices that help them meet their energy savings goals.

PG&E’s data access tools and programs provide convenient access by customers and their approved third-party energy efficiency service providers to customer energy usage data, including whole building energy usage data for building benchmarking. Where needed, PG&E’s tools simplify a landlord’s process of gaining tenant approvals for data sharing.

In support of all of its customers and their energy efficiency and management needs, PG&E provides a wide variety of customer-specific, as well as aggregated and anonymized energy data, to customers, their service providers, researchers and local governments across several new web-based energy data platforms that provide convenient and comprehensive access to energy usage

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<sup>10</sup> 2015 Draft IEPR, p. 17

<sup>11</sup> Docket 15-IEPR-05: California’s Existing Buildings Energy Efficiency Action Plan: [Comments of Pacific Gas and Electric Company](#), April 21, 2015, pp. 7-8



data. PG&E is continually examining ways to develop and improve its data access tools. A full list of PG&E's data access tools and programs can be found in PG&E's Comments on the CEC's "Data Drives Informed Decisions" workshop that was held on April 14, 2015.<sup>12</sup>

PG&E agrees with the CEC that a major technical hurdle to data aggregation is the difficulty in defining the physical relationship between buildings and meters. PG&E is currently evaluating the best way to establish that relationship. PG&E recently kicked-off a project with OPower that will use advanced analytics to create a building-to-meter relationship for all non-residential customers, allow customers to edit and revise the information as needed, and then upload the results into PG&E data systems. PG&E anticipates that the resulting robust database of non-residential buildings in its territory will be helpful in facilitating the goals of AB 758 and AB 802.<sup>13</sup> PG&E is also participating in the CEC and California Public Utilities Commission (CPUC) Service Point Working Group to address this issue and share best practices with stakeholders around the state.

PG&E notes that the AB 758 Action Plan and other energy efficiency initiatives proposed in the IEPR will continue to need to comply with customer privacy and cyber-security protections, and also avoid duplicating utility-administered energy efficiency and demand response programs implemented under CPUC supervision or pursuant to SB 350.

### iii. Existing Building Energy Efficiency Standards Must Be Streamlined to Achieve the Best Results

As noted in PG&E's August 10, 2015 comments on the Staff Workshop on Existing Building Energy Efficiency Standards, PG&E, along with the Statewide Investor-Owned Utility (IOU) Codes and Standards Program (C&S Program) agrees that significantly improving the energy efficiency of the existing building stock is imperative to reaching the State's climate- and energy-related policy goals.<sup>14</sup> Although the current and future energy standards, i.e., Title 24, Title 20, and federal appliance standards, will make a significant impact toward meeting those goals, additional efforts will be required to fully meet them ("...the vast majority of these additional savings will result from new efforts and revised approaches").<sup>15</sup>

Despite a very vocal chorus from nearly all corners of the industry that complying with the Standards is too complex, costly, time-consuming, and requires too much paperwork, the Standards development and implementation process has employed a "supply-side" approach to the market. In the interest of increasing savings, the Standards have become even more complex;

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<sup>12</sup> Docket 15-IEPR-05: California's Existing Buildings Energy Efficiency Action Plan: [Comments of Pacific Gas and Electric Company on Nonresidential Benchmarking and Disclosure and Modern, Accessible Data Resources](#), April 29, 2015, pp. 2-5

<sup>13</sup> Docket 15-IEPR-05: California's Existing Buildings Energy Efficiency Action Plan: [Comments of Pacific Gas and Electric Company on Nonresidential Benchmarking and Disclosure and Local Government Leadership](#), May 22, 2015, p. 7

<sup>14</sup> Docket 15-IEPR-05: [Comments of the Statewide IOU Codes and Standards Program on the Staff Workshop on Existing Building Energy Efficiency Standards](#), August 10, 2015

<sup>15</sup> California Energy Commission. 2015 *Existing Buildings Energy Efficiency Action Plan*, p. 24

they require more forms, more documentation, more inspections, and apply to more additions and alterations.

The C&S Program applauds the Commission's willingness to step back and develop an approach to the Standards that specifically acknowledges the challenges of meeting and exceeding code in existing buildings. PG&E encourages the Commission to approach this challenge from the perspective of the consumer and consider the most efficient way to achieve the desired energy efficiency outcomes.

PG&E agrees with the CEC that the passage of AB 802 represents a significant shift for California. Measurement of savings at the meter has the potential to streamline the state's energy efficiency system, allow the state to achieve deeper savings and unlock below-code, behavioral, and operational savings.

#### iv. PG&E Applauds the Continued Work on Asset Rating Systems

PG&E appreciates the opportunity to provide comments on asset ratings, and acknowledges the Energy Commission for taking its previous recommendation to separate asset ratings (i.e. the relative efficiency score of building properties) from buildings' energy performance assessments.

As outlined in recent comments on the Action Plan, PG&E applauds the Commission's effort to re-evaluate the Home Energy Rating System (HERS) II.<sup>16</sup> PG&E hopes to be part of this ongoing discussion and encourages the Commission to weigh the need for pinpoint accuracy against the ease of use, cost, and accessibility of a tool. PG&E appreciates the Commission's desire to assess and potentially leverage existing asset rating approaches that have been developed and/or adopted elsewhere. PG&E also appreciates the CEC's effort to identify specifications for uniform rating methods that can then be integrated into market-facing tools. PG&E notes that existing offerings, such as the Department of Energy's (DOE) Home Energy Score for residential use, provide a customer-centric comparison that would be consistent nationwide. PG&E agrees with the need to clarify how green building rating systems relate to energy asset rating systems. PG&E supports efforts to standardize commercial building energy asset rating approaches and hopes to actively participate in the development of such approaches.

#### v. The CEC Should Leverage PG&E Efforts to Broaden and Improve Assessment Tools

As discussed during the AB 758 Workshop on April 7, 2015 and noted in PG&E's AB 758 Action Plan Comments,<sup>17</sup> PG&E, on behalf of the IOUs, led an effort to broaden the allowable software modeling tools in the Energy Upgrade California® Advanced Home Upgrade program. This CalTRACK/CalTEST effort was developed in conjunction with regional and national stakeholders, to better support the confidence in and adoption of residential performance assessment software with more persuasive reporting. The goals of this effort included increasing

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<sup>16</sup> Docket 15-IEPR-05. California's Existing Buildings Energy Efficiency Action Plan: Comments of Pacific Gas and Electric Company, April 21, 2015, p. 7

<sup>17</sup> *Ibid*, pp. 4-5

the accuracy of energy modeling, improving the functionality to enable contractor or rater sales processes, establishing a common data language (HPXML) and weather normalization process, and enabling better customer and market decision-making. PG&E encourages the CEC to build off of this effort to ensure consistency.

PG&E currently offers a “no-touch” energy assessment that is free to all customers and provides customers, through Customer Data Access, a secure way to share their usage data with third party tool providers. It is important to distinguish this preference for sharing and to discourage the sharing of account login information, which contains additional sensitive data, to protect customers. PG&E is currently evaluating residential “no-touch” disaggregation tools and encourages the CEC to incorporate and leverage those findings to accelerate the adoption of eligible tools.

Finally, it is also important to note that the upgrade decision making process is not solely focused on energy savings. Any performance tool should enable a rater or contractor to describe the entire value proposition to customers, including other components such as comfort, water, and lighting quality.

#### vi. Reducing Plug-Load Consumption Is Critical

PG&E agrees that reducing plug-load energy consumption and improving plug-load efficiency are critical priorities on the path to meeting the state’s efficiency goals, and commends the Commission for “considering energy efficiency standards for computers, monitors, and displays through its Title 20 authority,” which will soon allow the state to save more than 2,700 GWh per year.<sup>18</sup> PG&E is encouraging the DOE to accelerate product specification revisions and will be pursuing DOE advocacy through codes and standards.

PG&E also applauds the CEC’s strides in plug-load research – namely, the collaborative work being done on “a new standard for energy-proportional mobile and ‘wall-powered’ electronic systems [since September 2014, which] will enable specifying, modeling, verifying, designing, managing, testing, and measuring the energy features on a device.”<sup>19</sup>

PG&E believes even more aggressive policy and evaluation changes are needed in the near term, however, and we reiterate some comments from the Plug-Load Efficiency workshop:

- For innovative program models to be truly impactful, they need to operate under a policy framework that is conducive to market transformation.
- A new evaluation approach – where impact is assessed by an independent party, with stakeholder input, and with an independent mediator for dispute resolution – is needed to allow innovative program models to achieve their full potential.

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<sup>18</sup> 2015 Draft IEPR, p. 31-32

<sup>19</sup> *Ibid*, p. 32

To truly move the market, the number of energy efficient devices available to consumers needs to increase. To this end, challenge programs such as the “Golden Carrot” program and the “X-Prize,” that offer a prize for technology advancements that enable “luxury- type” products that are *also* energy efficient *and* affordable, have been demonstrated to be effective in the past, and new challenge programs should be investigated. To be successful, California should collaborate not only statewide, but also nationally or internationally, and leverage existing relationships.<sup>20</sup>

*a. Update on the Retailer Products Platform*

On October 22, 2015, the members of the California Technical Forum (CalTF) affirmed the work paper for Retail Products Platform (RPP). This important milestone is the culmination of over a year’s collaboration between PG&E’s evaluation, measurement, and verification (EM&V) team, engineering services, consultants, and the CalTF.

The RPP Program uses mid-stream design to influence retailers to stock, sell, and demand more energy efficient models of home appliances and consumer electronics in targeted product categories. RPP’s long term goal is to transform nationwide markets to reduce the growth of miscellaneous plug loads. Created by PG&E, RPP is a model for truly market-transformational activity, and embodies the principles of PG&E’s Efficiency 2.0 initiative: pursuing positive change, collaboration, and innovation. Next steps include submittal of the work paper for review and approval by the CPUC Energy Division, launch of an expanded pilot in 2016, and encouraging other program administrators to join this nationwide effort.

**B. California Clean Jobs Program**

PG&E has demonstrated leadership in facilitating implementation of the Clean Jobs Act and remains committed to the success of this program. PG&E has led statewide coordination efforts related to various facets of Clean Jobs Act implementation, including the Proposition 39 Zero Net Energy Schools Pilot (discussed below), Proposition 39 historical data reporting requirements, and general Proposition 39 CEC, CPUC, and utility activities.

PG&E, along with the CPUC and the other IOUs, is leveraging Proposition 39 funding to initiate the Proposition 39 Zero Net Energy Schools Pilot, which aims to drive market transformation in the K-12 and community college existing buildings market.

In addition to the Zero Net Energy Schools Pilot work, PG&E has helped local educational agencies, including school districts, charter schools, and county offices of education, complete Proposition 39 funding applications. PG&E staff, local government partners, and third party programs, in collaboration with public school districts, have also completed over 175 K-12 Proposition 39 Energy Expenditure Plans (EEPs) to-date.

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<sup>20</sup> Docket 15-IEPR-05. [Comments of Pacific Gas and Electric Company on Plug Load Efficiency](#), July 7, 2015, p. 2

### **C. Zero-Net Energy**

PG&E generally supports the discussion of ZNE in Chapter 1 of the IEPR, and notes apparent progress in the marketplace as multiple production builders have begun to target ZNE on a pilot basis. The technical feasibility of ZNE for residential single-family and low rise multi-family buildings is increasingly well established. As detailed below, emphasis should remain on achieving ZNE at least cost. Additionally, PG&E agrees that there is a need for more public education regarding the cost implications of a ZNE building, and suggests updates to the Time Dependent Value (TDV) metric and ZNE definition.

#### i. ZNE Must Be Achieved at Least Cost

Continued emphasis on achieving ZNE at least cost will benefit all stakeholders, from the builder to the customer to the utility. Achieving ZNE at least cost requires that cost optimization be considered comprehensively across four areas:

1. The required building consumption footprint (not counting renewables) should be done at least cost;
2. Offsetting renewables should be installed at least cost;
3. Items 1 and 2 should be implemented in a way which imposes the least cost on the grid and the grid operator (with respect to physical equipment requirements, operations, reliability and maintenance);
4. Item 2 should be implemented in a way that minimizes impacts on other customers.<sup>21</sup>

This sequence generally reflects the “loading order” for demand-side resources in California, with a preference for energy efficiency until renewables become more affordable than additional energy efficiency measures. Similarly, least cost renewable options are preferred, as are configurations of renewables that avoid unnecessarily high costs (and operational uncertainties) on the grid.

Regarding point one above, highly efficient residential building footprints should be targeted that impose, at scale, modest levels of incremental cost (ranging from 0% to 3%) compared to a code baseline. Much of what is said in the IEPR will contribute to the goal of low incremental cost; however, achieving ZNE at low incremental cost should be an explicit goal articulated in the IEPR.

Regarding the second point above, it is well known that megawatt (MW) scale renewable systems are less expensive than smaller systems often found on individual homes. PG&E agrees that there will be site conditions for which solar installations are either marginally feasible or infeasible, and that some accommodation for such buildings must be made. This could mean

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<sup>21</sup> PG&E is aware that ratemaking is not within the purview of the CEC, nor the IEPR. However, the CEC should recognize the need to work with the CPUC to ensure that the rate impacts from rooftop solar as a result of ZNE implementation do not result in a subsidy from other customers to ZNE customers.

exemption from ZNE requirements, modification to those requirements, or compliance credits earned from off-site renewables.

PG&E is aware of developers willing to consider community-scale systems at the MW scale; however, there is no clear commercial pathway to establish such a system, and there is no current business case to do so. The IEPR should acknowledge that larger, off-site solar systems are highly likely to produce power less expensively than individual rooftop systems. In addition, larger systems can be more easily monitored, controlled, dispatched, and maintained. Accordingly, a policy preference should be set for off-site renewables to be considered in cases where on-site renewables are infeasible or when viable off-site systems are found to be less costly and more reliable.

In light of this, the need for fair and accurate accounting systems for off-site renewables is clearly needed, as stated in the IEPR. In addition, there must be an infrastructure to enable such installations: whether through the CAISO market, appropriate feed-in-tariffs, participation in utility green tariffs, or some other structure. The value to California of developing innovative methods to procure such systems, systems likely to reduce the cost of renewables, should be emphasized in the IEPR.

With regard to the third point above, there is still much to be learned about the comparative costs imposed on grid design, connection, and operation between many thousands of individual rooftop units versus smart location of a community-scale facility with an equivalent amount of renewable generation. Acknowledging that various efforts are currently underway to study this issue, the IEPR should include a commitment to 1) understanding cost and operational issues associated with mass deployment of renewables and 2) that least cost pathways to achieving ZNE will be preferred.

PG&E recognizes the value of rooftop solar as a renewable resource and element of ZNE buildings, and has worked to support solar customers in many ways, including by reducing interconnection times to just three days. The points made above are suggested to ensure that the value of community-scale solar for ZNE buildings is fully recognized in the regulatory framework as well.

#### ii. ZNE Cost Expectations Require Public Education

Most industry stakeholders acknowledge that access to a robust and healthy power grid is an essential pre-requisite to ZNE implementation. Accordingly, it will be necessary for any grid operator to collect the revenue required to maintain, operate, and upgrade the grid, and that ZNE facilities will need to contribute to that revenue requirement according to both the costs they impose as well as the benefits they provide. However, there are still commonly held views among the public that ZNE buildings should result in bills which are zero or close to zero. PG&E appreciates that the IEPR recognizes this situation, and suggests that the IEPR further state that the only sustainable ZNE commitment must ensure that customers pay for services they receive.

Similarly, the concept of TDV is arcane and very difficult to understand for anyone not intimately involved in the California Title 24 arena. As with the issue around bills for ZNE

buildings, PG&E suggest that the IEPR recognize the inherent difficulty in communicating around the TDV metric.

### iii. Suggested Updates to the TDV Metric and ZNE Definition

PG&E supports the appropriate use of the TDV values; however, these should be updated periodically to reflect the current value of energy. For example, the current TDV values do not reflect the net load served by CAISO, the lower mid-day value of energy and the increasingly steep evening load growth. These considerations will become even more critical as California moves to 50 percent RPS.

Additionally, the TDV as currently estimated could tend to over-value solar PV, because the increasingly large amount of utility-scale PV on the system creates lower (than TDV) real energy values in mid-afternoon. On the other hand, correcting the TDV value, while using the current definition of ZNE where “energy” is TDV-energy, might result in having to install greater and greater rooftop solar to achieve ZNE. PG&E suggests the CEC reconsider the definition of ZNE with regard to rooftop solar and require solar PV, whether at-site or community-based, to offset the net energy from a building.

### **D. Planning Processes Will Benefit from Updating End-Use Surveys**

Many important planning functions depend on end-use surveys; these include: energy efficiency program planning, energy efficiency potential and goals, long-term forecasting, and load shape development, among others. Existing surveys are out of date and as a result many important decisions are being made based on old data. The last updates for the RASS and CEUS were 2010 and 2006 respectively, and the underlying data for each of these was from several years earlier (for instance, CEUS usage data was from 2002). This means decisions in the commercial sector are being made based on data that is 13 years old. An industrial sector survey has never been completed. CPUC Code requires that these surveys be conducted every four years. PG&E understands that an update to the CEUS is being planned at the CEC. PG&E supports this update and looks forward to working with the CEC on the effort.

### **E. Suggested Modifications on Rolling Portfolios and Fuel Switching**

PG&E appreciates the IEPR’s assessment of utility progress in achieving energy efficiency goals, and offers the following technical and clarifying corrections on the rolling portfolio and fuel switching language of the IEPR for CEC consideration. Note that additions are shown in bold and deletions in strikethrough.

- On pages 35-36: “Some of the key objectives of this proceeding include greater funding stability for energy efficiency program administrators and implementers; reduced transaction costs for program implementation; ~~better coordination with~~ **more timely forecasts of program savings and use of those timely forecasts in the** demand forecast, procurement planning, and transmission planning; and **transparent program evaluations and timely use of that information** ~~timely forecasts of program savings and use of these forecasts to enhance energy efficiency portfolios.”~~

- On page 36: “**Several** proposed decisions describing the new rules of engagement associated with the rolling portfolio cycle ~~was were~~ made public in **the fall of August 2015, and the CPUC voted to adopt D.15-10-028 in October 2015** ~~although the CPUC has not yet voted on it~~. One of the key changes that the ~~proposed~~ decision identifies is the use of ~~firm deadlines~~ **a clear timeline for coordinating various activities each step** in the regulatory process, **including technical updates, program design and portfolio planning, program operations and program reporting and evaluation**. This approach will allow for different types of EM&V studies, including studies with faster turn-around times, and will also allow EM&V results to be incorporated into the portfolio on a timelier and more frequent basis.”
- On page 53: “Continue the transition toward “rolling portfolios” of investor-owned utility efficiency programs and update the evaluation measurement and verification (EM&V) process accordingly. The Energy Commission supports the CPUC plan to improve and accelerate the program development and EM&V processes, as a means to ~~align~~ **improve the timeliness of incorporating program-related evaluation analyses and resulting future program savings forecasts and lessens with into** the Energy Commission’s forecasting process.”
- On page 53: “Continue to work toward standardized savings reporting by publicly owned utilities (POUs). **The Commission is** assessing whether existing EM&V approaches are adequate, or if a new direction is needed to quantify energy efficiency gains and greenhouse gas reductions by POU’s.”
- On page 49: “One potential way to address this situation would be to identify strategies to offset residual natural gas usage ~~offsite~~, such as through ~~uses using of~~ waste heat **in lieu of natural gas**, including CHP, or potentially through the use of renewable gas resources at the building site or on a community basis. The latter might rely on a system similar to the previously discussed “development entitlements” for off-site PV.

### **III. DECARBONIZING THE ENERGY SECTOR AND STRATEGIC TRANSMISSION PLANNING**

In Chapter 2, “Decarbonizing the Energy Sector,” the CEC discusses opportunities for increasing the amount of renewable energy in California in the context of meeting the 50 percent RPS set by SB 350. Chapter 3 puts forth the Commission’s Strategic Transmission Investment Plan for 2015. Because adequate transmission capacity is important to successfully meeting the 50 percent RPS, PG&E will address elements of both chapters in this section of comments.

PG&E has a long history of commitment to clean energy. In 2014, PG&E’s electricity supply was approximately 55 percent carbon-free, making the company’s electricity supply portfolio



one of the cleanest of any investor-owned utility in the country.<sup>22</sup> PG&E generally agrees with the ideas discussed in Chapters 2 and 3 of the IEPR, as they are in line with the clean energy targets set by SB 350. PG&E is a key partner in the deployment and integration of low-carbon, clean energy technologies, and requests that the IEPR be updated to reflect PG&E's latest RPS compliance report.<sup>23</sup>

PG&E recommends that the provisions of SB 350, including the 50 percent RPS requirement, the newly established Integrated Resource Plan (IRP), the GHG reduction goals, CAISO expansion study and process, energy efficiency goals, and reliability provisions be explicitly expressed in the IEPR. PG&E provides detailed comments on the recommendations from Chapters 2 and 3 below.

#### **A. Flexibility is Critical for Meeting the 50 Percent RPS**

PG&E supports a diverse portfolio of renewable resources, but remains technology agnostic and does not support prescriptive procurement in the name of diversifying the renewable portfolio. A mix of renewable energy technologies of different scales may be required to reach a 50 percent RPS requirement. However, the components of this mix are dynamic and the state should avoid technology- and size-specific carve-outs that do not provide the most cost-effective path to optimizing the grid or reducing GHG emissions.

To be clear, PG&E recognizes the benefits of resource diversity in meeting the 50 percent RPS requirement. However, flexibility should be preserved to achieve this goal as cost-effectively as possible. Further consideration is needed on the role of distributed resources in the RPS and PG&E strongly recommends that renewable distributed generation should be considered part of the RPS in the future. As a principle, the focus on emissions intensity should shift to the power that is consumed rather than the more narrowly-focused view on what is delivered by the state's electricity providers.

Accordingly, PG&E offers the following changes the recommendations of Chapter 2.

- From page 86: “Pursue a diverse renewables portfolio. Different renewable technologies provide different benefits and services to the grid. The procurement process should **be technology agnostic**. ~~avoid overreliance on cost alone, rather considering the range of benefits renewables can provide individually and in aggregate.~~ Strategies to reach 50 percent renewables by 2030 should explicitly address resource diversity, **but the state should avoid technology-, fuel-, or size-specific carve-outs that do not provide the most cost-effective path to optimizing the grid or reducing GHG emissions.**”
- From page 86: “Zero-carbon solutions should maintain system reliability while integrating renewables. Renewable resources can be combined with supporting

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<sup>22</sup> Based on PG&E's 2014 Annual 10-K Filing. Docket 15-IEPR-11: [Appendix A to PG&E Comments on Climate Adaptation in the Energy Sector](#). August 10, 2015.

<sup>23</sup> PG&E's 2014 Annual RPS Compliance Report 2014. September 4, 2015.

technologies such as demand response and a variety of energy storage options to enable low- or no-carbon electricity without compromising system reliability. ~~Energy procurement should therefore consider combinations of desired attributes rather than focusing only on traditional products such as bulk energy or baseload power.~~ **New technologies will emerge and the mix and cost-effectiveness of GHG emissions reduction strategies will undoubtedly evolve in the coming years. Load-serving entities should be given flexibility to select cost-effective GHG reduction strategies that best suit their needs and allow them to continue to provide safe, reliable and affordable energy to customers while meeting climate goals.”**

- From page 86: “Further consideration is needed on the role of distributed resources in the Renewables Portfolio Standard (RPS). California’s RPS Program was designed at a time when distributed renewable resources represented a tiny percentage of total renewables. With increasing penetration of customer-side renewables and the inclusion of distributed resources in the California Independent System Operator wholesale market, the future role of distributed renewables ~~in~~ **should be fully included in** the RPS. ~~should be carefully evaluated through a public process such as the California Public Utilities Commission’s RPS proceeding~~

## **B. Renewables Policy Must Consider the Ultimate Objective of GHG Emissions Reduction**

Recommendation two of Chapter 2 states, “The 50 percent renewable goal should be a floor, not a ceiling.” PG&E recommends that the CEC explore the challenges of achieving a 50 percent renewable procurement requirement before recommending an even larger RPS requirement, considering the ultimate goal of GHG emissions reductions. As the state develops renewable energy to meet the 50 percent target, additional renewable resources will be less effective at reducing GHG emissions. Rather than lock in higher renewable mandates, the state should consider a more integrated GHG policy that achieves emissions reductions at the lowest cost to California residents. Furthermore, PG&E believes there is a need for more broad-based policy solutions that can optimize GHG reductions across multiple sectors, especially in light of new policies such as the EPA Clean Power Plan.

Accordingly, PG&E recommends the following changes to the second recommendation of Chapter 2:

- From page 84: “**Renewables will continue to be an important element in achieving California’s GHG emission reduction targets. However, renewable resources are just one of several ways to achieve GHG emission reductions.** ~~The 50 percent renewable goal should be a floor, not a ceiling. To achieve California’s greenhouse emissions reduction targets, studies have indicated that renewables will likely need to be higher than 50 percent by 2030. State energy planning and procurement processes should therefore be conducted under the assumption that the 50 percent by 2030 renewable target is a floor, not a ceiling.”~~

## **C. Renewables and Transportation Electrification**

On page 57, the IEPR states, "...new renewable procurement should go hand-in-hand with increased electric loads from electrification of the transportation sector. If they are not in lock-step, then California will not realize the full potential of the GHG reduction potential from decarbonizing the electricity sector."

While PG&E is committed to helping electrify the transportation sector, it must be noted that GHG emissions from the transportation sector will be significantly reduced by vehicle electrification even when natural gas is on the margin. Further decarbonization of the electricity sector will certainly enhance GHG reductions from transportation emissions, but these GHG reductions must be considered in light of other options that could be more cost-effective, such as increasing the penetration and range of hybrid electric vehicles, and improving fuel economy standards.<sup>24</sup>

**D. The SB 350 IRP Process Should Be Closely Coordinated Across State Agencies**

The IRP process established by SB 350 is an opportunity to further align energy sector planning. Given the critical role that the state agencies play in achieving the Governor's GHG reduction targets, PG&E recommends that the CEC, in coordination with the California Air Resources Board (ARB) and the CPUC, develop a framework for the IRP process to evaluate alternatives to achieve a common, economy-wide GHG emissions reduction goal that is aligned across IOUs, publicly-owned utilities (POUs), and community choice aggregation and direct access providers.

**E. Collaborative and Regional Transmission Planning Will Assist in Reaching 50 Percent RPS**

As stated in the IEPR, developing transmission as required to support increasing amounts of renewable resources will be critical to meeting the state's GHG reduction goals. PG&E supports collaboration among the CEC, the CPUC, and the CAISO, with appropriate stakeholder input, to determine the transmission needs to reach the 2030 RPS target, and commends the current RETI 2.0 process and the expanding functionality of the RPS Calculator as examples of such collaboration.

In addition to supporting integrated and comprehensive statewide planning initiatives like RETI 2.0, PG&E also supports increased regional coordination for transmission planning, renewable integration, system operations, and greater participation in CAISO's energy imbalance market (EIM). PG&E notes that the IEPR should be updated to reflect that CAISO's EIM has already expanded to include PacifiCorp, that NV Energy plans to join in December of 2015, and that Puget Sound Energy and Arizona Public Service plan to join in October 2016. Also, SB 350 includes provisions for developing a governance structure and studying the benefits of an expanded CAISO. CAISO has already outlined a timeline for stakeholder initiatives targeted

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<sup>24</sup> University of California, Davis. 2015. [\*From Cradle to Junkyard: Assessing the Life Cycle Greenhouse Gas Benefits of Electric Vehicles.\*](#)

towards exploring regional expansion issues for the 2015-2016 period. PG&E suggests that these developments be included in the IEPR to inform and facilitate participation of stakeholders across the state in these initiatives.

#### **F. The Proposed San Luis Transmission Project Should Be Evaluated Through the CAISO Process**

PG&E is a proponent of identifying right-sizing opportunities to ensure that future transmission projects take into account long-term reliability and the economic needs of the system. Therefore, with regard to Duke American Transmission Company's proposed San Luis Transmission Project, PG&E recommends that the 500 kV alternative recommended in the IEPR should be evaluated through the CAISO process. The project should only be approved if the CAISO determines a need for the project within the CAISO balancing authority where there are clear customer benefits that are greater than the costs of building the project.

### **IV. DIABLO CANYON NUCLEAR POWER PLANT**

Chapter 7 of the 2015 Draft IEPR addresses a number of topics related to Diablo Canyon Power Plant (DCPP). The discussion provides a relicensing update, addresses seismic studies and seismic hazard re-evaluation that have been undertaken, and discusses safety issues and the status of compliance with the State Water Resources Control Board (SWRCB) Once-Through Cooling (OTC) policy. The IEPR also addresses the role of DCPP in the CAISO grid. Finally, the draft report includes a generic discussion of nuclear waste issues.

PG&E's comments below are intended to correct factual and legal errors in the 2015 Draft IEPR regarding the relicensing update, seismic studies, and tsunami studies. In addition, PG&E identifies certain wording that is incorrect or incomplete. Although some of PG&E's proposed changes may appear to be smaller wording issues, it is extremely important that the CEC ensure that the final 2015 IEPR is accurate and complete. After the 2015 IEPR is issued, it will be considered and relied on by policymakers and officials in California. For that reason, it is important that the final 2015 IEPR is complete and accurate.

#### **A. Relicensing Update**

The two Nuclear Regulatory Commission (NRC)-issued licenses for Units 1 and 2 at DCPP expire in 2024 and 2025, respectively. The IEPR describes the relicensing activities that have occurred to date.<sup>25</sup> The report also describes a letter sent from CPUC President Michael Picker in May 2015 to PG&E President Christopher Johns. However, the report leaves the mistaken impression that the items identified in Commissioner Picker's letter were to be performed by PG&E as "compliance items" and recommends that PG&E provide an update on these compliance items.<sup>26</sup>

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<sup>25</sup> 2015 Draft IEPR, p. 228-230

<sup>26</sup> *Ibid*, p 244.

Commissioner Picker's letter explained that the items identified must be included in any PG&E request for customer funding of relicensing activities.<sup>27</sup> However, PG&E does not have an active request pending at the CPUC for customer funding for relicensing, nor has PG&E filed such a request in the last year. The items identified in Commissioner Picker's letter are not "compliance items" as the IEPR mistakenly implies, but rather are a list of items to be included in any future relicensing funding request. Thus, the IEPR should be modified to indicate that if PG&E files a request for funding for relicensing, that it should include in that request the items requested by Commissioner Picker. References to "updating" "compliance items" are erroneous and should be removed from the 2015 Draft IEPR recommendations.

## **B. Seismic Studies**

### **i. Providing a Draft Report to the IPRP**

The 2015 Draft IEPR describes the Central Coastal California Seismic Imaging Project (CCCSIP) Report that was prepared by PG&E in response to the CEC's AB 1632 Report recommendations and direction from the CPUC.<sup>28</sup> The 2015 Draft IEPR criticizes PG&E for not making available to the Independent Peer Review Panel (IPRP) a draft of the CCCSIP Report before it was made final.<sup>29</sup> This criticism is based on the testimony of John Geesman, that was submitted on behalf of the Alliance for Nuclear Responsibility (A4NR) in a CPUC proceeding.<sup>30</sup> Unfortunately, A4NR's testimony included numerous factual and legal errors and thus should not be relied on by the CEC. The issues raised by A4NR regarding IPRP review of the CCCSIP Report are currently the subject of intensive litigation at the CPUC. However, a brief summary of the arguments made at the CPUC, demonstrates that A4NR's testimony should not be relied on by the CEC in the final 2015 IEPR given the numerous flaws in that testimony.

As a preliminary matter, when the CPUC approved PG&E's request to conduct seismic studies, as directed by the CEC in its AB 1632 Report, and to recover the associated costs, the CPUC was quite clear about the role of the IPRP. The IPRP was intended to be made up of outside entities that would "conduct a peer review of the seismic studies including independently reviewing and commenting on the study plan and completed study findings."<sup>31</sup> PG&E was ordered by the Commission to submit two items to the IPRP: (1) study plans; and (2) completed study findings.<sup>32</sup> This requirement was made explicit in the Ordering Paragraphs of D.10-08-003, which separate these two items into two different Ordering Paragraphs. Ordering Paragraph 6, which addresses the study plan requirement, provides:

Pacific Gas and Electric Company shall provide the Independent Peer Review Panel with its seismic study plans prior to implementation of the seismic studies. The Independent Peer Review Panel shall review and provide Pacific

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<sup>27</sup> Letter from Commissioner Picker to Christopher Johns dated May 27, 2015, p 1

<sup>28</sup> 2015 Draft IEPR, p. 230-231

<sup>29</sup> 2015 Draft IEPR, p. 231

<sup>30</sup> 2015 Draft IEPR, p. 231, n. 328

<sup>31</sup> CPUC Decision ("D.") 10-08-003 at pp. 9-10 (emphasis added).

<sup>32</sup> D.10-08-003, p. 10

Gas and Electric Company written comments on the study plan within 30 days of receipt.

Ordering Paragraph 7, which addresses IPRP review of the resulting report requirement, provides:

Pacific Gas and Electric Company shall provide the Independent Peer Review Panel the findings and/or results associated with the seismic studies upon finalizing those findings and/or results. The Independent Peer Review Panel shall review and provide Pacific Gas and Electric Company written comments on those findings and/or results within 30 days of receipt. (*Emphasis added.*)

The CPUC did not change the scope of IPRP review in D.12-09-008.<sup>33</sup> Instead, the CPUC determined that PG&E had been properly working with the IPRP to develop the seismic studies plans,<sup>34</sup> as required by Ordering Paragraph 6 in D.10-08-003, and directed that PG&E continue to work with the IPRP.<sup>35</sup>

As described above, there are two requirements with regard to the IPRP – review of the study plans and final study results. A4NR does not claim that PG&E failed to satisfy the first IPRP requirement concerning the review of study plans. A4NR had previously raised concerns about the IPRP’s review of study plans, but these concerns were squarely rejected by the CPUC. In D.12-09-008, the CPUC noted that “[t]he record developed in this proceeding demonstrates that PG&E has been meeting regularly with the IPRP to review seismic survey plans and have revised those plans in response to IPRP comments.”<sup>36</sup> Indeed, PG&E’s Rebuttal Testimony in the CPUC proceeding established that PG&E interacted with the IPRP on thirty-seven (37) separate occasions both before and after issuance of the CCCSIP Report.

In the A4NR testimony cited in the 2015 Draft IEPR, A4NR did not claim that PG&E failed to provide the final study results to the IPRP, nor did A4NR assert that the IPRP was not allowed to comment on the final study results, as provided for in Ordering Paragraph 7 of D.10-08-003. Rather, A4NR claimed that PG&E should have provided drafts of the CCCSIP Report to the IPRP in advance of finalizing the report.<sup>37</sup> However, as explained above, nothing in D.10-08-003 or D.12-09-008 required PG&E to provide the draft CCCSIP Reports to the IPRP for review. Quite the contrary, the CPUC decisions clearly state that PG&E is to provide the final report to the IPRP for review, which is exactly what happened.

Moreover, PG&E’s Rebuttal Testimony in the CPUC proceeding, which is not addressed in the 2015 Draft IEPR, explained why, even though PG&E had no obligation to do so, drafts of the CCCSIP Report were not provided to the IPRP. PG&E did not want to provide the IPRP piecemeal data or an incomplete report and felt that it was better to provide the IPRP the final

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<sup>33</sup> PG&E’s Rebuttal Testimony in CPUC Application 15-02-023 (“Rebuttal Testimony”), p. 3, lines 17-21

<sup>34</sup> D.12-09-008, p. 16

<sup>35</sup> D.12-09-008, Ordering Paragraph (OP) 6

<sup>36</sup> D.12-09-008 at p. 16.

<sup>37</sup> A4NR Testimony, p. 6

CCCSIP Report so that they could look at it comprehensively, not in a piecemeal fashion.<sup>38</sup> At a minimum, the 2015 Draft IEPR needs to be modified to include a complete recitation of the facts, including the reason why PG&E did not provide a draft of the CCCSIP Report to the IPRP.

Finally, in the CPUC proceeding, A4NR did not dispute that the IPRP had the opportunity after the CCCSIP Report was finalized to review and comment on the report. PG&E had interactions with the IPRP on nine occasions after the CCCSIP Report was issued, the IPRP issued three reports on the CCCSIP Report, and PG&E addressed each of the IPRP reports.<sup>39</sup> The IPRP reports have been used by PG&E to design and plan future seismic studies as a part of the Long Term Seismic Plan (LTSP).<sup>40</sup>

The 2015 Draft IEPR should delete the discussion of the IPRP review of the draft CCCSIP Report because this discussion is incomplete and based on A4NR testimony which is legally and factually flawed.

#### ii. Responses to the IPRP

The 2015 Draft IEPR describes in some detail the IPRP reports issued as a result of the IPRP's review of the CCCSIP Report.<sup>41</sup> In order to make the 2015 IEPR complete, a discussion of PG&E's response to each of the IPRP reports (*i.e.*, Report Nos. 7-9) should be included. Specifically, PG&E responded to the IPRP Report Nos. 7-9 on April 22, 2015.<sup>42</sup> In its response, PG&E addressed the slip rate issues discussed in IPRP Report No. 7, the modeling results for the Irish Hills discussed in IPRP Report No. 8, and the shear-wave velocities and site amplification discussed in IPRP Report No. 9. In short, PG&E fully and completely addressed each of the substantive issues identified in the 2015 Draft IEPR as being raised in IPRP Report Nos. 7-9. PG&E's response to the IPRP reports appears to have been inadvertently omitted from the 2015 Draft IEPR. Including this additional information will ensure that the 2015 IEPR is balanced in presenting the facts regarding the CCCSIP Report, and does not simply present the IPRP's discussion of the CCCSIP Report.

The 2015 Draft IEPR also fails to include a discussion of PG&E's meetings with the IPRP after the CCCSIP Report was issued to discuss the issues raised in IPRP Report Nos. 7-9. PG&E met with the IPRP in January 2015 to discuss the CCCSIP report and had subsequent meetings in September, 2015. These meetings provided an opportunity to engage in a more detailed discussion with the IPRP and to address IPRP comments on the CCCSIP Report. These meetings were collaborative and PG&E believes were useful to addresses a number of the issues raised in the IPRP Report. Again, to ensure that the 2015 Draft IEPR is complete, these meetings should be identified.

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<sup>38</sup> PG&E Rebuttal Testimony, p. 6-6, lines 1-11

<sup>39</sup> PG&E Rebuttal Testimony, p. 6-6, lines 22-27 and Attachment A

<sup>40</sup> PG&E Rebuttal Testimony, p. 6-6, lines 28-32

<sup>41</sup> 2015 Draft IEPR, p. 231-232

<sup>42</sup> See Attachment 13 of PG&E's Comments to the CEC on Nuclear Issues dated May 11, 2015 in CEC Docket 15-IEPR-12

### **C. DCPD Seismic Hazard Re-Evaluation**

The 2015 Draft IEPR also includes a discussion of the DCPD seismic hazard re-evaluation submitted to the Nuclear Regulatory Commission on March 12, 2015.<sup>43</sup> This discussion includes some erroneous references that should be corrected in the final 2015 IEPR to ensure that the report is accurate. First, the 2015 Draft IEPR references a “Hosgri exception.”<sup>44</sup> This terminology is incorrect, no such “exception” exists, and instead the 2015 IEPR should be revised to refer to the “Hosgri earthquake.”

Second, the 2015 Draft IEPR incorrectly refers to “the double design earthquake standard, which is the original design basis for the plant.”<sup>45</sup> In fact, the design basis of DCPD has included three earthquakes: the design earthquake, the double design earthquake, and the Hosgri earthquake since prior to the start of operations. In addition, as a condition to the operating licenses, PG&E has implemented a Long Term Seismic Program (LTSP). Under this program, the seismic potential of the area was re-evaluated and an additional Ground Motion Response Spectra developed. The additional seismic input was utilized to perform a margin assessment for the plant structures, systems and components that are important to safety. After completion of this margin assessment in 1991, PG&E committed to maintaining a Geosciences department staffed with Geologist and Seismologist to continue to apply state of the knowledge updates to the understanding of local seismic hazards. This should be clarified in the final 2015 IEPR to ensure that the report is accurate.

Third, the 2015 Draft IEPR notes that the Atomic Safety and Licensing Board (ASLB) may rule on whether the NRC “granted PG&E greater operational authority than provided under its current licenses.”<sup>46</sup> This should be updated to reflect the fact that the ASLB issued its ruling September 28, 2015, concluding that the NRC did not grant PG&E greater operational authority than that provided under its current licenses.<sup>47</sup>

### **D. Status of Compliance with Once-Through Cooling Policy**

The IEPR references two apparent findings from the Diablo Canyon Independent Safety Committee (DCISC) review of a Bechtel report identifying engineering solutions for nuclear power plants to comply with California’s OTC policy without providing any background or context.<sup>48</sup> If the CEC feels it is necessary to include information from the DCISC review of the Bechtel report in the 2015 IEPR, it should include a full summary. Additionally, the 2015 Draft IEPR references “DCISC safety criterion.”<sup>49</sup> The DCISC does not issue regulations or maintain unique safety criteria applicable to nuclear power plants in addition to the safety regulations and

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<sup>43</sup> 2015 Draft IEPR, p. 233-234

<sup>44</sup> 2015 Draft IEPR, p. 233

<sup>45</sup> 2015 Draft IEPR, p. 233

<sup>46</sup> 2015 Draft IEPR, p. 234

<sup>47</sup> <http://pbadupws.nrc.gov/docs/ML1527/ML15271A139.pdf>

<sup>48</sup> 2015 Draft IEPR, p. 235

<sup>49</sup> 2015 Draft IEPR, p. 235



criteria adopted and enforced by the NRC. It is unclear what the reference to “DCISC safety criterion” means. Without further explanation, the reference should be removed.

### **E. The Role of Diablo Canyon in the CAISO System**

The 2015 Draft IEPR discusses the 2012-13 CAISO Transmission Planning Process (TPP) Report with regard to the potential shutdown of Diablo Canyon, and the potential impact of a DCPD shutdown on state-wide GHG emissions based on the E3 Pathway Studies.<sup>50</sup> As a preliminary matter, the 2015 Draft IEPR does not include some of the more critical assumptions included in the E3 study. For example, E3’s models assume an additional 16,000 gigawatt-hours (GWhs) of natural-gas-fired replacement beginning in 2025 if DCPD is shutdown. This would equate to approximately 7,000 metric tons of GHG emission annually, or adding back 60 percent of the CO<sub>2</sub> that was avoided by the 33 percent RPS mandate. Given the wide distribution of the 2015 IEPR to policy makers, it is important to highlight that the shutdown of DCPD could have significant, detrimental impacts on California’s ability to meet its ambitious GHG targets. This is certainly a factor that should be discussed in the 2015 IEPR.

With regard to the issue of grid stability, the CAISO TPP studies determined the absence of DCPD would present no mid- or long-term grid stability impacts provided RPS resources are developed according to CPUC plans. One of CAISO’s core functions is to ensure that the absence of any single resource, whether Diablo, a large gas-fired resource, or a solar facility, would not threaten grid stability. This type of contingency planning should not be cited as an argument for the absence of the state’s largest GHG-free base-load resource.

### **F. Nuclear Waste Storage**

Similar to the 2013 IEPR, the 2015 Draft IEPR addresses the issue of nuclear waste storage.<sup>51</sup> This is an issue that PG&E recently addressed in its 2017 General Rate Case (GRC), which was filed at the CPUC in September 2015. In the 2017 GRC, PG&E explained that in D.14-08-032, the CPUC directed PG&E to file in its 2017 GRC application "a satisfactory plan to comply with [CEC] recommendations regarding the transfer of spent fuel to dry cask storage in its Assembly Bill 1632 Report."<sup>52</sup> The decision further states that PG&E's forecast of \$26.1 million to construct the remaining five pads at the Independent Spent Fuel Storage Installation (ISFSI) was approved subject to and conditioned on PG&E's compliance with this directive. In its 2017 GRC, PG&E submitted a report to comply with this CPUC requirement.

The specific recommendation in the AB 1632 Report was that “PG&E and SCE should return their spent fuel pools to open racking arrangements as soon as feasible, while maintaining compliance with NRC cask and pool spent fuel storage requirements, and report to the Energy

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<sup>50</sup> 2015 Draft IEPR, p. 238

<sup>51</sup> 2015 Draft IEPR, p. 240-241

<sup>52</sup> D.14-08-032, Ordering Paragraph 29(b)

Commission on their progress in doing so.”<sup>53</sup> PG&E addressed this issue in its response to Nuclear Recommendation #9 in the CEC’s 2013 IEPR.

In the recent 2017 GRC, PG&E explained that it is committed to transferring used fuel from the spent fuel pools at DCPD to dry fuel storage as soon as operationally achievable. Storage of used fuel in pools and in dry storage have both been approved by the NRC as safe storage methods. The radiological safety oversight role, including assessments of spent fuel storage, is subject to the exclusive jurisdiction of the NRC. The NRC recently evaluated the potential safety benefits of expediting transfer of spent fuel to dry cask storage for the U.S. reactor fleet. In COMSECY-13-0030, dated November 12, 2013, Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel, the NRC Staff concluded that the expedited transfer of spent fuel to dry cask storage would neither provide a substantial increase in the overall protection of public health and safety nor sufficient safety benefit to warrant the expected implementation costs. The NRC analysis indicates that undertaking additional study of the low-density spent fuel pool storage alternative is not justified. In the analysis the NRC staff recommends that no regulatory actions be taken to require the expedited transfer of spent fuel. Storing spent fuel in pools is a safe, proven, and effective strategy that is employed successfully throughout this country and around the world. The storage methods used at Diablo Canyon follow industry’s best practices and have been approved, and are continuously monitored, by the NRC.

PG&E regularly moves fuel from the spent fuel pools to its dry cask storage facility. There are a number of considerations that must be evaluated in the development of PG&E’s fuel transfer plan. These factors include:

- Thermal limits of the dry casks imposing a minimum threshold on the age of the spent fuels
- Federal requirements on older spent fuels surrounding newer spent fuels
- Availability of dry casks
- Building schedule of dry cask storage pads, which was completed in the first quarter of 2015
- Coordination of refueling outages and the associated pre-outage work activities with dry cask loading schedules
- Availability of plant staff and contractors for dry cask loadings
- License amendments issued to accommodate the specific fuel characteristics, i.e. high burnup fuel, and damaged fuel

Moving fuel from pools to dry storage is very complex and takes years to plan and perform. PG&E’s spent fuel management program is guided by a well-considered strategy and relies on an established process. For example, there are safety and operational reasons for keeping the fuel in the pools for longer than the minimum number of years before moving it to dry storage; keeping older, colder assemblies in the pools provides important advantages as they are strategically

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<sup>53</sup> See AB 1632 Report at 15; D.14-08-032, p. 413

placed around younger, hotter assemblies to help absorb and dissipate heat. This added thermal barrier makes it easier to maintain constant pool temperatures, which aids in the cooling of the younger assemblies. In addition, the NRC requires that spent fuel in pools be arranged in a “checkerboard” fashion to reduce the potential for fuel to burn if the assemblies were ever exposed in an emergency.

To ensure the safety of the dry cask storage system, the heat load in the casks must be effectively managed. To accomplish this, PG&E strategically loads the casks with a mixture of older and younger fuel with cooler assemblies surrounding hotter assemblies. To maintain this configuration when loading casks, PG&E needs to have an adequate supply of spent fuel at various ages available in the pools.

From an industrial safety perspective, minimizing the amount of time spent during the actual fuel transfer and the number of transfers PG&E performs reduces worker exposures and reduces interference with the day-to-day operations and schedules of the plant. In addition, some assemblies have useable energy left. It is desirable to have them available for reload into the reactors as a contingency if a damaged assembly is identified during a refueling outage.

The NRC requires as a compensatory measure in the spent fuel pools that PG&E maintain four cold assemblies available to surround one hot assembly. With a 193 assembly cores, PG&E needs to keep at least 772 cold assemblies in the pool, which can include new fuel assemblies received for an upcoming refueling outage (average of 84).

Additions to the spent fuel pool occur during each refueling outage (an average of 84 used assemblies per outage). This occurs on an 18 to 21 month frequency per unit. The quantity of assemblies in the spent fuel pool is at the end of the cask loading cycle for that year. The planned cask loadings in 2015 and 2016 were expanded to the maximum available time schedule to fit in with plant operational needs. As a result of these campaigns the NRC compensatory value is approached by the end of 2016.

Beginning in 2018, fuel movements from the pools to dry cask storage are planned every two years at a rate that keeps the pools at the NRC compensatory value. The forecast of expenditures provided above includes the procurement of spent fuel casks in addition to transfer campaigns.

## **V. DROUGHT AND CLIMATE ADAPTATION**

Chapters 8 and 9 of the Draft 2015 IEPR discuss California’s current severe drought and the threats presented by climate change to the energy system as well as efforts to mitigate those threats. PG&E recognizes the challenges presented by drought and climate change, and is actively working to address the challenges of both in a way that will sustain and improve the company’s ability to provide safe, reliable, affordable, and clean energy to customers. With years of experience administering customer water and energy efficiency programs, PG&E is eager to partner with the CEC to help Californian’s meet the Governor’s water use reduction goals. PG&E is also proud to share the great deal of work the company is pursuing to adapt to the effects of climate change.

**A. PG&E Is Eager and Prepared to Collaborate with the CEC on Drought Mitigation Efforts**

PG&E acknowledges the severity of the California drought and stands ready to work with all stakeholders on drought mitigation efforts. The 2015 Draft IEPR mentions that the Commission is contracting with “an experienced rebate administrator to manage the statewide rebate program.”<sup>54</sup> PG&E would like to highlight the company’s proven track record in performing many of the same services that the CEC plans to outsource and PG&E’s strong interest in collaborating in these realms.

As articulated in PG&E’s letter to Chair Weisenmiller dated May 14, 2015:

One area where PG&E can partner immediately with the CEC is on implementing the water appliance rebate program. PG&E has extensive experience, tested processes, and retail and manufacturer relationships in the appliance rebate arena that allow us to easily deploy incentive programs and educational initiatives to customers. Over the past several years, PG&E has partnered with dozens of water agencies to provide over a hundred thousand water and energy rebates for high efficiency clothes washers. In this program, PG&E processes both the water agency and energy efficiency rebates, issues customer rebates, and advertises the program through our multiple channels. The water agencies are invoiced for their portion of the rebate and a \$10 fee per application. This model has been extremely successful, given many local water agencies have limited staff and infrastructure to support water efficiency rebates and program. PG&E could easily expand existing programs throughout our service territory to accommodate CEC water efficiency rebates. This would allow the state to launch a rebate program immediately, limit costs for administration, and ensure a consistent customer message.”<sup>55</sup>

Additional details about PG&E’s current water-related appliance and fixture rebate programs can be found in response to questions submitted June 12, 2015.<sup>56</sup>

PG&E urges the Commission to expedite authorization of funding for the proposed water appliance rebate program (estimated at a total of \$30 million for both the statewide rebate program and a direct-install program focused on disadvantaged communities). PG&E would welcome an opportunity to partner with the CEC to implement Governor Brown’s Executive Order on the drought and looks forward to continued collaboration on this subject in the future.

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<sup>54</sup> 2015 Draft IEPR, p. 257

<sup>55</sup> Docket 15-WATER-03: [PGE Drought Support Letter](#). May 14, 2015.

<sup>56</sup> Docket 15-WATER-03: [Drought Response, Water Appliance Rebate Program. Response of Pacific Gas and Electric Company to Questions for Stakeholder Input](#). June 12, 2015.

## **B. PG&E Is Highly Engaged in Climate Change Research and Planning**

As discussed in PG&E's comments on the July 27, 2015 Joint Agency Workshop on Climate Adaptation Opportunities for the Energy Sector, PG&E is actively working to address the challenges of climate change.<sup>57</sup> PG&E climate adaptation activities include:

- Robust emergency response plans and procedures to address near-term risks, including more extreme storms, heat and wildfires.
- Active engagement at the federal, state, and local level on climate change adaptation and resilience.
- A comprehensive risk assessment process to prioritize infrastructure investments for longer term risks.
- An in-house climate change science team that regularly reviews the most relevant science and integrates its research into PG&E's risk assessment process.

PG&E's work on climate change and climate adaptation is consistent with many of the IEPR's findings. Indeed, PG&E was been involved in some of the studies cited in the IEPR.

With regard to hydropower, the IEPR states "the changing precipitation patterns may mean a reduction in California hydropower in the hotter months of the year."<sup>58</sup> PG&E agrees with this observation, and is managing the impact to the company's hydropower facilities with strategies such as maintaining higher winter carryover reservoir storage levels, reducing discretionary reservoir water releases, and developing modeling tools for forecasting runoff.

PG&E was involved in the UC Berkeley study, "Climate Impacts on the Natural Gas System," mentioned in the IEPR.<sup>59</sup> A cross-functional team at PG&E is now conducting a holistic assessment of the risks to PG&E assets from different natural hazards, including inland flooding, sea level rise, and subsidence. This effort will take some time to complete given its scope and complexity.

PG&E supports the IEPR's commitment to ensuring that the CEC and the California Natural Resources Agency (CNRA) will ensure future studies use common climate and sea-level rise scenarios to ease the integration of results. PG&E hopes that in the future government agencies will coordinate requests for utility information to reduce the number of varying information requests PG&E receives.

PG&E recognizes the value of collaboration and shared learning with regard to climate change, as many stakeholders are involved in understanding its future impacts and the best ways to prepare. However, there are limits on the information that PG&E can share as the release of sensitive infrastructure information poses a security risk. With regard to PG&E's natural gas

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<sup>57</sup> Docket 15-IEPR-11: [PG&E Comments on Climate Adaptation in the Energy Sector](#), August 10, 2015

<sup>58</sup> 2015 Draft IEPR, p. 274

<sup>59</sup> *Ibid.* p. 278

system, certain gas pipeline, valve, regulator, and station information is limited from public disclosure for reasons of national security consistent with federal law, including:

- The Critical Infrastructure Information Act of 2002
- Federal Energy Regulatory Commission Order 630, Critical Energy Infrastructure Information Rule
- The Research & Special Programs Administration (RSPA) Pipeline Security Information Circular, Security Guidance for Natural Gas and Hazardous Liquid Pipelines and Liquefied Natural Gas (LNG) Facilities

PG&E asks that the first recommendation in Chapter 9 be modified to reflect the limits placed on IOUs with regard to sharing critical infrastructure information that might be of use in climate change planning.

Finally, PG&E recommends that the text accompanying Figure 62 be clarified to reflect that the disparity in temperature fluctuations between the world and California are a result of the fact that temperature fluctuations are largely averaged out at a planetary scale; fluctuations will be more extreme at any more granular level.<sup>60</sup>

## **VI. TRANSPORTATION ELECTRIFICATION IS ESSENTIAL TO MEET CALIFORNIA'S CLIMATE GOALS**

PG&E is broadly supportive of the findings and recommendations in Chapter 4 of the IEPR, "Transportation," and strongly agrees that diversifying California's transportation sector, and utilizing cleaner, less polluting fuels, is essential to meet California's aggressive climate goals.

Accessible fueling infrastructure is required for this transition, and PG&E has proposed to build electric vehicle charging stations to support an increase in light-duty transportation electrification. PG&E appreciates that the CEC is monitoring the IOUs' electric vehicle infrastructure applications. The CPUC is continuing to evaluate the utilities' applications, and each proposed model has value in providing insights into effective infrastructure deployment. PG&E has recently filed supplemental testimony for its application to propose a phased approach, with a decision expected in June 2016. It is important to ensure that the proposals are approved quickly and provide for continued deployments of charging infrastructure to help meet the Governor's ZEV Executive Order of supporting 1 million electric vehicles by 2020. PG&E continues to support the Advanced Clean Cars Program, including the ZEV Program, as part of the portfolio of programs to advance electrification.

In addition to accelerating transportation electrification, significant emissions reductions can also be achieved quickly by using other existing technologies, such as compressed natural gas (CNG) and liquefied natural gas (LNG) engines, in the high-emitting heavy-duty, marine, and rail sectors. Further emissions reductions can occur as renewable natural gas (RNG) is utilized by these large fleets. It is also important for the CEC to monitor hydrogen fuel cell technology for

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<sup>60</sup>*Ibid.*, p. 269

future transportation applications. Continued development and utilization of these alternative fuels will help create a diverse fuel supply and reduce emissions from the transportation sector to help the state meet its climate goals.

## **VII. ELECTRICITY DEMAND FORECAST**

Chapter 5 of the 2015 Draft IEPR presents the CEC's 2016-2026 Electricity Demand Forecast (Preliminary Forecast). PG&E provided detailed comments on the Preliminary Forecast presented in this chapter on July 21, 2015.<sup>61</sup>

PG&E appreciates the workshop held by CEC, utilizing the DAWG, to address some of the issues raised by PG&E and other stakeholders. Specifically, the collaboration to develop a consistent forecast methodology in the estimation of expected PV penetration and its impact on system demands, the review of forecast assumptions and modeling behind PG&E rate forecasts, and the estimation of base year weather normalized peak demand forecast for IOUs were greatly appreciated.

PG&E also appreciates the inclusion of accounting for other load-modifying assumptions included in the Preliminary Forecast; for example, new demand response strategies, time-of-use rates, customer-side distributed generation, combined heat and power, distributed energy storage, and electric vehicles.

PG&E does however note that the Preliminary Forecast presented in the IEPR does not include the impact of any AAEE. PG&E strongly encourages the CEC to include the impact of expected energy efficiency programs in future demand forecasts. This would be similar to the CEC's inclusion of distributed generation, electric vehicles or any other significant technological change impacts affecting the demand for electricity, and allow stakeholders to have a complete view of the expected demand for electricity and the ability to provide a more complete and consistent set of comments.

As the IEPR Electricity Demand Forecast is an important planning instrument guiding IOU plans in many areas such as the TPP, Long-Term Planning Process (LTPP) and Distributed Resource Plan (DRP), having a forecast that is inclusive of all significant components of future demand in the Preliminary Forecasts, and presented earlier in forecasting the cycle, will allow the IOUs to provide timely comments on this important component of the electricity demand, resulting in better alignment of planning assumptions. This would be consistent with the existing efforts by the CEC to continue alignment of agency planning cycles.

As the Electricity Demand Forecast presented in Chapter 5 does not include any AAEE, and as the CEC is reviewing its forecast of some key drivers underlying the preliminary forecast presented in this chapter, PG&E has no additional comments on forecast details beyond those already provided on July 21, 2015 at this juncture.

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<sup>61</sup> Docket 15-IEPR-03: [Comments of Pacific Gas and Electric Company on the California Energy Demand 2016-2026, Preliminary Electricity Forecast](#), July 21, 2015

## VIII. NATURAL GAS

Chapter 6, “Natural Gas,” of the 2015 Draft IEPR characterizes natural gas as a relatively low-carbon fuel source compared to other fossil fuels. PG&E agrees that natural gas can play an important role in reaching California’s climate goals, including decreasing the carbon intensity of the transportation sector, especially for market segments such as medium- and heavy-duty vehicles and maritime vessels for which electrification is difficult. PG&E is also committed to improving energy efficiency for established end-uses of natural gas pursuant to SB 350.

PG&E previously addressed many provision of Chapter 6 in comments on the AB 1257 Report.<sup>62</sup> PG&E appreciates the opportunity to raise some of those points again in the context of the IEPR, and also offers additional specific input below.

### A. More Study is Needed to Definitively Determine Methane Emissions from the Natural Gas Pipeline System

As discussed in the IEPR and noted in PG&E’s comments on the AB 1257 Report, estimating fugitive methane emissions is an emerging area of study and the conclusions of the studies to date have varied significantly. While the IEPR currently mentions the disparity between various study estimates,<sup>63</sup> PG&E recommends that the Report specifically recognize that a recent study of fugitive emissions found that emissions from the gas distribution system are 36 to 70 percent less than the 2011 United States Environmental Protection Agency (US EPA) inventory due to significant upgrades at gas metering and regulating stations and improvements in leak detection and maintenance activities.<sup>64</sup>

PG&E appreciates the IEPR’s recognition of the steps California’s natural gas utilities are taking to reduce fugitive emissions from the gas pipelines system, including developing cost-effective leak detection and pipeline monitoring tools, replacing older, cast iron pipe, and PG&E’s use of an innovative mobile leak detection platform.<sup>65</sup>

PG&E recommends adding AB 1496 to the list of activities underway to reduce methane emissions in California.<sup>66</sup> AB 1496 requires the ARB to monitor methane emissions and to “gather or acquire the necessary information for the purpose of carrying out a life-cycle greenhouse gas emission analysis of natural gas produced and imported into the state” using best-available, cost-effective methods. These actions will complement previous ARB initiatives like the Short Lived Climate Pollutant Strategy mentioned in the IEPR and will provide

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<sup>62</sup> Docket 15-IEPR-04: [Comments of Pacific Gas and Electric Company on the AB 1257 Natural Gas Act Report](#), October 1, 2015

<sup>63</sup> 2015 Draft IEPR, p. 182

<sup>64</sup> Laboratory for Atmospheric Research at Washington State University and associated authors. “Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States” (March 2015). <http://pubs.acs.org/doi/full/10.1021/es505116p>

<sup>65</sup> 2015 Draft IEPR, p. 183

<sup>66</sup> Assembly Bill 1496, Thurmond. 2015-2016.



information to help close some of the gaps in estimating methane emissions that the Report identifies.

**B. Recommendations for Combined Heat and Power Should Be Consistent with the Report’s Discussion Section as Well as the AB 1257 Report**

PG&E supports the 2015 Draft IEPR discussion of “exploring renewable-fueled CHP and how it fits into the state’s renewable energy goals” and the recommendation that “applications for critical facilities and soliciting new microgrid applications should be pursued and studied so clean, efficient, and reliable CHP can continue to contribute to California’s energy and environmental goals.”<sup>67</sup> However, the Report’s CHP recommendation is inconsistent with the discussion of CHP earlier in the IEPR and in the AB 1257 Report.<sup>68</sup> PG&E suggests this recommendation be modified for the following reasons.

Regarding evaluating “the effects of the CPUC decision on exporting CHP,” it is not clear what effects of the CPUC Decision on exporting CHP are recommended for study. The AB 1257 report does not mention the issue at all. It is possible this recommendation is made in the context of the potential closure of CHP facilities that are unable to secure new contracts. If this is the case, PG&E informs the Commission that many CHP facilities have been observed to continue to operate in the California market after rolling-off from legacy qualifying facility (QF) contracts. Additionally, PG&E has noted a number of reasons for CHP facilities to shutdown, including declining thermal host needs and switching to low carbon technologies.

Second, studying the standalone costs and benefits of any technology type, in this case CHP, will provide limited information to state policymakers. All demand- and supply-side resources should be studied on a consistent basis to assess a cost-effective way to reduce statewide GHG emissions and to understand a resource’s potential to provide system benefits. Standalone cost-benefit analysis of a single resource will not provide meaningful information to design utility incentives. Moreover, with respect to assuring long-term GHG reductions, renewable CHP—such as CHP fueled by biogas from wastewater treatment facilities—is more attractive than conventional topping-cycle CHP fueled by fossil fuels. Bottoming-cycle CHP may also be attractive in certain applications as a GHG reduction measure. Carbon neutral forms of CHP (renewable and bottoming-cycle) should be evaluated differently from fossil-fueled CHP to emphasize their GHG reduction potential.

To align the IEPR’s CHP recommendation with the discussion of CHP elsewhere in the Report and in the AB 1257 Report, PG&E suggests the Energy Commission make the following modifications:

- From page 192: “Analyze the costs and benefits of **all demand-side and supply-side resources including conventional and renewable CHP.** ~~and on exporting CHP.~~ ~~Continue to~~ Develop and support new frameworks ~~that will better value to~~

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<sup>67</sup> Draft 2015 IEPR, p. 176

<sup>68</sup> *Ibid.*, p. 192

**understand** the true costs and benefits of **demand-side and supply-side resources including** combined heat and power generation, and align utility incentives with those costs and benefits. The Energy Commission recognizes that new regulatory and market frameworks could lessen the challenges facing combined heat and power today. Also, the Energy Commission should **explore potential for carbon neutral forms of CHP (renewable-fueled and bottoming-cycle CHP) and assess how it fits into the state’s renewable energy goals.** ~~evaluate the effects of the CPUC decision on exporting CHP.”~~

### C. California’s Electric Profile is Unique in the United States

The 2015 Draft IEPR discusses new federal air and water quality regulations that will likely increase demand for natural gas generation in most of the United States and possibly affect California’s electricity imports and exports.<sup>69</sup> It may be helpful to clarify that, while changes in neighboring energy markets could affect California, these regulations will likely have a dampened effect in California because of California’s unique position of utilizing minimal coal-fueled electric generation and decreased gas-fueled generation demand due to high and increasing levels of renewables. PG&E recommends this section be revised to reflect California’s specific power generation mix.

### D. Detailed Comments on the Natural Gas Outlook

PG&E offers the following detailed suggestions regarding the Natural Gas Outlook included in the Draft 2015 IEPR.

- From page 168: “**However**, the immediate gas infrastructure challenges California faces relate to pipeline safety **and** Southern California infrastructure enhancements. **Continued growth of and potential** exports to Mexico along the pipelines east of California **could reduce the flow of gas to California, posing a market issue.**”

**Justification:** The above modifications reflect the growth of natural gas exports to Mexico in recent years and related impact on the flow of gas into California.

- From Page 178: “As discussed below in the section on *GHG Emissions Associated With the Natural Gas System*, scientific understanding of the scale of methane emissions due to leakage throughout the natural gas system—from extraction, **gathering**, processing, distribution and transmission, and at the end use—is evolving.”
- From page 181: “Methane emissions originate from the intentional operations of the natural gas system (for example, venting of natural gas or pneumatic devices using natural gas) as well as from leakage throughout the natural gas supply chain from the production, **gathering**, processing, transportation, storage, distribution, and use of natural gas.”

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<sup>69</sup> 2015 Draft IEPR, p. 172

**Justification:** PG&E recommends “gathering” be included in these sections as gathering activity is a source of methane emissions.

- On page 182, the IEPR states, “Recent work estimating methane emissions from California’s natural gas system suggested emissions of less than one percent of total throughput (or percent of production). Some studies indicate these may be underestimated.” PG&E recommends the source of this information be cited to provide background for discussion.
- On page 176, the CEC mentions that there is an opportunity for natural gas to play “an important role in the development of the emerging hydrogen vehicle industry” and highlights the opportunity for “the existing natural gas infrastructure [to serve] as a secure source of fuel for hydrogen production”. However, it is unclear how the demand from this potential natural gas end-use is reflected in the forecast. PG&E recommends the CEC clarify this aspect of the forecast.
- Regarding Figure 42 on page 186, PG&E notes that the CEC forecast prices for Henry Hub (HH) are much higher than most industry forecasts. The CEC’s mid-demand case is approximately \$6.00/MMBtu compared to the industry’s base forecast of \$4.00 to \$5.00/MMBtu for 2030.
- Regarding Figure 44 on page 187, the figure shows a -\$0.6 per Thousand Cubic Feet Topock differential to HH for 2012, but sources show that the Topock differential for 2012 averaged approximately \$0.15 per Thousand Cubic Feet. PG&E suggests that source data be checked for accuracy.
- Page 188 mentions that “Staff expects the differential to grow in the coming years, driven by a widening gap between these low-cost traditional basins and increasing cost of extracting gas from other parts of the country.” PG&E would like to note that although the cost of extracting gas from other parts of the country (e.g. shale) may be increasing, staff should consider the higher well productivity from unconventional shale basins (Marcellus, Utica, and Haynesville) compared to the traditional basins (Rockies and San Juan). The higher well productivity from the unconventional shale basins may offset the increased cost of extracting gas when taking into account unit cost of gas production. Therefore, gas from unconventional shale basins is cheaper than most traditional basins on unit cost basis.
- The natural gas low demand forecast should reflect potential climate change regulations as these regulations seem to drive down natural gas demand as shown in Table 11 on page 189. This is reflected by the 2024 natural gas mid-demand forecast being lower than the low demand forecast. Starting with the 2020 forecast, annual growth rates and demand values for the mid-demand forecast are lower than the one presented for the low demand case.

- PG&E notes that the mid-demand gas forecast is predicted to grow even as gas demand for electricity generation declines over the next ten years. PG&E does not expect that gas demand increases from residential, commercial, and industrial sectors will offset the decline in electricity generation demand and lead to overall demand growth during the period in question. PG&E seeks clarifications on the staff's conclusions on the topic.

## **IX. Conclusion**

PG&E thanks the CEC for considering these comments and is happy to meet with CEC staff on these important topics.

Sincerely,

/s/

Nathan Bengtsson

cc: Heather Raitt (Heather.Raitt@energy.ca.gov)