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Mr. Craig Segall
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Re: Pacific Gas and Electric Company's Comments on the California Air Resources Board Clean Power Plan Compliance Discussion Paper

Pacific Gas and Electric Company (PG&E) thanks the Air Resources Board (ARB) staff for the opportunity to comment on the "California Air Resources Board Clean Power Plan Compliance Discussion Paper (CPP Paper)." As a result of California's progressive and forward-looking policies, the state is already on track to achieve the reductions prescribed by the new rules.

In fact, California's climate programs, which PG&E has supported and played an integral role in implementing, are working successfully. The company believes that the rule provides the flexibility for the state to continue to make progress. PG&E will work with California's other utilities, the ARB, and other state agencies on an implementation plan that builds off of existing initiatives, while providing the flexibility to meet the rule's emission reduction goals in the most affordable and sustainable manner. With this objective in mind, PG&E has developed the following responses to questions posed in the CPP Paper.

Whitepaper Questions

Question 1: Do stakeholders agree that a mass-based, state measures plan, based primarily on the continued operation of the Cap-and-Trade Regulation, and recognizing the emissions-reducing consequences of the State's complementary energy sector policies, is an appropriate compliance plan design for California?

Response 1: A mass-based, state measures plan as contemplated by the ARB in its CPP Paper is one of many possible designs for California's CPP compliance plan. It is premature to reach a conclusion regarding which compliance plan design is most appropriate for California. As outlined in response to other questions below, PG&E recommends that ARB and its fellow agencies conduct, with stakeholder input, an analysis of several alternative compliance plan designs before determining its preferred approach. The analysis could help clarify the impacts of plan design choices on key evaluation metrics such as emissions and customer costs and lead to a more transparent discussion of the tradeoffs between alternative compliance plans. The analysis

should also consider any associated impacts on the design on the remainder of California's cap-and-trade program.

In particular, we encourage ARB to further explore compliance plans that are consistent with the plan design principles identified by the Joint Utility Group in its comment letter. In addition, we support a focus on mass-based alternatives because they are consistent with California's existing programs, administratively simpler to implement, and likely less costly (e.g., see US EPA's analysis[1]). Finally, we strongly encourage ARB to evaluate alternatives under both state measures and emission standards that allow for trading of allowances across state lines (e.g., through "trading ready" or identification of specific trading partners in the Western Electricity Coordinating Council (WECC)). We would like to note that larger and more diverse markets could enhance the prospects for efficient market outcomes, eventually leading to lower-cost emission-reduction opportunities, while maintaining the environmental integrity of state and federal programs. Moving forward, it is important to recognize that California's major economic sectors operate in markets that extend well beyond our borders. A uniform carbon price across the WECC (or even more broadly) can promote efficient dispatch and investment in power markets. It will also simplify and strengthen implementation of the Energy Imbalance Market (EIM) and potential development of a regional electric market through expansion of the California Independent System Operator (CAISO).

Question 2: What other compliance plan designs, if any, hold significant promise?

Response 2: PG&E encourages ARB to explore several alternative plan designs as part of the analytical process described in response to Question 1. In addition to the mass-based, state measures design ARB identified in the CPP Paper, we encourage consideration of mass-based emission standard approaches that utilize the emission budgets for California that US EPA finalized in the CPP.

For both state measures and emission standard plan types, we believe that allowing for allowance instrument trading across state lines holds significant promise as a means of achieving California's emission goals at lower cost and creating a level playing field for dispatch across power markets. We recognize that EPA has established several mechanisms through which this can occur (e.g., "trade ready", identifying specific trading partners, multi-state plans) and encourage ARB to explore the mechanisms it, other states, and stakeholders believe are the most promising for allowing allowance instrument trading across state lines. PG&E views "trade ready" as particularly deserving of additional attention.

Regional trading across the WECC should also be explored as a CPP compliance option. As US EPA notes, power markets across the United States have become increasingly integrated regionally. Indeed, California has experienced increased integration with the CAISO and PacifiCorp's operation of the western EIM, a mechanism that provides real-time reliability and renewable integration benefits over footprint wider than the CAISO. Broader integration of

[1] http://www2.epa.gov/cleanpowerplan/clean-power-plan-final-rule-regulatory-impact-analysis

California's energy market is anticipated over the coming years: CAISO and PacifCorp are exploring full integration of their two systems into a regional energy grid.[2] CAISO is also seeking to develop a western regional energy market across the WECC to take full advantage of the region's renewable resources by integrating clean, renewable energy on a coordinated western grid. Indeed, ARB notes that within the continental US, three synchronous interconnection "act like a single machine" including the Western Interconnection.

PG&E has conducted an initial analysis[3] to explore potential CPP compliance approaches. The analysis results support our interest in exploring linkage opportunities between California's and other state programs as a means to cost-effectively achieve our state and federal GHG reduction goals. We plan to undertake additional analysis and welcome feedback on policy cases most of interest to ARB and stakeholders.

Question 3: How might ARB and air districts ensure that any permit terms developed for federal enforceability reasons are appropriately designed, and protect the confidentiality of market-sensitive data?

Response 3: PG&E recommends that ARB develop uniform, model language for use by the Air Districts that meets the federal enforceability requirements of section 111(d). ARB should clearly state in guidance to the Air Districts that the cap-and-trade provisions of AB 32 shall not be made federally enforceable. The guidance should clearly communicate that the cap-and-trade program is intended to be implemented as a state measure to achieve the California's CPP emission goal and need not be a federally enforceable permit condition applicable to individual facilities. Any CPP-related federally enforceable permit conditions should be limited to those necessary to implement federally required backstop measures. Because cap-and-trade related permit conditions should not be included in Title V permits, there is no reason for permitted facilities to submit market sensitive information under the permit.

Question 4: What lessons may be learned from permit terms enforcing other trading programs?

Response 4: The primary lesson to be learned from permit terms associated with other trading programs is that simplicity is paramount. The Title IV Acid Rain Trading Program provides an excellent example of how such an approach would work.

Question 5: Assuming that the Cap-and-Trade Regulation is used to support a state measures plan, what backstop designs might integrate best with the design of the Cap-and-Trade Regulation? If a market response is appropriate, what compliance instruments, or pools of compliance instruments, might be appropriate for use within the backstop?

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[2] http://www.caiso.com/informed/Pages/BenefitsofaRegionalEnergyMarket.aspx#PacifiCorp

[3] Available at: http://www.westernstate111dplans.com/wp-content/uploads/2014/07/PGE_Exploring-Potential-Impacts-of-111d-on-the-WECC1.pdf

Response 5: As ARB suggests in the CPP Paper, it is unlikely that a federal backstop would be triggered given the emissions reductions the state is expected to achieve throughout the CPP compliance periods.

In addition to the application of the model rule, in the event of a backstop trigger, ARB could modify its cap-and-trade program to facilitate a backstop program. This could be achieved through the segregation of allowances based on emitter category. Specifically, two categories of allowances may be created (1) allowances for the sole use of electric generating units (EGUs) located in California that are regulated under the CPP ; and (2) allowances which may be used by covered entities which do not meet the criteria set forth in the CPP. Allowances in category 1 may not be used for cap-and-trade compliance in the event of a federal backstop trigger. Likewise, banked allowances from previous compliance periods and offsets would not be available for use by an EGU during the period of a backstop. By limiting the categories of allowances available to EGUs to the quantity of emissions required by the CPP, the cap-and-trade program and infrastructure can be used to facilitate a federal backstop.

In the compliance period in which the backstop measures apply, the number of EGU allowances in any compliance period would be capped at the level of emissions to be achieved under the CPP compliance period in which the trigger occurs, less allowances reflecting emissions reductions that the EGUs failed to achieve in the period which triggered the backstop. For example, if in 2022-2024, California EGUs targets equal 161 million metric tons (MMT) and California EGUs covered under the CPP emit 191 MMT, then the 30 MMT deficiencies which caused the application of the backstop should be deducted from the quantity of category 1 allowances available to EGUs for Cap-and-Trade compliance.

We also recommend that ARB explore backstop flexibility features such as "trade ready" that would allow EGUs in California to utilize allowances from other "trade ready" CPP programs if the backstop is triggered.

Question 6: What other backstop design options are available, inside or outside of the market?

Response 6: Under the CPP, a state adopting a state-measures approach to CPP compliance has the option of selecting backstop emission standards based on the model rule, which focuses on the use of emissions trading as a core mechanism. Therefore, California EGUs regulated under the CPP can be removed from the cap-and-trade program and regulated pursuant to US EPA's mass-based model rule and approved-tracking system to achieve CPP compliance.

Question 7: Are there particular glidepaths that might best integrate the backstop into the larger California carbon market and the economy-wide emissions reductions trajectory?

Response 7: Given the overlap of entities participating in the cap-and-trade program and those which will be regulated under the CPP, California should adopt glidepaths that correspond to both programs. For the purpose of the CPP, the US EPA adopts an 8-year interim period that begins in 2022, and a gradual glide path separated into three steps: 2022-2024, 2025-2027, and 2028-2029. Thereafter, annual compliance with the CPP 2030 target must be met and sustained.

These three multi-year interim compliance periods may be incorporated into any broader post-2020 cap-and-trade program.

Question 8: What data sources, analytic processes, and model types should ARB and its partners consider in developing the required demonstrations? How best might ARB and its partners integrate analysis processes and data used in the Greenhouse Gas Inventory, IEPR, and update to the Scoping Plan?

Response 8: PG&E recommends that ARB examine the CAISO's analysis conducted for the California Public Utilities Commission's (CPUC) Long-term Procurement Plan (LTPP) proceedings. The CAISO performed numerous 2024 studies using the PLEXOS production cost model (e.g. Trajectory, High Load, Wet Hydro and 40% RPS). The starting point for these studies was the WECC Transmission Expansion Planning and Policy Committee (TEPPC) 2024 Common Case, a 10-year WECC-wide data-set that is vetted through a robust stakeholder process. Each case is modified to reflect the key drivers being investigated such as load, resources, fuel price and CO_2 prices. The production simulation is a security constrained economic dispatch, which can provide insight into the economic dispatch of thermal plants including energy, fuel consumption, and GHG emissions.

In addition, PG&E suggests that ARB participate in the WECC-TEPPC study programs to provide a broader perspective on potential impacts from anticipated changes in resource-mix and dispatch to meet CPP goals across 10-year and 20-year horizons. As a stakeholder, ARB could request studies be performed.

Question 9: Are there particular scenarios that staff should investigate in the demonstrations? For instance, are there particular "stress" or "policy" cases—including those associated with various IEPR demand forecasts—that should be considered?

Response 9: Yes, as described in PG&E's responses to Questions 1 and 2, the agencies should conduct scenario analyses to inform the design of California's compliance plan (including the type of plan and the degree of allowance trading). In addition, if ARB selects state measures as the preferred compliance approach, PG&E supports the development of sensitivity scenarios as part of the modeling demonstration to US EPA. Important sensitivities include: natural gas prices, hydro conditions, and electric load growth (e.g. related to electrification, economic growth). In addition, staff may also consider varying assumptions about what other WECC states choose for their CPP compliance plans and the implications of those choices (e.g., coal retirements), as we would expect these choices to affect California's electric sector (e.g., by changing the quantity of electric imports).

Question 10: Do stakeholders agree that ARB's Mandatory Reporting Regulation requirements, and incorporated Part 75 requirements, will enable existing reporting to comply with most of CPP's reporting and recordkeeping requirements? Are amendments to ARB's reporting regulations appropriate to more fully integrate the programs?

Response 10: PG&E believes that ARB's Mandatory Reporting Regulation (MRR) is comprehensive in nature and should be sufficient to meet the CPP's reporting and recordkeeping requirements. However, amendments to the MRR reporting and verification deadlines are required to more fully integrate the programs.

Question 14: How can ARB and its coordinating agencies best use existing processes to ensure reliability during CPP implementation? Are any additional analyses warranted?

Response 14: PG&E recommends that ARB work with the CAISO and other coordinating agencies, including the CPUC, to ensure electrical system reliability during CPP implementation.

There are two primary California proceedings that determine core electric infrastructure needs for reliability : (1) the biennial LTPP proceedings conducted by the CPUC and (2) the Annual Transmission Planning Process (TPP) performed by the CAISO. The LTPP assesses capacity needs for system, local, and operational flexibility and determines how to best meet these needs (e.g. generation and/or non-generation alternatives). The CAISO performs technical studies to assess system and local area needs, and develops an annual comprehensive transmission plan that examines the CAISO-controlled grid and reliability requirements and identifies mitigation solutions.[4]

In addition, ARB should consider the regional impacts of CPP implementation on the Western Interconnection as the CPP may significantly change the resource mix serving demand. There are new areas of studies needed in regards to maintaining system reliability including: (1) impact of deep penetration of wind and solar on system reliability f (e.g. capability of inverter-based generation for frequency response, maintaining system inertia, single largest contingency); (2) impacts of deep penetration of behind-the-meter Solar PV on the bulk system electric grid; (3) impacts of local air-board restrictions on natural gas fired generation on system and local area reliability; and (4) impacts of high coal retirements.

ARB should work closely with the CAISO to ensure that as the CAISO expands, consistent carbon prices and appropriate incentives are in place for the resource products and characteristics needed to maintain reliability across the expanded region.

Question 15: Should California submit a nonbinding statement of interest in participating in the Clean Energy Incentive Program? What advantages and disadvantages do stakeholders see for such participation?

Response 15: PG&E would not object to California's submission of a non-binding statement of interest in participating in the Clean Energy Incentive Program (CEIP). The advantages of participation in such a program could include:

[4] Note the CAISO Transmission Plan feeds into the CPUC LTPP proceeding.

- An increase in the supply of compliance instruments to California, which could help reduce compliance costs to covered entities, and if allocated to LSEs, could be auctioned to provide revenue that could be returned for the benefit of California's electric ratepayers; and
- These ratepayer benefits could be an additional bonus to activities already planned or forthcoming in the areas of low-income energy efficiency and renewable energy as called for under SB 350 and SB 802, for example.

Disadvantages to participation in the CEIP could include:

- It could require an adjustment to California's allocation provisions;
- Its benefits may not be commensurate with ARB's costs to administer the program - the budget of matching compliance instruments from EPA would be relatively insignificant (~657,000 short tons over the program, using the EPA's proposed methodology); at $20/short ton, these compliance instruments would be worth about ~$13 million over the program period, which is a tiny percentage of California's energy efficiency budget[5]; and
- It is unclear how the CEIP would result in cost savings to California electric customers by reducing the above-market cost of renewable energy.

Question 16: If so, what mechanisms might be necessary to integrate the program with California's Cap-and-Trade Regulation? How should compliance instruments associated with the federal program be treated? Are there other options for participating in the Clean Energy Incentive Program that would not require such integration?

Response 16: If California's state implementation plan were deemed "trade-ready," then the state would be prepared to accept CPP compliance instruments such as those provided under the CEIP. If ARB pursued trade-readiness under a state measures approach, the ARB would need to amend its cap-and-trade regulation to recognize CPP instruments for AB 32 compliance. ARB would also have to determine how it would set aside AB 32 allowances for the CEIP.

Additional CEIP instruments, if meaningful in supply to the cap-and-trade program, could help reduce compliance costs. If load-serving entities (LSEs) receive CEIP instruments, they could be used for compliance, auctioned, or otherwise sold to provide revenue that could be returned for the benefit of California's electric customers.

A simpler option for participating in the CEIP would be for projects that earned the federal matching instruments to sell them to other states.

Question 17: What analytic tools and venues are appropriate for assessing the emissions and compliance cost opportunities and concerns, including any emissions leakage or accounting concerns, associated with various regional compliance options?

[5] In 2013, almost $1.8 billion was budgeted for energy efficiency programs in the state. Source: http://energy.gov/eere/femp/energy-incentive-programs-california

Response 17: PG&E recommends that ARB use production cost models such as the PLEXOS model used in the CPUC LTPP proceedings. The model can also be used to assess variable production costs under different scenarios, which bears on compliance costs. Potential scenarios include those in which there are different carbon prices or emission constraints on the dispatch of thermal plants in different states.

ARB could also continue to participate in the meetings hosted by the Center for a New Energy Economy (CNEE), which have engaged Western state environmental agencies and utilities in a dialogue on the CPP. CNEE has compiled a modeling inventory[6] that identifies existing modeling efforts to facilitate conversation about areas where further modeling is needed. CNEE has noted that it intends to convene a modeling working group in the near future.

At the most recent CNEE meeting on September 10 in Denver, Colorado, PG&E shared the results of our preliminary modeling analysis of power sector impacts of the CPP (available at footnote 3), which was conducted by ICF Consulting using their Integrated Planning Model (IPM®). Similar to PLEXOS, IPM is a production cost model of the electric power sector that can be used to assess emissions leakage and CPP compliance costs. PG&E is continuing its analysis using this model and welcomes ARB's feedback on regional compliance scenarios to analyze.

Question 18: What regional compliance options should ARB staff evaluate? Which of these options are more or less consistent with the state measures plan design ARB staff has identified as a strong compliance option?

Response 18: PG&E recommends ARB evaluate compliance under both state measures and emission standards approaches that allow for trading of allowances across state lines (e.g., through "trading ready" or identification of specific trading partners in the WECC).

ARB should work closely with CAISO and stakeholders to evaluate the impacts and risks to an expanded regional CAISO electricity market under different compliance options. For instance, a compliance pathway that results in different GHG prices across various states that are participating in CAISO's electricity market could lead to inefficient dispatch. Inconsistent GHG prices across the CAISO's footprint could result in less efficient, higher heat rate units being dispatched because of a lower GHG price in their state. This could risk the environmental and economic efficiency of CAISO's dispatch and result in increased GHG emissions across the CAISO footprint. This could also have a significant impact on the economic benefits to California associated with CAISO's regional expansion. For these reasons, it is important that ARB's approach to compliance considers consistency with an expanded regional CAISO electricity market and that ARB coordinates with CAISO and regional entities to achieve efficient dispatch.

[6] http://www.westernstate111dplans.com/modeling-meta-analysis/

Federal regulation of GHG emission from power plants presents provides California an opportunity to align carbon policies with nationwide efforts and contribute to a cleaner, more efficient power generation sector. ARB should consider modifications to its existing cap-and-trade program to consider the impact that national regulation of GHG emissions have on the continuation of its existing program design. For example, the ARB must consider whether the regulation of imported electricity is appropriate where the carbon emission of the underlying generation resource is covered under the CPP. This potential double regulation of imported power could distort least-cost dispatch in electric markets and siting incentives, and raise costs for California ratepayers.

In the final Rule, US EPA created a pathway under the state measures approach for states with cap-and-trade programs with different program rules (e.g., scope, offsets, cost containment, etc.) to participate in mass-based trading programs that develop under the CPP in states using the emission standards approach. We are further investigating the implications of this pathway, which we call "SM Trades" and encourage other stakeholders and ARB to do so as well.

Under the SM Trades pathway, California would be able to trade by indicating it is "trading ready" or by trading with specific partners by identifying those partner states in its state plan. Under a California-only SM Trades plan, the state could only trade with emission standard states. California would be able to trade with other state measures states if it submitted a multi-state SM Trades plan.

Question 19: Are there features of the proposed model state and federal plans that California should highlight as particularly important to retain, or to modify, in the finalized version of these proposals?

Response 19: We agree that California has substantial experience to offer US EPA and has an interest in the final form of these programs as they have the potential to interact with California's GHG program and electric market.

First, we encourage ARB to weigh in on the choice of a rate or mass approach for the Federal Plan. We plan to encourage US EPA to choose a mass-based approach as the single approach for the Federal Plan and encourage ARB to do the same; this could potentially broaden the number of trading partners, assuming California also adopts a mass-based approach.

Second, to the extent that ARB is interested in pursuing the CEIP, we encourage ARB to recommend modifications to the CEIP that would better recognize California's contributions to early reductions and allow states to recognize a broader set of clean energy technologies. US EPA's proposed approach of basing the CEIP matching allocations on required reductions does not fairly recognize California's early actions and results in a very small CEIP matching budget for California. We'd prefer alternative approaches, such as output-based allocations of the CEIP matching allowances, and encourage ARB to provide feedback in this area as well. We also find EPA's proposal to limit participation to solar and wind arbitrary, and would support modifications to allow other non-emitting generators (e.g., geothermal, biomass) to participate.

Third, we'd like to see additional analysis on the effectiveness of US EPA's proposed output-based set-asides at addressing emissions leakage to new sources under state plan designs that only cover existing sources. We believe there is both an emissions and "level playing field" interest in having US EPA design the output-based set-asides in a way that adequately prevents leakage to new sources. We encourage ARB to analyze this issue and to provide its findings to US EPA and we plan to do the same.
Fourth, we believe California may have helpful perspectives to offer on allowance allocation for transition assistance purposes.

Finally, we support ARB's use of the metric system in California's program and would support ARB encouraging EPA to use metric tons as the trading unit for the Federal Plan.

Question 20: What potential interactions between these proposed plans and California's compliance strategy should ARB staff consider in the planning process?

Response 20: ARB staff should consider possible interactions between the proposed Federal Plan and California's plan through a "trade ready" approach. If California chooses a trade-ready approach, it could potentially trade compliance instruments with states in which the Federal Plan is implemented. In addition, to extent that any WECC states utilize a Federal Plan, ARB staff should consider how the Federal Plan may interact with California's approach to electricity imports under the cap-and-trade program.

Question 21: What issues and processes do stakeholders believe to be most important for coordination?

Response 21: As described above, ARB must seek to participate as a stakeholder in CPUC proceedings concerning resource planning and in CAISO stakeholder processes concerning transmission planning. In addition, ARB participation in CAISO processes concerning GHG costs is critical. Given CAISO's expanding footprint and regulation of generation under the CPP, there is significant value in re-evaluating whether and how imported electricity should be regulated under any California state plan. ARB's participation in these broader processes will remove ambiguity and will contribute to comprehensive energy and climate strategy, which will critical to achieving both the federal and state's ambitious climate goals.

ARB should coordinate with CAISO to ensure that as CAISO expands, the economic and environmental efficiency of CAISO's regional dispatch is maintained. Currently, generators are only subject to ARB's GHG regulations to the extent they are located within California or serve California load. Under the CAISO's regional Energy Imbalance Market (EIM), the CAISO is centrally dispatching resources in real-time across the footprint of all EIM participants. The CAISO's central dispatch identifies specific emissions associated with individual resources in EIM entities that the EIM selects to serve imports into the CAISO. This EIM resource is responsible for compliance with ARB's GHG regulations, including the cost of procuring the required compliance instruments. The EIM has a methodology that allows generators to include GHG compliance costs in their offers to supply California load which is working in a construct

where only California has a GHG price to prevent leakage and maintain the environmental integrity of ARB's Cap and Trade program.

As part of the CAISO's effort to integrate the EIM's first participant into its market as a full Participating Transmission Owner that will also participate in day-ahead markets, the CAISO will look at how the day-ahead market should address GHG compliance costs. The CAISO will seek to leverage the existing GHG design in the EIM and apply it to the day-ahead market.

CAISO and its stakeholders have not yet contemplated an EIM market design or an expanded CAISO footprint that contains multiple states with different GHG compliance structures. Different compliance regimes could lead to challenging and complicated dispatch solutions in which the CAISO's regional dispatch has to solve for multiple GHG prices depending on where the energy is generated or delivered. Additionally, compliance pathways that result in different GHG prices across various states that are participating in CAISO's electricity market could lead to inconsistent GHG prices across the CAISO's footprint and could result in less efficient, higher heat rate units being dispatched because of a lower GHG price in their state. This could also have a significant impact on the economic benefits to California associated with CAISO's regional expansion.

Sincerely,

/s/

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