

November 18, 2015

E-Filing
ARB's Cap-and-Trade Website

Ms. Shelby Livingston
California Air Resources Board
1001 I Street
Sacramento, CA 95812-2828

Re: Pacific Gas and Electric Company's Comments on the Air Resources Board's Concept Paper for the Draft Cap-and-Trade Auction Proceeds Investment Plan

Dear Ms. Livingston:

Pacific Gas and Electric Company (PG&E) welcomes the opportunity to submit these comments on the Air Resources Board's (ARB) Draft Cap-and-Trade Auction Proceeds Investment Plan (Draft Plan).

I. INTRODUCTION

PG&E's detailed comments on the Concept Paper are set forth below. The following summarizes the key issues:

- Focus on expanding energy efficiency investments in the buildings sector
- Acknowledge the role of the loading order in making decisions about serving demand
- Include additional complementary post-2020 strategies
- Funding for bioenergy projects and technologies can reduce costs of renewable energy
- Design of carbon capture and sequestration projects requires careful consideration
- PG&E supports the Draft Plan's focus on reducing emissions from transportation
- Medium and heavy duty vehicles need a path to commercialization
- Greater emphasis on quantifiable and cost-effective greenhouse gas reductions needed
- PG&E supports additional investment in research, development, and demonstration projects

II. DISCUSSION

A. Energy Efficiency

Focus on Expanding Energy Efficiency Investments in the Buildings Sector

Current investor-owned utility (IOU) energy efficiency programs are designed to provide incentives to move building owners above and beyond current Title 24 building codes. However, as codes have become more stringent in recent years (and will become even more so as the state moves to zero-net-energy homes and buildings), many customers find bringing their home or building up to code challenging and cost-prohibitive. While the recently passed Assembly Bill (AB) 802 will likely expand the opportunities for IOU energy efficiency programs to support customers in bringing their buildings “up to code,” more investments in these types of activities are paramount to delivering substantial energy savings and greenhouse gas (GHG) emissions reductions in the state’s existing buildings. Bringing an existing building “up to code” can prove costly, and in many cases can create a disincentive to act, which only contributes to a widening energy efficiency gap. Investments that target this gap, and bring buildings both up to *and* beyond code, would benefit building owners, communities, and the state as a whole.

Preliminary results from two complementary studies, one of which studied heating, cooling, and lighting energy consumption in nearly 70,000 buildings in PG&E’s service territory and the other that examined all energy consumption in 164 buildings, indicate that approximately two-thirds of the energy savings potential in California’s existing buildings is in to-code savings. These results are consistent across climate zones and market sectors. This indicates that similarly inefficient buildings exist throughout the state, including in disadvantaged communities. Given the large amount of to-code savings prevalent in California’s existing building stock, the state could achieve more energy savings by bringing these less efficient buildings up to and beyond modern codes and standards.

Investments that target this gap include programs that provide financial incentives, rebates, technical assistance, and support to customers to increase the energy efficiency of existing buildings based on energy usage reductions, as measured through normalized metered energy consumption. Programs should focus on bringing buildings up to- and beyond- Title 24 code levels, and include energy-saving operational, maintenance, and behavioral activities. Such programs can:

- Target the state’s least efficient buildings, particularly those in disadvantaged areas
- Encourage deeper whole-building upgrades and behavioral and operational energy savings
- Increase the adoption curve for building upgrades and new efficient equipment

The Clean Energy and Energy Efficiency Section Should Acknowledge the Loading Order

California has a resource “loading order” that requires customer demand be met first through cost-effective energy efficiency and demand response followed by renewables and non-emitting resources with the remainder of demand met by highly efficient natural gas power plants. In its discussion of energy efficiency and renewable generation as strategies to reduce GHG emissions, the Draft Plan’s “Clean Energy and Energy Efficiency Section” should acknowledge the role of the loading order and prioritize energy efficiency investments accordingly.

Include Additional Complementary Post-2020 Strategies

Page 14 of the Draft Plan includes a list of “Complementary Post-2020 Strategies.” We would recommend that the California Public Utilities Commission’s (CPUC) energy efficiency and water/energy nexus proceedings be added as these proceedings will result in post-2020 GHG emissions reductions. We would also recommend that the California Independent System Operator’s (CAISO) plans to expand the Energy Imbalance Market (EIM) and create a regional energy market be added to this list since these actions are also expected to reduce GHG emissions over the long term.

B. Funding for Bioenergy Projects Can Reduce Costs Long-term

Utilizing biogenic feedstocks for energy and fuel production may offer broad, statewide societal benefits such as reduced water and air pollution, reduced wildfire risk, increased forest health, waste reduction and recycling, job preservation or creation, and watershed improvements. Bioenergy can also serve many valuable applications and end-uses, ranging from electric generation to alternative transportation fuels. To ensure a competitively priced renewable energy product is available to Californians, many new and existing bioenergy facilities will need financial support to overcome the market barriers and costs associated with the collection and transportation of feedstocks. PG&E supports the Draft Plan’s proposal to allocate funds to new and existing bioenergy projects as this could play a key role in lowering costs and creating a viable market for these resources.

The GGRF is an appropriate, public source of support for the development and expansion of potential uses for woody biomass and organic waste matter, including energy production and the creation of biofuels and other valuable wood products. While these are all potential pathways for reducing methane emissions from organic waste, PG&E agrees with ARB on the need for further analysis. Additional research is needed to fully explore, identify, and prioritize the most beneficial pathways and end uses for these feedstocks. As noted in the Draft Plan, unintended consequences associated with different bioenergy use options could arise, and the most

convenient options today may not provide the most value in the future.¹ A robust lifecycle and economic analyses of the many waste diversion options available will support the development of a comprehensive proposal for the most cost effective, impactful and statewide solutions.

PG&E is currently working to better understand the feasibility of injecting biogas within our gas system, and what infrastructure would be required to support this work. PG&E is continuing to identify locations that are not only cost effective, but provide societal and environmental benefits as well. PG&E would support state efforts to study how RNG can be produced and delivered safely and cost effectively to California's natural gas customers. We are very interested in partnering with the state and other stakeholders on pilot programs and strategies to bring down the costs of this fuel stock. Given the broader societal benefits of RNG, PG&E believes that the associated development costs should be funded through dedicated RD&D programs. PG&E supports state funding for RNG projects through the Greenhouse Gas Reduction Fund (GGRF) or other sources. This could lower the costs of RNG and make it more competitive with current natural gas commodity costs, potentially leading to market development and adoption across the state.

C. Transportation and Sustainable Communities

PG&E Supports the Draft Plan's Focus on Reducing Emissions from Transportation

It is clear from ARB's recent public workshops that Californians support a transition to electric vehicles and the need for infrastructure to accelerate adoption. PG&E is committed to working with state agencies to ensure that utility investments in electric vehicle (EV) infrastructure will complement state efforts to accelerate adoption of clean fuel vehicles.

Medium and Heavy Duty Vehicles Need A Path to Commercialization

PG&E supports the Draft Plan's proposal for demonstrations, pilot projects, and deployment of zero and near-zero emission medium and heavy duty trucks (class 3-8). While the light duty passenger car sector offers an increasingly diverse range of consumer options for alternative-fueled vehicles, the electric drive medium and heavy duty vehicle sector is still in the development stage. Support is needed to foster both electric and natural gas technologies from concept, R&D, and demonstration to commercialization. Funding to help bring these technologies to market within California can support the State's GHG and criteria pollutant reduction goals and advance the use of clean air technologies in disadvantaged communities.

¹ Draft Plan, page 38

D. Carbon Capture and Sequestration

The “Clean Energy and Energy Efficiency” category of the Draft Plan includes a proposal to provide funding toward a demonstration project to capture carbon dioxide from an industrial source, like a power plant, and inject it into an underground geologic formation.² PG&E recommends that the state agencies carefully consider this proposal to fund a demonstration of carbon capture and sequestration (CCS) technology for the reasons outlined below.

A 2015 CEC report notes that the lifecycle economics of CCS at natural gas combined cycle (NGCC) plants are negatively impacted if the plant has a capacity factor lower than the study’s base case assumption (i.e., lower than 65% for a plant retrofit and 80% for a new build).³ It should be noted that the capacity factor of NGCC plants in California averaged only 52% between 2001-2013; for all natural gas power plants in California during this time period, the average capacity factor was only 31%.⁴

By 2030, significantly less total thermal generation is expected to operate in California due to low load growth, increased renewable generation and the changing composition of the thermal generation fleet. The utilization of these thermal resources, however, is expected to decrease as renewable generation increases.⁵ The need for more flexible capacity to integrate higher amounts of renewable generation⁶ means that it is less likely that high capacity factor natural gas power plants, at which CCS could more cost-effectively be installed and efficiently run, will be needed in California. Therefore, PG&E believes that CCS technology may not be a cost-effective pathway given California’s generation mix and future resource needs. If a CCS demonstration project is pursued, however, PG&E recommends that it be located at an industrial facility that operates at a high capacity factor.

E. Energy Storage

The “Clean Energy and Energy Efficiency” section of the Draft Plan also discusses the need to expand energy storage capacity, and includes a proposal to support renewable energy storage such as “power-to-gas, batteries, etc.”⁷ Further investment in all storage technologies may lead to both cost and efficiency gains towards improving the overall cost effectiveness of these technologies. PG&E’s comments on the ARB’s recent “2030 Target Scoping Plan” workshop note that power-to-gas is a new technology that may potentially help California achieve its

² Draft Plan, pages 28, 37 and 39

³ Holden, Ed. “Assessment of Natural Gas Combined Cycle Plants for Carbon Dioxide Capture and Storage In a Gas-Dominated Electricity Market: Supporting Westcarb Initiatives - Final Project Report.” January 2015. [CEC-500-2015-002](http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2015-002). <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2015-002>

⁴ Nyberg, Michael. “Thermal Efficiency of Gas-Fired Generation in California: 2014 Update.” September 2014. <http://www.energy.ca.gov/2014publications/CEC-200-2014-005/CEC-200-2014-005.pdf>

⁵ Energy + Environmental Economics. “Investigating a Higher Renewables Portfolio Standard in California.” January 2014. https://www.ethree.com/public_projects/renewables_portfolio_standard.php

⁶ CEC. “Tracking Progress – Resource Flexibility.” Last updated 8-19-2015.

http://www.energy.ca.gov/renewables/tracking_progress/documents/resource_flexibility.pdf

⁷ Draft Plan, page 39

climate goals, but that a number of issues related to cost-effectiveness, technology, operation, and financing need to be addressed on a significant scale. Further funding through the GGRF could help to address some of these issues.

F. Program Administration

Greater Emphasis on Quantifiable and Cost-effective GHG Reductions Needed

The Draft Plan should place greater emphasis on the need to quantify and prioritize cost-effective GHG reductions presented in dollars per metric ton of GHG emissions reduced or sequestered that could be achieved or facilitated by each investment. PG&E understands that ARB and its sister agencies are currently developing metrics to determine the cost-effectiveness of individual projects. This methodology should also be used when evaluating broader areas for appropriations.

The AB 32 Scoping Plan requires the ARB to adopt emission reduction measures that are both technologically feasible and cost effective (HSC section 38562, subd. (a) and (c)). As such, emission reduction measures supported by auction proceeds should also be both technologically feasible and cost effective. Cost effectiveness need not be the sole mechanism for prioritizing investments. Any investments that are expected to provide relatively fewer emission reductions at a high cost should be a small percentage of the overall investments and also should be strongly supported by other principles, such as the ability to deliver multiple societal benefits to protect human and natural resources, the ability to benefit disadvantaged communities, the ability to leverage other investments, or the potential over time to bring significant abatement at a more reasonable cost. The State must prioritize spending that leads to quantifiable emissions reductions over projects that might satisfy other objectives or social benefits, but lack a clear and significant potential for emissions reductions.

Achieving reductions through GGRF funds will reduce demand for allowances, meaning consumers and ratepayer will likely see a lower GHG price embedded in the products and energy they consume. Thus, by achieving the maximum number of GHG reductions with limited GGRF funds, California will be able to achieve its GHG reduction goals with the least impact to our economy.

For these reasons, PG&E strongly recommends that the ARB develop a cost-effectiveness metric, and that the ARB work with stakeholders to either recommend a range of acceptable costs per unit of GHG emission reductions, or set a minimally acceptable cost per ton. For example, the ARB could develop an index based on allowance prices, or review previously funded projects to demonstrate a range of acceptable costs. A related metric could be developed for research and development projects, particularly for technologies that hold the promise of significant, cost-effective GHG reductions.

Ms. Shelby Livingston

November 18, 2015

Page 7

Accountability

With regard to the accountability of administering agencies, a review should take place at the completion of a project that receives auction proceeds, or at some significant milestone, to characterize the impact of the investment using predetermined criteria. This information could be used to inform future investment, including which supported activities should be expanded and which should sunset. For example, each Three-year Investment Plan could include a section evaluating the effectiveness of programs stemming from the previous Investment Plan.

G. Research, Development, and Demonstration

PG&E strongly supports further investment in research, development, and demonstration (RD&D) activities. PG&E recommends a stronger focus on RD&D for low-GHG technologies and practices. Such spending is widely supported by a range of academics and policy analysts and can help produce new knowledge and tools that will be needed to achieve California's longer-term GHG reduction goals. We also recommend that, to the extent possible, RD&D efforts be administered through existing programs to ensure close coordination and avoid duplication.

III. Conclusion

Thank you for the opportunity to submit these comments. We look forward to continuing our work with ARB and other stakeholders to ensure the successful investment of cap-and-trade auction revenue.

Sincerely,

/s/

Claire Halbrook

Climate Policy Principal
Pacific Gas and Electric Company