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PG&E Comments on Climate Innovation Program (CIP) Workshop

Additional submitted attachment is included below.

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November 29, 2022

California Energy Commission
Jonah Steinbuck, Director
Energy Research and Development Division
Climate Innovation Program
Docket Unit, MS-4
Docket Number 22-ERDD-02
715 P Street
Sacramento, CA 95814

Re: Pacific Gas and Electric Company Comments on the Climate Innovation Program (Docket Number 22-ERDD-02)

Dear Director Steinbuck,

Pacific Gas and Electric Company (PG&E) thanks the California Energy Commission (CEC) for hosting a workshop to discuss the implementation of its new $525 million Climate Innovation Program (CIP) held on November 15, 2022. PG&E appreciates the opportunity to provide responses to the following questions posed by the CEC during the workshop:

1- What criteria should the CEC use to evaluate eligible technologies?

PG&E recommends that the CEC use the following additional criteria to evaluate technologies considered for funding:

A- Alignment with existing State plans: PG&E recognizes and appreciates that the CIP is designed to fund technologies not adequately addressed by other funding programs; however, the CEC should ensure that the specific technologies considered for funding under this program are aligned with the State's overall objectives around decarbonization and climate resiliency. The CEC can ensure alignment with the State's goals by requiring applicants to clearly identify how their technology will help to achieve a key resiliency or decarbonization effort. Additionally, if the new technology does not explicitly relate to a statewide effort(s), the CEC can require applicants to highlight how their technology demonstrates significant potential for climate resiliency or decarbonization.

PG&E recommends that the CEC establish a coordinated approach to fund technologies that are aligned with existing State plans. The CEC also should ensure that financial incentives are provided to advance technologies that are a robust contributor to California's climate goals. To ensure that technologies are relevant to California's climate goals, the CEC's solicitation manual

should include guidance and required reports from awardees on how their plans are aligned with the State's plans.

For example, PG&E and other investor-owned utilities (IOUs) file annual Wildfire Mitigation Plans, which are reviewed and approved by the California Office of Energy Infrastructure Safety. These mitigation plans detail an IOU's activities to address climate resiliency by ending catastrophic wildfires.[1] The California Air Resources Board (CARB)'s Scoping Plan for Achieving Carbon Neutrality and the CEC's own Building Decarbonization Assessment[2] identify actions to reduce greenhouse gas emissions. The State's Extreme Heat Action Plan is another potentially relevant plan, which was developed after extensive public input.[3]

The CEC's solicitations should align with these programs and plans when providing funding to specific technologies, and applicants should clearly illustrate how their technologies contribute to and/or support the plans stated in the above-mentioned or other State policy documents.

B- Early-stage Technologies: PG&E recommends the CEC consider early-stage technologies for funding. Vehicle-to-grid (V2G) research offers a good example where the CEC could require specific criteria of technology readiness level to evaluate eligible technologies for specific projects. For example, in current pilot projects to test V2G technologies, PG&E is primarily focused on partnerships with companies that have a Technology Readiness Level (TRL) 6 or higher[4] and the CEC could fund projects with a lower TLR. PG&E offers to work collaboratively with the CEC to identify early-stage technologies that can support the CEC's goals.

Similar criteria of technology readiness can be used to evaluate eligible technologies for biomass management and conversion technologies. PG&E recommends that the CEC consider early-stage technology development for funding. However, if investing in a specific technology represents a high, then the CEC should receive a commensurately higher upside to make that specific technology worthy of the attention and investment.

C- Grid Capacity Upgrades: PG&E recommends that the CEC supports fund grid infrastructure projects— such as capacity upgrades, to help IOUs fund projects that enable building and transportation electrification while easing ease ratepayers' impacts. CEC funding can also help support capacity upgrade projects that will prepare the grid to withstand extreme heat events in vulnerable communities. While many climate innovation technologies may be available for additional sources of funding, the infrastructure required to ready the grid for these projects has not yet been considered by the CEC for funding opportunities.

2- What is your top-priority technology topic where you believe the most funding and emphasis should be placed because it could have the most significant impact and why?

[1] PG&E's WMP can be found here: https://www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan.page?WT.mc_id=Vanity_wildfiremitigationplan

[2] https://www.energy.ca.gov/data-reports/reports/building-decarbonization-assessment

[3] https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Climate-Resilience/2022-Final-Extreme-Heat-Action-Plan.pdf

[4] Source: https://www.nasa.gov/directorates/heo/scan/engineering/technology/technology_readiness_level/

PG&E recommends the following three priority areas for funding because they have the most significant impact on California's electrification goals:

A- Vehicle-to-Grid (V2G) Research: One of PG&E's top priority technology topics is affordable bi-directional charging installations at residences. Currently, the number of residential bi-directional electric vehicles (EV) charging stations is minimal, and costs for the upgrades required to install an EV charger (e.g., trenching, panel upgrades, etc.) exceeds $15,000 per residence. This cost prevents many customers from installing V2G charging stations. PG&E believes there are technology solutions that can alleviate these costs and allow all customers to access affordable bi-directional charging in two-to-three years.

PG&E recommends that the CEC prioritize funding for V2G-enablement because V2G technology serves to alleviate grid capacity constraints during times of capacity constraints by paying customers to utilize their EV battery power for use on the grid. To enable customers to use their EVs reliably, affordably, and safely in instances of grid constraints, PG&E needs to test technologies in both the laboratory and in the field before scaling up to customer homes across the service territory.

As an example, PG&E, in separate partnerships with Ford and General Motors, is conducting Vehicle-to-Home pilots in 2023 and 2024. However, the cost paid by customers to adopt these solutions is more than originally anticipated due to upgrade costs. PG&E recommends that the CEC fund a technology project to help offset much of those costs because increasing the scale of V2G or Vehicle-to-Home integration will help to decarbonize the grid and increase resiliency to extreme heat events and other capacity events.

B- Biomass Management and Conversion Technologies: PG&E also considers that biomass management and conversion technologies are another area of high-benefit funding opportunity. California intends to, at a minimum, triple the acreage of forest hazardous fuels reduction by 2025. Per a joint Memorandum of Understanding (MOU) between PG&E and the U.S. Forest Service, the two organizations agreed to increase the acreage of reduction by an order of magnitude if California pursues the 2.3 million acres to be treated as part of CARB's Scoping Plan Update (pending adoption in December 2022). CARB's Short-lived Climate Pollutant (SLCP) Strategy adopted pursuant to Senate Bill (SB) 1383 expanded the number of organic materials that need to be managed to reduce SLCP emissions. New air quality policy will also seek reductions via agricultural biomass. Technologies such as pyrolysis, methanization and other waste-to-energy pathways could be aided by CEC funding and further help to reduce SLCP emissions with high global-warming potential.

PG&E recommends that the CEC fund projects to identify new efficient technologies to manage and convert wood. Such investment opportunities could range from funding more fundamental to potentially break-through research and development (R&D).

C- Grid Capacity Upgrade Projects: PG&E recommends that the CEC help fund capacity upgrade projects to serve transportation and building electrification projects and prepare the grid for high-heat events. Electrification is increasing at an unprecedented rate and—in order to meet the State's goals—will expand more quickly than CPUC funding can support without outsized rate increases. As the electrification load increases and the CEC funds additional climate innovation projects, the CEC must heavily consider the capacity upgrades required to serve

those projects and more. Funding such capacity upgrade projects will help ease ratepayer impacts, serve customers more quickly, facilitate economic development, and harden the grid against a future with an increasing number of high-heat events.

3- What important gaps are not being addressed by other funding programs?

A- Early-Stage Technologies: There is an important funding gap in technologies being tested for the first time with a potential to scale in commercial projects. Early-stage projects are often too nascent to receive financing and are too costly for most startups to fund. Giving these startups access to non-dilutive or affordable capital would be beneficial because they will become investable companies while also validating their technology in the market.

B- Biomass Management and Conversion Technologies: PG&E recommends additional funding for biomass technologies to increase the economic viability of clean wood conversion pathways such as post-processing R&D (i.e., for wood-based biofuels refining), or market development for resulting wood conversion output (e.g., biochar), which could help such large-scale demand to solidify over time.

C- Grid Capacity Investments and Programs: Another important gap not addressed by current funding programs is the grid capacity investments required to facilitate new technologies. Transportation and building electrification are accelerating at an unprecedented rate due, in part, to the amount of state and federal dollars allocated to decarbonization innovation. While PG&E celebrates these programs, IOU customers cannot bear the entire burden of capacity costs without stymying achievement of our goals. Funding from the CEC and other State programs will be necessary for the pace and scale required of our ambitious decarbonization agenda.

PG&E recommends that the infrastructure required to facilitate and support climate innovation projects should be eligible for funding from the CEC.

4- What other suggestions would you like the CEC to consider in the development of this program?

A- Follow-on Funding: PG&E suggests that the CEC allocate follow-on funding from the CIP to allow for the scalability of technologies. Funds from CIP can be allocated for future funding opportunities in technology projects that succeed and are scalable.

One-time funding can be useful; however, in many cases, the grantee company constructs its team to comply with the CEC's administrative requirements for grant eligibility, but the funds are not enough to scale the technology. Nascent companies need funding to build out a commercial team and grow. While this currently is and should remain the domain of private equity, venture capital, and angel investors, PG&E suggests the CEC prioritize investing in those early-stage commercial projects once the grantee company has raised sufficient capital to grow its operations. The CEC should fund these first commercial projects while still receiving a return on its investment through some of the cash flows that result in the short-term or equity in the firm over the long-term. Funding follow-up projects will also serve as an incentive to get these nascent companies to focus on commercialization in the marketplace, rather than pure R&D. It also ensures these companies are more viable long-term as they would be able to access non-dilutive capital to fund revenue-generating projects on their own, rather than using venture

capital or private equity to develop those projects. While both private equity and venture capital are useful sources in the scaling phase, these funds are often not as valuable during the phase in which the first commercial projects are commissioned and operated with paying customers.

B- Biomass Benefits: In terms of biomass management and conversion technologies, PG&E believes that biomass innovation represents a climate opportunity via wildfire emissions prevention, displacement of fossil fuels, and removal of carbon from the carbon cycle. Biomass innovation also represents an opportunity to increase climate adaptation to wildfire, drought, and flood. In addition, biomass innovation can enable co-benefits beyond those related to climate and energy such as enhancing air and water quality, helping to preserve biodiversity, and improving public health in California and other states from reduced catastrophic wildfire emissions. Such "stacked" values should be considered when evaluating total climate upside from biomass technology development.

C- Grid Capacity Projects: Finally, for grid capacity projects, PG&E suggests that IOUs be eligible to apply for funding for grid upgrades. However, before pursuing this or any other funding, PG&E would need to better understand the CEC's view on the repayment option per the CIP requirement provisions in slide five of the CEC's presentation.[5]

PG&E recognizes the need to invest in various energy technologies that enable the State to meet its greenhouse gas reduction goals more quickly and at a lower cost, as well as increase resiliency to the impacts of climate change. PG&E looks forward to continued collaboration and further engagement with the CEC on the implementation of this program and to bolster our joint efforts in building more resilient communities in California. Please feel free to reach out to me if you have any questions.

Sincerely,

Licha Lopez
State Agency Relations

[5] CEC's $525 million Climate Innovation Program.