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PG&E Comments on the Draft 2021 Integrated Energy Policy Report (IEPR), Volume III Decarbonizing the Stateâ€™s Gas System

Additional submitted attachment is included below.

Pacific Gas and Electric Company

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January 28, 2022

California Energy Commission
Commissioner Andrew McAllister
517 P Street
Sacramento, CA 95814
Docket Number 21-IEPR-01

RE: Pacific Gas and Electric Company Comments on the Draft 2021 Integrated Energy Policy Report (IEPR), Volume III: Decarbonizing the State's Gas System (Docket Number 21-IEPR-01)

Dear Commissioner McAllister:

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to comment in response to the California Energy Commission's (CEC) draft 2021 Integrated Energy Policy Report (IEPR) Volume III on decarbonizing the state's gas system, released on January 12, 2022.

PG&E applauds the CEC's efforts in drafting this report and generally agrees with the policy issues and recommendations outlined in Chapter Ten. PG&E offers the following additions, proposed amendments, and clarifying questions in some chapters, as noted below, and organized by chapter.

Chapter 4: Opportunities for Renewable Gas and Renewable Hydrogen

PG&E appreciates the information presented in Chapter Four of the draft IEPR, Volume III, on renewable gas and hydrogen. The draft IEPR provides a good overview of the value chain (feedstock, production, transportation, utilization) of these gases, the role they can play in decarbonizing California's gas system, and the work (technical, financial, and regulatory) that still needs to be done to move toward a low-carbon or zero-carbon future. California's evolving gas system is already receiving renewable gas in some areas and is taking steps toward hydrogen blending.

PG&E recognizes the importance of renewable gas and hydrogen in reducing greenhouse gas (GHG) emissions on the path to a clean energy economy. PG&E continues its work with industry partners, academic entities and governments to close knowledge gaps, develop novel technology, and execute renewable projects to transform our gas system to deliver clean energy. This chapter, however, should recognize a few points that PG&E recommends adding to the report as follows:

- Explicit inclusion of forestry waste and municipal solid waste (MSW). In the introduction to The Future of Renewable Gas, there was no mention of forestry waste and MSW as potential

feedstocks. These are mentioned later in the chapter in Figures 25 and 26, with mention of the Gas Technology Institute project specific to woody biomass co-funded by PG&E and the CEC's potential funding of woody biomass to renewable gas projects. To align with these references, PG&E recommends including these additional sources of renewable gas in the introduction and a brief explanation about thermochemical conversion processes that are used to create renewable gas from these feedstocks.

- Additional information on synthetic methane where anaerobic digestion is discussed. Anaerobic digestion creates biogas that contains roughly 60 percent methane (the main component of natural gas), and 40 percent carbon dioxide. The carbon dioxide can be combined with hydrogen and using excess renewable electricity to form what is called synthetic methane. It is completely interchangeable with the existing natural gas system. Transforming carbon dioxide in this way allows the production of renewable gas that is carbon neutral or even carbon negative. This would effectively increase the output capacity of the overall renewable gas production process. It also helps businesses such as dairies to reduce their greenhouse gas emissions by capturing carbon dioxide otherwise released into the atmosphere.

- An update to the chapter that includes the latest developments from the California Public Utilities Commission's (CPUC) Proposed Decision implementing Senate Bill 1440 on Biomethane Procurement Program.[1]

- Including a paragraph about hydrogen from fossil gas methane pyrolysis as an alternative to steam methane reforming. It creates both hydrogen gas and a solid carbon product that can be used as an additive in cement or other products or stored. The solid carbon from this process is more beneficial in terms of its use in comparison with gaseous carbon dioxide from steam methane reforming.

- Under the section Transportation and Storage of Hydrogen, more context is needed around the following statement:

  > *Estimates vary regarding how much hydrogen can be blended into existing gas transmission and distribution infrastructure without significant upgrades, with some showing quantities of up to 20 percent in volume or up to 7 percent by weight without adverse effects.*[2]

  Elaborating on the following points, in addition to this high-level statement would provide a deeper understanding of the technical hurdles that must be overcome. These hurdles include impacts to different gas system infrastructure components, knowledge gaps, and the research and development (R&D) needed to close those gaps. For example:
  - For pipeline integrity, an understanding of the embrittlement of steel materials is needed;
  - Impacts of hydrogen blending on safety-related parameters like flammability;
  - Regarding end-use, a better understanding of appliance performance changes is needed;

[1] Proposed Decision Implementing Senate Bill 1440 Biomethane Procurement Program, California Public Utilities Commission. January 2022. 436700096.PDF (ca.gov)

[2] Draft 2021 Integrated Energy Policy Report, Volume III: Decarbonizing the State's Gas System, California Energy Commission, p. 68, 12 January 2022.

- With metering and gas quality, it must be determined if measurement capabilities are impacted;
- The effects of system capacity changes and impacts to compression stations must be understood for network management and compression;
- It is not clear if certain maintenance and inspection techniques will need to be modified;
- With hydrogen natural gas separation, it must be understood what technologies exist to be able to provide pure hydrogen to natural-gas-sensitive customers and provide pure natural gas to hydrogen-sensitive customers;
- A better understanding of microbial interactions is needed for underground gas storage.

The Pipeline Research Council International (PRCI) published *Emerging Fuels – Hydrogen SOTA Gap Analysis and Future Project Roadmap* in 2020 that provides a detailed overview on the state of the art for hydrogen blending, knowledge gaps, research and development (R&D) landscape worldwide, and a roadmap of R&D activities for PRCI members.[3]

- Recognition of the rapid growth in production and development of hydrogen in California. The IEPR should mention significant projects related to the development of hydrogen production and utilization[4] The need for transportation and storage of hydrogen is eminent between these projects, and the hydrogen fueling station network should be funded by the State. California needs solutions in the near-term and long-term for storing and transporting hydrogen to end users.

- Discussion of recent developments on hydrogen at the federal level including the Department of Energy (DOE) Hydrogen Shot Initiative[5] and the 9.5 billion dollars funding from the Infrastructure Investment and Jobs Act (IIJA)[6] to increase hydrogen production and to build at least four hydrogen hubs. The DOE's first Earthshot—Hydrogen Shot—which seeks to reduce the cost of clean hydrogen by 80% to one dollar per one kilogram in one decade ("1 1 1") was launched by the DOE on June 7, 2021. Two significant mandates in the IIJA related to hydrogen include:

    1) National Clean Hydrogen Strategy and Roadmap that directs the development of the first U.S. national strategy to facilitate a clean hydrogen economy as follows:

        a. The U.S. Secretary of Energy shall develop a technologically and economically feasible national strategy and roadmap to facilitate widescale production, processing, delivery, storage, and use of clean hydrogen.
        b. The strategy should be updated every 3 years.

[3] Emerging Fuels – Hydrogen SOTA Gap Analysis and Future Project Roadmap, Pipeline Research Council International, Domptail, Kim et al., 2020.
PR-720-20603-R01 Emerging Fuels - Hydrogen SOTA Gap Analysis and Future Project Roadmap | PRCI
[4] A few large projects include the Plug Power H2 production facility in Fresno county, Lancaster Hydrogen project World's Largest Green Hydrogen Project to Launch in California — SGH2 Energy, and Hydrogen rail project Bid Express: Tri-Valley San Joaquin Valley Regional Rail Authority. All of these projects are large scale and will benefit from pipeline transportation and storage.
[5] Hydrogen Shot | Department of Energy
[6] https://www.congress.gov/bill/117th-congress/house-bill/3684/text

2) Clean Hydrogen Production Qualifications, which directs the development of a clean hydrogen production carbon intensity standard including:

    a. The U.S. Secretary of Energy shall award grants for research, development, and demonstration projects to advance new clean hydrogen production, processing, delivery, storage, and use of equipment manufacturing technologies and techniques.
    b. To begin no later than three years following enactment and recurring every four years thereafter.

The federal efforts will provide guidance and funding to the state governments for development of clean fuel sources and decarbonization.

- Under the section European and United Nations Programs, the draft IEPR states, "European utilities are now blending as much as 20 percent hydrogen with fossil gas in the pipelines with no apparent damage."[7] PG&E recommends clarifying this statement on whether this means they are blending hydrogen into their existing infrastructure or in an isolated system as part of a pilot or demonstration project.

Chapter 5: Decarbonization and Gas System Planning

The State of California and over 50 local jurisdictions are addressing decarbonization from a policy perspective through advancements in building codes and appliance standards. PG&E has provided written support for these state and local efforts where they are cost-effective and reduce emissions for our customers. PG&E's first-of-its-kind WatterSaver program and the upcoming California Energy-Smart Homes Program (launching in 2022) will also incentivize low-carbon solutions in the building sector. These building electrification programs are complemented by a robust series of PG&E-led electric vehicles, demand response, and resiliency efforts, as well as state-wide programs like the Building Initiative for Low-Emissions Development (BUILD) Program and the Technology and Equipment for Clean Heating (TECH) Initiative (established under Senate Bill 1477) further enabling our clean energy future.[8]

PG&E agrees with the draft IEPR's emphasis on zonal electrification as a potential avenue to maintain long-term rate affordability. PG&E has developed an internal gas asset analysis tool to identify locations where "zonal electrification," or strategic decommissioning of the natural gas system may reduce gas system costs. The tool aims to synthesize various system conditions and asset characteristics—such as, but not limited to, age of assets, risks, number of customers, and system throughput—to provide insight about locations that may warrant further engineering and/or costing review for zonal electrification. To help with systems-level planning, a version of this tool is in use with participating jurisdictions in PG&E's service area.

In addition to the recommendations included in the draft IEPR, PG&E stresses the need for external funding and innovative financial mechanisms (e.g., capitalization of zonal electrification projects in lieu of planned gas pipeline replacement work, including the costs of externalities such as GHG reduction) as being imperative to the success of decarbonization of the gas system.

[7] Draft 2021 IEPR, Volume III, page 75.
[8] PG&E Comments on 2022 Energy Code Pre-Rulemaking (Docket Number 19-BSTD-03). https://efiling.energy.ca.gov/GetDocument.aspx?tn=237100&DocumentContentId=70295

Chapter 7: Addressing Stranded Gas System Investments

This chapter tees up discussion around stranded gas system investments. There are discussions around the challenges for gas rates, asset cost recovery, and ratemaking issues related to (a) a decline in throughput as residential households electrify; and, (b) assets that may become stranded due to elimination of throughput in those areas.

PG&E agrees that these issues are very important and notes that the CPUC is already addressing them in proceedings such as the Affordability Order Instituting Rulemaking (OIR), Building Decarbonization OIR, and the Gas System Planning OIR.

One item worth exploring further in the ratemaking section is utilizing the state's general fund to help mitigate rising gas rates as throughput to core customers declines over time.

Chapter 8: Improvements to Gas Forecasting and Assessments

PG&E welcomes the CEC's ambitious forecasting goals presented in the draft 2021 IEPR. However, a greater granularity of modeling is expected to present technical challenges, including coordination among all stakeholders to ensure agreement on the system description in the model. The results of this forecasting depend on detailed information on the transmission and distribution network, as well as on locational energy usage patterns. These assumptions will require work to guarantee consistency, both internal to the large model and with stakeholders. Further, the modeling of usage aggregates that are smaller and more numerous may lead to forecasts that are fragile or have higher variance because the law of averages may not smooth results to produce clear solutions without inserting many unconstrained variables. Along with statistical weather modeling – which will presumably also have a correspondingly high level of spatial granularity – the granularity of the forecast will present a data management task that includes the challenge of gaining agreement on model assumptions among stakeholders. The data requirements of this effort will call for significant data-sharing and cooperative work with the investor-owned utilities (IOUs). PG&E looks forward to continued collaboration with the CEC.

Chapter 9: Gas Price Outlook

PG&E recognizes the improvements that the CEC made to its models and methods to better reflect actual market conditions. To improve the chapter and provide clarity, PG&E offers the following comments and edits:

- In the California Price Outlook section, gas prices at Malin, Oregon show more stability given the abundance of supplies from Canada combined with lower pipeline usage. It is unclear whether this section refers to interstate or intrastate pipelines. PG&E requests that the report clarify which pipeline is referred to and also review usage of that pipeline. Both the Gas Transmission Northwest interstate pipeline and the PG&E intrastate pipeline (Redwood Path) have a high utilization compared to other pipelines at Malin or on other PG&E system paths. This observed high utilization appears counter to the statement that pipelines show lower usage.

- Figures 41 and 42 show price projections for the PG&E Citygate, SoCalGas Citygate, and SDG&E Citygate. Both the PG&E Citygate and SoCalGas Citygate are recognized as viable trading hubs. However, the SDG&E Citygate has little-to-no recognition as a trading hub. Furthermore, this section refers to a high-demand/low-price case that yields prices above the mid-case. Yet, these graphics do not support this assertion. PG&E suggest the draft IEPR provide additional clarity regarding whether the CEC intends to promote the SDG&E Citygate as a trading hub and supplement the price-case trends.

- Figure 48 shows customer class by gas investor-owned utility transportation rates. For PG&E, however, many end-use sectors have more than one rate schedule. For example, electric generation (EG) end-use customers use a transportation rate based on the type of service they receive. An EG customer taking service from the backbone system uses the tariff G-EG BB.[9] Another rate to note is the backbone tariff. Figure 48 shows only one rate for customers using the backbone rate. Backbone rates vary on the path used, such as Baja or Redwood, and by schedule, e.g., annual firm and as available. PG&E's subject matter experts offer to work with the CEC staff to ensure appropriate use of tariffs for each path and schedule.

- PG&E recommends that burner tip prices for the PLEXOS modeling be improved, either from improved granularity in the production cost model or better assignment of burner tip hub and relevant transportation rate. This applies to both Table 8 (Out-of-State Burner Tip Price Differences) and Table 9 (California Burner Tip Price Difference). One example is the PLEXOS fuel group Oregon and Washington. This fuel group may need improved geographic definition or a better blend of commodity and transportation rates, depending on the relevant desired modeling insights. PG&E recommends additional granularity to the modeling of burner tip gas prices. The additional granularity could influence the burner tip prices and forecast due to improved relative economics of transportation and prices.

  Under the column PLEXOS Fuel Group in Table 9 (California Burner Tip Price Difference), the PG&E BB row needs to be corrected. In this row, the Previous Burner Hub and Transportation Rate column adds together the PG&E Citygate hub plus the G-EG backbone end-use rate. This formulation represents the burner tip price. The weighted average of Malin and Topock, in the next column, is not representative of the PG&E Citygate hub.

- Figure 50, Burner Tip Price Comparison by IEPR Common Case (MMBtu), is unclear as to which burner tip price the graph is showing or some other price representation. PG&E recommends that the CEC specify which burner tip price(s) to help reader comprehension.

  Secondly, PG&E suggests that the figure include an explanation of the forecasted prices. The high-demand case price line crosses the mid-demand case price line. To provide clarity, PG&E also suggests that the CEC add an explanation of the drivers and assumptions to cause this trend.

  Lastly, PG&E suggests the inclusion of a deeper explanation of the fundamentals behind the North American Market Gas Trade Model (NAMGas) results along with the transportation costs to add clarity to the burner tip price graphic.

[9] Tariff G-EG BB: https://www.pge.com/tariffs/assets/pdf/tariffbook/GAS_SCHEDS_G-EG.pdf

This chapter contains typographical errors, and PG&E recommends correcting as follow:

1) Page 120, change $2.22/metric million British thermal units to $2.22/million British thermal units.
2) Page 127, the wording “Figure 45” is repeated twice.

Chapter 10: Policy Issues and Recommendations

PG&E appreciates the thought that the CEC has put into the policies and recommendations section of this report. We agree that a long-term, comprehensive gas planning process is needed for California to ensure gas system safety, reliability, and reasonable rates for customers receiving gas service. We also believe that inter-agency collaboration is a key element for a successful planning process. And, we agree that for California to continue down the path of a decarbonized future, an emphasis must be placed on how the gas and electric systems will work together to deliver carbon neutral energy to our customers. PG&E agrees with all elements touched on in this chapter with the following notes and exceptions:

- The utilities’ obligation to serve must be addressed in a manner that allows a utility to deliver energy to a customer, regardless of the type of energy, so long as it is safe, reliable, and affordable.

- PG&E strongly encourages the continuation of allowances, discounts, and refunds for projects that provide an economic and/or environmental benefit. This includes but is not limited to industrial and large commercial applications that are currently difficult or impossible to electrify. Therefore, we do not support the blanket elimination of allowances for all new gas hookups.

  Large non-residential or industrial customers are likely to be using gas for an industrial process, for shipping or rail or long-haul trucking, or for uses such as electric generation or electric backup power that displaces current use of higher GHG-emitting fuels such as diesel. Currently, PG&E has over 100 projects that are planned or underway that fall into these categories. The removal of the allowances, discounts, and refunds for these non-residential projects creates additional hardship, which may cause developers to either abandon projects or develop projects outside of California; thus, moving jobs and economic growth out of California. There are also financial benefits for maintaining allowances, discounts, and refunds for certain non-residential customer classes. As evidenced by PG&E’s low-deficiency billing rate of less than one percent for non-residential customers in 2019 and 2020, nearly all these large commercial customers pay back their investment in the gas system within three years, reducing the remaining system costs for all remaining gas ratepayers, including residential customers. As such, there is an imperative need to continue allowances, discounts, and refunds for such projects that may either reduce emissions to help California meet its climate goals or provide financial benefit to all California ratepayers.

PG&E appreciates the opportunity to comment on the 2021 Draft IEPR, Volume III: Decarbonizing the State’s Gas System, and looks forward to continuing to work with the CEC on the topics addressed by this draft report. Please reach out to me if you have any questions.

Sincerely,

Licha Lopez
State Agency Relations