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SoCalGas Comments on 2023 IEPR Draft Scoping Order

Additional submitted attachment is included below.

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March 17, 2023

Commissioner Patty Monahan
Vice Chair Siva Gunda
California Energy Commission
Docket Unit, MS-4
Docket No. 23-IEPR-01
715 P Street
Sacramento, CA 95814-5512

Subject: Comments on the 2023 IEPR Draft Scoping Order

Dear Commissioner Monahan and Vice Chair Gunda:

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide comments on the California Energy Commission's (CEC) 2023 Integrated Energy Policy Report (IEPR) Draft Scoping Order.

The draft Scoping Order identifies key risks to deploying clean energy resources by reference to the *Joint Agency Reliability Planning Assessment*.[1] The risks or barriers to new project development identified in the Scoping Order include supply chain disruptions, permitting delays, and interconnection delays. Additionally, overreliance on a single technology can result in an additional risk to maintaining reliability to the electricity system in the short-, medium-, and long-term. Prudent planning for electric system reliability necessitates not only the enhancement of existing portfolio options, but also to developing opportunities to diversifying the portfolio of energy resources that enable decarbonization and support resiliency. California's portfolio approach is a cornerstone to energy and decarbonization policy going back to 2002 and 2007 when the first Renewables Portfolio Standard and Alternative Fuels and Vehicle Technologies programs were created.

[1] *See* "Joint Agency Reliability Planning Assessment: SB 846 Quarterly Report and AB 205 Report," February 2023, CEC-200-2023-002, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=248714&DocumentContentId=83233.

The *Joint Agency Reliability Planning Assessment* indicates that "[c]limate change, which is resulting in greater weather variability and natural disasters, is creating real challenges for the expansion of clean energy resources in California, most of which are weather-variable themselves."[2] It is in the public interest to increase technology diversity and avoid prematurely excluding certain clean technologies in the energy supply risk assessment/ We note that many of the projects that have come online following the August 2020 electricity disruptions have integrated clean fuels. For example, on January 27, 2023, the CEC provided a report on the Demand Side Grid Support (DSGS) and the Distributed Electricity Backup Assets (DEBA) programs. During the September 2021 heatwave, the majority of the participants in DSGS were backup power generators (many of which were fueled by natural gas), as shown in Figure 1 below.

Figure 1: DSGS Impact: Estimates Based on Enrollment[3]

It is important that we create and build opportunities to explore the integration of cleaner technologies such as fuel cells and linear generators because they can help to reduce local electric demand and provide flexibility to the system that is greatly needed. SoCalGas offers the following recommendations to the Draft 2023 IEPR Scoping Order in the spirit of creating the most resilient, reliable and decarbonized grid:

1. The definition of distributed energy resources and microgrids should be expanded because the State needs a diverse portfolio of clean resources to meet the goals of reliability and resiliency and to address the urgent need to bring resources online.
2. Hydrogen production should be included in the IEPR Demand Forecast because with volume it could add significant electric load to the system that should be considered in planning efforts.

[2] *Id.*, p. 1.
[3] *See* Lead Commissioner Workshop Presentation, Demand Side Grid Support Program and Distributed Electricity Backup Assets Program, CEC, January 27, 2023, Docket Number 22-RENEW-01, TN#248608, at slide 17, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=248571&DocumentContentId=83043.

3. Examples of hydrogen as a decarbonization pathway for electricity and transportation as described by Senate Bill (SB) 1075 should be specifically addressed at planned workshops to enhance public understanding.
4. Include language into the Scoping Order directly from Public Resources Code 25303.5 to be consistent with statute.

1) The definition of distributed energy resources (DERs) and microgrids should be expanded because the State needs a diverse portfolio of clean resources to meet goals of reliability and resiliency, and to address the urgent to bring resources online

SoCalGas proposes the following edits to the Scoping Order language under the Accelerated Connection of Clean Energy section (suggested edits in red):

> "Examples of clean energy technologies that will require rapid deployment and integration include but are not limited to grid-scale renewable and clean hydrogen generation, short-term and seasonal storage, and community solar; zero-emission vehicle fueling infrastructure; microgrids and distributed energy resources ~~namely~~ like rooftop solar, customer-level storage, linear generators, fuel cells, and vehicle-grid integration (including battery electric vehicles and hydrogen fuel cell electric vehicles); and decarbonized buildings."[4]

a. A diverse technology portfolio will better support zero-emission vehicle infrastructure and strengthen energy system resilience

Clean technologies are foundational to the State's energy goals. As seen with solar and battery adoption, successful market transformation begins by creating policies that support emerging technologies. California has adopted ambitious decarbonization goals that will increase the need for reliable electricity. As noted in the *Joint Agency Reliability Planning Assessment,* supply chain disruptions, permitting and interconnection delays are risks of deploying solar and batteries, but these risks can also affect installation of battery electric vehicle charging stations. In his testimony to an Assembly Budget subcommittee on March 8, 2023, CEC staff indicated that California will likely fall short of reaching its goal of 250,000 charging stations by 2025.[5] While this statement was made in the context of justifying additional funds necessary for battery electric vehicle (BEV) charging, the agency has also acknowledged that permitting and interconnection challenges have resulted in delays that could hinder optimization of funds that might be added. Given the lessons

[4] *See* California Energy Commission (CEC), *Notice of Request for Comments on the Draft Scoping Order for the 2023 Integrated Energy Policy Report* (Draft Scoping Order), March 3, 2023, Docket No. 23-IEPR-01, at page 2, available at: https://efiling.energy.ca.gov/getdocument.aspx?tn=249037.

[5] *See* Hearing Testimony, Assembly Budget Committee, Subcommittee No. 3 on Climate Crisis, Resources, Energy, & Transportation, *Hearing on CDFA, CARB, and ZEVs*, California State Assembly, Testimony of Hannon Rasool, CEC Fuels & Transportation Division Director, March 8, 2023. For more information, *see* https://abgt.assembly.ca.gov/sites/abgt.assembly.ca.gov/files/March%208%20-%20Sub%203%20Agenda%20CDFA.CARB_.ZEVs_.pdf.

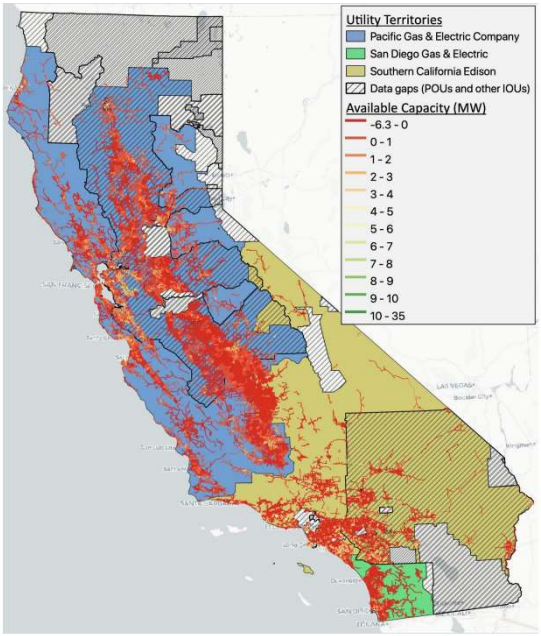
learned from these challenges, it is in the public interest for the 2023 IEPR process to explore all realistic options to reduce permitting and interconnection times. For example, expanding DER technologies to include linear generators for electricity support to charge the vehicles could reduce lengthy interconnection processes and relatively expensive distribution upgrades. Not only would these charging systems avoid distribution upgrades, but they could also have islanding capabilities and provide BEV charging during grid stress or outages. One example of a linear generator is produced in California by Mainspring Energy, which receives CEC funding. Mainspring Energy indicated they could scale manufacturing with 9-12 months' notice to significantly reduce supply chain risk issues the CEC has identified as impacting other technologies based outside the U.S.[6] Linear generator-supported electric vehicle charging infrastructure offers potential to lower overall site development costs. National Electric Vehicle Infrastructure program projects along Alternative Fuel Corridors that would otherwise require more substantial infrastructure upgrades would be well suited to this approach. Such sites could be scaled to support high-density charging plazas and may be readily powered by renewable natural gas (RNG).

The Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment Report identifies a need for alternatives to BEV charging due to interconnection challenges.[7] The CEC developed the electric vehicle supply equipment (EVSE) Deployment and Grid Evaluation (EDGE) Model, which geospatially analyses and tracks local grid capacity, air quality, travel demand, and equity considerations. As evident in Figure 2 below, there are large areas of the grid with little to no excess capacity, and these capacity-constrained areas tend to be located in heavily populated areas and transportation corridors.

[6] *See* Mainspring Energy's Comments on the October 28th CEC Lead Commissioner Workshop on Clean Energy Alternatives for Reliability, November 10, 2023, CEC-21-ESR-01, at page 4, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=247399&DocumentContentId=81787.

[7] *See* Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment: Analyzing Charging Needs to Support Zero-Emission Vehicles in 2030, July 2021, CEC-600-2021-001-CMR, available at: https://efiling.energy.ca.gov/getdocument.aspx?tn=238853.

Figure 2: EDGE Capacity Analysis and Data Gaps[8]



The red areas in this figure refer to areas where the grid cannot accommodate additional load without any thermal or voltage violations. There are also data gaps for areas served by publicly owned utilities (indicated by grey shading).

Technology diversity must be a policy cornerstone to address reliability for the existing system as well as new markets, such as the electric transportation sector. Technologies that are capable of filling in the gaps of time-intensive and costly system upgrades should be factored into the calculations. In addition, technologies with the flexibility to quickly dispatch incremental capacity to serve demand during extreme weather conditions should be added to the definition of Distributed Energy Resources.

b. Linear generators and fuel cells should be included as critical components for microgrids to enhance resiliency and reduce pollutant emissions

One of the principal functions of a microgrid is its resiliency, or ability to operate independent of the electric grid during unforeseen power outages caused by climate change, fires, earthquakes, imbalances, public safety power shutoffs, and other events. Reliable fuel sources can support this primary microgrid function. Given its ability to store and deliver gaseous fuels, the gas grid is necessary for providing long-term, long-duration resiliency, for both the greater electric grid and smaller microgrids. To further the public interest, the CEC should expand its consideration of microgrids beyond solar and battery only limitations and to beneficial and complementary technologies like fuel cells and linear generators, especially when running on RNG or clean hydrogen.

[8] *Id*., p. 53.

Even solar and battery only microgrids are typically supported by gaseous fuels. For example, the Energy Commission-funded microgrids at the City of Fremont fire stations continue to rely on diesel back-up generators if there is a need for reliable power beyond 72 hours.[9] Even if never used as backup, the diesel backup generators must still be run periodically for maintenance and operability.

Fuel cell- and linear generator-powered microgrids can be a viable clean energy alternative for critical facilities like data centers, grocery stores, first responder stations, and hospitals that need power to operate 24/7. These technologies can be fueled by the gas grid, which is underground and can provide reliable and resilient service during extreme weather conditions.[10] As noted by consulting firm ICF in submittals for the California Climate Change Assessment, the gas grid is better protected from natural (fires, flooding, soil erosion) and manmade (fires, terrorist attacks) disasters relative to the electric grid, and it therefore provides a reliable and continuous fuel supply to keep fuel cells and microgrids running at any given time the gas infrastructure is unimpacted by a potential disaster.[11] Subsequent studies by ICF found that gas infrastructure was considerably more resilient to climate impacts during climate disasters in 2017-2018.[12] Existing gas infrastructure can also deliver clean fuels like RNG and the potential for hydrogen through blending into the pipeline stream.

It is imperative to have an inclusive definition for microgrids that does not preemptively remove technology options that could be installed quickly relative to other resources while reducing the need for and use of diesel backup generators and associated emissions.

c. Hydrogen fuel cell electric vehicles should be included in the definition of vehicle-grid integration because such vehicles can be adapted to deliver power to the grid

Hydrogen fuel cell electric vehicles (HFCEV) have the potential to be adapted to deliver power back to the grid. These vehicles may even offer some advantages over BEVs when used in a vehicle-to-grid configuration. For instance, HFCEVs can have faster refueling times and large tank capacity. The CEC can facilitate exploration of this potential future resource by expanding the definition of vehicle-grid integration to include both battery electric vehicles and hydrogen fuel cell electric vehicles in the Scoping Order (as indicated in our suggested edits to the Draft Scoping Order language above). In addition, as the hydrogen fuel cell electric vehicle market is still early

[9] *See* "Solar Emergency Microgrids for Fremont Fire Stations: Demonstrating Energy Savings and Grid Resilience for Critical Facilities," September 2019, CEC-500-2019-054, at page 9, available at: https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-054.pdf.

[10] *See* Energy Sector Adaptation Webinar Presentation Potential Climate Impacts and Adaptation Options for Electricity and Natural Gas Systems in the San Diego, ICF, January 24, 2019, available at: http://www.climateassessment.ca.gov/events/docs/20190124-Slides_ICF.pdf.

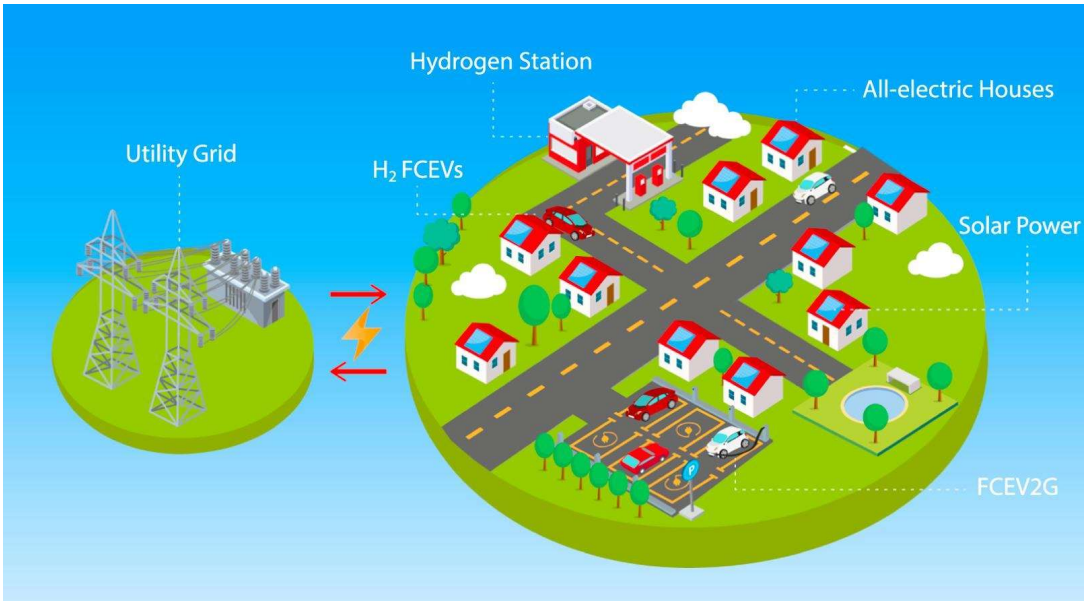
[11] *Ibid. See also* "Fourth Climate Change Assessment: Statewide Summary Report," CEC, CNRA, and Governor's Office of Planning & Research (Coordinating Agencies), p. 51, available at https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf.

[12] *See* "Case Studies of Natural Gas Sector Resilience," ICF, October 21, 2019, available at: https://www.socalgas.com/sites/default/files/regulatory/documents/r-18-04-019/SoCalGas-Case-Studies.pdf.

in its development, the recommendations of the CEC IEPR could help to positively influence the design HFCEVs to be readily available for vehicle-to-grid operation.

A 2018 study conducted by the Delft University of Technology in the Netherlands successfully demonstrated using a set of hydrogen fuel cell electric vehicles in a vehicle-to-grid configuration to return power to an all-electric residential home, which reduced the house's annual imported electricity from the grid.[13] The HFCEV test vehicles were Hyundai ix35s that had been modified using power output sockets so as to enable delivery of power back to the national grid when the vehicles were parked.[14,15] The microgrid consisted of five HFCEVs and ten all-electric homes with building-integrated solar photovoltaics (PV) (see Figure 1). The study collected data on the HFCEVs power production while in vehicle-to-grid mode and on the solar PV power production and household consumption. The study found the HFCEVs were able to offer fixed power output and load-following balancing services to the residential microgrid. When using the data collected to run a one-year simulation of the microgrid, the study found using a HFCEV in vehicle-to-grid mode could reduce the annual imported electricity from the grid by 71% over one year and aid the buildings in the microgrid in achieving a net zero energy building target.[16]

Figure 2: Simulated Case Study Microgrid[17]



[13] *See* Robledo et al., "Integrating a hydrogen fuel cell electric vehicle with vehicle-to-grid technology, photovoltaic power and a residential building," the Delft University of Technology, 2018, available at: https://www.sciencedirect.com/science/article/pii/S0306261918301636.
[14] *Id.* Hyundai ix35s are electric vehicles that use a proton exchange membrane fuel cell stack to convert hydrogen and oxygen into electrical power and water.
[15] *Id.* The vehicles were capable of delivering up to 10 kW direct current (DC) to the alternating current (AC) national grid.
[16] *See* Robledo et al., *supra*.
[17] *Id.*, Robledo et al.

2) Hydrogen production should be included in the IEPR Demand Forecast because with volume it could add significant electric load to the system that should be considered in planning efforts

SoCalGas supports the extension of the demand forecast period from 10 to 15 years, as many of the innovative technologies will need longer lead times for financing and deployment than incumbent technologies. The CEC's extension of the California Energy Demand (CED) forecast from 10 years to 15 years will allow better insight into the impacts of the State's decarbonization strategies on electric and gas demand. There could be significant changes to electricity and natural gas end use due to fuel substitution in the 2035 timeframe.

Furthermore, clean fuels like hydrogen and renewable natural gas are expected to play a significant role in hard-to-electrify sectors like transportation and industry. In its Scoping Plan, CARB anticipates the need for up to 9GW of hydrogen power generation needed for reliability. The volumes of these units are anticipated to grow, as the Scoping Plan itself, recognizes the need to conduct a NERC standard for Loss of Load Expectation (LOLE) analysis on the proposed portfolio prior to any formal adoption. This more rigorous analysis is anticipated to increase the need for firm dispatchable power and long duration storage, particularly as greater amounts of intermittent renewables are integrated into the power system and electricity demand is anticipated to more than double. These reliability needs can be further exacerbated by extreme weather events that are anticipated to increase in frequency due to climate change.

Given these factors, SoCalGas strongly encourages the CEC to add electricity demand for the production of hydrogen to the demand forecast. In addition, SoCalGas encourages the CEC to explore hydrogen supply for the electric generation, industrial, and transportation sectors.

3) Examples of hydrogen as a decarbonization pathway for electricity and transportation as described by SB 1075 should be specifically addressed at planned workshops to enhance public understanding

SoCalGas appreciates the CEC's decision to prioritize the analysis of the potential growth of hydrogen and its role in decarbonizing the electricity and transportation sectors, per Senate Bill (SB) 1075, as part of the 2023 IEPR Scope.

SoCalGas supports the inclusion of this topic and highlights some projects that can help grow renewable hydrogen adoption in the transportation and electricity sectors.

SoCalGas has proposed the Angeles Link, an energy infrastructure system that could deliver reliable clean renewable hydrogen to the Los Angeles basin for use in heavy-duty transportation, industrial processes, electric generation, and other hard-to-electrify sectors of the Southern California economy. If used in the transportation sector, Angeles Link could displace 3 million gallons of diesel fuel per day once fully operational and support the integration of renewable electricity resources. Angeles Link would serve hard-to-electrify end-uses like dispatchable electric generation, heavy-duty trucking, and industrial processes. Building the system to provide a clean alternative fuel could, over time and combined with other future clean energy initiatives, reduce natural gas demand while continuing to provide reliable and affordable energy to the region.

Similarly, hydrogen blending into the existing natural gas pipelines has the potential to establish decarbonization opportunities and a means to encourage renewable hydrogen production at scale. Blended hydrogen and natural gas streams can potentially be separated at point of use through the deblending process. Deblending can leverage existing natural gas infrastructure to enable transmission and distribution of hydrogen for a variety of end uses that require pure hydrogen. For instance, emerging electrochemical or physical technologies can achieve the selective extraction of hydrogen from a blended stream and may produce fuel cell grade hydrogen for refueling stations. The existing gas system is an in-place investment made by California ratepayers that should be leveraged to transport and deliver clean fuels as it does today for renewable natural gas and potentially in the future for hydrogen.

We recommend the CEC consider incorporating proposals like Angeles Link and deblending technologies into the agenda for a workshop regarding the potential for hydrogen to decarbonize the transportation and electric sectors.

4) Include language into the Scoping Order directly from Public Resources Code 25303.5 to be consistent with statute

Public Resources Code 25303.5 requires the Energy Commission to "identify strategies to maximize the benefits obtained from natural gas, including biomethane…" Benefits could include reduction of diesel consumption in transportation, integration of renewable electricity resources, and improved energy system resiliency, as we discuss in depth herein.

Thank you for your consideration of our comments.

Respectfully,

/s/ Kevin Barker

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