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SoCalGas Comments on the 2020-2023 Investment Plan Update for the Clean Transportation Program

Additional submitted attachment is included below.

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California Energy Commission
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1516 Ninth Street
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Subject: Comments on the 2020-2023 Investment Plan Update for the Clean Transportation Program, Docket #19-ALT-01

The Southern California Gas Company (SoCalGas) appreciates the opportunity to be a part of the newly appointed advisory committee and to comment on the 2020-2023 Investment Plan Update for the Clean Transportation Advisory meeting held on March 3, 2020 by the California Energy Commission (CEC). SoCalGas believes a portfolio approach, utilizing all energy sources and technologies to meet our climate goals, will best serve Californians and those that follow our lead. Renewable gases (such as renewable hydrogen and renewable natural gas such as biomethane) are clean, reliable, and resilient sources of transportation fuels that should be part of the California's transportation solutions. California should be thinking about how we can get more diversity into the energy portfolio. We should be investing into the diversity that already exists, and not eliminate available resources to meet our greenhouse gas (GHG) emissions reduction goals.
SoCalGas appreciates the California Energy Commission's efforts to engage stakeholders throughout 2020-2023 Investment Plan Update for the Clean Transportation Program. In response, SoCalGas offers information on the following:

1. Light-Duty Electric Vehicle Charging Infrastructure and eMobility

a. *How should we balance (or prioritize) project types?*

SoCalGas commends the CEC for their efforts to increase charging infrastructure for light-duty zero-emission vehicles. However, SoCalGas believes that the state of California would significantly benefit from a diverse technological approach in reaching its GHG emissions reduction and energy goals. The state should not decide what zero emission technologies will be used in the future by over investing in a single technology. Consumers have different needs and require a broad array of options. For example, while hydrogen powered vehicles may be more expensive today, hydrogen powered vehicles are forecast to be more affordable than battery vehicles by 2030[1]. Affordable hydrogen powered vehicles may be a more suitable option for those that do not have access to charging stations (e.g. renters), those that cannot afford electrical infrastructure upgrades to their homes (e.g. disadvantaged communities) or those that may be required to drive high mileage.

[1]"By 2030, the TCO of FCEVs is lower than that of BEVs for the majority of the market." Geoff Morrison, John Stevens, Fred Joseck (2018) "Relative economic competitiveness of light-duty battery electric and fuel cell electric vehicles" Transportation Research Part C doi: 10.1016/j.trc.2018.01.005

SoCalGas recommends the CEC to prioritize alternative charging technologies and infrastructure that utilize natural gas and renewable gases (such as hydrogen and renewable natural gas such as biomethane) to broaden electric vehicle (EV) charging infrastructure. The CEC should consider technologies such as Combined Heat and Power (CHP) and Fuel Cell systems fueled by renewable natural gas and renewable gases to provide a reliable source of electricity for EV charging. As California moves to reach its goal of 5 million zero-emission vehicles, the increase of electric vehicles charging will have a significant impact on the existing electrical grid. Electric utilities will need to spend a substantial amount of capital to upgrade their existing grid to address these increases and subsequently pass those cost to its consumers and the state. CHPs and fuel cells offer a more viable and cost-effective solution to address the added electricity load of California's growing charging infrastructure. CHP and fuel cell technologies commercially available today can provide high power ratings (in the range of several hundred kWs and MWs) and can supplement the existing electrical grid and renewable energy sources to create a balanced energy future for California

CHP and Fuel Cells fueled by renewable natural gas and hydrogen can also bring significant advantages by providing reliable and resilient sources of electricity for EV charging and surrounding facilities. These systems rely on the vast underground natural gas pipeline infrastructure throughout California and on-site storage, making it less susceptible to risks associated with unplanned detrimental events, such as unusual weather patterns, wildfires, and natural disasters. Relying on the existing natural gas infrastructure will significantly reduce infrastructure costs and installation costs and can provide California and consumers with more zero emission vehicle options such as hydrogen fuel cell vehicles.

2. Medium- and Heavy-Duty Zero Emission Vehicle Infrastructure

a. Is the proposed funding approach (decrease in FY 2020-21; increase in the FY 2 ½ FYs) the best approach for the MD-HD sector)?

SoCalGas recommends the CEC to consider a balanced funding approach across the FYs to provide earlier adoption of MD-HD zero emission vehicles and infrastructure in the proposed sectors. The funding approach should also clearly define the amount of funding split between electric and hydrogen MD-HD zero emission vehicles and infrastructure. SoCalGas also recommends the CEC to consider an equal funding approach towards electric and hydrogen MD-HD infrastructure and allow consumers and the public to decide the desired pathway. The CEC should not favor funding towards one fuel and should remain agnostic towards technologies. Furthermore, the CEC should support the deployment of near-zero emission technologies running on renewable fuels for truck and bus applications because it is cost effective and ready today.

b. Which of the following concepts should be prioritized? Are there others that should be considered?

The following concepts should be prioritized by the CEC.

1. Freight Demonstration Infrastructure
2. Transit Bus Infrastructure
3. Planning Blueprints
4. Innovative Charging/Refueling
5. Marine and Rail Infrastructure

SoCalGas strongly urges the CEC to consider a balanced approach with liquified natural gas (LNG), renewable natural gas (RNG), hydrogen, and battery electric technologies as part of these concepts for MD-HD zero emission vehicles and infrastructure. Funding for these technologies in the right sector can help California attain its emissions reduction goals.

Hydrogen technologies for MD-HD zero emission vehicle and infrastructure should be strongly considered. Hydrogen fuel cell technologies are zero emissions and are not limited by the same challenges as battery electric. They provide significant range without sacrificing payload capacity with battery weight. Hydrogen refueling is similar to diesel in the time at the pump as well as having the same public fueling business model. In contrast, plug-in technologies take multiple hours to charge and fundamentally changes the existing public fueling model of a truck purchasing fuel from a third-party provider in a matter of ten to fifteen minutes. Additionally, hydrogen fueling can utilize the existing or nearby natural gas pipeline infrastructure, further reducing costs to station owners. Hydrogen Fuel Cell Electric Trucks (HFCET) also have similar range as existing diesel trucks, which is a significant advantage over plug-in technologies which currently only achieve around 100 miles per full charge. HFCETs, like the ones from Toyota and Kenworth, are currently being demonstrated throughout Southern California and the ports. Hydrogen Fuel Cell Electric Buses (HFCEB) are commercially available through New Flyer and being utilized at transit agencies.

LNG, RNG, and Hydrogen should be considered when looking at Marine and Rail infrastructure, Innovative Charging and Refueling, and Planning Blueprints. Marine and rail infrastructure utilize significant amounts of fuel and energy to travel to its destinations. LNG for marine and rail has been extensively researched in the past and has proven to significantly reduce emissions when compared to diesel. LNG technology for marine and rail is commercially available and can be easily implemented when compared to battery electric options. Cruise lines and shipping companies have already started to implement LNG powered vessels as part of their fleet in response to global regulations to reduce GHG emission. Utilizing LNG in Marine and Rail can significantly reduce NOx and PM emissions when compared to diesel and using RNG will help further reduce GHG emissions in these sectors. However, LNG and RNG infrastructure in the Marine and Rail sectors is non-existent.

The state is looking to fundamentally change how medium- and heavy-duty trucks are being charged/fueled. Currently, trucks are receiving fuel from a gas station or truck stop with a relatively small footprint, which can serve a truck in under 15 minutes and can serve hundreds of trucks per day. Plug-in charging would require significantly more land, time to charge, more infrastructure upgrades than an existing “station”. No state agencies or private companies openly have examined what concepts would create a feasible “public” charging station/lot with a sustainable business model. A thorough study should be conducted to identify and evaluate Innovative Charging and Refueling concepts for both electric and hydrogen charging/fueling. While hydrogen would have a similar fueling model as diesel there are still unknowns that need to be assessed such as footprint, fuel time, and capital costs. Detailed business models for public electric and hydrogen charging/fueling should be developed as part of this effort.

Planning blueprints and innovative charging and refueling concepts should consider LNG, RNG and hydrogen infrastructure. Hydrogen can be produced using natural gas and renewable hydrogen can be produced using RNG or biogas. Hydrogen technologies can be used to support applications such as Hydrogen Fuel Cell Trucks for port and drayage operations. LNG and RNG infrastructure for Marine and Rail can be utilized to power stationary Solid Oxide Fuel Cells for stationary power or shore power for Ocean Going Vessels while at-berth. These sectors can rely on

the vast underground natural gas pipeline infrastructure throughout California and on-site storage, making it less susceptible to risks associated with unplanned detrimental events, such as unusual weather patterns, wildfires, and natural disasters. Relying on the existing natural gas infrastructure will significantly reduce infrastructure costs and installation costs when compared to electrification.

To date, the Clean Transportation Program has funded over $300M toward battery electric vehicles and infrastructure, yet Medium- and Heavy-Duty vehicles still account for 70% of state's on-road NOx emissions and 45% of on-road PM emissions. Battery Electric Trucks (BET) and Buses (BEB) have been widely demonstrated in recent years and aside from transit buses, these technologies remain relatively unavailable for commercial purchase. This is apparent when looking at incentive programs like Prop 1B, Carl Moyer, and Community Air Protection Program (CPP) that provided funding for fleets to purchase zero emission (BETs) or near-zero emission (CNG) trucks. From the programs, 89 zero emission BETs were awarded for a total funding of $17,700,000. As of January 31, 2020, SCAQMD has reported that none of the BETs awarded have been delivered, while 301 near-zero CNG trucks were delivered in the same time period. Not only are battery electric vehicles unavailable, the state of technology of BETs and BEBs have limitations that need to be further addressed, including, but not limited to, costs (vehicle, infrastructure, maintenance), range, and weight that can severely impact freight and transit agencies.

c. How should we account for the impact of current and anticipated MD/HD CARB regulations (e.g. Innovative Clean Transit; Advanced Clean Transit)?

A "Blueprint" to zero emission infrastructure will be useful for those transitioning, especially early actors. Hydrogen blueprint should also be produced, particularly for transit. Many transit agencies were surprised that Los Angeles Metro and Foothill Transit costs to electrify their fleet were so much higher than predicted in the California Air Resources Board (CARB) Innovative Clean Transit (ICT) Regulation. CARB used very optimistic estimates in the ICT rulemaking and the real-world costs are much higher. A hydrogen blueprint for transit transition would provide options for transit agencies in meeting the requirements of the regulation. Additionally, transit agencies currently running on natural gas could leverage some of their existing footprint, electrical infrastructure and fuel contracts to ease the transition.

3. Hydrogen Refueling Infrastructure

a. AB 8 (2013) requires $20 million annually until there are at least 100 publicly available hydrogen stations. Once 100 retail hydrogen stations are open, should funding continue?

SoCalGas recommends a commitment to continue funding hydrogen stations after 100 retail hydrogen stations are open. This will promote the growth of hydrogen fuel cell vehicles and will send a market signal that the state sees a future for zero emission hydrogen vehicles. Hydrogen fuel cell vehicles offer longer range and quicker refueling for consumers, while also offering zero tailpipe emissions and helping the state attain its climate change policies. California's goal is to reach 200 hydrogen stations by 2025 as set forth by legislation and executive orders. Building out a network of hydrogen stations will also help promote the purchase and lease of hydrogen fuel cell vehicles to help California reach its goal of 1.5 million ZEVs by 2025 and onwards to 5 million ZEVs by 2030

It is strongly recommended for the CEC to revisit funding allocations for hydrogen refueling infrastructure. Funding for hydrogen refueling infrastructure is more cost effective when compared to electric charging infrastructure. The CEC has allocated $65 million of funding during FY 2020-2023 for hydrogen refueling stations. This funding will allow the CEC to construct 79 more hydrogen stations bringing the total to 123 stations out of 200, or 61.5%. Funding for EV charging through SB 350 and settlement agreements amount to over $1 billion for the construction of light-, medium-, and heavy-duty vehicle EV charging. This funding allows for 170,000 total EV stations out of the 250,000 EV stations needed, or 68%. The required funding level for hydrogen stations is 6.5% of EV charging and allows California to reach 61.5% of its hydrogen station goals.

Hydrogen stations will also free up much needed real estate throughout the state. Available land in California is a growing problem with real estate becoming scarce and expensive. Building out an extensive network of electric vehicle charging infrastructure will only add to the high cost of real estate. One hydrogen station can service hundreds of zero emission hydrogen fuel cell vehicles in a smaller footprint than installing hundreds of EV chargers in a parking lot. Currently, the funded capacity of the hydrogen stations can support 35,000 FCEVs and the average new station capacity can support upwards to 1400 FCEVs. Building out 200 hydrogen refueling stations would support over 250,000 FCEVs on the road and refueling a FCEVs can take anywhere from 5-10 minutes. Comparing the two technologies, FCEV and EV, one hydrogen station can fully refuel 6-10 vehicles in one hour while it would require 6-10 chargers and 4-6 hours for EV charging to do the equivalent job. Building out Level 3 DC fast charging to recharge EV's in 20-40 minutes would require extensive capital and infrastructure improvements and result in 5-10 times the cost of level 1 and 2.

b. How much should the program focus on light vs. heavy-duty hydrogen infrastructure, especially given new regulations on transit fleets?

The program should prioritize the attainment of California's GHG emission reduction goals and reaching the CEC's goal of 200 hydrogen refueling stations sooner. The program should encourage both light and heavy-duty vehicle manufacturers to adopt a standardized approach for both light and heavy-duty hydrogen infrastructure and allow the industry to choose between light and heavy-duty hydrogen infrastructure. Even though the light and heavy-duty sectors have unique challenges, the technology and infrastructure have a lot of synergies. Light and heavy-duty fuel cell vehicles utilize the same components and fuel. Several light-duty hydrogen fuel cell vehicles are commercially available, and development of hydrogen fuel cell trucks has significantly advanced in the last few years. Toyota has deployed their Mirai Fuel Cell in a Class 8 heavy duty truck that operates on 700 bar hydrogen and operates in the South Coast Basin. Several key manufacturers such as Cummins, Kenworth, Hyundai, and Nikola have announced plans for hydrogen fuel cell trucks soon. Quicker adoption of light-duty hydrogen fuel cell vehicles can help reduce the cost of HFCV components while quicker adoption of heavy-duty hydrogen fuel cell trucks can help bring down the cost of hydrogen fuel. Both sectors can benefit from each other and an increased network of hydrogen infrastructure can help reduce and streamline the hydrogen supply chain. Allow for adoption of zero emission hydrogen fuel cell vehicles sooner.

4. Zero- and Near Zero-Carbon Fuel Production and Supply

a. We intend to fund zero and near zero carbon fuel production (includes net negative fuels). These fuels may be used in ZEVs or combustion vehicles. How should we balance GHG emission reductions and technology flexibility?

SoCalGas commends the CEC for recognizing different pathways for renewable fuels productions. SoCalGas is supportive of the CEC to develop biomethane and renewable hydrogen production facilities in California. Renewable hydrogen from biogas is a key pathway for the state to reduce its carbon emission. California's goal is to achieve GHG Emissions reductions, but in order to reach these goals the CEC should promote technology flexibility. One method is to support zero-carbon or negative carbon fuel or renewable hydrogen. These opportunities provide immediate GHG reduction without expensive costs to the state or developers. The use of renewable natural gas (RNG) can reduce carbon intensity in fuels, today. Depending on sources of RNG, carbon intensity can provide consumers with zero- or negative carbon fuels. Technology flexibility will provide consumers with the choice to select the best option to fit their needs and to create significant GHG emission reduction impacts sooner.

b. We have traditionally funded grants to biofuel production facilities, but we are now considering expanding to address system barriers, like the lack of blending equipment for biodiesel. Is this the right direction?

Interconnection of RNG to the NG pipeline is a significant hurdle for production facilities. SoCalGas urges the CEC to consider funding grants towards RNG production facilities to interconnect with the NG pipeline. RNG interconnection projects have significant cost barriers where funding could be used to promote the delivery of zero- and negative-carbon RNG through the NG pipeline to be delivered to customers. This would provide immediate and cost-effective solutions for California to attain its GHG emission reduction goals and promote the use of zero- and negative-carbon fuels such as RNG to customer. Delivery of RNG through the vast network of NG pipeline infrastructure will also remove barriers of the production of renewable hydrogen through biogas, further helping California attain its GHG emission reduction goals sooner.

5. Manufacturing and Workforce Development

a. What considerations and priorities should guide the program's investment into the ZEV manufacturing supply chain?

b. What approaches or priorities should we apply toward future investments in workforce development?

c. We are choosing to fund manufacturing and workforce development in alternating years; is this the right approach?

SoCalGas commends and supports the CEC to continue program investments towards Manufacturing and Workforce Development. Funding and investments should allow technology flexibility and remain technology agnostic. This program should target GHG emission reductions while remaining flexible to industry needs. As California and the CEC aim to reach its goal of 1.5 million ZEVs by 2025 and 5 million ZEVs by 2030, there will be a need for education and workforce development in both hydrogen fuel cell vehicles, battery electric vehicles, and the supporting

infrastructure. Critical workforce development and manufacturing is necessary for California to sustain its GHG emission reduction well beyond after it has reached its targets and goals.

Sincerely,

Tim Carmichael

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