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July 9, 2021

The Honorable Liane M. Randolph
California Air Resource Board
1001 I Street
Sacramento, California 95814

Subject: Comments on the Public Workshop Series to Commence Development of the 2022 Scoping Plan Update

Dear Chair Randolph,

Southern California Gas Company (SoCalGas) appreciates the opportunity to comment on the California Air Resources Board (ARB) Public Workshop Series to Commence Development of the 2022 Scoping Plan Update. Additionally, we thank the ARB Staff for the thoughtfulness in initiating the development of the 2022 Scoping Plan Update to assess progress towards achieving the Senate Bill (SB) 32 2030 target and lay out a path to achieve carbon neutrality by mid-century. On July 9, 2021, Governor Gavin Newsom sent letters to the CPUC and ARB requesting a plan for Integrated Resource Plans to meet a lower 2030 GHG target than 46 million metric tons and a scenario in the scoping plan that meets a 2035 carbon neutrality goal, respectively, and we intend to assess and comment on these directives at a future time. [1,2] Our comments in this letter center on the value of: clean fuels and technologies, near-term GHG emission reductions, energy system reliability, and transparent, robust modeling to ensure that the State achieves its net-zero carbon goal.

The timing of the 2022 Scoping Plan Update development is optimal -- as unprecedented heatwaves have ravaged the pacific northwestern United States and Canada. These heat waves clearly indicate the exigent need for California to ensure that our energy system is clean, safe, reliable, and resilient. SoCalGas supports the statewide target of carbon neutrality by 2045 and has

[1] Governor Newsom's letter to CPUC President Batjer dated July 9, 2021. Letter can be found at the following link: https://www.gov.ca.gov/wp-content/uploads/2021/07/CPUC-Letter_07.09.2021.pdf
[2] Governor Newsom's letter to CARB Chair Randolph dated July 9, 2021. Letter can be found at the following link: https://www.gov.ca.gov/wp-content/uploads/2021/07/CARB-Letter_07.09.2021.pdf

announced its ASPIRE 2045[3] sustainability strategy which aligns with the state's climate policy. SoCalGas is targeting net-zero GHG emissions in our operations and delivery of energy by 2045 by reducing Scopes 1, 2, and 3 emissions. This ambitious goal actively advances the State's policy objectives and clearly demonstrates our dedication to California's environmental goals. Practically speaking, ARB policies and regulations are the foundation for reducing our customers' emissions (i.e., scope 3), and which SoCalGas must facilitate and actuate to achieve our shared net-zero goal.

Deep decarbonization requires clean fuels, a supporting clean fuels network and the advancement of carbon management tools

Existing literature and initial results from SoCalGas' ongoing studies analyzing various decarbonization pathways available to California have shown that a broad suite of technologies and carbon mitigation measures will be needed to achieve full decarbonization. Furthermore, research demonstrates that clean fuels, like hydrogen or renewable natural gas (RNG), and carbon management technologies, like carbon capture and utilization/storage and direct air capture, will be vital in achieving decarbonization across all sectors of the California economy. Clean fuels, and a supporting clean fuel network along with carbon capture technologies can play key roles in:

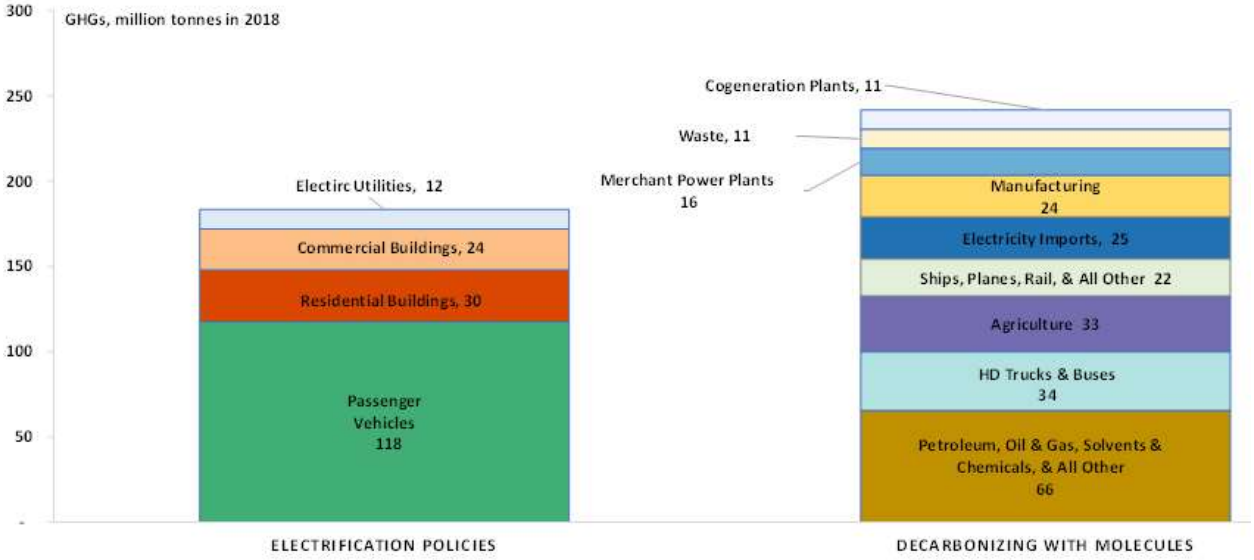
1) Providing a decarbonization solution for hard to abate sectors such as industry and transportation (e.g., heavy-duty long-haul trucking, airplanes, etc.),
2) Enabling dispatchable, firm generation capacity that serves electric system reliability, providing the flexibility needed to further decarbonize the electric sector, and
3) Supporting resiliency and affordability of the energy system.

For illustrative purposes, SoCalGas took the ARB's 2018 greenhouse gas (GHG) inventory and created a stack bar graphic to illuminate the magnitude of the need for clean molecules. Hard to electrify, hard to decarbonize or abate are a significant portion of current GHG emissions. The figure below broadly stacks GHG emissions from different sectors into two main buckets; those that the State has identified as desiring electrification policies, and those that are more conducive to clean molecule solutions[4]. Additionally, the figure indicates that over half of all GHG emissions could be addressed and abated by policies that support clean molecules development. It would thus be in the public interest for the 2022 Scoping Plan Update to recognize the need for clean molecules and begin developing feasible strategies that include the use of clean molecule solutions.

[3] 2021-03, SoCalGas, "Aspire 2045 Sustainability and Climate Commitment to Net Zero", https://www.socalgas.com/sites/default/files/2021-03/SoCalGas_Climate_Commitment.pdf

[4] Note the total adds up to 426 million metric tons due to rounding. Also, worth noting is that these categories do not necessarily fall completely within one strategy bucket or another, for example fuel cell electric vehicles could play a role in passenger vehicles and some buses and last mile trucks likely will electrify.

Figure 1: GHG Emissions by Sector Grouped by Decarbonization Strategy



At present, clean molecules are achieving greater GHG emission reductions than electrification contributing to an indispensable suite of technologies for both near term and long term decarbonization solutions; particularly so y in a scenario with an expedited carbon neutrality goal of 2035. In 2020, the heavy-duty natural gas fleet were fueled with an average of (-) 5.845 gCO2e/MJ as compared to plug-in battery electric trucks fueled by grid electricity at a carbon intensity of 82.92 gCO2e/MJ.[5,6] The co-benefit of NOx emission reductions is also significant as the Natural Gas-fueled trucks 0.02 NOx g/bhp-h is a reduction of 90 percent below that required for diesel trucks while also performing a very similar duty cycle. Pursuing technologies with similar duty cycles to diesel trucks will prove to be the most efficient strategy to getting diesel trucks off the road. A 2020 University of Southern California study found that, because of several factors limiting performance of plug-in electric trucks, a fleet of 19 diesel drayage tucks would have to be replaced by 36 zero-emission drayage trucks – a one-to-1.7 replacement ratio.[7] It is therefore not a surprise that corporations are making investments in natural gas trucks to meet their sustainability goals and operational needs.[8] An additional pathway SoCalGas is pursuing to

[5] According to ARB data released in May 2021 and analyzed by NGVAmerica. The article "California's renewable natural gas vehicles turn carbon negative in 2020" available at: https://www.reuters.com/business/autos-transportation/californias-renewable-natural-gas-vehicles-turn-carbon-negative-2020-2021-06-02/.

[6] The electric grid carbon intensity comes from ARB's calculation in the Low Carbon Fuel Standard: Annual Updates to Lookup Table Pathways, 2020 January 16. Available at https://ww2.arb.ca.gov/sites/default/files/classic//fuels/lcfs/fuelpathways/comments/tier2/elec_update.pdf.

[7] Developing Markets for ZEVs in Short Haul Goods Movement, USC METRANS, 2021. Available at https://ncst.ucdavis.edu/research-product/developing-markets-zero-emission-vehicles-short-haul-goods-movement.

[8] Amazon purchased 700 natural gas trucks in 2021 and United Parcel Service (UPS) purchased 6,000 natural gas trucks. See the announcements here: https://www.reuters.com/article/us-amazon-engines-natural-gas-exclusive/exclusive-amazon-orders-hundreds-of-trucks-that-run-on-natural-gas-idUSKBN2A52ML and https://www.reuters.com/article/us-amazon-engines-natural-gas-exclusive/exclusive-amazon-orders-hundreds-of-trucks-that-run-on-natural-gas-idUSKBN2A52ML. UPS also committed $450 million to natural gas trucks and

decarbonize the gas system is through hydrogen blending. SoCalGas and SDG&E proposed a Hydrogen Blending Demonstration Program to the California Public Utilities Commission and are also exploring other pathways to demonstrate blending hydrogen at lower levels in isolated sections of the gas grid, similar to international demonstrations of blending hydrogen at less than 20 percent.[9] The blending of hydrogen into the existing gas systems will further contribute to decarbonization in California.

In sum, SoCalGas is currently helping the State accelerate GHG reductions by investing in a diverse portfolio of technologies and applications. Some of these technologies can leverage Southern California's existing fuels network to transport clean fuels while others may require new investment in a next generation complementary clean fuels network. SoCalGas is broadly considering options for the future, including solutions like hydrogen, biogas, biofuels, synthetic natural gas and other clean fuels, as well as transporting and storing carbon. It's important to note that in addition to providing clean fuels, several bioenergy pathways have important complementary benefits addressing fugitive methane emissions and supporting tree and forest management. The State must support and incentivize development of nascent technologies and promote decarbonization pathways that facilitate emissions reductions in hard to abate sectors to make the net-zero goal a viable target. Continued investment and innovation across these decarbonization technologies is essential for developing the tools needed to make a net zero future feasible and affordable.

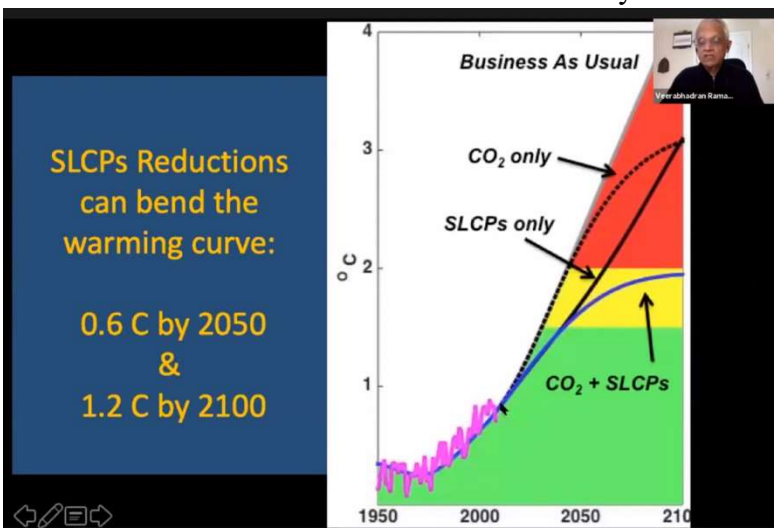
Near-Term Reduction of Short-Lived Climate Pollutants (SLCP) is Critical

On July 9, 2021, Governor Newsom held a virtual discussion with the internationally renowned leading climate scientists, including Dr. Ram Ramanathan from the University of California, San Diego Scripps Institute of Oceanography. Dr. Ram Ramanathan has cogently argued that addressing SLCPs must be an active GHG emission reduction strategy to have a chance at meeting global temperature targets. In a recent presentation during a California Energy Commission (CEC) workshop, Julia Levin of the Bioenergy Association of California shared a graphic from a presentation by Dr. Ramanathan to illustrate the importance of reducing SLCP emissions as depicted in Figure 2.

fueling infrastructure. See announcement here: https://www.bizjournals.com/memphis/news/2019/10/14/ups-makes-3-year-450m-commitment-to-expand-natural.html

[9] *See* CPUC A.20-11-004, Joint Application of SoCalGas, SDG&E, PG&E, and Southwest Gas Regarding Hydrogen-Related Additions or Revisions to the Standard Renewable Gas Interconnection Tariff (Nov. 20, 2020). Available at: https://www.socalgas.com/sites/default/files/2020-11/Utilities_Joint_Application_Prelim_H2_Injection_Standard_11-20-20.pdf, see also the GHRYD project in France blended up to 20% hydrogen into the gas network serving a new residential community around 200 homes without any modifications to the gas system or customer appliances. Blending demonstration projects in other countries produced similar results. Engie, "The GRHYD demonstration project." Available at https://www.engie.com/en/businesses/gas/hydrogen/power-to-gas/the-grhyd-demonstration-project.

Figure 2: Short-Lived Climate Pollutants Will Be Key to Our Success



The figure indicates that we will fall short of our goal of limiting global warming by 1.5 degrees centigrade as recommended by the International Panel on Climate Change to avoid the most severe and irreversible impacts of climate change.[10] According to Dr. Ramanathan, mitigation measures that are low hanging fruit are reductions of diesel soot, reductions of food waste and repurposing of farm manure and crop waste, reduction of methane leaks from fracking and gas infrastructure, forest management and phasing out of hydrofluorocarbons.[11] Acting now to dramatically mitigate SLCPs would markedly reduce their heating effect providing a tool to bend the warming curve within the next 10 to 15 years. To be successful in addressing the existential climate threat head on, California must utilize the technologies we have now to bring down SLCPs quickly such as CARB's SLCP Reduction Strategy which identifies biomethane capture and utilization for transportation.

Electric sector modeling must consider reliability

SB100 sets aggressive electric sector decarbonization goals. As the electric grid takes on unprecedent levels of renewable energy, the results of the SB 100 Joint Agency Report show that natural gas generation will continue to play an important reliability role in the future.[12] Gas generation units are a proven and economic option to meet the State's reliability needs. The minimal amount of gas generation output that SB 100 permits will offer critical reliability and flexibility benefits that will in turn support the widespread electrification of many parts of the California economy. Thermal generation can transition to low- or zero-carbon emission resource when fueled by clean molecules or combined with carbon capture and utilization/storage, thus maintaining the operational flexibility that is indispensable to support an increasingly renewable

[10] International Panel on Climate Change, https://www.ipcc.ch/sr15/.
[11] Op-Ed: To help stop global warming, curb short-lived pollutants, Los Angeles Times, December 28, 2015, Veerabhadran Ramanathan and Daniel Press. Available at https://www.latimes.com/opinion/op-ed/la-oe-1225-ramanathan-press-slcps-climate-change-20151225-story.html.
[12] 2021-03, "2021 SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity In California: An Initial Assessment", https://www.energy.ca.gov/sb100#anchor_report

and intermittent electric grid. Recent reports for ARB's consideration include *Getting to Neutral: Options for Negative Carbon Emissions in California*,[13] *An Action Plan for Carbon Capture and Storage in California: Opportunities, Challenges, and Solutions*,[14] and *Getting to Net Zero – and Even Net Negative – is Surprisingly Feasible, and Affordable*.[15] Thermal generation and the fuels network, including natural gas storage, are essential to providing multi-day and seasonal flexibility maintaining resiliency and affordability of the interdependent energy systems.

The reliability services and capabilities provided by the gas grid are increasingly being called upon to complement renewable resource deployment, as stated in an Integrated Energy Policy Report Commissioner Workshop on Natural Gas Infrastructure, held by the CEC on June 3, 2021. Electricity production supported by the gas grid seamlessly fills the gaps when other electricity resources wax and wane. For example, natural gas-fired generation increased from 2012 to 2014 due to lower hydropower production because of the significant drought. The gas grid also supported the overnight loss of the San Onofre Nuclear Generation Stations when a steam generator leaked and both units were forced offline, never to return. No new resources were needed to be built to ensure the lights stayed on. This level of reliability and resiliency could be worth billions of dollars to the California economy if blackouts were to become common place. The CEC's "Energy Insights" report from July 2020 indicated that the overall electricity demand during March 23, 2020 through June 21, 2020 of the COVID-19 stay at home order was down 3 percent. And yet, Pacific Gas and Electric's natural gas fired generation was up 53 percent.[16]

SoCalGas encourages the ARB to develop more robust electric portfolios for the 2022 Scoping Plan so that stakeholders can better understand the cross-sector relationships and costs of decarbonization. The ARB should take steps to ensure their modeling efforts here align with other agencies and organizations, like the CPUC, with regard to reliability and performance standards.[17] In addition, resource portfolios will be more robust if they are tested for reliability with production cost and power flow modeling. Doing so helps ensure that viable resource portfolios and pathways that meet reliability standards are pursued.

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[13] Sarah E. Baker et al., *Getting to Neutral: Options for Negative Carbon Emissions in California*, Lawrence Livermore National Laboratory, January 2020. Available at https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf.

[14] Energy Futures Initiative and Stanford University, *An Action Plan for Carbon Capture and Storage in California: Opportunities, Challenges, and Solutions*, 25 October 2020. Available at https://sccs.stanford.edu/sites/g/files/sbiybj7741/f/efi-stanford-ca-ccs-full-rev1.vf-10.25.20.pdf. And, CCS in CA: Summary for Policymakers Download | Stanford Center for Carbon Storage.

[15] James H. Williams et al., *Carbon-Neutral Pathways for the United States,* Energy Systems Management, University of San Francisco, Sustainable Development Solutions Network, New York, Evolved Energy Research, San Francisco, Lawrence Berkeley National Laboratory, Berkeley, Energy and Resources Group, University of California, Berkeley, Berkeley, January 2021. Available at https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020AV000284.

[16] *See* California Energy Commission's Energy Insights, July 2020. Available at *https://www.energy.ca.gov/sites/default/files/2020-07/Energy%20Insights_FINAL%2007-17-2020.pdf*.

[17] For example, increasing the planning reserve margin to align with assumptions in other proceedings.

A transparent and collaborative ARB modeling process will benefit the public

At the workshop, ARB staff indicated that emissions modeling must be completed at least five months prior to publication of drafts to allow sufficient time for air quality, health, economic, and other analyses. Ensuring that stakeholders have ample opportunity and sufficient access to modeling inputs and results will improve both the modeling and the policy outcomes thereby informed. Many stakeholders have expertise to provide helpful vetting and additional context based on their own modeling experiences. The ARB should leverage that expertise.

In closing, ARB's vision for the 2022 Scoping Plan Update supports and will advance public welfare. We would like to stress the importance of diverse resource portfolios and prioritizing system reliability and flexibility. We also restate the critical nature of reducing SLCP emissions in combating climate change impacts. We look forward to providing feedback on the development of successful policies informed by robust, fully vetted modeling and grounded in comprehensive analysis of the programs and/or solutions required to achieve the State's long-term climate goals.

Respectfully,

/s/ Kevin Barker

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