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Ms. Rajinder Sahota
California Air Resources Board
1001 "I" Street
Sacramento, CA 95812

Re: SoCalGas Comments on the 2017 Climate Change Scoping Plan Update

Dear Ms. Sahota,

The Southern California Gas Company (SoCalGas) appreciates this opportunity to comment on the California Air Resources Board's (ARB) 2017 Climate Change Scoping Plan Update (Scoping Plan). SoCalGas strongly supports ARB's efforts to meet California's long-term climate change goals while also sustaining the vitality of the state's economy. SoCalGas wants to emphasize the role that natural gas can continue to play in policies that deliver on this vision. As we enter the second chapter of California's efforts to fight climate change, we continue to offer our support, expertise and partnership to ARB to create a technology neutral Scoping Plan that allows the best ideas to be deployed.

SoCalGas respectfully submits the following comments on the Scoping Plan:

I. SoCalGas supports the continuation of the existing Cap-and-Trade Program beyond 2020.

The Cap-and-Trade Program should continue to be one of the primary strategies in the State's efforts to achieve cost-effective greenhouse gas (GHG) reductions. After four years of recorded auctions and successful compliance, Cap-and-Trade has proven to be a flexible, low-cost and reliable mechanism for reducing GHG emissions. In addition, the Cap-and-Trade Program is unique in its ability to protect ratepayers from higher energy prices, serve as an emissions backstop when other reduction strategies are underperforming and facilitate international action on climate change through jurisdictional linkages.

The Program has also established the Greenhouse Gas Reduction Fund (GGRF), providing vital resources to fulfill the goals of AB 32 and delivering key co-benefits. We applaud the continuation of investments that have so far been an economic, environmental and a public health boon to Californians, particularly those investments that benefit disadvantaged

communities. The State has invested heavily in GGRF programs, incentivizing emission reductions and driving long-term market transformation in many sectors of the economy.

Using the Cap-and-Trade Program to reduce emissions provides a level playing field and allows all fuels and technologies to compete. This encourages innovation and competition, while reducing the costs of attaining air quality and GHG goals. The Cap-and-Trade Program also helps reduce greenhouse gas emissions while considering impacts to affordability of energy service. As noted in the Scoping Plan and above, the Cap-and-Trade Program is designed to protect utility ratepayers from higher energy prices. Ratepayers should continue to benefit from free allowances at the current cap adjustment factor that together with the continuation of a gradual consignment schedule will avoid any significant rate shocks.

In addition, GHG offset credits provide a critical cost containment function. Offsets have historically been a cost competitive source of emission allowances and a means to finance GHG reduction projects in sectors outside of the Program. California plays a leading role in developing frameworks and markets that achieve climate goals shared by jurisdictions globally. Now more than ever, it is critical for local and state entities to show leadership on this issue. Therefore, ARB should strengthen rather than diminish the early-stage offset market by expanding the role of offsets in California's Cap-and-Trade program. SoCalGas supports actions that contribute to a robust offset market including increasing usage limits, improving and expanding offset protocols, and other actions that instill confidence in the offset market. Overall, Cap-and-Trade offers the needed flexibility and reliability to meet the ambitious goals of AB 32 and address climate change in a bold and pragmatic way.

II. The Low-Carbon Fuel Standard is critical to continue the transition to cleaner fuels.

SoCalGas also enthusiastically supports the extension of the Low Carbon Fuel Standard (LCFS) program to 18% reduction beyond 2020. The extension will help meet California's environmental and economic goals: it has been instrumental in creating price parity between alternative fuels and fossil fuels, thereby spurring the development of low carbon fuels in California—such as renewable gas—that will yield substantial future GHG reduction benefits. It sends clear market signals to producers that their investments in research and development will yield returns in the long-run. It has increased demand for alternative fuels, such as renewable gas, leading to new technologies to produce, deliver, and use the fuel. The LCFS program helps contribute to fuel diversification in ways that the Cap-and-Trade program cannot achieve on its own. It sends a long-term policy signal that complements the short-term price signal of Cap-and-Trade, which helps reduce volatility in the transportation fuels market, and sends strong signals to investors.

The LCFS program identifies renewable gas from existing organic sources like dairy waste, landfills, and waste water treatment as the lowest carbon intensity fuels available. A review of the LCFS reporting tool shows that renewable gas as a percentage of total natural gas used in the transportation sector has increased dramatically in the past year. For example, in 2015,

encouraged by the increasing availability and decreasing price of alternative fuels, Big Blue Bus, the transit agency of the City of Santa Monica, switched its bus fleet to 100% RNG, reducing its fleet's carbon footprint by an estimated 8,000 tons per year. Innovations like this will help California achieve the climate goals set forth in SB 32.

III. Renewable Gas provides multiple opportunities to reach climate goals.

The Scoping Plan specifically highlights using "methane as a renewable source of natural gas to fuel vehicles and generate electricity[1]" and as an important measure to reduce GHG emissions and air pollution. SoCalGas supports the inclusion of renewable gas in the Scoping Plan, and we plan to coordinate with ARB, other state agencies and industry stakeholders to help ensure successful implementation of the final Short-Lived Climate Pollutant (SLCP) strategy, as called for in the SB 1383 timeline[2]. We offer the following recommendations on renewable gas to help further the goals of the Scoping Plan.

A. The Proposed Scenario should include a Renewable Gas procurement requirement.

Utilities can play a key role in the development of renewable gas resources by investing in infrastructure needed to produce renewable gas and connect the projects to the gas pipeline system, and deliver renewable energy to end users. Under California's Renewable Portfolio Standard (RPS), electric utilities have invested in renewable generation, and upgraded transmission and distribution infrastructure to support increasing levels of electricity delivery from wind and solar. These investments by the utilities have allowed California to stay ahead of schedule for meeting the RPS requirements[3]. Similarly, a gas procurement requirement, such as a Renewable Gas Portfolio Standard (RGS) and the ability to invest in and recover costs associated with renewable gas production, conditioning and delivery would drive investment in renewable gas production, processing and pipeline interconnection. In the Scoping Plan, only Alternative 1 includes an RGS (specified as a 5% increased utilization of renewable gas by 2030). SoCalGas recommends that ARB include an RGS in the Proposed Scenario, which would accelerate the goals of SB 1383 to encourage development of RG infrastructure. In fact, this is anticipated in the legislative language, directing the agencies to develop procurement policies, among other directives.

B. Power-to-Gas

The Scoping Plan notes the need for large-scale electricity storage to meet the increasing use of renewable energy[4]. Power-to-Gas (P2G) technology can specifically help meet the State's renewable energy and GHG reduction goals in several ways, such as helping to manage overgeneration, providing flexible energy storage, producing zero and near-zero GHG transportation fuels, and decarbonizing electricity production, gas systems, and industrial processes. We elaborate on P2G technology in our previously submitted letter on the Scoping

[1] 2017 Climate Change Scoping Plan Update, p. 106
[2] Revised Proposed Short-Lived Climate Pollutant Strategy p. 14.
[3] California Energy Commission, http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf
[4] 2017 Climate Change Scoping Plan Update, p. 89

Plan workshop on the Energy Sector[5]. SoCalGas is currently demonstrating P2G projects at the National Renewable Energy Laboratory in Golden, Colorado and at the University of California, Irvine (UCI). These demonstrations will assess the feasibility and potential benefits of using the natural gas pipeline system to store photovoltaic and wind-produced energy. At UCI, preliminary findings demonstrated that implementing P2G could increase the fraction of renewable power used on campus from 3.5 percent to 35 percent[6].

P2G Is Part of a Strategy That Is More Feasible than Electrification Alone

Using the existing gas infrastructure, P2G makes achieving California's ambitious climate and clean energy targets more feasible than a strategy that relies solely on electrification by:

- Decarbonizing end-uses that are difficult—if not impossible—to electrify at scale, such as long-haul heavy-duty vehicles, aviation, residential and commercial cooking, and industrial end-uses, like process heating;
- Implementing a more realistic and cost-effective strategy for long-term, seasonal electricity storage than flexible loads and long-duration batteries, which will be needed in a high renewable electricity generation future;
- Reducing the need for other low-carbon energy infrastructure by taking advantage of the state's existing gas pipeline distribution system; and
- Diversifying the economic risk that any one technology may not achieve commercial success.

We encourage ARB to consider P2G as a tool to help meet the goals of California's clean energy future.

IV. Near-zero heavy-duty technology is critical to public health.

The Scoping Plan should prioritize measures that address both climate and public health concerns. Air contaminants such as NOx, PM 2.5 and Diesel Particulate Matter (DPM) are identified in the Scoping Plan as causal factors in premature mortality[7].

In the next decade, the South Coast and San Joaquin Valley Air Basins must both achieve significant reductions in NOx to attain ozone and particulate matter National Ambient Air Quality Standards. More than 80 percent of the region's NOx emissions come from mobile sources. With heavy-duty trucks as the largest categorical contributor, the widespread deployment of near-zero heavy-duty trucks is the single most impactful emission reduction strategy. ARB's own recently adopted SLCP Plan notes that "using renewable natural gas as a

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[5] SoCalGas and SDG&E Comments on the Scoping Plan Workshop on the Energy Sector, submitted September 2016. https://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=scoplan2030energy-ws

[6] http://www.prnewswire.com/news-releases/socalgas-and-university-of-california-irvine-demonstrate-power-to-gas-technology-can-dramatically-increase-the-use-of-renewable-energy-300432101.html

[7] Scoping Plan Workshop, March 2017. Slide 24. https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf

transportation fuel can result in significant potential revenue streams and reduce criteria pollutant emissions from the transportation sector." [8]

ARB has acknowledged that Class 7 and 8 heavy-duty electric and fuel cell electric vehicles will not be available until the 2030 timeframe.[9] Renewable gas can provide an immediate opportunity for California to achieve its air quality and climate change goals in those heavy-duty transportation sectors more quickly. Increasing the use of renewable gas as a transportation fuel would not only reduce methane emissions from organic waste streams, but also reduce black carbon, a component of PM 2.5, by displacing diesel in older, conventionally fueled heavy-duty vehicles. Thus, major reductions of cancer causing toxic air contaminants can immediately be achieved in disadvantaged communities adjacent to freeways and areas of high diesel engine activity, where relief is most urgently needed.

Several measures in the Proposed Scoping Plan Scenario preclude the widespread adoption of renewable gas in the transportation sector by mandating electrification. We address these issues and offer the following recommendations for the Scoping Plan transportation sector.

A. Advanced Clean Transit

The Scoping Plan proposes a zero-emission bus requirement by 2030 under Advanced Clean Transit (ACT) regulations. ARB should consider that transit agencies including Los Angeles County Metropolitan Transportation Authority (LA Metro), San Diego Metropolitan Transit System, Orange County Transportation Authority, and Santa Monica's Big Blue Bus have thoroughly studied the use near-zero emission natural gas buses running on renewable gas, and have found that they provide significant emissions benefits at an acceptable cost. LA Metro's recent study found that the use of near-zero engines with renewable gas is the most cost-effective strategy by an order of magnitude for reducing NOx and GHGs as compared to using battery electric or fuel cell powered buses.[10] Moreover, to effectively serve California citizens, transit agencies need flexibility to deploy advanced technologies in ways that are synergistic with their operations. Transit agencies in the South Coast Air Basin have already begun investing in upgrading their fleets with near-zero engines running on renewable gas, and a mandate to electrify fleets would result in stranded investment.[11]

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[8] Revised Proposed Short-Lived Climate Pollutant Strategy p. 122.

[9] See ARB Technology Assessment: Medium and Heavy Duty Battery Electric Trucks and Buses, October 2015, available at http://www.arb.ca.gov/msprog/tech/techreport/bev_tech_report.pdf and ARB Technology Assessment: Medium and Heavy-Duty Fuel Cell Electric Vehicles, November 2015, available at http://www.arb.ca.gov/msprog/tech/techreport/fc_tech_report.pdf

[10] "Zero Emissions Bus Options: Analysis of 2015-2055 Fleet Costs and Emissions," Ramboll Environ (Feb. 5, 2016) (prepared for LA Metro), *available at*: https://media.metro.net/board/Items/2016/09_september/20160914atvcitem4.pdf.

[11] For example, Orange County Transportation Authority has invested heavily to upgrade fleets to significantly reduce emissions by utilizing renewable gas, repowering 199 buses with 0.2 g-bhp/hr engines, and purchasing 98 new, near-zero, 0.02 g-bhp/hr buses. *See* August 9, 2016 letter from OCTA to Dr. Philip Fine re Draft 2016 Air Quality Management Plan, *available at*: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/2016aqmpRTC-1of2.pdf?sfvrsn=4.

We urge ARB to align this measure with the Innovative Clean Transit measure in the 2016 State Strategy for the State Implementation Plan, which considers a more flexible approach to allow transit fleets to deploy advanced, clean technologies[12]. SoCalGas supports the pursuit of a performance-based standard, not a technology mandate, to address GHG and criteria pollutant emissions, thereby providing transit agencies with affordable technology choices and operational flexibility.

B. Last Mile Delivery

The Scoping Plan proposes a requirement to phase in zero emission class 3-7 trucks used for last mile delivery starting in 2020. Although still considered in the heavy-duty category, the vehicle engines targeted by ARB are smaller than those trucks utilized for commercial drayage. We believe natural gas engines, paired with the use of renewable gas and hybrid technology, can have a useful role in helping reduce emissions from last mile delivery. Efficient Drivetrains Inc. (EDI) partnered with Greenkraft, Inc. to design and optimize a Plug-in Hybrid Electric (PHEV) powertrain and battery pack compatible with an existing US EPA and California Air Resources Board-certified 6.0 liter class-4 compressed natural gas (CNG) engine. Integrated into a CNG-powered Greenkraft 14,500 lbs class 4 medium-duty truck, the optimized EDI Drive was then validated, tested, and demonstrated on the road to prospective fleet customers. The results showed approximately 51% reduction in CO2 emissions, 70% reduction in particulate matter, and an increase in fuel economy compared to a conventional CNG truck. The project was completed in June 2016, resulting in valuable lessons learned by both Greenkraft, Inc. and EDI. EDI has improved on the design and is building another Class 4 CNG-PHEV on a General Motors low cab forward platform. The truck is scheduled for in-service emissions testing and demonstration this fall.

The CEC and US Hybrid are testing a truck that combines the Cummins Westport heavy duty liquefied natural gas engine with a 223 kW electric motor, optimizing battery storage and engine controls. The goals of this pilot effort include exhibiting an ability to meet and exceed ARB emissions limits, and demonstrating improved fuel economy while reducing air emissions. This hybrid truck would achieve both particulate matter and NOx emissions lower than existing ARB regulations. Further, and most importantly for those concerned with pollution from ports and freight movement, this truck would eliminate frequent periods of idling typical at the Port facilities where drayage trucks often queue for long periods of time waiting for their cargo. This natural gas hybrid truck will operate in electric mode (EV mode) around 25% of time (30 miles) in charge depletion mode, then in hybrid mode with sustaining charge. The hybrid truck would have no limitation on range and usage and it would have a higher number of operating hours than a diesel truck, resulting in a potentially dramatic reduction in truck emissions in port and in last mile delivery.

[12] "Revised Proposed State SIP Strategy," ARB, pp. 69-70 (March 7, 2017).

C. Sustainable Freight

We disagree that the needed reductions in the freight system are best achieved through electrification alone. Near-zero natural gas technologies for both on-road and off-road sectors, when fueled by renewable gas, will considerably help achieve the State's emissions targets.

As detailed in the Game Changer Technical Whitepaper prepared by Gladstein, Neandross & Associates (GNA), there is now a commercially-available heavy-duty natural gas engine that meets ARB's lowest-tier optional low-NOx emission standard at 0.02 g/bhp-hr NOx[13]. A recent report by the University of California Riverside's College of Engineering-Center for Environmental Research and Technology (CE-CERT) found that these ultra-low emission natural gas heavy-duty vehicles met and exceeded their certification standards during a full range of duty cycles[14]. This finding is in stark contrast to previously released CE-CERT data and a recently released report by ARB that found heavy-duty diesel trucks emitted higher levels of NOx than their certification standards in the same duty cycles. When paired with renewable gas, this technology will provide a commercially proven, broad-based, and affordable strategy to achieve major reductions immediately in emissions of criteria pollutants, air toxins, and GHGs

V. California's 2030 goals cannot be achieved by excluding natural gas from the building sector.

SoCalGas supports the continued use of natural gas in buildings in the Proposed Scenario. We agree that California can meet its 2030 goals without complete electrification of buildings. The Scoping Plan's economic modeling further supports that the Proposed Scenario achieves higher GHG reductions at a lower cost than the Alternative 1 Scenario, which includes building electrification. In addition, the range of cost per metric ton to electrify buildings in Table III-3 in the Scoping Plan is above the social cost of GHG (and the ceiling price of the Cap-and-Trade Program), as also noted in SDG&E's submitted comments.

Further, the 40% reduction of methane emissions, as directed by SB 1383, can only be accomplished by the capture and delivery of biomethane as decarbonized gas for transportation and stationary source end uses, such as water and space heating in the residential sector, as well as commercial and industrial applications. Electrifying such end uses, by contrast. would directly halt implementation of California's goals to increase the use of renewable gas, as well as undermine the economic impetus for biomethane capture.

VI. Enabling Local Action is critical to efforts to reduce GHG emissions.

SoCalGas supports the efforts outlined in the Scoping Plan to achieve success by partnering with local governments to achieve California's goals to reduce GHG emissions. We agree they can better engage citizens while finding solutions that are best suited to the needs of their community. SoCalGas works closely with cities and counties to help them achieve greenhouse

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[13] Game Changer Technical White Paper, Gladstein, Neandross & Associates, May 3, 2016. http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf.

[14] Johnson, Kent. Ultra-Low NOx Natural Gas Vehicle Evaluation. University of California, Riverside. November 2016.

gas and ozone emission reduction goals, providing resources on energy efficiency, natural gas vehicle, distributed energy resources, renewable gas, and energy storage programs. We believe it helps provide environmental as well as economic benefits to the communities we serve. The utility's role is critical in achieving emissions reductions, and we are an important partner with communities as they develop policies and action items to meet the goals.

We applaud the numerous examples included in Appendix B that will guide local action in reducing GHG emissions through the development and use of renewable gas. Such examples include requiring biogas generation at wastewater treatment plants and methane capture at landfill facilities, and the waste management tactics to require the collection of organic materials for use in anaerobic digestion. By putting organic waste to beneficial use, California can create value for renewable gas derived from these resources and enable significant mitigation of atmospheric methane emissions while simultaneously producing a flexible and reliable renewable energy resource. To expand the use of biogas in the transportation sector, we suggest including within the "Transportation and Land Use" section an example to streamline local permitting and siting for CNG/RNG fueling infrastructure.

We have several suggestions for additional examples within Appendix B to reflect fuel and technology neutrality. As discussed earlier, P2G technology can support greater use of renewable technology, and we suggest its inclusion as an example of on-site storage in the "Energy" and "Green Building" sections. Also in those sections, we suggest including other examples of energy efficient distributed generation, such as natural-gas powered micro-turbines, fuel cells and co-generation. Lastly, consistent with our earlier discussion of building electrification, under "Green Buildings," we suggest the inclusion of newer low emission and more efficient natural gas heating units as an option for new residential buildings, and for converting existing residences that have older natural gas equipment.

Conclusion

SoCalGas strongly believes that a diverse energy portfolio that includes multiple fuels and technologies is needed to meet California's energy needs and climate change targets in a cost-effective and timely manner. As an innovation leader, California has always been at the forefront of improving our environment. Climate change policies are necessary to secure the continued health of our environment for future generations, and California must move forward with not only policy leadership on GHG emissions reductions, but also policy leadership on how to accomplish reductions in a manner that continues to grow our economy.

SoCalGas is eager to help implement what we hope to be a cost-effective, sustainable, and flexible strategy to reach the State's ambitious goals.

Respectfully submitted,

Tim Carmichael

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