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October 16, 2015

Ms. Stephanie Kato
Ms. Sara Nichols
Mr. Jakub Zielkiewicz
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814
P.O. Box 2815
Sacramento, CA 95812

Re: Joint Agency Workshop to Initiate Discussion of an Update to the AB 32 Scoping Plan to Reflect the State's "40% by 2030" Greenhouse Gas Emission Reduction Target – October 1, 2015

Dear Ms. Kato, Ms. Nichols and Mr. Zielkiewicz:

The Southern California Gas Company (“SoCalGas”) and San Diego Gas & Electric (“SDG&E”) appreciate this opportunity to comment on the October 1, 2015, Joint Agency Workshop Initiating Discussion of an AB 32 Scoping Plan Update to Reflect California’s “40% by 2030” Greenhouse Gas (“GHG”) Emission Reduction Target (“Workshop”). SoCalGas and SDG&E want to emphasize the role of natural gas in achieving California’s long-term environmental and economic goals. This is the beginning of a rigorous, transparent process, and we suggest that it not be initiated with biases toward a single pathway, but remain open to potential technological changes that may create alternate pathways.

1. There Are Many Pathways to Reach The State’s GHG Reduction Goal

SoCalGas and SDG&E emphasize the importance of natural gas to the California environment and economic health. We continue to work with our customers and technology developers to identify clean technology solutions through energy efficiency programs, customer education and outreach initiatives, and by supporting near-term and long-term technology development that can reduce both GHG and criteria pollutant emissions and better meet our customers’ changing energy needs. SoCalGas and SDG&E seek to meet a range of customer needs, including serving traditional and new uses such as heating, power generation and transportation fueling, as well as continuing to leverage natural gas resources to deploy industry leading energy efficiency, conservation and emerging technology programs.

In the future, the State should consider opportunities to develop “renewable” natural gas (“RNG”) through research and demonstration projects. Natural gas is our customers’ preferred energy source to cook and heat their homes and water; the direct use of natural gas is more efficient and cost-effective than electricity when measured by source/primary energy. Distributed generation resources, like combined heat and power (“CHP”) systems, natural gas microturbines and fuels cells, can help manage load centers and our electricity demand and

enhance the resiliency of the State's energy infrastructure. Natural gas can help move toward total-building-efficiency and Zero Net Energy homes ("ZNE") while providing the comfort and convenience our customer's expect. While natural gas can in some cases help decarbonize the electricity sector with lower emitting generation compared to coal technology, for example, new Power to Gas ("P2G") energy storage technologies and RNG carbon capture/carbon-transformation technologies, can also decarbonize the gas sector by growing our renewable gas supply in the future, just as the electric sector has grown its renewable supply of electricity.

Diversity in the State's energy portfolio is also important for prudent risk management to support resiliency in the energy infrastructure as a climate adaptation strategy and should be a factor in the overall analysis of future pathways. As weather becomes more extreme from droughts, hurricanes and El Nino events, there are risks to overreliance on one fuel. Hurricane Sandy provided an example where every system dependent on electricity was jeopardized, from the refueling pumps at gasoline stations to the water pumps for putting out fires. Developing micro-grids supported by natural gas distributed technologies can operate for a limited timeframe separate from the grid; they can create more diversity in the electric grid since the natural gas system is mostly underground and relatively immune to extreme weather events.

Further, the natural gas energy sector continues to create jobs and grow our economy. In California, the existing natural gas energy industry supports (directly and indirectly) more than 250,000 jobs and adds over \$36 billion to the State's economy. Future natural gas infrastructure improvement projects offer significant job opportunities and contribute to the local and State economy. Additionally, the manufacturing, industrial, and building sectors rely on natural gas as a low-cost energy source to run profitable operations. SoCalGas alone employs more than 8,000 Southern Californians and, in 2014, spent \$571.4 million with diverse suppliers encompassing 48.4 percent of SoCalGas' procurement. SoCalGas' natural gas energy efficiency programs have created approximately 8,000 jobs in California.

California's leadership on energy efficiency and the use of natural gas in the electric generation and transportation sectors are being embraced by other states as part of the solution to cost-effectively reduce GHG emissions. Policies that move California away from natural gas as part of our energy mix should be carefully examined so as to not put our State at an economic disadvantage, which could cost jobs and future investment. The California Air Resources Board ("ARB") and other agencies beginning the AB 32 Scoping Plan Update should not exclude natural gas as an affordable and practical way to meet California's near-term clean energy goals and develop plans to advance research on cleaner natural gas technologies and accelerate development of RNG to keep this option open as a way to meet our long-term environmental goals. SoCalGas and SDG&E believe there is sufficient data available to clearly recognize the benefits of natural gas and consider pathways with it as a clean energy solution to meet the goal of the Governor's Executive Order B-30-15.

GHG Reduction Focus Areas

As articulated at the Workshop via 94 PowerPoint slides, we understand that the main areas of GHG emissions reductions are:

- Short-Lived Climate Pollutants;
- Energy Efficiency;
- Natural and Working Lands;
- Electricity; and
- Transportation and Land Use.¹

¹ "2030 Target Scoping Plan" Workshop Slide Presentation, October 1, 2015, Slides 2, 17.

We have used these categories to organize our comments and have provided substantive information, concerns and suggestions with respect to each, as articulated below.

2. Preliminary Concerns Regarding the Draft Short-Lived Climate Pollutant Strategy

SoCalGas and SDG&E support ARB's recognition of RNG as a key strategy to reduce short-lived climate pollutants in the State. SoCalGas will provide further ideas on harnessing organic waste streams to reduce methane emissions in our separate comments on the Draft Short-Lived Climate Pollutant Strategy ("Draft SLCP"), released for public comment on September 29, 2015. Below are high-level responses to the Draft SLCP in the areas of methane reduction from oil and gas, as well as organic waste from landfills, dairies and wastewater treatment plants.

A. Methane Emissions Reduction Target of 40%

The section *Recommended Actions to Further Reduce Methane Emissions* details plans to reach a methane reduction level of 40 percent below current levels by 2030 in the oil and gas sector. The Draft states that "California can match the goals of the Obama Administration to reduce methane emissions from the oil and gas sector by 40-45 percent by 2025." However, the oil and gas sector in California has far lower methane emissions than the rest of the nation. In fact, the recently published Washington State University Study found that methane emissions from natural gas local distribution systems in California contribute less than 5% of the total U.S. emissions². This is due to more miles of plastic and protected steel pipe, as well as utility best practices in leak detection and reduction. In addition, SoCalGas is participating in the Natural Gas STAR Methane Challenge Program ("Methane Challenge"), which would provide an additional mechanism through which oil and gas companies could make and track commitments to reduce methane emissions. Therefore, ARB should consider that attempting to meet a 40 percent reduction goal from baseline could result in costly restrictions on operations. We encourage ARB to consider the progress of California Local Distribution Companies that have been proactive in reducing methane, as well as future reduction plans such as SB 1371 and the U.S. Environmental Protection Agency ("EPA") Methane Challenge, and set a target below the national average level expected in 2025 for the nation that reflects what can be done cost-effectively rather than trying to meet an arbitrary percentage reduction.

B. Projecting Increase in Pipeline Leaks

In Appendix A of the Draft SLCP, natural gas pipeline leaks are projected to *increase* from 9% in 2013 to 12% in 2030 due to aging infrastructure and expansion of the pipeline system. However, both the EPA GHG Inventory and the WSU study found that methane emissions from local natural gas distribution systems have decreased in the past 20 years, and will continue to decrease - even as miles of pipeline main and service lines have increased. Specifically, the number of pipeline leaks have decreased 25% for mains and 16% for services due to the use of better pipe materials, efforts to seal cast iron joints, and enhanced leak detection and repair procedures.³

In addition, SoCalGas submitted a plan to the California Public Utilities Commission ("PUC") in November 2014 to increase the rate of pipe replacement and repair on its system: a decision by the PUC is anticipated by the end of 2015. Once funding is approved, we anticipate repairing all currently identified pending non-hazardous leaks by the end of 2018. We urge ARB to take into account recent studies, SoCalGas' planned

² Lamb et al (2015) Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States

³ Lamb et al (2015) Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States

improvements, as well as leak reduction under SB 1371 and voluntary measures under EPA Methane Challenge, in calculating California's projected methane emission sources in 2030.

C. Utilizing Renewable Natural Gas

SoCalGas and SDG&E appreciate and support the analysis ARB staff put into exploring RNG as a strategy to reduce methane emissions. We are pleased that the Draft recognizes the need to develop anaerobic digestion infrastructure, address barriers to capturing biogas to use in CHP systems, and focus on solutions such as uniform biogas pipeline standards and manure-to-methane-to-transportation pathways. Developing policies that create additional market incentives and promote more diverse end-use demand for RNG will reduce California's GHG emissions and help ensure a reliable, diverse, and sustainable energy future for the State.

3. Concerns Regarding the Energy Efficiency Focus Area

As identified by ARB, the California Energy Commission ("CEC") and the PUC, energy usage by buildings constitute approximately 25% of the State's GHG emissions, and buildings use about 68% of the State's electricity and 55% of our natural gas.⁴ SoCalGas and SDG&E recognize the importance of energy efficiency in reducing GHG emissions. For example, SoCalGas and SDG&E agree that comprehensive appliance standards should be established to address growing electrical plug loads, discussed in Workshop Slide 22. This will provide improved awareness and accountability for the energy efficiency performance of consumer electronics, and is also appropriate in the effort to more accurately account for energy consumption across all customer end-uses. Below are some of our additional suggestions and comments specifically regarding this subject area as presented at the Workshop.

A. Emerging Technologies and R&D Should Include Natural Gas Options

Natural gas end uses are in fact predominant throughout the market for residential water and space heating, cooking, and many industrial and commercial processes. In these areas, there has been significant investment in the electrical efficiency market. Natural gas is a foundation fuel in this market, and equitable investments should be prioritized to support increased efficiency of these end uses.

B. Potential for Electrification of End Uses Currently Natural Gas – Water Heating / Space Heating

SoCalGas and SDG&E support the use of appropriate energy technologies that are technically feasible, economically justified, and safe for our customers to use. As such, current and near term natural gas technologies, including gas water and space heating are already proven safe, and are technologically and economically feasible now, and are deserving of continued research and development of energy efficiency investments in these technologies. The Update should not assume electrification is the best pathway without extensive analysis of continued improvements in the efficiency of natural gas end uses.

C. Safety and Cost Considerations of Industrial Electrification

Many industrial facilities use natural gas for direct heating applications. SoCalGas and SDG&E are concerned by the apparent proposal for electrification of industrial heating processes, which may be extremely expensive, inefficient, and could have substantial impacts on the State's broader economy and job market as electricity costs force companies to leave California. Thorough analysis should precede any industrial electrification pathway.

⁴ "2030 Target Scoping Plan" Workshop Slide Presentation, October 1, 2015, Slide 21.

D. Lifecycle Costs of Zero Net Energy Policy Must Be Appropriately Calculated

SoCalGas and SDG&E understand and support California’s ambitious goals to achieve Zero Net Energy (“ZNE”) for all new residential construction by 2020, and for existing residential and all new commercial construction by 2030. SoCalGas and SDG&E are strongly supportive of accurate methods for measuring the true cost and environmental impacts of energy use. In addition, RNG has the potential to deliver renewable, clean, safe and efficient energy for on-site use in heating, cooking, and even electrical generation.

SoCalGas and SDG&E support accurate methods for calculating lifecycle cost and the total GHGs resulting from the generation and consumption of electrical energy that would be based upon the U.S. Department of Energy (“DOE”) definition of ZNE.⁵ The source of electrical power generation must be included in calculations of ZNE to accurately assess the lifecycle cost, efficiency, and carbon footprint of a given unit of energy.

4. Electricity

A. Power to Gas Technology

The creation of RNG from electrolysis, known as P2G, should be rigorously evaluated by ARB and the agencies developing the AB 32 Scoping Plan Update. Since California is faced with an increasingly urgent need to deploy utility-scale energy storage solutions to support the integration of a rapidly expanding supply of intermittent renewable power generation resources, we strongly recommend researching P2G technologies.

In the P2G process, electricity is run through water to produce hydrogen gas. This hydrogen can be used in transportation, industrial, injected into the pipeline, or methanated. Today, 35 entities in the European Union are being planned, constructed, or operating P2G facilities. It is referred to as a “system solution” because of the added benefits of helping to balance the grid and storage capacity.

SoCalGas is leading the nation in assessing P2G technologies and has two projects underway that employ three electrolyzers: a 7kw pilot unit, and two larger 60 kW and 150 kW electrolyzers. SoCalGas has a P2G research project at the National Renewable Energy (“NREL”) Laboratory in Golden, Colorado that is co-funded by the DOE, see Appendix B-7. The SoCalGas/NREL project team will use an existing 150 kW electrolyzer to convert electricity from simulated photovoltaic system into hydrogen and oxygen. The hydrogen and previously-produced CO₂ will be injected into a liquid media contained by a specially designed bioreactor containing single-cell “methanogens.” The methanogens will consume the hydrogen and CO₂ and produce methane. The synthetic methane will be converted back to hydrogen and used to produce electricity via a high-efficiency fuel cell. The demonstration at NREL will allow us to study the entire round-trip renewable electricity storage cycle. It will also increase our understanding on the best approach and application for creating and using synthetic natural gas in a carbon neutral energy cycle.

At the University of California, Irvine (“UCI”), SoCalGas is operating two electrolyzers that run on photovoltaic power generated on campus. This allows us to experiment and model the dynamics of integrating renewable power generation with energy storage in the form of hydrogen production. Under various experimental scenarios, the produced hydrogen is injected directly into a simulated pipeline grid, blended with natural gas and then injected into the pipeline, or injected into the campus pipelines and sent to the onsite power turbines. At UCI, we are also testing the potential impacts of hydrogen on natural gas system components and end-use equipment.

⁵ In September 2015, the U.S. Department of Energy released *A Common Definition for Zero Energy Buildings*: “An energy-efficient building where, on a source energy basis, the annual delivered energy is less than or equal to the on-site renewable exported energy.”

As a next step, we strongly believe that a 1 MW P2G energy storage system should be built as a pre-commercial pilot demonstration. Ultimately, systems as large as 50 MW will be required. To accomplish this we recommend:

1. Research Development and Demonstration (also known as “RD&D”) funding targeting P2G technologies supported by collaborative efforts between California agencies and DOE;
2. A regulatory framework for monetizing the services that can be provided by P2G technologies; and
3. Incentives to encourage the first commercial P2G projects.

Carbon capture and sequestration (CCS) is another opportunity to produce a zero carbon gas supply. Instead of just being sequestered, carbon can be combined with hydrogen to produce methane. The resulting methane injected into the pipeline is carbon free, resulting in a net-zero carbon gas supply.

B. Efficiency Procured as a Clean Distributed Energy Resource, Analogous to Generation

Distributed energy technologies are opportunities for increased energy resilience, flexibility, responsiveness, efficiency and grid reliability by being located nearby and sized appropriately for local energy demands. Distributed energy resources can include solar, wind, and hydroelectric generation, but we strongly urge ARB and the other agencies working on the Scoping Plan Update to also include highly efficient and cost effective natural gas technologies such as combined heat and power (“CHP”) systems, including fuel cells, micro turbines, and internal combustion engine (“ICE”) technologies.

C. Renewable Natural Gas As A Renewable Portfolio Fuel

While SB 350 mandates a Renewable Portfolio Standard (“RPS”) goal of 50% renewable energy by 2030, the State has a way to go. California’s current electrical generation mix includes approximately 25% RPS eligible energy (solar, wind, geothermal, biomass, small hydro) and 75% non-RPS eligible (gas, oil, coal, nuclear, large hydro). To help meet the California RPS target of 50%, RNG may be a viable fuel that could be derived from a variety of sources including P2G, landfills, dairy and agricultural operations, and wastewater treatment facilities.

5. Natural Gas Fuel and Technologies Are Already Part of Clean Transportation and Land Use

For years, California has been a leader in energy and environmental policy, adopting the most aggressive emissions control measures in the nation. And while we’ve significantly cleaned up the air, we still have a long road ahead. Reducing emissions and petroleum use within the transportation sector will be critical to meet both air quality goals and climate change policy goals for California. Natural Gas Vehicles (“NGVs”) have the potential to help the State meet both near-term and long-term environmental and petroleum reduction goals, and should be included as a potential pathway, particularly in the heavy-duty vehicles sector.

A. Natural Gas Can Help Reduce NOx and GHG Emissions in the Transportation Sector

The transportation sector is responsible for 37% of statewide greenhouse gas emissions and over 80% of oxides of nitrogen (“NOx”) emissions in South Coast Air Quality Management District (“SCAQMD”) and San Joaquin Valley Air Pollution Control District (“SJVAPCD”).⁶ Meeting the federal ozone standards and particulate

⁶ 37% figure: California Air Resources Board (CARB). “2000-2012 California Greenhouse Gas Emission Inventory.” CARB, May 2014. http://www.arb.ca.gov/cc/inventory/inventory_current.htm ; 80% figure: South Coast Air Quality Management District (SCAQMD). “Final 2012 Air Quality Management Plan.” SCAQMD, February 2013, p. ES-9. [http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-\(february-2013\)/main-document-final-2012.pdf](http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-(february-2013)/main-document-final-2012.pdf)

matter standards in Southern and Central California are the most significant air quality challenges for the State. Both regions have been deemed “extreme non-attainment” areas for the ozone by the EPA. There are two critical deadlines facing these regions – 2023 and 2031 – to meet federal ozone standards of 80 parts per billion (“ppb”) and 75 ppb, respectively.

To reduce ozone in these regions, the local air districts are focused on strategies to reduce NOx emissions, which is a pre-cursor to ozone. Heavy-duty vehicles are the largest contributor to NOx emissions in both SCAQMD and SJVAPCD. Therefore, it is critical for the State to support heavy-duty vehicle technologies that can significantly reduce NOx emissions in the near-term and mid-term. SCAQMD and SJVAPCD have both indicated that the rapid commercialization of the near-zero engine technologies will play an important role in meeting the federal ozone standards. The State needs a plan for deployment of near-zero engines in order to claim these benefits in the Ozone State Implementation Plan (“SIP”) that will be submitted to the EPA next summer. In fact, ARB and SCAQMD have publicly urged EPA to adopt a lower NOx standard for all heavy-duty trucks in order for the State to meet the ozone standard.⁷

The State should consider achieving GHG and NOx reductions through medium- and heavy-duty on- and off-road vehicles powered by near-zero emission natural gas engines.⁸ Converting heavy-duty vehicle fleets from diesel to natural gas can provide a way to meet California’s goals without crippling the economy. Natural gas does not emit particulate matter, and has 15% fewer GHG emissions than diesel vehicles.⁹ As a result, both NOx and GHG emissions can be reduced, statewide, by large-scale utilization of natural gas fuel.

B. Newly Certified Engine Makes Even Lower NOx Engine Commercially Feasible

With the recent ARB certification of the Cummins Westport Innovations (“CWI”) near-zero emissions engine, California has the opportunity to reduce NOx emissions by 90% from heavy duty trucks.¹⁰ The Scoping Plan Update should include a discussion on this near-zero emission CWI engine, which was certified the last month with lower NOx and methane emissions. ARB established an Optional Low NOx Standard to incent engine development of trucks with emissions in the range of 0.02 to 0.1 grams of NOx per brakehorse power (“g/bhp”). The SCAQMD refers to 0.02 g/bhp as power plant equivalent emissions because electric vehicles may have zero tailpipe emissions but if full life cycle emissions are considered they are not zero emission. The near-zero CWI engine actually certified to emissions of 0.01 g/bhp, which means a natural gas truck or bus would have lower overall emissions than an equivalent battery electric truck.

The commercialization of this *game changing* technology for heavy-duty trucks and buses is a vital step in meeting our air quality goals and improving health in disadvantaged communities along the transportation corridors of California. CWI’s first near-zero 8.9L engine can be utilized by transit fleets, waste haulers and some regional goods movement trucks. This provides an opportunity for transit and waste hauling fleets in Southern California to continue using compressed natural gas (“CNG”) buses with even greater environmental benefits- achieving emission levels below electric buses and trucks. Commercialization of this technology also provides opportunities for transit districts in the Central Valley and Northern California to transition to cleaner fleets today, as many of the Southern California transit agencies have already done. All of these fleets can

⁷ Comments made by Mary Nichols and Barry Wallerstein at the EPA meeting in Long Beach on August 18, 2015.

<http://www.gpo.gov/fdsys/pkg/FR-2015-08-03/pdf/2015-19004.pdf>

⁸ Gladstein, Neandross & Associates (GNA). “Pathways to Near-Zero-Emission Natural Gas Heavy-Duty Vehicles.” GNA, May 19, 2014, p. 1. < http://www.gladstein.org/pdfs/On-Road_Pathways.pdf>

⁹ California Air Resources Board Low Carbon Fuel Standard, re-authorized on September 24, 2015:

<http://www.arb.ca.gov/regact/2015/lcfs2015/lcfsregtext.pdf>

http://www.energy.ca.gov/low_carbon_fuel_standard/UC_LCFS_study_Part_1-FINAL.pdf

¹⁰ <http://www.cumminswestport.com/press-releases/2015/near-zero-nox-emissions-isl-g-natural-gas-engine-proprietary-technology-capable-of-reducing-nox-emissions-by-90>

move to near-zero levels with the acquisition of the new CWI engine. Further, with the use of increasing volumes of RNG, the transit sector has the potential to drive the carbon intensity of its emission *below* electric buses. We can do this in the next several years and not wait 20 years – a generation – before we begin to realize these emission reductions.

In addition, ARB has reflected deployment of low emission, low-carbon fueled trucks, such as low NO_x, RNG fueled trucks as part of their 2014 Scoping Plan Update on how to meet the 2020 GHG reduction goals.¹¹ Ryan McCarthy from ARB noted during the Joint Agency Symposium on Petroleum Reductions that heavy-duty natural gas vehicles will also play a role in meeting the 2030 targets for GHG and petroleum reductions.¹² The AB 32 Scoping Plan Update should include this pathway.

C. Low NO_x, Natural Gas Engines Can Reduce GHG and Other Emissions in the Sustainable Freight and Transport Sectors

In addition to the certified 8.9L engine, CWI is also working on applying the same technologies to a larger engine, which can be commercialized for the goods movement sector in the next twelve to eighteen months. Goods movement is an important economic driver in Southern California. Maintaining cost effective solutions for long-haul drayage truckers will help the region remain competitive and meet stringent emissions goals.

The agencies developing the AB 32 Scoping Plan Update should be compelled to examine policies that will support the rapid deployment of the near-zero emissions engine technology in the on-road goods movement sector. This technology can play an important role in meeting multiple ARB and California goals, relating to California’s Sustainable Freight Strategy, petroleum reduction goal, GHG reduction goal, and, most importantly, NO_x emissions reductions that are vital to SCAQMD and SJVAPCD meeting the federal clean air standard. This new ultra-low NO_x engine technology, and the resulting NO_x emission reductions, is achievable in the near future.

Beyond heavy-duty truck engines, liquefied natural gas (“LNG”) is an ideal choice to replace diesel and bunker fuel for the goods movement industry in the rail and marine sectors. Using LNG to reduce GHG and criteria pollutant emissions has been discussed by the rail and marine industries as well as the ports. This is not required through regulation - it is driven by the benefit from the fuel price differential between natural gas and diesel. Nationally and internationally, we have seen an increase in the number of LNG-fueled vessels in the marine sector, as well as LNG-fueled engine pilot programs by the railroads. SoCalGas has had discussions with the Ports of Long Beach and Los Angeles about the possibility of utilizing LNG as a multi-sector transportation fuel, and natural gas as an energy source, at the ports. The Port of Long Beach identified this as a potential strategy in their Energy Island proposal.¹³

D. Use of Renewable Natural Gas as Transportation Fuel

The Low Carbon Fuel Standard (“LCFS”) identifies RNG from existing organic sources, such as dairy waste, landfills, and waste water treatment as the lowest carbon intensity fuels available, even lower than hydrogen. Today, we are seeing RNG used in California for the transportation sector. For example, Waste Management

¹¹ <http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm>

¹² <http://www.arb.ca.gov/cc/pillars/transportation/mccarthyppt.pdf>

¹³ Port of Long Beach Press Release, “Energy Island, The Port’s Power Plan,” June 25, 2015, <http://www.polb.com/news/displaynews.asp?NewsID=1464>.

“The Port will explore options that include liquefied natural gas (LNG) as fuel for ships and locomotives, hydrogen generation, fuel cell technology and related infrastructure. This goal builds on existing progress the Port has made under its Clean Trucks Program and Technology Advancement Program to support drayage trucks that run on LNG, compressed natural gas, and hydrogen fuel cell technology.”

uses RNG produced at its Altamont facility to fuel its waste hauling fleet in that region. Clean Energy provides RNG at their CNG and LNG stations throughout California. A review of the LCFS reporting tool shows that RNG as a percentage of total natural gas used in the transportation sector has increased dramatically in the past year. The State needs to look at the development of RNG in the State to support heavy-duty natural gas vehicles.

These natural gas opportunities in the transportation sector are only marginally addressed in the Workshop Slide Presentation of October 1.¹⁴ SoCalGas and SDG&E request that ARB and the other agencies developing the AB 32 Scoping Plan Update consider the active inclusion of natural gas engines in the Transportation and Land Use GHG Reduction Focus moving forward. The Scoping Plan Update should also consider the strategy of reducing GHG emissions by investing in natural gas transportation technologies and fueling infrastructure with the co-benefit of substantial NOx emission reductions.

6. Decarbonizing the Natural Gas Pipeline Is an Essential Part of California's Energy Future

SoCalGas have been looking at the long-term role for natural gas in a low carbon energy mix. We engaged Energy + Environmental Economics (E3) to look at *Decarbonizing Pipeline Gas to Help Meet California's 2050 Greenhouse Gas Reduction Goal*.¹⁵ In the scenarios explored in this E3 study, there would be deep decarbonization of the natural gas supply. By 2050, more than 50% of our natural gas supply can come from RNG, also known as biomethane. On this premise, E3 concluded:

- Pipeline de-carbonization works together with renewable electricity and electrification strategies towards GHG reduction objectives.
- Decarbonized pipeline gas reduces emissions in sectors that are otherwise difficult to electrify, including heavy duty vehicles; certain residential and commercial end uses, such as cooking, and existing space and water heating; and certain industrial end uses, such as process heating.
- Decarbonized gas in the form of P2G can play an important role integrating variable renewable generation by producing gas, and then storing it in the existing pipeline distribution and storage infrastructure for when it is needed to serve residential and commercial customers or for electricity generation.
- A transition to decarbonized pipeline gas would enable continued use of the State's existing gas pipeline distribution network, eliminating the need for new energy delivery infrastructure to meet 2050 GHG targets, such as dedicated hydrogen pipelines or additional electric transmission and distribution capacity.
- Decarbonized gas technologies help diversify technology risk associated with heavy reliance on a limited number of decarbonized energy carriers, and would allow consumers, businesses and policymakers greater flexibility and choice in the transition to a low-carbon energy system.

In the electric generation sector, natural gas may have a long-term and significant role to decarbonize electricity generation through the production of RNG. P2G can also aid in managing the intermittency of renewable sources like wind and solar. Production of RNG-from electricity offers the opportunity to increase consumption in low net load periods. P2G creates a new and potentially cost-effective beneficial use for electricity that can be stored in existing natural gas infrastructure and delivered on demand.

¹⁴ "2030 Target Scoping Plan" Workshop Slide Presentation, October 1, 2015, Slide 63, 69.

¹⁵ SoCalGas' initial work with E3 was on the 2050 target to reduce GHG emissions by 80% below 1990 levels. We had assumed a straight-line progression to the 2050 target. So, by 2030, we would achieve a 34% reduction in GHG emissions. We would hit the 40% GHG reduction target between 2032 and 2033.

By avoiding proscriptive mandates and developing appropriate policies, a possible path forward may be to displace a significant amount of our statewide natural gas usage with RNG, leveraging and reusing resources from landfills, wastewater treatment facilities, dairies, agricultural waste, urban waste, and woodland waste that would otherwise be discarded. The path does have challenges such as determining the most cost effective and efficient way to deliver biomethane into the pipeline. Another challenge is sufficient supply of RNG. Non-arable land and non-potable water could be used to grow switch grasses and algae that would be used to produce RNG. Carbon capture and carbon transformation may provide another path forward. Further study is needed to understand the potential development of all of these RNG resources which can provide significant environmental benefits.

SoCalGas is actively working to support each of these short-, mid-, and long-term clean energy solutions to reduce GHG emissions as part of our continued leadership in the natural gas research and development sector. For example, SoCalGas has signed an agreement with the NREL to analyze the California Independent System Operator (“CALISO”) grid constraints and determine where there will be deployable electricity in the future to site power to gas facilities. CALISO’s “duck curve,” shows the future of when generation will occur and predicts times with excess generation capacity and not enough demand, presenting an opportunity to implement P2G to create much needed zero or near-zero carbon energy storage medium.

Conclusion

SoCalGas and SDG&E suggest the Update be postponed for two years, but if not, welcome opportunities to engage with ARB and the California agencies participating in the AB 32 Scoping Plan Update and urge ARB to analyze and consider natural gas pathway solutions.

Sincerely,

Tamara Raspberry