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California Energy Commission  
Dockets Office, MS-4  
Re: Docket No. 14-IEP-1B  
1516 Ninth Street  
Sacramento, CA 95814-5512

**Re: Docket No. 14-IEP-1B – Comments of Southern California Gas on the 2014 IEPR Lead Commissioner Workshop on Electric and Natural Vehicles in California**

Dear Commissioners:

The Southern California Gas Company (“SoCalGas”) appreciates the opportunity to comment on the workshop on electric and natural gas vehicles held by the CEC on June 23, 2014. SoCalGas looks forward to working with the CEC during this evaluation of the transportation sector as it transforms to meet California’s air quality and climate policy goals.

Listed below are SoCalGas responses to various questions that were raised during the workshop.

**What are the market opportunities for Natural Gas as a transportation fuel?**

SoCalGas sees natural gas as a foundation for new energy pathways that can deliver energy with combustion emissions approaching emission levels associated with electric generation. The ongoing drive to reduce both criteria pollutant and GHG emissions, and to improve overall vehicle efficiency, will continue to reshape gas technologies. We are already witnessing the resurgence of an important transportation pathway; Natural gas – as both CNG and LNG – is moving into the transportation sector. In Southern California, we have seen large transit bus fleets shift to natural gas to both reduce emissions and realize significant fuel cost savings. And, now, we are seeing a move towards natural gas for heavy duty trucks, rail, port operations, and even shipping to provide greater fuel diversity and to capture the fuel cost savings from natural gas.

**Should natural gas be considered as:**

- a) A near-term, low cost bridging fuel with moderate environmental benefits? Or,
- b) As a potential ZEV-caliber truck fueling option with the potential to meet the environmental performance standards associated with electricity and hydrogen?

NGV have the potential to help the state meet both near-term and long-term environmental goals, particularly in the heavy-duty sector. Reducing emissions from the transportation

sector will be critical to meet both air quality goals and climate change policy goals for California. The transportation sector is responsible for almost 40% of statewide greenhouse gas emissions and 80-90% of oxides of nitrogen (NOx) emissions in South Coast Air Quality Management District (SCAQMD) and San Joaquin Valley Air Pollution Control District (SJVAPCD).

In Southern and Central California, meeting the federal ozone standards is the most significant air quality challenge for the state. Both regions have been deemed as extreme non-attainment zones for ozone by the federal Environmental Protection Agency (EPA). With this determination, the regions have twenty years to meet the ozone standards established by EPA. There are two critical deadlines facing these regions – 2023 and 2032 – 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 oxides of nitrogen (NOx) emissions, which is a pre-cursor to ozone. Heavy-duty trucks are the largest contributor to NOx emissions in both SCAQMD and SJVAPCD. Therefore, it is critical for the state to move quickly to support heavy-duty vehicle technologies that can significantly reduce NOx emissions in the near-term and mid-term.

Natural gas is gaining momentum in the transportation sector, especially in fleet and heavy duty applications. The move to NGV has been driven primarily by the low fuel price. We have the opportunity to leverage this interest in NGV to develop and promote the deployment of cleaner NGV engines to meet the ozone challenge.

NGV engine manufacturers are currently working on the development of “power plant-equivalent” NOx engines for heavy-duty trucks. This project, funded by CEC, SCAQMD and SoCalGas, has the potential to reduce heavy-duty truck NOx emissions by 90% from current levels within the next 3 to 5 years. This project provides an opportunity to achieve substantial NOx emissions reductions more quickly and at a lower cost than other alternatives that have been discussed, such as battery electric or hydrogen fuel cell vehicles for the heavy-duty sector.

The other major emissions challenge for California is greenhouse gas emissions. According to the California Air Resources Board, conventional natural gas provides a 20-30% reduction from diesel and gasoline. Therefore, the conversion of heavy-duty trucks to natural gas provides an opportunity to help the state meet its near-term AB32 goal. Longer-term, the 2050 goal is to reduce GHG emissions to 80% below 1990 levels. This long-term target will require development of more fuel efficient vehicles and cleaner fuels. National fuel efficiency standards will continue to push heavy-duty truck manufacturers to make improvements in aerodynamics, vehicle weight and rolling resistance. These vehicle improvements will reduce fuel consumption and GHG (and NOx) emissions from conventional and alternative fuel vehicles.

In the long term, utilizing blends of conventional natural gas with renewable natural gas (RNG) and/or hydrogen will be needed to meet our 2050 GHG goals. The low carbon fuel standard (LCFS) identifies renewable natural gas 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 already seeing RNG used in California for the transportation sector. For example, Waste Management uses RNG that they produce at their Altamont facility to fuel their waste hauling fleet in that region. Clean Energy provides RNG at their CNG and LNG stations in California. The state needs to look at policies and incentives to promote more development of renewable natural gas in the state.

By moving forward on the development of cleaner engines, more fuel efficient vehicles and the use of cleaner fuel blends and renewable natural gas, heavy-duty NGV can be a vital part of the state meeting near- and long-term air quality and climate change goals. Cleaner heavy-duty NGV can be deployed more rapidly than other technology options to meet the near term ozone and GHG targets. Long-term, natural gas and renewable natural gas blends can be utilized by NGV to meet the 2050 GHG targets.

**How should policy makers and regulators consider the long-term potential for natural gas as a transportation fuel given the risk and uncertainties associated with methane leakage and potentially higher carbon intensity values?**

Due to proactive efforts by the natural gas industry, emissions from the natural gas system overall are on a declining trend. These reductions are the results of advancements in natural gas sector technologies and best practices. Understanding the rate and location of emissions from the natural gas system-- and the degree to which emissions can be reduced -- is critical to ensure that policymakers and regulators continue to include natural gas as a viable transportation fuel and energy resource in future state energy and GHG reduction plans.

According to EPA and EIA data, only 0.24 percent of produced natural gas is emitted from distribution systems owned and operated by local natural gas utilities<sup>1</sup>. These emissions have declined 22 percent since 1990 even as natural gas utility companies added 600,000 miles of pipeline to serve 17.5 million more customers<sup>2</sup>, an increase of more than 30 percent in both cases. This exceptional record can be traced to safety as the top priority for gas utilities who continue to be vigilant and deeply committed to systematically upgrading infrastructure through risk-based integrity management programs.

An example of a program that has been successful in reducing methane emissions is the EPA Natural Gas STAR. SoCalGas was one of the first members to join in 1993 to voluntarily adopt technologies and practices to reduce methane emissions. Since then, SoCalGas has successfully implemented numerous Best Management Practices (BMPs), such as replacing steel pipe without effective corrosion control, and replacing pneumatic devices with electronic or non-venting devices. As Rosa Dominguez-Faus highlighted<sup>3</sup>, the program has reduced emissions by 26.7 million tonnes CO<sub>2</sub> equivalent in 2012 alone<sup>4</sup>, all from voluntary measures. Emissions reductions will be significantly higher when reduction efforts are adopted more broadly across the natural gas sector, as the Administration is

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<sup>1</sup> U.S. EPA Inventory of Greenhouse Gas Emissions and Sinks 1990-2012, U.S. Energy Information Administration

<sup>2</sup> U.S. Department of Transportation

<sup>3</sup> "Methane Leaks in Context," Rosa Dominguez-Faus, CEC IEPR Workshop Panel 2, June 23, 2014

<sup>4</sup> <http://www.epa.gov/gasstar/accomplishments/index.html#three>

working to promote. Both Tim O' Conner and Simon Mui point out that existing cost-effective technologies can address nearly all emissions from the natural gas sector<sup>5</sup>.

There are a number of regulatory and legislative efforts to address methane emissions. At the federal level, the White House released its Interagency Strategy to Reduce Methane Emissions earlier this year. The Obama Administration is working with the natural gas industry and several federal agencies to develop a comprehensive strategy to cut methane emissions. The EPA has recently solicited comments on five technical white papers on the oil and gas sector, which will be used to develop new federal methane regulations that go beyond existing new source performance standards (NSPS). On the state level, CARB and the Gas Technology Institute (GTI) conducted a study of the oil and gas sector. The key findings of this survey are influencing CARB's approach to developing a new measure in 2014 to reduce fugitive GHG emissions from these operations. In legislation, SB 1371 requires the CPUC to adopt rules governing operation, maintenance, repair and replacement of gas lines to minimize leaks and limit uncontrolled emissions to the maximum extent possible. These regulations, when based on scientific data, will serve to promote the safe use of natural gas that leads to cleaner air.

To address the uncertainty associated with methane emissions, there are numerous efforts currently underway to provide greater transparency on the factors that contribute to the overall methane emissions rate. Specific to transportation, Environmental Defense Fund (EDF) has partnered with West Virginia University and leading engine manufacturers, fleet operators and fueling station equipment owners within the natural gas industry to conduct the first study of methane leakage from medium and heavy duty trucks and CNG and LNG fueling stations<sup>6</sup>. The study is part of a series of studies sponsored by EDF aiming to find and measure the leaks and releases across the natural gas supply chain. The project currently involves about 85 academic researchers and natural gas industry companies, including SoCalGas. Roughly 16 studies have been undertaken, and results are expected to be released by end of 2014 in peer-reviewed science journals. Study findings will better inform sound policies for addressing methane emissions from natural gas local distribution, and create greater public certainty of methane leakage rates.

Natural gas provides substantial GHG benefits relative to alternatives even at the current, modest and declining, levels of natural gas emissions. Methane emissions from the natural gas supply chain are on a declining trend due to industry best practices. Scientific studies are identifying and reducing the rate of emissions, and regulators are partnering with the natural gas industry to reduce emissions even further. The ongoing drive to reduce emissions, coupled with fuel performance and emissions standards, will facilitate natural gas as a clean, cost-effective alternative to conventional fuel.

### **What are the opportunities and constraints for using biogas at a commercial fueling scale in California?**

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<sup>5</sup> <http://www.edf.org/icf-methane-cost-curve-report>

<sup>6</sup> <http://www.edf.org/methaneleakage>

## Opportunities:

CARB has approved various Low Carbon Fuel Standards (LCFS) pathways that have resulted in carbon intensity well below that of gasoline. In addition, the revenue stream from the sale of the LCFS credits increase the value of biogas and biomethane which aids with the economics of upgrading biogas to the CNG quality fuel (for onsite use) or pipeline quality fuel (for offsite use). Finally, injecting renewable natural gas/biomethane into the pipeline for transportation fuel provides the flexibility for the CNG station to store the commodity during low flow/volume periods (no vehicles filling up) and dispatch the storage during high flow/volume periods.

## Constraints:

The majority of the existing biogas producing facilities does not have a strong demand for onsite CNG for transportation. Unless the biogas producing facility has a large CNG storage facility or another onsite use for the biogas that can generate a premium (additional revenue streams), the economics are difficult to justify the installation of a biogas upgrading plant onsite. Additionally, LCFS and EPA Renewable Identification Number prices credit continue to be unstable and provide market uncertainty for investors. Entities are currently not willing to enter into long term agreements for purchasing these credits. Finally, the three primary programs (RPS, SGIP and LCFS) that create a price premium for biogas/RNG currently have a sunset date on or prior to the year 2022. While all three likely will be extended beyond 2022, there is some degree of uncertainty and risk for the investment community.

## **What changes in natural gas engine design and sizing options are needed to make natural gas trucks competitive in California and the West? When can we expect sizeable numbers of vehicle products?**

The following engine sizes need to be available in order to make natural gas trucks competitive in California and the West: 6.7L, 9L, 12L and 15L. Additionally, SoCalGas has also included a presentation from CalHEAT on their Heavy-Duty Truck and Bus NGV Roadmap from June 2014. This document was referenced during Jeff Reed's presentation at the April 10 IEPR workshop on transportation technology. The presentation specifically goes over what is needed in NGV engine design criteria and it also includes forecasts for NGV in the marketplace. Furthermore, technical proposals from both Cummins and Cummins Westport for their advanced heavy duty natural gas engines with near zero NOx emissions have been included.

## **What do fleet operators need from OEMs and government policy makers and regulators to make natural gas trucks a competitive alternative to diesel-fueled trucks?**

Providing incentives and funding for at least a portion of the incremental cost for fleet operators will be critical. The price differential between natural gas and diesel fuel is already driving fleet purchases of natural gas fueled heavy-duty trucks. Incentives will be critical to get heavy-duty truck purchasers to choose the lowest emissions engines. Additionally, for near-zero emissions engines to become economically viable for manufacturers to produce and to ultimately bring down the incremental vehicle cost, they will need to be able to sell

into vehicle markets in other regions. CEC and ARB need to reach out to other states to support programs like the Optional Low-NOx Standard and incentive programs to support adoption of near-zero emission technologies. CEC grant funds (through the ARFVT) are critical to building out the infrastructure needed to accelerate the adoption of alternative fuel vehicles.

### **Additional Materials**

At the June 23<sup>rd</sup> workshop, George Minter's presentation included charts showing a forecast of CNG prices and a comparison of the carbon intensity of renewable natural gas compared to other fuel sources based on ARB's Low Carbon Fuel Standard. Attached are the supporting documentation for these charts. The first document is a letter from Gladstein, Neandross Associates presenting the CNG price forecast and discussing the underlying assumptions for this forecast. The second document is a set of slides from ICF showing the relative value of different fuels per the LCFS and a description of the assumptions used to create these LCFS comparison chart.

### **Conclusion**

SoCalGas believes there are important natural gas pathways that can help California achieve our clean energy and clean air transportation goals faster and more economically. Developing near-zero natural gas end use technology and decarbonizing the gas delivery system keep intact the inherent energy efficiencies of direct uses of natural gas, at a lower carbon content, without creating the dramatic increase in electric demand and systems costs that make decarbonizing electric generation such a challenge. And, it utilizes our existing energy infrastructure, protecting energy users from paying future stranded costs. SoCalGas appreciates the opportunity to comment on the workshop on electric and natural gas vehicles and for the ability to share information on long-term pathways for natural gas vehicles to help the state meet the air quality and climate policy goals for the transportation sector.

Sincerely,

A handwritten signature in cursive script, reading "Amara Rasby". The signature is written in dark ink and is positioned below the "Sincerely," text.