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Mr. Mike Tollstrup
California Air Resources Board
Office of Climate Change
1001 I Street
Sacramento, CA 95814

RE: 2013 AB 32 Scoping Plan Update

Dear Mr. Tollstrup,

Southern California Gas Company (SoCalGas) appreciates the opportunity to submit these comments on the proposed AB 32 Scoping Plan Update as described at the Air Resources Board's (ARB) June 13 and June 26 workshops. In response to the information presented at the workshops, SoCalGas requests that ARB consider the contribution natural gas has already made, and continues to make, to the statewide effort to meet the 2020 greenhouse gas (GHG) reduction goals and how natural gas is well-situated to provide a pathway to achieving the 2050 vision.

Specifically, we ask ARB to consider the role of natural gas in reducing GHG emissions, how post-2020 targets must balance multiple environmental and economic challenges faced by California**,** natural gas use in the transportation sector, the importance of creating a robust biomethane market in California and natural gas use in the distributed generation sector.

Role of natural gas in reducing emissions

The natural gas sector has worked with California's air and energy agencies for many years to address concerns about emissions and air quality. As a result, California has led the way in developing cleaner, more efficient natural gas equipment. Due to energy efficiency programs and standards, the GHG emissions from the natural gas sector (i.e., residential, commercial and small industrial customers) are already 8% below 1990 levels[1]. Furthermore, the oxides of nitrogen (NOx) emissions from natural gas equipment have been reduced by 90% over the past 20 years[2]. Achievement of these emissions reductions has been a good first step. However, California continues to face significant challenges in reducing both GHG and NOx emissions.

Natural gas, when combined with new equipment technologies and with biomethane, provides the opportunity to achieve zero- and near-zero emissions for a broad range of energy applications. As such, SoCalGas believes natural gas will continue to play a role in reducing emissions across all sectors of our economy – residential, commercial, industrial, power generation and transportation.

Post-2020 targets must balance multiple environmental and economic challenges faced by California

AB32 focuses specifically on California's goal to reduce GHG emissions by 2020. As ARB looks to the post-2020 period, it is important for ARB to consider the larger spectrum of environmental and economic challenges

[1] The objective of AB32 is to reduce GHG emissions to 1990 levels by 2020. The natural gas sector has already achieved this goal.
[2] NOx emissions are a precursor to ozone formation. Under the federal Clean Air Act, the South Coast Air Quality Management District is a severe non- attainment zone for ozone and must take actions to reduce emissions.

faced by California. In addition to concerns about global climate change, California must address the United States Environmental Protection Agency (US EPA) mandates to reduce criteria pollutants, such as ozone and particulate matter. At the same time, California policy-makers must pursue policies that will encourage economic growth in all sectors.

Policy Leadership

In addition to balancing air quality and climate change policies, California must be alert to the economic impact of its long-term environmental policies. California has been a leader in both energy and environmental policy for many years. As one example, we have been a leader in establishing energy efficiency standards and programs. These programs have been extremely successful because in the long-run they have reduced energy use and associated emissions, and saved money for California businesses and residents. As a result, California's path has been followed by others and many of the technologies developed for the California market and are being used throughout the country.

Now, California is looking to be a leader in creating carbon reduction programs. While California can independently implement programs to reduce carbon emissions, ***our efforts will only be meaningful if other states and nations adopt similar policies***. To be an effective leader on carbon reduction policies, and to make a difference, others must follow. Thus we must balance carbon reduction with quality of life and economic viability. Others will watch how the implementation of our carbon reduction policies impact California's economy. ***Overall success will be gauged by the ability of California to achieve its aggressive GHG emission reduction targets without damage to the state's economy.***

Flexibility will be required to meet the goals while maintaining our diverse business and industrial base. Agriculture, manufacturing, goods movement and service industries are sectors that will play a key role in rebuilding California's economic prosperity. However, there are regional variations in the way industries drive local economies. Therefore, it is important that ***state policy considers how programs will impact industry and the economy, and influence energy technologies utilized, in different regions*** of the state.

Natural Gas in the Transportation Sector

In addition to reducing GHG emissions, Southern California faces important near-term challenges to reduce criteria pollutant emissions, specifically particulate matter and ozone emissions. These priorities require immediate deployment of clean technologies, especially in the transportation sector. While, the transportation sector represents around 40% of California's GHG emissions, this sector accounts for 80% of the oxides of nitrogen (NOx) emissions in the South Coast air basin.[3]

Currently planned pathways to GHG attainment (that rely heavily on electric vehicle and fuel cell vehicles) do not happen fast enough to meet criteria pollutant targets. For example, turnover of heavy duty trucks to cleaner technologies must occur more quickly to achieve the criteria emission reductions needed than to reach the GHG goal. Hence, we cannot rely only on long term GHG goals to drive compliance with criteria pollutant targets and must establish more aggressive near and mid-term technology pathways.

In this vein, air districts now are now considering a multi-technology approach to achieve criteria pollutant goals. A multi-technology approach will rely upon even cleaner versions of natural gas vehicles, as well as a heavy reliance upon electric vehicles and fuel cell vehicles as these technologies mature beyond 2020.

[3] SCAQMD is focused on reducing NOx emissions as the most expedient way to reduce ground-level ozone in the region. NOx is a pre-curser to ozone formation. Percentages are from the Vision for Clean Air Public Review Draft, June 27, 2012, p. 11 http://www.arb.ca.gov/planning/vision/docs/vision_for_clean_air_public_review_draft.pdf

The ARB and other air quality regulators are appropriately focused on the heavy-duty vehicle sector to achieve large NOx and GHG reductions. Since diesel-fueled heavy-duty vehicles and equipment are by far the largest source of smog forming gases in the state, and since ozone reduction deadlines are just around the corner, strategies that quickly reduce NOx emissions from this sector are of critical importance.

The use of heavy-duty engines powered by natural gas offers a unique and viable strategy to meet California's aggressive reduction goals for NOx and GHG emissions. It also supports a variety of other state and national goals, such as reducing the public's exposure to toxic diesel exhaust and reducing the nation's dependence on foreign energy sources.

In the transportation sector, we can envision pathways that help us meet our near term ozone goals and our long-term GHG goals. Early reliance on cleaner heavy duty natural gas trucks achieves more NOx emission reductions sooner. The technology is here today. And, there are key technology strategies now available to make heavy duty NGV trucks even cleaner as we approach 2023 (the next ozone attainment deadline) and beyond.

By moving to natural gas for heavy duty trucks, we can immediately reduce GHG emissions by up to 20%. Over the mid-term, efficiency improvements from advanced engines, hybridization, and integration of improved aerodynamics and similar technologies should yield another 40-45% reduction to GHG emissions. In the long term, utilizing blends of renewable natural gas and/or hydrogen can provide the remaining reductions (about 20-25%) needed to meet our 2050 GHG goals[4].

These technology pathways for heavy duty natural gas trucks can be expanded into other transportation sub-sectors. The synergies that exist in these key technology pathways can achieve both NOx emission reductions and GHG reductions in the mid-term, and also for the long-term. Finally, technology advances in trucking can be transferred to rail, marine and other applications in the mid- to the long-term.

As the nation's supply availability of natural gas continues to grow, and gas prices, relative to gasoline and diesel fuel, continue to remain low, we see prolonged adoption of natural gas by our ports and the freight movement sector. This adoption of natural gas as a transportation fuel will contribute significantly to air quality improvements while sustaining long term job creation and economic opportunity.

Renewable Natural Gas / Biogas

Renewable natural gas can play an important role in California's gas supply portfolio. For example, when renewable natural gas is injected into the pipeline network and is consumed by a Renewable Portfolio Standard (RPS) certified generation facility, the power produced is RPS-eligible and can be counted towards a utility's RPS goal[5]. A secondary benefit of renewable natural gas, unlike many other renewable technologies (such as wind and solar), is that it is dispatchable and does not require construction of new electric transmission lines.

When renewable natural gas is used as a transportation fuel in natural gas vehicles, the emissions are extremely low as the carbon intensity of renewable natural gas is approximately 14% of gasoline (based on dairy digester biogas)[6]. The use of renewable natural gas will not only help provide a more diverse gas supply portfolio but can also assist California in meeting its AB32 goals.

SoCalGas has been a leader in supporting development of biomethane in the state. We have actively supported the development of the two facilities in the state that are conditioning biogas to pipeline quality and have issued a Biomethane Guidance Document to provide a process for non-landfill biomethane projects to interconnect to our system. SoCalGas has been studying the unique clean-up issues related to landfill gas for several years and is

[4] Based on analysis by SoCalGas, ARB published well-to-wheels values and research by CalHEAT.
[5] CEC RPS GUIDE: http://www.energy.ca.gov/2013publications/CEC-300-2013-005/CEC-300-2013-005-ED7-CMF.pdf
[6] http://www.arb.ca.gov/fuels/lcfs/lu_tables_11282012.pdf

actively involved in the rulemaking called for by AB 1900 to seek ways to safely accept conditioned landfill gas into the utility pipeline system. Furthermore, SoCalGas has filed a tariff that would provide biogas conditioning services on an optional basis to further develop biogas supplies in its service territory[7]. In the longer term, dedicated energy crops like algae, which do not displace food crops, and other renewable methane pathways such as solar thermochemical conversion can increase supplies still further.

Natural Gas in the Distributed Generation Sector
Combined Heat and Power

California must continue to consider a portfolio of energy generation resources to meet the state's energy demands while working toward the 2020 greenhouse gas (GHG) reduction goals established by AB32 and the 2050 goals in Gov. Schwarzenegger's 2005 executive order.

Combined heat and power (CHP) has been identified as an efficient, clean, and beneficial means of meeting electricity demand in California by the governor's office, the legislature, the California Public Utilities Commission (CPUC), the ARB, and the California Energy Commission (CEC). CHP is recognized as an energy efficiency measure by the Department of Energy, the Environmental Protection Agency, ARB, and CEC. As such, CHP is part of the preferred loading order for new power supplies in the state that also includes energy efficiency, demand response, and renewable energy. CHP is an integral natural gas pathway for the utilization of natural gas technologies, which can contribute to the state's climate, clean air and energy efficiency goals.

Further, the President's recently released Climate Action Plan specifically cites the role of natural gas in the transition to a clean energy world.[8] In particular, encouraging the generation of electricity by efficient CHP facilities will be an important part of California's strategy to meet its GHG reduction goals.

A recent study by ICF International indicated that accelerated deployment of CHP could: [9]

- Significantly increase energy savings through CHP efficiency
- Add significant new investment, stimulating the state's economy
- Create significant customer savings in energy costs providing funds to be economically re-deployed towards new investment, higher business income or growth and more jobs and economic development.
- Deliver additional CO2 emission reductions
- Improve electric utility operations impacts, including:
    - Decreased congestion and increased system reliability
    - Greater resource adequacy
    - Improved stability and power quality
    - T&D and capacity investment deferrals
    - Reduced electricity supply costs resulting from decreased demand

Although some parties are questioning the future GHG benefits of CHP, SoCalGas strongly believes, as reflected in the above referenced ICF study and numerous other analyses, well designed CHP systems deployed so that waste heat is well utilized, provide substantial GHG benefits and will do so over the long term. SoCalGas' technical perspective is that, when new CHP is installed, GHG benefits should be assessed by assuming that the power produced is replacing the most inefficient base loaded combined cycle gas generation. This approach should be adopted for calculation of GHG benefits and an appropriate allowance allocation component should be adopted to encourage GHG-reducing CHP installations.

[7] A.12-04-024. Under the proposed optional tariff, SoCalGas will condition (clean) biogas to pipeline quality standards or other standards specified by the customer for non-pipeline applications under special contract.
[8] The President's Climate Action Plan, June 2013, p. 19.
[9] Effect of Departing Load Charges on CHP, ICF International, May 2013

Well-designed, gas-fired CHP systems remain an important part of this state's effort to reduce GHG emissions. Because of their inherent ability to take advantage of an energy cascade, energy that is usually lost during the production of power can be used to offset energy consumed for process or heating and cooling needs. If sufficient care is taken to be certain that the thermal energy produced as a result of generating electric power is used effectively, CHP can be a significantly more efficient use of fossil fuel than the most efficient natural gas fired combined cycles available on the market. Some examples of emissions factors based on current technologies are provided in Table 1.

Table 1 – Comparative CO_2 Emissions Net of Full Thermal Use

Technology	CO_2 Emission Factors
Tecogen 75 kW Gas Engine CHP System[10]	.24 Tonnes/MWhr
Jenbacher 4300 kW Gas Engine CHP System[11]	.24 Tonnes/MWhr
Solar Mars 100 10,600 kW Gas Turbine CHP System[12]	.34 Tonnes/MWhr
Siemens 618 mw Combined Cycle (57.3% Efficiency, LHV)[13]	.35 Tonnes/MWhr

The ARB 2008 scoping plan called for 6.7 MMT of GHG benefits from accelerated deployment of CHP. Although ARB may find it appropriate to modify this target to some degree, SoCalGas believes that the 2008 analysis was fundamentally on target and that the ARB should maintain CHP goals at or near those in the 2008 scoping plan. The modest progress toward the 2008 goals should be addressed by removing barriers to CHP adoption such as excessive departing load charges, potential incentives with proper protocols for verification of GHG reduction, technology advancement support, electric utility procurement programs and implementation of other innovative utility programs such as utility ownership of CHP (and other distributed generation resources) with program designs that support development of fair completion and competitive markets while protecting ratepayers.

Other Efficient Distributed Generation Technologies

In addition to CHP applications, natural gas technologies can be highly efficient and provide both grid support and GHG benefits even when operating in simple cycle configurations. Fuel cells are the best current example. With simple cycle efficiency exceeding 50% in some cases, these systems provide significant GHG benefit when grid losses are considered. When operated on directed biomethane, GHG reduction is nearly 100% while avoiding intermittency issues and potentially providing other support to the grid.

Another example is mechanical drive applications with heat capture. Mechanically-driven engines operate in a similar manner to CHP with the exception that they produce mechanical power instead of electricity. The engine shaft is typically used to drive a compressor, pump, or industrial process. Similar to CHP, waste heat can be captured and used to produce steam or hot water. This technology option offers similar GHG benefits when used in place of a CHP system but often with lower equipment costs. A mechanical drive system does not require an electric generator, invertor, or grid interconnection unless the waste heat is utilized in a bottoming cycle to generate electricity.

SoCalGas encourages the ARB to carefully consider the GHG benefits of ultra-low-emission natural gas and renewable natural gas solutions in revising the scoping plan and establishing appropriate regulations to promote their deployment.

[10] http://www.tecogen.com/Collateral/Documents/English-US/CogenDS.pdf
[11] *Standard Technical Specification JMS624 H01 13800V Two Stage Turbo Charger GE Jenbacher Gas Engines*, JMS 624 GS-N.L, General Electric, 2011.
[12] http://mysolar.cat.com/cda/files/126861/7/ds100md.pdf
[13] http://www.energy.siemens.com.cn/Energy/FpowerGeneration/CCPP/Pages/Default.aspx

New Considerations for Natural Gas Generation

With the permanent shutdown of San Onofre Nuclear Generating Station (SONGS), the state has experienced a loss of over 2,200 MW of GHG-free electric generation with an average capacity factor of 90%. Without this nuclear power resource, the state will replace a large volume of carbon neutral baseload power with a mix of resources. Ensuring that California maintains reliability of its energy supply while it increases its renewable generation capability will require additional natural gas generation as well as CHP as a distributed generation resource as part of the energy portfolio mix.

Natural Gas will Continue to be a Foundational Energy Resource for all Sectors of our Economy

The drive to reduce both criteria pollutant and GHG emissions, and improve overall energy efficiency, is re-shaping our technology and use. We are already seeing this, as natural gas moves into the transportation market – and not just for trucks and buses, but for rail and for port operations, some of the biggest sources of our NOx emissions in the South Coast air basin. We see new end use technologies that help customers meet energy needs in different ways, like combined heat and power, micro turbines and fuel cells, all providing energy needs more efficiently than today, and all relying upon natural gas over the long term.

We see flexible and appropriately scaled highly efficient gas technology balancing the intermittency of renewables, helping to integrate them into the grid, and grow our renewable portfolio over the long term. And we see a mix of distributed generation resources, including renewables and gas, including renewable natural gas, helping us manage our load centers, and our electricity demand. Until we see the technology breakthroughs needed for large scale battery storage, we know natural gas will continue to play an important role in electric generation. Our challenge will be to reduce GHG emissions in this sector. And new carbon capture and carbon use technologies are already moving into commercial deployment to facilitate that role. These are some of the reasons we don't see natural gas as a bridge or transitional fuel, but as a foundational fuel to our clean energy future

California needs policies that balance economic opportunity and emissions reduction plans for both climate and criteria pollutant goals. Energy and environmental policy are not only about cleaner air, as we often think, but also about jobs and economic opportunity. We understand how our state works, and we seek to grow jobs and our economy; while at the same time we are committed to progress on cleaner air and climate change policy, as well as needed energy transitions.

Natural gas is a low-cost, abundant, domestic resource that meets many of the energy needs of homes and businesses in California. As the nation's supply availability of natural gas continues to grow and prices continue to remain relatively low, we see prolonged use of natural gas contributing significantly to air quality improvements while sustaining long term economic opportunity for the State. We need to continue to support development of cost-effective technologies that reduce emissions, while giving customers the choice of products they value. We need to examine the cost of technology and infrastructure investment required to produce the sort of energy transformation envisioned in California's climate initiative, while minimizing the cost impact on consumers.

Thank you for the opportunity to participate in the development of the updated scoping plan and to submit these comments.

Yours sincerely,