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SoCalGas Comments: Climate Adaptation and REsiliency

Additional submitted attachment is included below.



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California Energy Commission Dockets Office, MS-4 1516 Ninth Street Sacramento, CA 95814-5512

Subject: Comments in response to 2019 IEPR Workshop on Climate Adaptation and Resiliency in the Energy Sector, Docket #19-IEPR-10

Dear Commissioners:

The Southern California Gas Company (SoCalGas) appreciates the opportunity to submit comments in response to the California Energy Commission's (CEC) and the California Public Utilities Commission's (CPUC) joint agency Workshop on Climate Adaptation and Resiliency in California's Energy Sector held on August 8th as part of the 2019 Integrated Energy Policy Report (IEPR). SoCalGas strongly supports the state's climate goals: we are focused on becoming the cleanest natural gas utility in North America and are committed to 20% renewable gas being delivered to our core load by 2030.

SoCalGas actively participates in CEC's public workshops on climate adaptation and resiliency. We have submitted still relevant comments on the subject for the 2016 IEPR Update,¹ 2017 IEPR,² and 2018 IEPR Update³ proceedings. Each year, SoCalGas' comments express the need for natural gas infrastructure stakeholders to be included in the planning for, and the development of, climate adaptation and resiliency measures. Additionally, we point out that diversity in the state's energy portfolio is important for prudent risk management to support resilient energy infrastructure. We ask that you review these comments in addition the points made below.

¹ SoCalGas and SDG&E Comment in response to Climate Adaptation & Resiliency Workshop. 2016 IEPR Update. Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=212121

² SoCalGas Comments on Climate Adaptation and Resiliency Workshop. 2017 IEPR. Available at: <u>https://efiling.energy.ca.gov/GetDocument.aspx?tn=221128</u>

³ SoCalGas Comments in response to Lead Commissioner Research Workshop on Climate-Related Risks to California's Energy System. 2018 IEPR Update. Available at:

https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&DocumentContentId=55054

- I. California Must Allow an "All of the Above" Approach to Climate Adaption and Resiliency Solutions
- II. Natural Gas Infrastructure Is an Important, Reliable Economic Asset
- III. Case Studies of Natural Gas Sector Resilience Following Four Climate-Related Disasters in 2017
- IV. Preliminary Key Results from ICF Research on Climate Hazard's Impact on Greenhouse Gas and Criteria Pollutant Emissions and Renewable Gas Production Potential

I. California Must Allow an "All of the Above" Approach to Climate Adaption and Resiliency Solutions

Given the challenge of projecting the pace and scale of innovation and economic trends, California must allow an "all of the above" approach to solutions with maximum flexibility and technology neutral policies to decarbonize California's economy as per the recommendation of The Energy Futures Initiative's recently released report, *Optionality, Flexibility and Innovation: Pathways for Deep Decarbonization in California.*⁴ The authors analyzed the options by sector (within the parameters of existing state policy) for meeting California's near- (2030), mid-(2045) and long-term (2050) carbon emissions reduction goals: they concluded that renewable gas (RG) and hydrogen are needed. By leveraging California's existing energy infrastructure, technological expertise, and skilled workforce, we can transition to a deeply decarbonized economy and mitigate the impacts of climate change.

II. Natural Gas Infrastructure Is an Important, Reliable California Asset

California's natural gas infrastructure is a critical, interdependent, safe, and reliable part of the state's energy system. However, this year's IEPR climate workshop was solely focused on the increased vulnerability of the *electricity* sector to climate hazards and communities' resilience. While SoCalGas appreciates the research and discussions the CEC and the CPUC are conducting, the critical role natural gas plays in California's energy sector, as well as natural gas climate change adaptation and resiliency measures were again neglected in the workshop's discussions.

The CEC and the CPUC must recognize that the electric and gas systems do not operate in separate silos. Rather, they are interdependent; working together to ensure a continuous supply of reliable, safe energy. Therefore, it is vital that both systems are evaluated for strategies and solutions to help adapt to climatic changes. California agencies should not be predisposed to favoring electrification over natural gas, but must instead set standards and rely on market competition to ensure cost-effective implementation.

https://energyfuturesinitiative.org/s/EFICADecarbonizationFull-b3at.pdf

⁴ Energy Futures Initiative. *Optionality, Flexibility, & Innovation: Pathways for Deep Decarbonization in California.* May 2019. Available at:

The Lawrence Livermore National Laboratory has provided several compelling reasons why attempts "to phase out all existing natural gas infrastructure would be ill advised from a climate mitigation standpoint."⁵ These include the following:⁶

- 1. Existing natural gas distribution infrastructure could provide a platform to broaden the use of carbon-neutral or carbon-negative RG and clean hydrogen. California should not preclude these options;
- California has the largest RG potential of any state, and reducing short-lived climate pollutants is a key strategy in California Air Resources Board's Assembly Bill 32 Scoping Plan. California must also satisfy the requirements of Senate Bill 1383⁷ to reduce greenhouse gas (GHG) emissions from the agricultural and waste sectors;
- 3. Natural gas-fired electricity generation can be decarbonized through efficiencies;
- 4. Natural gas reduces the need for energy storage by allowing for flexible, dispatchable generation. "This can ease the burden on Demand Response, which is estimated to be required on the order of 22 GWh of energy shifting alongside 11 GW of shedding by 2030.⁸ A hedged approach of not relying on a single resource or technique would alleviate outcome risks and almost overall costs at the same time."⁹ Additionally, the California Independent System Operator warns that there will be a 2000 MW electricity capacity shortfall in 2022. The agency advocates that the CPUC ensure there are natural gas resources available in the near-term to ensure reliability.¹⁰
- 5. Existing natural gas infrastructure, coupled with RG supply, can help decarbonize hard-to-electrify sectors, such as industry and transportation.
- 6. California already has the largest number of natural gas refueling stations in the nation and this number is expected to grow.

It is therefore vital that both the electric and natural gas systems are evaluated for strategies and solutions to optimize adaptation to climatic changes. Additionally, as the largest natural gas distributor in the nation, SoCalGas representatives and other natural gas stakeholders should be invited to participate in climate adaptation and resiliency workshops to ensure that effective and equitable solutions are available to help communities adapt to and be more resilient against climate change-driven natural disasters.

https://energyfuturesinitiative.org/s/EFICADecarbonizationFull-b3at.pdf

⁵ Lawrence Livermore National Laboratory (LLNL). Comments in response to the CEC's Workshop on The Natural Gas Infrastructure and Decarbonization Targets. P.2. Available at:

https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143 ⁶ *Ibid.* Information summarized from LLNL.

⁷ Senate Bill 1383 requires a 40% reduction of methane emissions by 2030. SB 1383 text available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383

⁸ Energy Futures Initiative. *Optionality, Flexibility, & Innovation: Pathways for Deep Decarbonization in California.* May 2019. Available at:

⁹ LLNL. Comments in response to CEC's Workshop on The Natural Gas Infrastructure and Decarbonization Targets. P.5. Available at:

https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143 ¹⁰ CPUC Rulemaking 16-02-007. Comments of the California Independent System Operator Corporation. July 22, 2019. Available at: <u>http://www.caiso.com/Documents/Jul22-2019-Comments-</u>

PotentialReliabilityIssues-R16-02-007.pdf

III. Case Studies of Natural Gas Sector Resilience Following Four Climate-Related Disasters in 2017

Following the 2018 IEPR Update Climate Adaptation Workshop, SoCalGas submitted ICF International's research on *Case Studies of Natural Gas Sector Resilience Following Four Climate-Related Disasters in 2017*¹¹ which summarize the damages and disruptions experienced, resilience successes, and lessons learned from four natural disasters: Hurricane Harvey in Texas; Hurricane Irma in Florida; the October wildfires in Northern California; as well as the December wildfires and subsequent mudslides in Southern California.¹² While we do not expect hurricanes to take place in California, the state experiences severe storms, wind, and flooding thus making these lessons learned applicable.

A. Key Lessons Learned

The key lessons learned were clear: 1) natural gas is a resilient energy resource that provides heat and hot water for homes; 2) natural gas provides back-up generation for hospitals and relief centers via the use of fuel cells and combined heat and power systems; and 3) vehicles that run on compressed or liquid natural gas (such as transit buses, garbage trucks, etc.) are critical for keeping cities running during emergency response situations. See Appendix A for more information.

B. Further Research on Case Studies: Preliminary Lessons Learned

Building off the 2017 case studies, SoCalGas asked ICF to further investigate energy sector resilience in the context of 2018 natural disasters, including Hurricane Michael as well as the Camp and Woolsey Fires. This research is nearly finalized and we will submit it to the docket when it is publicly available in Fall 2019. Below are preliminary key lessons learned. We ask the CEC and the CPUC to review these case studies and reconsider their approach to and value of natural gas infrastructure.

a. <u>Natural gas infrastructure and services were relatively resilient to hurricanes,</u> <u>wildfires, and mudslides.</u>

Most natural gas infrastructure is belowground, which is inherently less vulnerable to most natural disasters than aboveground infrastructure. The greatest observed impacts to natural gas infrastructure were due to intensive scouring of creeks during flood events, uprooted trees during hurricanes, and large boulders carried by mudslides. However, the distribution system was working and distributing natural gas where homes were not destroyed or where the system was proactively isolated to support emergency responder requests.

¹¹ SoCalGas Comments in response to CEC Lead Commissioner Research Workshop on Climate-Related Risks to California's Energy System. 2018 IEPR Update. Available at:

https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&DocumentContentId=55054 ¹² SoCalGas Comments in response to Climate Adaptation and Resiliency Workshop. 2017 IEPR. Appendix 1. Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=221128

b. <u>Reductions in natural gas supply during the California wildfires were</u> <u>primarily caused by the utilities' efforts to selectively isolate service thereby</u> <u>turning off the gas supply to targeted areas affected by fire.</u>

Selective isolation of gas service, a protective measure that can be put in place quickly to avoid gas flowing through open ended aboveground meter set assemblies if the house or structure was damaged during wildfires, can also be time-consuming and expensive to reverse while impacting customers without service in the interim.

c. <u>Natural gas contributed to resilience during emergencies.</u>

Back-up generation for electricity service disruptions is an important component of overall resilience from climate hazards. In most examples of back-up generation explored in the case studies, facilities successfully maintained power because of such investments. In particular, natural gas provides a cleaner source of fuel for back-up generators than diesel. Natural gas can be a reliable source of energy over long-term disruptions of electricity service (i.e., multiple days) when/during which current battery capacity for renewable systems may not be adequate. Diesel fuel supply can be interrupted by the very climate disasters that created the need for the use of generators. Compressed and liquefied natural gas-fueled vehicles can help to maintain functionality, especially when access to other fuel sources is disrupted. Natural gas generators can also power life-saving medical equipment.

d. <u>Natural gas supply is significantly more reliable than electricity supply.</u>

Two recent reports from the Natural Gas Council¹³ and Gas Technology Institute¹⁴ found that characteristics of natural gas's transmission and distribution infrastructure, such as greater storage capacity and underground assets, make natural gas a more reliable energy source than electricity. These reports conclude that only one in almost 800 gas customers experience service disruptions annually, whereas on average the typical electric customer will experience at least one outage per year. The economic impacts of disruptions to gas customers are insignificant when compared to those of electricity customers.

e. <u>Technology supported the resilience of natural gas service.</u>

SoCalGas has improved infrastructure resilience through utilizing technologies such as automatic pressure sensors, which detect leaks and immediately shut off flows for specific lines. SoCalGas' use of drones and satellite imagery has also been useful, providing visibility into areas inaccessible by personnel to closely assess damage. Satellite imagery was particularly helpful immediately following climate events, such as the Southern California mudslides when Federal

¹³ Natural Gas Council. *Natural Gas Systems: Reliable & Resilient*. July 2017. Available at: <u>http://www.ngsa.org/download/analysis_studies/NGC-Reliable-Resilient-Nat-Gas-WHITE-PAPER-Final.pdf</u>

¹⁴ Gas Technology Institute. *Assessment of Natural Gas and Electric Distribution Service Reliability*. July 2018. Available at: <u>https://www.gti.energy/delivering-quantitative-data-to-support-natural-gas-standby-and-emergency-generators/</u>

Aviation Administration restrictions prohibited flights to avoid conflict with first responders' rescue efforts.

f. <u>Clear communication and coordination between utilities across sectors and</u> with emergency personnel is critical to successful disaster response.

Emergency responses are most effective when there is clear communication and coordination between utilities across sectors and with emergency personnel. Access to gas infrastructure must be carefully coordinated when conditions are unsafe, and natural gas utilities must communicate the locations of their assets and potential risks to avoid further damage during response activities.

IV. Preliminary Key Results of ICF's Research on Climate Hazard's Impact on GHG and Criteria Pollutant Emissions and RG Production Potential

A. GHG Impacts from Wildfires in 2017 and 2018 in California

The estimate of GHG emissions impacts from wildfires in California includes emissions from combustion, or burning of forest biomass, and carbon sequestration losses to create a total estimate for GHG emissions from California's 2017-18 wildfires.

Key point: Net wildfire GHG emissions from these wildfires are estimated at a range of 250 to 700 MMTCO₂e, comparable to California's entire non-wildfire GHG emissions in 2016 (430 MMTCO₂e).¹⁵

B. Criteria Pollutant Emissions from Wildfires in 2017 and 2018 in California

Criteria pollution from California wildfires includes estimates of the total emissions of particulate matter (PM), carbon monoxide, volatile organic compounds,¹⁶ and nitrogen oxides.

Key point: PM emissions from these wildfires were roughly seven to 10 times the total emissions of PM from all on-road mobile sources in the state in 2017 and 2018. Based on these estimates, wildfires should be considered amongst the greatest threats to air pollution in California.

C. RG Potential from Gasifying Deceased Trees in California Forests

Key point: California's existing inventory of the annual supply of dead trees has the potential to produce 48 billion cubic meters (1.7 trillion cubic feet) of RG through gasification, nearly double SoCalGas' total gas demand in 2018¹⁷ and 80% of California's total natural gas consumption in 2017.¹⁸ While there is currently little infrastructure to support dead tree thermal conversion, this process could offer considerable benefits for wildfire prevention and recovery, renewable energy

¹⁵ California Air Resources Board Website. California's Greenhouse Gas Emission Inventory -2019 Edition. Accessed June 26, 2019. Available at: <u>https://ww3.arb.ca.gov/cc/inventory/data/data.htm</u> ¹⁶ Veletile ergenia compounds reported as methane.

¹⁶ Volatile organic compounds reported as methane.

¹⁷ SoCalGas Website. California Gas Report. 2018. Available at: <u>https://www.socalgas.com/regulatory/cgr.shtml</u>

¹⁸ U.S. Energy Information Administration. Natural Gas Consumption by End Use. 2019. Available at: <u>https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm</u>

generation, and GHG emission and air pollution reductions. See Appendix B for more information.

V. Conclusion

SoCalGas appreciates the opportunity to submit comments in response to the joint agency Workshop on Climate Adaptation and Resiliency in California's Energy Sector. California *must* maintain diversity in the state's energy portfolio and *must not* preclude solutions to adapt to and mitigate the impacts of climate change, including utilizing existing infrastructure and supporting the RG and hydrogen markets. Additionally, ICF's research demonstrates the importance of natural gas infrastructure in the face of natural disasters. Please do not hesitate to contact us for more information as we are eager to be included in the conversation.

Sincerely,

/s/ Tim Carmichael

Tim Carmichael Agency Relations Manager Southern California Gas Company

Encl.

APPENDIX A

Our lives depend on electricity. But what happens when the power goes off?

Recent history shows it's best not to put all our eggs in one basket.

Oct 2017 Northern California Fires

Electric power outages left water valves open leading to major leaks and loss of critical resources.

Emergency deliveries of compressed and liquified natural gas ensured the power stayed on at local hospitals affected by electricity outages.

When the electricity goes down, natural gas keeps the power on.

Dec 2017 - Jan 2018 Southern California Fires & Mudslides

When electric water pumps failed, firefighters ran out of water to put out the fires.

SoCalGas' Advanced Meter network supported life-saving actions of first responders by pinpointing impacted areas.

Hurricane Harvey

Submerged electric substations left over 250,000 people without power, in some places for up to two weeks.

Hospitals with natural gas powered Combined Heat and Power (CHP) Systems maintained uninterrupted service despite historic flooding.

Sep 2017 Hurricane Irma

Loss of electricity at nursing homes led to heat exposure and caused 12 deaths.

Local hospitals and businesses with natural gas backup generators kept AC and refrigeration working, saving both lives and livelihoods.

Here's what you can do to prepare your community.

Communities over-reliant on the electric grid risk losing critical tools needed for emergency response.

Natural gas gives communities the resiliency to respond to nature's worst disasters.



Comply with SB 379 and include climate adaptation strategies in your General Plan Keep utilities in the know about goals and timelines for planning projects Assess critical infrastructure systems for vulnerabilities and interconnections

Work with utilities to deploy advanced monitoring technology & streamline safety-related infrastructure maintenance Consider adopting CNG/RNG fleets and fueling stations Encourage use of gas-fired distributed generation to reliably power CHP, fuel cells, and water pumps

Incentivize development of RNG-powered Microgrids and island-able blackstart technologies at hospitals, schools, and community centers Invest in gas-powered back-up generators in case of emergencies Support a diverse energy portfolio to mitigate the risks of a singular energy solution

APPENDIX B

In 2018, wildfires released 15% of California's greenhouse gas (GHG) emissions.¹

The state's 147 million+ dead trees are kindling for future wildfires.²

Today, some of these trees are being burned as a feedstock (biomass) to generate electricity in waste-to-energy plants.

We need a better, more sustainable solution.

Inefficiency: The process to produce electricity from the woody biomass has about a 30% yield, so producing electricity is not the highest, most beneficial use of this feedstock.³

Inability to Cycle with the Grid: These facilities do not integrate with today's modern, increasingly renewable grid. The electricity produced cannot ramp up and down quickly to meet demand.⁴

Jobs: Biomass electricity is not competitive, resulting in plant closures and job loss that is hurting local economies.³

Thermal Conversion can turn millions of dead trees into renewable natural gas (RNG)

How it works:

It's not combustion-in other words, there's no burning.

Thermal conversion works like your steam cooker at home. The dead trees are fed into the converter with a small amount of oxygen and heated. The high temperature in the converter cooks and breaks the dead trees—also called woody biomass—down into hydrogen and carbon. These gases are processed and conditioned into RNG that can be stored in our existing pipelines.





The benefits are clear:

- Reduces criteria pollutants from existing biomass facilities by 99%.³
- The process has a 65-70% yield—more than 2x as efficient as electric generation from woody biomass.³
- Provides a more flexible, reliable source of renewable energy (RNG) that can be stored for use when and where people need it.
- Produces a significant feedstock for RNG, which could help meet California's 2030 and 2045 clean energy goals.
- Reduces the risk of future wildfires and associated black carbon emissions.
- Some thermal conversion processes produce biochar, an organic fertilizer that reduces the environmental impact of agriculture practices.

Be a part of the solution and get ahead of the issue.

- · Expand the definition of biogas to include renewable gas produced through thermal conversion.
- · Evaluate opportunities to re-purpose existing waste-to-energy facilities to produce RNG.
- · Explore opportunities to build new thermal conversion plants to mitigate wildfire risks.
- Use the Greenhouse Gas Reduction Fund (GGRF) to finance thermal conversion technology demonstration projects.



1. U.S. Department of the Interior, "New Analysis Shows 2018 California Wildfires Emitted as Much Carbon Dioxide as an Entire Year's Worth of Electricity," November 30, 2018. / 2. Stephanie Gomes, Tree Mortality Information Officer, U.S. Department of Agriculture Forest Service, "Survey Finds 18 Million Trees Died in California in 2018: Forest Health Top Priority for USDA Forest Service and CAL FIRE," February 11, 2019. / 3. "Low-Carbon Renewable Natural Gas (RNG) from Wood Waste," Gas Fechnology Institute (GTI), February 2019. / 4. "Optionality, Flexibility & Innovation: Pathways for Deep Decarbonization in California," Energy Futures Initiative (EFI), May 2019. © 2019 Southern California Gas Company. Trademarks are property of their respective owners. All rights reserved.