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*Comment Received From: Southern California Gas Company*  
*Submitted On: 11/15/2019*  
*Docket Number: 19-IEPR-08*

**SocalGas Comments on AB 1257-The Natural Gas Act**

*Additional submitted attachment is included below.*

## **EXECUTIVE SUMMARY**

Assembly Bill 1257, the Natural Gas Act Comment Letter to the California Energy Commission  
in Response to October 30, 2019 IEPR Workshop

## **BACKGROUND**

Southern California Gas Company (SoCalGas) submits comments in response to the California Energy Commission's (CEC) 2019 Integrated Energy Policy Report (IEPR) Workshop on Revised Natural Gas Price Forecast and Draft Natural Gas Outlook/Electricity Modeling and Results (Workshop) held on October 30, 2019.

During the Workshop, the CEC provided an update on how it is complying with the requirements of Assembly Bill 1257, the Natural Gas Act (AB 1257), which requires the CEC to develop a report every four years concurrent with the preparation of the IEPR that identifies strategies to maximize the benefits obtained from natural gas, including biomethane.<sup>1</sup> Just last year, the California Legislature and the Governor reaffirmed the CEC's obligation to comply with all of the items in AB 1257 for two more report cycles and to prepare a report that lays out strategies and options for how to best utilize the natural gas system for the benefit of all Californians.<sup>2</sup>

SoCalGas submitted comments earlier this year noting the CEC's failure to solicit public and stakeholder input under AB 1257 and its concerns that the CEC was not fully complying with the statute. The CEC's compliance approach this year is in stark contrast to its approach four years ago, since the CEC has not solicited public feedback, held any AB 1257 specific workshops, nor gathered any input to inform the development of the required AB 1257 Report.<sup>3</sup> Instead, CEC staff presented a bulleted list of existing programs during the Workshop and stated their intent to include an appendix in the IEPR. It is evident the CEC has given little consideration to meeting the statutory requirements of AB 1257, i.e., to meaningfully identify strategies and options to maximize the benefits obtained from natural gas and renewable natural gas (RNG).

SoCalGas believes that the CEC's approach undermines the Legislature's intent to maximize the benefits of natural gas and RNG for Californians. The development of a comprehensive AB

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<sup>1</sup> California Legislative Information. AB-1257 Energy: State Energy Resources Conservation and Development Commission: natural gas. Available at: [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB1257](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1257)

<sup>2</sup> The Natural Gas Act was amended by Senate Bill (SB) 1374, which instates a sunset date for AB 1257. SB 1374 does not change or void any of the statutory requirements mandated by AB 1257.

<sup>3</sup> CEC. Workshops, Meetings, and Request Comments for the 2019 Integrated Energy Policy Report Proceeding. Available at: [https://ww2.energy.ca.gov/2019\\_energy\\_policy/documents/](https://ww2.energy.ca.gov/2019_energy_policy/documents/)

1257 report merits further attention from the CEC and could make the debate more balanced and comprehensive. Instead, at present, the CEC appears to be pursuing a policy of all-electrification based on marshaling one-sided stakeholder participation and commissioning studies to support pre-determined conclusions. Provided below is a brief overview of the comment letter and supporting information SoCalGas is submitting to the CEC.

## **COMMENT LETTER**

The comment letter describes that the CEC appears to dismiss the overwhelming evidence of the benefits of natural gas as a clean, reliable, and cost-effective source of energy. SoCalGas also notes that the CEC's stated approach to AB 1257 falls short of what the statute requires, and we then explain those shortcomings. In support of these points, SoCalGas states that while CEC staff highlighted legislation focused on meeting greenhouse gas (GHG) emissions targets and Renewables Portfolio Standard (RPS) requirements, meeting these targets is not a valid justification for dismissing what the CEC is required to do by AB 1257; as the goals are not mutually exclusive. The CEC thus should not focus on strategizing how to eliminate the natural gas system but rather strategize on how natural gas infrastructure can be leveraged to meet climate goals and also address concerns with energy reliability, resiliency, and affordability. There is a strong need for creative solutions to integrate renewables, increase the electric system's flexibility, and maintain system reliability. Natural gas, RNG, and hydrogen are key flexible energy sources that the CEC must acknowledge is necessary to provide millions of Californians reliable and resilient energy. Moreover, natural gas infrastructure and storage are becoming increasingly important to resilience, a critical component of any energy supply strategy and one that is gaining momentum in the context of today's increased wildfire risk and other climate-driven natural disasters. We also quote members of the California Public Utilities Commission (CPUC) who have recognized the need to consider all energy source options from the standpoint of environmental impact, affordability, and reliability. The comment letter then walks through each of the 10 statutory requirements, proposing strategies and options to maximize the benefits of natural gas and renewable natural gas (summarized below) and provides evidence to challenge the CEC's conclusions.

The comment letter also criticizes the CEC's apparent push toward all-electrification and asks the CEC to recognize the positive role that natural gas and RNG will play in a decarbonized future. Electrification of end uses is not mandated by law. It is also not the only nor the best solution or pathway to achieve California's climate and air quality goals. We therefore explain that if the CEC prematurely makes choices that support one pathway to achieve California's climate goals, it may inadvertently discourage new technologies, create problems with the reliability and resilience of the energy grid, and increase costs for Californians in the midst of an affordable housing crisis. And we explain why the CEC's compliance approach is not in accord with the intent and purpose of AB 1257, and with other state policies and regulations promoting balanced energy policy. We ask the CEC to reconsider its position, carry out its duties under the Natural Gas Act fully and impartially, and re-evaluate its in favor of all-electrification.

## **SUPPORTING INFORMATION**

SoCalGas's comment letter has two attachments: Appendix A and B. Appendix A lists all of the comment letters SoCalGas has submitted to the CEC in the past couple of years highlighting the benefits of natural gas and RNG, including affordability, reliability, resiliency, customer choice, and GHG and criteria air pollutant emissions reduction.

Appendix B provides comprehensive input on the strategies and options that the CEC should consider under each of the 10 issue areas identified by AB 1257, and that will support the State in realizing the environmental and cost benefits afforded by the use of natural gas and RNG as part of a long-term, diverse energy portfolio. Below is an outline of the information included in Appendix B.

### **1. Making the best use of natural gas as a transportation fuel**

- The CEC should continue to encourage the use of RNG as a transportation fuel by providing incentive funding for natural gas trucks and supporting infrastructure.
- Heavy-duty trucks contribute substantially to smog-forming and GHG emissions, and using low NO<sub>x</sub> trucks fueled by RNG is necessary to meet air quality requirements as well as California's GHG emissions reduction goals.
- RNG has a lower carbon intensity (CI) relative to electric heavy-duty vehicles and can reduce petroleum dependency.
- In addition to heavy-duty trucking, natural gas is a viable option for other transportation sectors, including marine vessels.

### **2. The role of natural gas in maintaining electric reliability**

- Natural gas-fired generation provides operational flexibility and stability during electric grid fluctuations resulting from intermittent renewable energy sources. As such, the CEC must consider the role natural gas plays as a flexible, grid stabilizing energy source in light of the growing reliance on intermittent resources.
- Natural gas-fired power generation should be optimized as it is essential for maintaining electric reliability. Overinvestment in building new electric infrastructure or importing electricity will jeopardize affordable electricity rates.
- Given the importance of natural gas generation in maintaining electric, the CEC must support Carbon Capture Utilization and Storage (CCUS) technologies since this technology will be key in meeting climate targets.
- Natural gas-powered distributed generation resources, like combined heat and power (CHP) systems, natural gas microturbines, and fuel cells, offer energy cost savings, reduced peak electricity demand on grid, leverages existing infrastructure, avoids expensive electric distribution additions, reduces GHG and criteria air emissions.
- Unlike battery storage, local natural gas generation is capable of adequately responding to peak demand or outages that do not deplete or have diminished

performance over time or are dependent on unpredictable weather and atmospheric conditions (e.g. smoke).

**3. Taking the best advantage of natural gas, RNG, and hydrogen as a low-emission resource**

- The CEC should continue to support projects that advance low-emission resource benefits such as those obtained from RNG, hydrogen, and power-to-gas.
- Sufficient RNG supplies are available to offset the use of fossil-based natural gas; but policy support is necessary to advance both in- and out-of-state RNG projects.
- The CEC should support technologies that gasify deceased trees in the state's forests to create RNG, as this process could offer considerable benefits for wildfire prevention and recovery, renewable energy generation, and GHG and criteria air pollutant emission reductions.
- The CEC should promote the production of hydrogen produced via low- to zero-carbon pathways.
- The CEC should support the use of RNG and hydrogen in the industrial sector as it is one of the most difficult to decarbonize sectors.

**4. Optimizing the role of natural gas for end uses**

- RNG can supplement the use of natural gas and reduces emissions in sectors that are otherwise difficult to electrify, including heavy-duty transportation; certain residential and commercial end uses, such as cooking and existing space and water heating; and certain industrial end uses, such as process heating.
- Energy efficiency measures should not be discounted by the CEC as an effective strategy to achieve near-term climate goals while still optimizing the role of natural gas as a flexible and convenient end-use energy source.

**5. Electric and natural gas industries should work together to ensure reliability**

- The CEC should take a holistic energy system approach in pursuing a decarbonization strategy that preserves customer choice and utilizes the resources known to work in tandem with electrification efforts to mitigate climate change.
- The CEC should support power-to-gas and fuel cell technologies to allow the electric and natural gas industries to work together to optimize the natural gas system's role in delivering reliable energy.

**6. Determine a long-term policy to ensure adequate infrastructure and storage**

- The natural gas system is critical for providing safe and reliable energy. The CEC must consider the resilience and operational flexibility of natural gas infrastructure when making long-term policy.
- The CEC's policies must halt its current path in undermining long-term investment in natural gas infrastructure. The CPUC has re-affirmed natural gas infrastructure is necessary.

- The CEC must promote policies that maintain, not eliminate, adequate natural gas infrastructure and support modernization efforts to reduce upstream emissions.
- Independent analysis conducted by the California Council of Science and Technology affirms the importance of underground storage for energy reliability. The CEC must consider this when developing policy recommendations for natural gas storage.

**7. The role of natural gas in zero net energy (ZNE) buildings**

- The CEC should continue to support and fund projects that advance the low-emission resource benefits obtained from using natural gas and RNG in buildings.
- SoCalGas' support of the development of advanced, high-efficiency energy systems for a variety of different buildings and uses shows the positive role of natural gas in moving toward ZNE buildings.

**8. Natural gas and RNG facilitate jobs development**

- Innovation is key to reducing the cost of decarbonization for manufacturing processes in California, perhaps more than in any other sector. The CEC must support an "all of the above" approach with maximum flexibility and technology-neutral policies in order to spur emissions reductions for California's diverse industrial sector.
- Natural gas and RNG benefit jobs development in the private sector, including in heavy-duty transportation and potentially in the industrial and agricultural sectors.

**9. State and federal policy support can facilitate development of natural gas and RNG strategies**

- The CEC should support policies to help renewable gas achieve parity with other renewable technologies.
- The CEC must make policy recommendations that promote the in-state production and distribution of RNG and hydrogen, including a program specifically designed to incentivize residential customers and developers to use RNG.
- The use of power-to-gas as a viable solution to the State's long-term clean energy storage problem should be accelerated.

**10. Evaluate the economic costs and environmental impacts of proposed natural gas strategies**

- When considering the relative benefits and disadvantages of the cost of natural gas strategies and systems, the CEC should fairly and comprehensively compare electric costs, including the significant infrastructure investments required to build new electric transmission and distribution systems and to protect against wildfires.
- In order to fully evaluate the beneficial and adverse environmental impacts of the natural gas system, the CEC should perform a fair and comprehensive assessment of the electric grid in order to have a neutral and balanced comparison.



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November 15, 2019

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

**Subject:** Comments in Response to October 30, 2019 IEPR Workshop, Docket #19-IEPR-08

Dear Commissioners:

I write on behalf of Southern California Gas Company (SoCalGas) in response to the California Energy Commission's (CEC) 2019 Integrated Energy Policy Report (IEPR) Workshop on the Revised Natural Gas Price Forecast and Draft Natural Gas Outlook/Electricity Modeling and Results (Workshop) held on October 30, 2019. SoCalGas appreciates the State of California's bold attempts to address climate change and wants to be a key partner in helping lead the way to significant reductions in greenhouse gas (GHG) emissions. SoCalGas believes that a portfolio approach, utilizing all energy sources and technologies to meet our climate goals, will best serve Californians and those that follow our lead. Natural gas and renewable gases (such as hydrogen, synthetic natural gas, biomethane, or renewable natural gas (RNG)) are clean, reliable, affordable, and resilient sources of energy that should be part of the *solution* to California's energy concerns.

The Natural Gas Act requires the CEC to "*identify strategies to maximize the benefits obtained from natural gas, including biomethane... as an energy source, helping the state realize the environmental and cost benefits afforded by natural gas*" (emphasis added).<sup>1</sup> The Act requires the CEC to thoroughly analyze and develop natural gas policy, and to produce a report to inform the use of natural gas across multiple sectors of the economy. Just last year, the California Legislature and the Governor reaffirmed the CEC's obligation to comply with all of the items in AB 1257 for two more report cycles and to prepare a report that lays out strategies and options for how to best utilize the natural gas system for the benefit of all Californians. The CEC has a legal mandate to comply with AB 1257, which is a bill that was affirmed by a near unanimous legislature and supported by a broad consensus of stakeholders representing industry, environmental, and health organizations (e.g. The Environmental Defense Fund, Los Angeles

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<sup>1</sup> FindLaw. California Public Resource Code. Section 25303.5(b). Available at: <https://codes.findlaw.com/ca/public-resources-code/prc-sect-25303-5.html>



Conservation Corps, Breathe California, American Lung Association (CA), Waste Management, Orange County Business Council, Los Angeles County Business Federation, California Chamber of Commerce, and more).<sup>2</sup> The CEC must recognize this consensus around the need to strategize how natural gas and RNG can help the State achieve its climate and air quality goals.

SoCalGas submitted comments earlier this year noting the CEC's failure to solicit public and stakeholder input under AB 1257 and its concerns that the CEC was not fully complying with the statute.<sup>3</sup> These concerns have not been allayed by the October 30 Workshop, nor by the subsequent issuance of the draft IEPR. During that Workshop, the CEC stated that it is complying with the requirements of AB 1257, but its work to date falls far below the level that the Natural Gas Act requires. In previous report cycles, the CEC itself recognized the robust effort required by AB 1257, holding a series of workshops specifically designed to gather stakeholder information and feedback and then issuing a comprehensive, free-standing report.<sup>4</sup> The CEC's compliance approach this year is in stark contrast, since the agency has not solicited public feedback, held AB 1257-specific workshops, nor gathered any input to inform the development of the required AB 1257 report.<sup>5</sup> Instead, the CEC appears to be relying on a bulleted list of existing programs presented by CEC staff during the Workshop and has elaborated on this list in an appendix in the 2019 IEPR as satisfying its obligations under the statute. It is evident the CEC has given little consideration to meeting the statutory requirements of AB 1257, i.e., to meaningfully identify strategies and options to maximize the benefits obtained from natural gas and RNG. SoCalGas believes that the CEC's approach undermines the Legislature's intent to maximize the benefits of natural gas and RNG for Californians. Development of a comprehensive AB 1257 Report merits further attention by the CEC.

Moreover, this dismissive approach to AB 1257 appears to be driven by a non-statutory policy disfavoring natural gas. During the Workshop, CEC staff highlighted legislation they interpreted as affecting AB 1257 requirements, namely policies that are focused on meeting GHG emissions targets and Renewables Portfolio Standard (RPS) requirements; but meeting those targets is not a valid justification for dismissing the requirements of the Natural Gas Act, which are in accord with other State policies promoting a balanced energy approach that addresses reliability, resilience, and affordability. The climate change policies highlighted by the

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<sup>2</sup> California Legislative Information. AB 1257 Bill Analysis. Senate Floor Analyses. September 11, 2013. Available at:

[https://leginfo.ca.gov/faces/billAnalysisClient.xhtml?bill\\_id=201320140AB1257#](https://leginfo.ca.gov/faces/billAnalysisClient.xhtml?bill_id=201320140AB1257#)

<sup>3</sup> SoCalGas Comments. 2019 Integrated Energy Policy Report (IEPR) Commissioner Workshop on Preliminary Natural Gas Price Forecast and Outlook. May 6, 2019. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=228064&DocumentContentId=59345>

<sup>4</sup> CEC. Docket Log 15-IEPR-04. AB 1257 Natural Gas Act Report. Workshop Materials. 2015. Available at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-IEPR-04>

<sup>5</sup> CEC. Workshops, Meetings, and Request Comments for the 2019 Integrated Energy Policy Report Proceeding. Available at: [https://ww2.energy.ca.gov/2019\\_energypolicy/documents/](https://ww2.energy.ca.gov/2019_energypolicy/documents/). No AB 1257-specific workshops were held.

CEC do not mandate electrification as the only nor the best way to meet the State's goals. Instead of pursuing an all-electrification approach and strategizing how to eliminate the natural gas system, the CEC should focus on how existing infrastructure can be leveraged both to meet our climate goals and to address the State's valid concerns with energy reliability, resiliency, and affordability.

In light of the substantially higher risk of climate-driven wildfires affecting thousands throughout the state, providing reliable and resilient energy to the residents of California is paramount. During extreme weather or wildfire conditions, electric utilities are increasing the number of Public Safety Power Shutoff (PSPS) events to mitigate wildfire risk and keep communities safe. In the wake of this, Governor Newsom launched a \$75 million Local Government PSPS Resiliency Program to support state and local government efforts to mitigate the impact of power shutoffs by supporting continuity of operations and efforts to protect public health, safety, and commerce in affected communities.<sup>6</sup> Further, in response to the Governor's call to reform PSPS rules and regulations,<sup>7</sup> the California Public Utilities Commission (CPUC) announced it intends to take actions focused on public health and safety to drive down risk of ignitions from utility infrastructure, risks that result from power loss, and the disruption to communities and commerce<sup>8</sup>, and has opened an investigation to examine the recent PSPS events and ensure utilities are held accountable for their actions during these events.<sup>9</sup>

Resilience—or the capacity to tolerate disturbance and continue to deliver energy services to customers—is a critical component of any energy supply. The ability to continue operations unaffected by climate events, such as wildfires, and to quickly resume service is a significant

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<sup>6</sup>Office of Gavin Newsom. Governor Newsom Launches \$75 Million Program for State and Local Governments to Mitigate Impacts of Power Shutoffs. October 25, 2019. Available at: <https://www.gov.ca.gov/2019/10/25/governor-newsom-launches-75-million-program-for-state-and-local-governments-to-mitigate-impacts-of-power-shutoffs/>

<sup>7</sup>Office of Governor Gavin Newsom. Governor Newsom on Major CPUC Investigation Into Utility Power Shutoffs. October 28, 2019. Available at: <https://www.gov.ca.gov/2019/10/28/governor-newsom-on-major-cpuc-investigation-into-utility-power-shutoffs/>

<sup>8</sup> CPUC. Press Release. CPUC Takes Additional Decisive Actions to Hold Utilities Accountable and Increase Public Safety. October 28, 2019. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M318/K885/318885370.PDF>

<sup>9</sup> CPUC. Press Release. CPUC Takes Action to Hold Communications Companies Accountable and Increase Public Safety. November 13, 2019. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K815/319815205.PDF>

factor. Natural gas performs highly in this regard.<sup>10,11</sup> It is of utmost importance that the CEC considers how to maximize the resilience and operational flexibility benefits of the natural gas system to enhance the reliability and resiliency of the state's energy supply (e.g. fuel distributed generation systems such as fuel cells to power microgrids). Diversity in the state's energy portfolio is important for prudent risk management to support resilient energy infrastructure. The State must leverage its existing energy infrastructure, technological expertise, and skilled workforce to maintain resilience and reliability while transitioning to a deeply decarbonized economy and mitigating the impacts of climate change.

Indeed, members of the California Public Utilities Commission (CPUC) have recognized the need to consider all energy source options from the standpoint of environmental impact, affordability, and reliability, including the potential to use RNG in buildings. As Commissioner Shiroma explained: "We do not yet in 2019, have [a] 24-hour source of electricity that is reliable, even, sustainable, and so forth... Currently, we have a gas system that is very essential for sustainability for our hospitals, for our low-income customers, for our med [medical] rate customers, and so forth."<sup>12</sup> CPUC Deputy Director for Energy and Climate Policy, Edward Randolph, recently noted: "Given the role methane plays in short-lived climate pollutants, it may be critical that the state agencies and industry find a way to make renewable natural gas affordable in playing a role in transportation and/or building sectors."<sup>13</sup> Like the CPUC, the CEC should recognize the positive role that natural gas and RNG will play in a decarbonized future, rather than dismiss these energy sources.

SoCalGas submits this letter and supporting information in support of its request that the CEC reconsider its approach to compliance with the Natural Gas Act, consider fully and impartially and even-handed evidence and viewpoints, and re-evaluate its stance in favor of all-electrification in light of the overwhelming evidence that natural gas plays an important role in achieving a reliable, resilient, and cost-effective energy supply for Californians.

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<sup>10</sup> Natural Gas Council. *Natural Gas Systems: Reliable and Resilient*. July 2017. Available at: <https://tinyurl.com/y7ffswse>

<sup>11</sup> Natural Gas Council. *Report: Weather Resilience in the Natural Gas Industry*. August 6, 2018. Available at: [www.naturalgascouncil.org/weather-resilience-in-the-natural-gas-industry/](http://www.naturalgascouncil.org/weather-resilience-in-the-natural-gas-industry/)

<sup>12</sup> California Public Utilities Commission (CPUC) Voting Meeting. September 12, 2019. Commissioner Shiroma's comments start at time 2:20. Available at: [http://www.adminmonitor.com/ca/cpuc/voting\\_meeting/20190912/](http://www.adminmonitor.com/ca/cpuc/voting_meeting/20190912/)

<sup>13</sup> ADMINMonitor. CPUC Commission Meeting. September 12, 2019. CPUC Deputy Executive Director Edward Randolph comments. Available at: [http://www.adminmonitor.com/ca/cpuc/voting\\_meeting/20190912/](http://www.adminmonitor.com/ca/cpuc/voting_meeting/20190912/)

**1) THE CEC’S COMPLIANCE APPROACH IS NOT IN ACCORD WITH THE INTENT AND PURPOSE OF AB 1257**

**a) The CEC has dismissed the overwhelming evidence of the benefits of natural gas and RNG for Californians**

SoCalGas supports the State of California’s and the CEC’s efforts to meet ambitious climate goals and to decarbonize the State’s economy. **But decarbonization should not be conflated with all-electrification.** An all-electrification pathway is not the best, nor the only route, to decarbonization. The CEC has the unique opportunity to recognize the potential for natural gas and RNG to aid the State in meeting its climate goals. Natural gas has played a role in improving air quality, particularly in electric generation as natural gas has replaced coal.<sup>14</sup> The use of natural gas as a low-carbon fuel<sup>15</sup> can continue to contribute significant benefits by reducing emissions of both GHGs and criteria air pollutants. Moreover, the incorporation of even relatively modest amounts of RNG as an alternative energy source has the potential to dramatically decrease GHG emissions at a much lower cost than other approaches, including all-electrification. In fact, replacing less than 20% of traditional natural gas with RNG can achieve GHG emissions reductions equivalent to converting 100% of buildings to electric-only energy by 2030, *at a significantly lower cost* and with less disruption to consumers.<sup>16</sup> It is important to highlight that AB 1257 requires the CEC to identify ways to maximize RNG in particular as an energy source. However, during the Workshop, CEC staff failed to specify how to leverage RNG beyond existing efforts by other agencies to meet climate goals.

Rather than objectively evaluating all energy sources and complying with its statutory mandates under AB 1257 to “identify strategies to maximize the benefits obtained from natural gas, including biomethane,”<sup>17</sup> the CEC is favoring a single-source energy system, through all-electric buildings and is supporting research calling for the elimination of the natural gas system. SoCalGas has provided the CEC many comment letters, reports, and studies over the past couple of years highlighting the benefits of natural gas and RNG, including affordability, reliability, resiliency, customer choice, and GHG and criteria air pollutant emissions reduction; these comments are collected in Appendix A. But the CEC, as shown by its superficial effort to

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<sup>14</sup> Congressional Research Service. “U.S Carbon Dioxide Emissions in the Electricity Sector: Factors, Trends, and Projections,” at p. 8-9. January 7, 2019. Available at: <https://fas.org/sgp/crs/misc/R45453.pdf>.

<sup>15</sup> California Air Resources Board (CARB). Low-carbon Fuel Standard (LCFS) Pathway Certified Carbon Intensities. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm>

<sup>16</sup> Navigant Consulting. *Analysis of the Role of Gas for a Low-Carbon California Future*. July 24, 2018. Available at: [https://www.socalgas.com/1443741887279/SoCalGas\\_Renewable\\_Gas\\_Final-Report.pdf](https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf)

<sup>17</sup> FindLaw. California Public Resource Code. Section 25303.5(b). Available at: <https://codes.findlaw.com/ca/public-resources-code/prc-sect-25303-5.html>

comply with AB 1257, has dismissed or ignored this overwhelming evidence of the benefits of natural gas and RNG to Californians. That the natural gas system has “environmental and cost benefits” for Californians is a determination already made by the Legislature that should not be re-written by the CEC. The CEC’s policy shift has not been the subject of comprehensive and balanced research and analysis, nor is it consistent with other legislative mandates, such as the legislation that created and gives authority to the CEC—The Warren Alquist Act (Act). The Act states that the CEC “shall conduct an ongoing assessment of the opportunities and constraints presented by all forms of energy, to *encourage the balanced use of all sources of energy* to meet the state’s needs, and to seek to *avoid possible undesirable consequences of reliance on a single source of energy*” (emphasis added).<sup>18</sup> The CEC’s all-electric approach and failure to fully comply with AB 1257 is a violation of what the CEC was mandated to do by the Legislature since its inception: develop balanced energy policy.

**b) The CEC’s compliance approach falls short of what AB 1257 requires**

The CEC has not meaningfully identified strategies and options to maximize the benefits obtained from natural gas and RNG. Earlier this year, SoCalGas participated in a call with CEC staff to discuss progress on the development of the AB 1257 Report.<sup>19</sup> During this call, staff were not prepared to discuss strategies that would make the best use of natural gas and RNG as an energy source – the heart of compliance with AB 1257. The Workshop continued this trend, suggesting that compliance with the statute may be satisfied with a bullet-point list of existing programs, later folded into an appendix to the 2019 IEPR – but this does not come close to meeting the mandate to develop and propose forward-looking strategies and proposals for maximizing the beneficial use of natural gas and RNG. In Appendix B, SoCalGas provides comprehensive input on strategies and options for each of the 10 areas identified by statute that the CEC must “at a minimum” address. Below we highlight some of these strategies and options and for reference insert the statutory language for each issue area the CEC is obligated to address.

**i) Making the best use of natural gas as a transportation fuel**

*Statute: Making the best use of natural gas as a transportation fuel, as appropriate, including for movement of freight, vessels, mass transit, and other commercial and passenger vehicle use and identifying methods to develop natural gas refueling infrastructure.*

At the September 11, 2019 CEC Business Meeting, the Commissioners approved the 2019-2020 Investment Plan for the Clean Transportation Program (Investment Plan) which shifts all

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<sup>18</sup> CEC. Warren Alquist Act. 2019 Edition. Available at:

<https://ww2.energy.ca.gov/2019publications/CEC-140-2019-001/CEC-140-2019-001.pdf>

<sup>19</sup> SoCalGas participated in a call with CEC staff, Jennifer Campagna and Le-Quyen Nguyen, to discuss AB 1257 requirements on August 26, 2019.

funding to support zero-emission transportation technologies, eliminates funding for near-zero emission natural gas vehicles, and does not allocate funding specifically for RNG production. Instead of cutting this funding, the CEC should support this technology and its inherent GHG emissions reductions and ambient air quality benefits.

The use of RNG as a transportation fuel, particularly in the heavy-duty sector, significantly reduces GHG emissions since RNG has a lower carbon intensity (CI) relative to electric heavy-duty vehicles.<sup>20</sup> RNG can have a low CI or even negative CI depending on the feedstock and conversion system.<sup>21</sup> Although the CEC recognizes that state policies have driven the share of RNG in California's transportation sector natural gas supply from 10% in 2013 to 70% in 2018,<sup>22</sup> this does not address the *number of vehicles* using natural gas as a transportation fuel. Between 2013 and 2017, GHG emissions in the transportation sector increased each year, despite advances in technologies and substantial incentive funding spent by the State.<sup>23</sup> And GHG emissions from heavy-duty trucks, which account for 20% of those emissions, have also increased each year.<sup>24</sup> Furthermore, since diesel remains the predominant fuel used for heavy-duty trucking, incentives are necessary to drive the continued fleet transition. For heavy-duty trucks, RNG provides a 51% decrease in GHG emissions compared to diesel.<sup>25</sup> In the absence of incentive funds, fleets would likely not have adopted natural gas at all and would likely revert back to diesel. The CEC should be on the forefront of the transition away from diesel and other petroleum-based fuels and must continue to support the use of natural gas and RNG in the transportation sector.

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<sup>20</sup> CI is expressed in grams of carbon dioxide (CO<sub>2</sub>) equivalent per megajoule (g CO<sub>2</sub>e/MJ) of energy provided by that fuel, and takes into account the GHG emissions associated with all the steps of producing, transporting, and consuming a fuel—also known as a complete life cycle of that fuel. Source: CARB. LCFS Presentation. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/background/basics-notes.pdf>

<sup>21</sup> This includes anaerobic digestion of manures, food scraps, or biosolids, with a subsequent gas upgrading system to produce RNG.

<sup>22</sup> CEC. 2019 IEPR Commissioner Workshop on Revised Natural Gas Price Forecast and Draft Outlook/Electricity Modeling and Results. Staff Presentation on AB 1257. October 30, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230388&DocumentContentId=61943>

<sup>23</sup> CARB. California Greenhouse Gas Emissions from 200 to 2017. 2019 Edition. Available at: [https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000\\_2016/ghg\\_inventory\\_trends\\_00-16.pdf](https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf)

<sup>24</sup> CARB. Greenhouse Gas Emission Inventory - Query Tool for years 2000 to 2017 (12th Edition). Available at: [https://www.arb.ca.gov/app/ghg/2000\\_2017/ghg\\_sector.php](https://www.arb.ca.gov/app/ghg/2000_2017/ghg_sector.php)

<sup>25</sup> *Ibid*



**ii) The role of natural gas in maintaining electric reliability**

*Statute: Determining the role of natural gas-fired generation as part of a resource portfolio, including, but not limited to, combined heat and power, and the impact of that role on meeting greenhouse gas targets.*

During the Workshop, CEC staff listed several CPUC decisions and programs that highlight natural gas' critical role in maintaining electric reliability. But the Natural Gas Act requires more from the CEC than just pointing at a couple of existing programs. There is a strong need for creative solutions to integrate renewables, increase the electric system's flexibility, and maintain system reliability through a "resource portfolio" that includes a role for natural-gas fired generation. The CEC should develop policy recommendations that support the use of natural gas and RNG as key flexible energy sources that are critical to a reliable system. Instead, the CEC is backing skewed research it commissioned from Energy and Environmental Economics, Inc. (E3), which recommends a "gas transition" strategy.<sup>26</sup> SoCalGas' comments on E3's research are provided in a separate letter.<sup>27</sup> But eliminating the natural gas system is not the only nor the best way to reduce GHG emissions, and it could, among other things, lead to problems with reliability and resiliency, as evidenced by the recent blackouts imposed due to wildfire risk; exacerbate California's affordable housing crisis;<sup>28</sup> impact affordability of electricity rates; and inadvertently discourage new technologies. For example, Germany embarked on an ambitious plan more than 15 years ago to shift away from fossil fuels and towards renewable energy resources. However, Germany is not on track to meet its GHG emission reduction goals,<sup>29</sup> which is a wake-up call for governments everywhere who should reconsider their energy policy strategies and re-assess the impact their policy decisions could have on energy reliability and the environment.<sup>30</sup>

Natural gas-fired power generation provides safe, reliable electricity at affordable rates to millions of Californians and it is essential for maintaining electric reliability as the California

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<sup>26</sup> CEC. E3. *Natural Gas Distribution in California's Low-Carbon Future*. October 2019. Available at: <https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/index.html>

<sup>27</sup> SoCalGas comments. E3's *Natural Gas Distribution in California's Low-Carbon Future*. November 13, 2017. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=230668&DocumentContentId=62284>

<sup>28</sup> Los Angeles Times. *Column: California's housing crisis reaches from the homeless to the middle class — but it's still almost impossible to fix*. March 29, 2018. Available at:

<https://www.latimes.com/business/hiltzik/la-fi-hiltzik-housing-crisis-20180330-story.html>

<sup>29</sup> Germany to fall short of 2020 climate goals: report. Available at: <https://www.dw.com/en/germany-to-fall-short-of-2020-climate-goals-report/a-47395605>

<sup>30</sup> Germany may have to extend the operation of coal-fired power plants or procure coal-fired electricity from other countries.

Independent System Operator (CAISO) relies on natural gas generation to keep the electric system running when intermittent wind and solar resources are offline. CAISO submitted comments to the CPUC on their 2019-2020 Integrated Resource Planning (IRP) rulemaking urging the CPUC to focus immediately on developing a comprehensive plan for addressing near-term reliability needs through 2022, since CAISO's analysis shows a potentially significant gap of up to 2,000 megawatts (MW) of electricity beginning in summer of 2021 and increasing to 2,500 MW in 2022.<sup>31</sup> Specifically, CAISO requests the CPUC to "work through the appropriate process to extend the State Water Resources Control Board's once-through-cooling (OTC) regulation compliance dates for gas-fired generating units that are needed to maintain reliability."<sup>32</sup> Further, the CPUC's preliminary IRP results highlight concerns with reducing the amount of natural gas generation. The CPUC notes that the "level of gas retention is dependent on the capacity value of battery storage in a grid with relatively abundant solar generation."<sup>33</sup> In addition, in connection with the IRP proposed reference system portfolio to achieve GHG emissions targets for 2030, the CPUC states that, "heavy emphasis on solar and battery storage in the selected portfolio may be of concern for several reasons... there is risk associated with the lack of diversification among the selected new resources, or putting all of California's eggs in a few baskets. Put simply, it is unknown whether there will be enough reliable energy resources to charge the large amount of storage so that it can discharge when needed to provide reliability services... While it is not quantified or necessarily quantifiable, there is certainly some value in resource diversity in resource planning, to manage risk."<sup>34</sup>

Given the importance of natural gas generation to maintain reliability and the uncertainty of battery storage technology, the CEC should also support carbon capture, utilization, and storage (CCUS) since this technology will be key in meeting climate targets. According to the Energy Futures Initiative, if California's natural-gas combined-cycle plants were retrofitted with CCUS at an assumed 90% capture rate, the emissions reductions would amount to nearly 27.4 million

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<sup>31</sup> Comments of the California Independent System Operator Corporation (CAISO) on Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements (Rulemaking 16-02-007). Available at: <http://www.caiso.com/Documents/Jul22-2019-Comments-PotentialReliabilityIssues-R16-02-007.pdf>

<sup>32</sup> *Id.*, at p. 2

<sup>33</sup> CPUC. 2019-2020 Preliminary Results. CPUC Energy Division. October 4, 2019., at p. 76. Available at: <https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/2019%20IRP%20Preliminary%20Results%2020191004.pdf>

<sup>34</sup> CPUC. Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions. November 6, 2019. At p.22-23. <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M319/K132/319132053.PDF>



metric tons of CO<sub>2</sub>e.<sup>35</sup> EFI estimates that there are 37 natural gas-fired power plants in California that could be potential candidates for CCUS.<sup>36</sup> CCUS technologies can produce high-grade solid carbon, which has a wide range of uses. It can be used to create fuels, chemicals, food products, industrial materials etc.<sup>37</sup> CCUS also produces decarbonized hydrogen<sup>38</sup> which can be injected into the natural gas grid displacing traditional natural gas.

A related issue in addressing reliability concerns is the potential use of distributed generation resources like combined heat and power (CHP) systems, natural gas microturbines, and natural gas-, RNG-, or hydrogen-powered fuel cells, which can be used to serve a single structure, such as a home, business, or hospital, or as part of a microgrid (smaller grid that is also tied into the large electricity delivery system). This helps maintain reliable power regardless of an external event—thus enhancing the energy resiliency of a community. This is especially important in those communities throughout the state that are susceptible to climate-related and natural disasters as well as PSPS events.

As these examples show, natural gas-fired power generation should continue to be used to provide safe, reliable electricity at affordable rates to millions of Californians for many years to come, and it has a critical role to play in a high-renewables, low-carbon world. According to the Lawrence Livermore National Laboratory:<sup>39</sup>

- Emissions from natural-gas fired power plants can be significantly reduced or eliminated by CCUS, making natural-gas fired generation environmentally attractive. Technology for retrofitting existing plants is available today and technological, efficiency, and cost improvements will follow first-generation retrofit solutions.
- Natural gas reduces the need for energy storage by allowing for dispatchable generation on a daily or seasonal basis. An electric grid composed solely of renewables and a large storage resource would be subject to higher costs. A more balanced pathway considers the full extent of costs for supporting infrastructure and wildfire mitigation, not just energy supply costs.
- Since natural gas and biofuels are easily transportable and storable, they are available upon demand where needed, and can help provide operational flexibility and load-

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<sup>35</sup> EFI. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*, at p.80. May 2019. Available at [https://energyfuturesinitiative.org/s/EFI\\_CA\\_Decarbonization\\_Full-b3at.pdf](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf)

<sup>36</sup> *Ibid.*

<sup>37</sup> National Energy Technology Laboratory. About Carbon Utilization. Available at: <https://www.netl.doe.gov/coal/carbon-utilization/about>

<sup>38</sup> Hydrogen Europe. Hydrogen Basics. Available at: <https://hydrogeneurope.eu/hydrogen-basics-0>

<sup>39</sup> Lawrence Livermore National Laboratory Comments. The Natural Gas Infrastructure and Decarbonization Targets. June 21, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143>

following capabilities that help maintain grid reliability and facilitate the growth of intermittent renewables.

In sum, there is a strong need for creative solutions to integrate renewables, increase the electric system's flexibility, and maintain system reliability. Natural gas, RNG, and hydrogen are key flexible energy sources that the CEC must acknowledge are necessary to provide millions of Californians reliable and resilient energy. Moreover, natural gas infrastructure and storage are becoming increasingly important to resilience, a critical component of any energy supply strategy and one that is gaining momentum in the context of today's increased wildfire risk and other climate-driven natural disasters.

**iii) Taking the best advantage of natural gas, RNG, and hydrogen as a low-emission resource**

*Statute: Taking the best advantage of natural gas as a low-emission resource, including potential zero and near-zero greenhouse gas emissions, natural gas, and biogas options, taking into account the impact on electric system operations.*

During the Workshop, staff pointed at decisions and projects helping advance the production and use of RNG in the State. But again, the statute requires much more than simply pointing at a few existing programs. The CEC is supposed to play a forward-looking, policy-setting role rather than just recognizing the good work that other agencies are doing. Natural gas has the potential to reduce GHG emissions by shifting away from higher CO<sub>2</sub> emitting fuels like coal, gasoline, or diesel commonly used in the transportation sector and for electric generation. RNG is an even lower emission fuel source with greater potential to reduce GHG emissions. Capturing waste stream biogas emissions and producing RNG is a valuable emission-reducing process that will help achieve critical climate change objectives since the majority of methane emissions come from livestock manure management (26%) and landfills (21%).

The California Air Resources Board's (CARB) Climate Change Scoping Plan identified a number of different approaches for "achieving success in clean energy," including enabling cost-effective access to RNG.<sup>40</sup> An important part of CARB's strategy is putting waste resources to beneficial use, including organic sources of methane from waste streams. Capturing these emissions is integral to lowering methane emissions in California in a reasonable and economic way.<sup>41</sup> And leveraging the existing natural gas infrastructure provides a cost-effective solution to reduce emissions from these sectors by transporting RNG over existing, safe transmission and

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<sup>40</sup> CARB. *California's 2017 Climate Change Scoping Plan*, at p. ES-11. November 2017. Available at: [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf).

<sup>41</sup> CARB. Introduction to the Phase I Report of the California Methane Survey from the Staff of the California Air Resources Board. October 2, 2017. Available at: [https://www.arb.ca.gov/research/methane/CA\\_CH4\\_Survey\\_Phase1\\_Report\\_2017.pdf](https://www.arb.ca.gov/research/methane/CA_CH4_Survey_Phase1_Report_2017.pdf)

distribution infrastructure. Further, hydrogen produced from natural gas reforming is a valuable low-carbon fuel that is being used for many applications. The CEC therefore should continue to take affirmative steps to encourage the use of these alternative fuels and technologies to reduce GHG emissions while also providing reliable electricity to residential and commercial customers.

**iv) Optimizing the role of natural gas for end uses**

*Statute: Optimizing the role of natural gas as a flexible and convenient end use energy source, including the efficient use of natural gas for heating, water heating, cooling, cooking, engine operation, and other end uses, and the optimization of appliances for these uses.*

There are many possible avenues that the CEC can support and explore for optimizing the role of natural gas for end uses such as heating, water heating, cooling, cooking, and engine operation. Although the CEC recognized during the Workshop that about two-thirds of Californians use natural gas, the CEC failed to mention any opportunities that will optimize natural gas in end uses. Instead, the CEC referenced E3's research, which erroneously concludes that "building decarbonization via electrification is the lower-cost, lower-risk alternative to meet statutory climate goals."<sup>42</sup> The evidence does not support this conclusion, as explained in SoCalGas's comments on E3's work. If the goal is to make significant strides to combat climate change, then a multifaceted approach that optimizes a diverse portfolio of resources and technologies to lower the carbon footprint of residential and commercial buildings is prudent, especially if there are more cost-effective and less disruptive ways to achieve the same goal.

SoCalGas is already pursuing many innovative ways to optimize the use of natural gas and RNG in various end uses, such as advancing the development of efficient gas technologies and advancing the use of natural gas and RNG in the transportation sector to significantly reduce GHG and criteria air pollutant emissions. These efforts (presented in Appendix B) illustrate some of the initiatives and policies the CEC should be pursuing.

**v) Electric and natural gas industries should work together to ensure reliability**

*Statute: Effective methods by which the electric and natural gas industries can facilitate implementation of any of the strategies identified in this section.*

To make the most of strategies that maximize the benefits of natural gas and RNG in transportation fuel, natural gas-fired generation, end uses, and other applications, the electric and natural gas industries must work together to ensure Californians have a reliable, resilient, and efficient energy system. California benefits from a robust energy system that utilizes many

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<sup>42</sup> CEC. 2019 IEPR Commissioner Workshop on Revised Natural Gas Price Forecast and Draft Outlook/Electricity Modeling and Results. Staff Presentation on AB 1257. October 30, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230388&DocumentContentId=61943>

different sources to provide the State with the power it needs. Natural gas is a major component in ensuring that the State's energy needs are met. The recent wildfires and PSPS events demonstrate the importance of a reliable and resilient energy supply, that does not rely on a single energy source. According to the CPUC's de-energization report, these intentional outages have resulted in over 7,500 outage hours from October 2014 through September 2019 – imposing substantial safety hazards and costs on Californians.<sup>43</sup>

Moreover, research into energy generation trends suggests that natural gas will continue to play a pivotal and growing role in electricity generation for years to come. This means that the interdependence between electricity and natural gas infrastructure is only going to increase.<sup>44</sup> Although the CEC recognized natural gas' role in supporting the integration of renewable energy when these resources are not reliable or cost-effective, CEC staff failed to recognize the growing interdependence between electricity and natural gas infrastructure and did not consider new strategies that would leverage the existing natural gas system to support electric reliability.

Similarly, natural gas infrastructure can be instrumental in storing vast amounts of clean energy for longer durations. Power-to-gas technology can be used to manage electric intermittency challenges experienced with the high penetration of renewables. Policy support from the CEC to advance power-to-gas technology and other measures is needed so Californians can reap the full benefit of all energy resources to provide the State with abundant clean energy, the ability to distribute it across sectors, and the capability to store it for long periods of time.

**vi) Determine a long-term policy to ensure adequate infrastructure and storage**

*Statute: Determining the extent to which a long-term policy is needed to ensure adequate infrastructure and storage and developing strategies for pursuing additional infrastructure development to maintain or enhance pipeline and system reliability, including increased natural gas storage. In developing those strategies, the Commission shall consider needed policies to protect against system capacity constraints, minimize system leakage and related emissions, mitigate investment risk associated with the long-term investment in infrastructure in an evolving energy market, and identify factors that could limit the ability to receive maximum benefits from natural gas as an energy resource.*

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<sup>43</sup> CPUC. De-Energization (PSPS). De-energization Spreadsheet. Available at: <https://www.cpuc.ca.gov/deenergization/>

<sup>44</sup> Odetayo, B., MacCormack, J., Rosehart, W.D., Zareipour, H., and Seifi, A.R. *Integrated planning of natural gas and electric power systems*. International Journal of Electrical Power & Energy Systems. December 2018. Volume 3 pp. 593-602. Available at: <https://www.sciencedirect.com/science/article/pii/S0142061517331654>

The resiliency and operational flexibility benefits of natural gas infrastructure should be considered by the CEC in long-term policy making. However, during the Workshop, CEC staff failed to advance any policies to support natural gas infrastructure and storage or to maintain pipeline and system reliability, and instead highlighted methane leakage concerns and questions regarding blending hydrogen into the natural gas system. Pursuant to Senate Bill (SB) 1371, SoCalGas submits a Natural Gas Leakage Abatement Report to the CPUC annually.<sup>45</sup> Comparing this SB 1371 report data with CARB's Climate Change Scoping Plan emissions reporting data,<sup>46</sup> SoCalGas' system only represents about 3% of statewide methane emissions, which is approximately 0.3% of the State's total GHG emissions inventory. In comparison, the 2019 wildfires in California are estimated to have produced over 10% of the State's GHG emissions<sup>47</sup>—contributing more than the commercial, residential, and agriculture sectors did in 2017. Instead of focusing on these comparatively minor emissions, the CEC should promote policies that encourage maintaining adequate natural gas infrastructure and support modernization efforts that continue to reduce upstream emissions. SoCalGas has taken several steps to modernize its system to improve safety and reduce leakage (see Appendix B, Section 6), but continued support from the State is needed to maximize the resiliency and operational flexibility of natural gas infrastructure and storage.

Similarly, the CEC should consider the importance of adequate natural gas storage. Independent analysis by the California Council of Science and Technology (CCST) validates the importance of underground storage for energy reliability. The CCST report ultimately determined that California needs natural gas and underground gas storage to run reliably, and that without such storage, California would be unable to consistently meet winter demand for natural gas.<sup>48</sup> The report states that “California has not yet targeted a future energy system that would meet California's 2050 climate goals and provide energy reliability in all sectors. California will likely rely on underground gas storage for the next few decades as these complex

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<sup>45</sup> CARB and CPUC. Joint Staff Report-Analysis for the Utilities' June 15, 2018, Natural Gas Leak and Emission Reports. December 21, 2018. Available at: [https://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Website/Content/Safety/Risk\\_Assessment/Methane\\_Leak/s/2017%20NGLA%20Joint%20Report%2012-21-18.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Safety/Risk_Assessment/Methane_Leak/s/2017%20NGLA%20Joint%20Report%2012-21-18.pdf)

<sup>46</sup> CARB. GHG Current California Emission Inventory Data. Available at: <https://ww2.arb.ca.gov/ghg-inventory-data>

<sup>47</sup> CARB California Wildfire Burn Acreage and Preliminary Emissions Estimates. Available at: [https://ww3.arb.ca.gov/cc/inventory/pubs/ca\\_wildfire\\_co2\\_emissions\\_estimates.pdf](https://ww3.arb.ca.gov/cc/inventory/pubs/ca_wildfire_co2_emissions_estimates.pdf)

<sup>48</sup> California Council on Science & Technology (CCST). *Long-Term Viability of Underground Natural Gas Storage in California: An Independent Review of Scientific and Technical Information*, p. 9 (Conclusion SR-2); and, p. 496 (Conclusion 2.1). February 5, 2018. Available at: <https://tinyurl.com/y9xwzdb8>

issues are worked out.”<sup>49</sup> It also concludes that with appropriate regulation and oversight, the risks associated with underground gas storage can be managed and mitigated.

During the Workshop, staff also seemed to discount the importance of maintaining natural gas infrastructure for use to store renewable fuels such as hydrogen. Staff mentioned SB 1369,<sup>50</sup> which adopts a definition for “Green Electrolytic Hydrogen,” but failed to recognize the value of this definition in policy making. SB 1369 requires the CPUC, CARB, and the CEC to consider electrolytic hydrogen for long-term energy storage to advance the State’s clean energy and pollution reduction objectives.<sup>51</sup> Considering this, the CEC should support strategies and policies that look at advancing the use of hydrogen to decarbonize natural gas infrastructure, instead of limiting its potential.<sup>52</sup>

### **vii) The role of natural gas in zero net energy buildings**

*Statute: Determining the role that natural gas can play in the development of zero net energy buildings, as appropriate.*

Zero net energy (ZNE) is defined as the ability of a building to generate as much energy as is consumed on-site, using renewable on-site generation, such as photovoltaic solar panels which will be required for all new low-rise buildings as of January 1, 2020. The CEC is tasked under AB 1257 with determining the role of natural gas in ZNE buildings, and it therefore should be investigating demonstration programs that show the role natural gas can play in ZNE design and should be including natural gas and RNG in analyzing the possibilities for ZNE.

During the Workshop, CEC staff mentioned that “aggressive GHG emission reduction policy initiatives support replacing ZNE policy goals with low-carbon, zero-emission buildings.” The statute does not, however, ask the CEC whether it thinks ZNE buildings are a good idea. It requires it to determine what role natural gas can play in developing them, which CEC staff failed to even attempt. In any event, the CEC should continue to support or fund projects that advance the low-emission resource benefits obtained from using natural gas and RNG in buildings.

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<sup>49</sup> *Id.*, p. 547, Conclusion 3.12

<sup>50</sup> California Legislative Information. SB-1369 Energy: green electrolytic hydrogen. Available at: [https://leginfo.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180SB1369](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1369)

<sup>51</sup> CEC. 2019 IEPR Commissioner Workshop on Revised Natural Gas Price Forecast and Draft Outlook/Electricity Modeling and Results. Staff Presentation on AB 1257. October 30, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230388&DocumentContentId=61943>

<sup>52</sup> IEA. The Future of Hydrogen: Seizing Today’s Opportunities Full report available at: <https://www.iea.org/topics/hydrogen/>



Because residential and commercial buildings account for 12% of total statewide GHG emissions,<sup>53</sup> SoCalGas supports the use of RNG in buildings to meet our climate goals. This supports a building decarbonization strategy that allows the State to maintain a diverse portfolio of energy options that still offers customers choice in their preferred appliances for heating their homes or businesses and for cooking. As mentioned above, replacing less than 20% of traditional natural gas with RNG can achieve GHG reductions equivalent to converting 100% electrification of buildings by 2030, *at a significantly lower cost*.<sup>54</sup> The CEC should consider this in their policy-making, as building decarbonization efforts will be most successful if it can be done in a way that is affordable to consumers and preserves consumer choice. Forcing a switch to all-electric buildings is neither cost-effective, consumer friendly, nor environmentally beneficial.

**viii) Natural gas and RNG facilitate jobs development**

*Statute: Optimizing the methods by which the pursuit of these strategies can facilitate jobs development in the private sector, particularly in distressed areas.*

Natural gas and RNG are crucial to existing jobs in California and to the development of additional jobs. Displacing natural gas with more expensive energy pathways will have an adverse impact on jobs both directly in the natural gas sector and indirectly in the commercial and industrial sectors, as employers may delay or cancel expansions or hiring due to increased utility costs. Conversely, promoting the use of natural gas and RNG has the potential to create jobs both directly in the natural gas and RNG sector, and indirectly in industries that rely on an affordable and reliable source of energy. During the Workshop, the CEC acknowledged the potential for their research and development dollars to create jobs in RNG production. But this fell short of the broader analysis that the CEC is required to conduct. Failing to support the use of RNG and hydrogen, particularly in the industrial sector where processes are hard to electrify,<sup>55</sup> could encourage many industrial and manufacturing operations that rely on natural gas to move their facilities out of State.

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<sup>53</sup> CARB. GHG Emission Inventory Graphs. Available at: <https://ww3.arb.ca.gov/cc/inventory/data/graph/graph.htm>

<sup>54</sup> Navigant Consulting. *Analysis of the Role of Gas for a Low-Carbon California Future*. July 24, 2018. Available at: [https://www.socalgas.com/1443741887279/SoCalGas\\_Renewable\\_Gas\\_Final-Report.pdf](https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf)

<sup>55</sup> Vox. *This climate problem is bigger than cars and much harder to solve*. October 10, 2019. Available at: <https://www.vox.com/energy-and-environment/2019/10/10/20904213/climate-change-steel-cement-industrial-heat-hydrogen-ccs>

**ix) State and federal policy support can facilitate development of natural gas and RNG strategies**

*Statute: Optimizing the methods by which state and federal policy can facilitate any of the proposed strategies.*

State and federal policy support is critical to the implementation of strategies that maximize the benefits of natural gas and RNG in various end uses and energy reliability applications. During the Workshop, staff mentioned that the “CEC enables participation of all interested state, regional, and federal agencies in the preparation of the IEPR; AB 1257 is part of the IEPR.”<sup>56</sup> But this is not the same as providing affirmative support for policy initiatives on natural gas and RNG. And the panelists convened by the CEC and participating in workshops do not bring diverse perspectives or ideas nor promote balanced discussions that equitably inform the public and policy makers on the purpose and requirements of AB 1257 – which is to maximize the benefits of natural gas. Staff also mentioned that the CEC “works closely with state agencies with a role in implementing SB 100 and other renewables and decarbonization policies.” However, this statement illustrates the shift in policy that the CEC has made, as the CEC should also be working closely with state agencies to optimize how state and federal policy can advance strategies that maximize the benefits of natural gas and RNG. If we are to achieve our climate goals, state and federal policy must assist all viable pathways. Both California and U.S. policymakers have a tremendous number of policy tools at hand to support the development, distribution, and utilization of renewable gas. Regulation, incentives, research, and market-based initiatives, such as cap-and-trade programs, have all contributed to the ability to make great strides forward to reduce GHG emissions. SoCalGas asks that the CEC make policy recommendations and work with other state and federal agencies to advance the adoption of RNG and hydrogen as decarbonization pathways to meet our climate goals.

**x) Evaluate the economic costs and environmental impacts of proposed natural gas strategies**

*Statute: Evaluating the incremental beneficial and adverse economic cost and environmental impacts of proposed strategies, including life-cycle greenhouse gas emissions from production, transportation, and use of natural gas, based on authoritative, peer-reviewed, and science-based analysis or in consultation with the State Air Resources Board.*

The Legislature tasked the CEC with these economic and environmental valuations by passing AB 1257. But the CEC appears to reject this responsibility, stating that the “Legislature tasked CARB with these evaluations in AB 32.” And while the CEC claims it performs cost

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<sup>56</sup> CEC. 2019 IEPR Commissioner Workshop on Revised Natural Gas Price Forecast and Draft Outlook/Electricity Modeling and Results. Staff Presentation on AB 1257. October 30, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230388&DocumentContentId=61943>



evaluations, during the Workshop it failed to share information showing how it is considering the economic benefits natural gas and RNG bring to California. When considering the relative benefits and disadvantages of the cost of natural gas strategies, a fair and comprehensive comparison to electric costs is also necessary to put costs in perspective. Energy affordability must remain paramount given the significant increases in electric rates Californians are expected to experience in the near future. It is not advisable to eliminate an entire energy infrastructure system that delivers affordable energy to customers today and which can be a vital part of the solution for delivering decarbonized energy in the future. Similarly, the CEC needs to perform a fair assessment of the environmental impact of the natural gas system and electric grid, which it has not done to date.

A fair valuation of both energy systems' costs and environmental benefits/risks needs to be conducted before making policy recommendations that favor one energy delivery system over another. And investment need not, nor should be, mutually exclusive—it should be optimized for both. For example, what transmission and distribution investments would be required statewide to support increased electric loads if the State were to pursue an all-electric strategy, and at what cost and impact to the environment to Californians? Does the electric grid yield a GHG emissions reduction benefit when considering impacts from wildfires, construction of large-scale transmission, the development of storage capability, and additional construction of renewable energy generation facilities? The CEC needs to follow its mandate to evaluate these incremental impacts in a fair, comprehensive, and neutral manner in order to inform the debate over the available paths forward and the best strategies to pursue.

## **2) THE CEC'S PURSUIT OF ALL-ELECTRIFICATION IS ILL-CONSIDERED AND CONTRARY TO STATUTE**

### **a) The CEC should consider all pathways to achieve climate goals**

If the CEC prematurely makes choices that support one pathway to achieve climate goals, it may inadvertently discourage new technologies, create problems with the reliability and resilience of California's energy grid (as is evidenced by the recent blackouts imposed due to wildfire risk), and increase costs for Californians in the midst of an affordable housing crisis.<sup>57</sup> As the State's primary energy policy and planning agency, the CEC should develop policy recommendations that are based in thorough and even-handed analysis and utilize all energy sources, consistent with Legislative mandates. Instead, the CEC appears to be on a path to eliminate an entire energy infrastructure system. SoCalGas asks that the CEC pause, and reconsider the various pathways available to reducing GHG emissions and increasing energy

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<sup>57</sup> Los Angeles Times. *Column: California's housing crisis reaches from the homeless to the middle class — but it's still almost impossible to fix*. March 29, 2018. Available at: <https://www.latimes.com/business/hiltzik/la-fi-hiltzik-housing-crisis-20180330-story.html>

efficiency, and allow for the development of more thorough, neutral research and debate on these options.

One need look no further than the recent presentation during the Workshop to see the CEC's goal to promote electrification is driving its dismissal of AB 1257 and other mandates supporting natural gas. Under the AB 1257 statutory factor of optimizing natural gas for end uses, the CEC cites E3's recent research: "Building decarbonization via electrification is the lower-cost, lower-risk alternative to meet statutory climate goals."<sup>58</sup> In other words, the CEC is going to "optimize" natural gas for end uses by converting to electrification. While this makes the predetermined goal express, the CEC's preference for 100% building electrification is also evidenced by a number of recent CEC actions and positions:

- The CEC has supported a study by E3 and the University of California, at Irvine (UCI) that supports 100% building electrification as the optimal pathway to decarbonize buildings. SoCalGas submitted a letter questioning the technical merits of the draft study and asked the CEC to revisit the technically unsound inputs and assumptions used by E3.<sup>59</sup> However, the CEC did nothing, and the latest draft released by the CEC presents the same results with little change to the faulty inputs and assumptions.<sup>60</sup> As referenced earlier, this is addressed in a separate comment letter.
- The CEC has convened 2019 IEPR and "decarbonization" workshops that consist almost entirely of advocates for building electrification. SoCalGas expressed concerns with this one-sided process in a comment letter submitted to the CEC earlier this year.<sup>61</sup>
- The CEC acknowledged that "renewable gas can be a part of the solution to reducing GHG emissions from buildings," but then dismisses it because "the role [of RNG] is likely to be constrained by limitations on renewable gas availability, cost, and ongoing

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<sup>58</sup> CEC. 2019 IEPR Commissioner Workshop on Revised Natural Gas Price Forecast and Draft Outlook/Electricity Modeling and Results. Staff Presentation on AB 1257. October 30, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230388&DocumentContentId=61943>

<sup>59</sup> SoCalGas. Comments on E3 Draft Results Future of Nat Gas Distribution. June 21, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&DocumentContentId=60170>

<sup>60</sup> CEC. Energy Research and Development Division. *Natural Gas Distribution in California's Low-Carbon Future*. October 2019. Available at: <https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-D.pdf>

<sup>61</sup> SoCalGas Comments in response to Joint Agency 2019 IEPR Building Decarbonization Workshop. April 22, 2019. Available at <https://efiling.energy.ca.gov/GetDocument.aspx?tn=227834&DocumentContentId=59209>. This year, the CEC has held three joint agency workshops on building decarbonization on April 8, July 30, and August 27, 2019.

- methane leakage concerns.”<sup>62</sup> The CEC again relies on a flawed analysis conducted by E3 at the CEC’s direction,<sup>63</sup> while ignoring the findings of multiple, neutral studies evaluating RNG resources that demonstrate there are sufficient supplies available, costs can be driven down over time through incentives to innovate and invest, and SoCalGas has successfully reduced fugitive emissions.<sup>64,65,66</sup> As noted above, using only 20% RNG will achieve the emissions reductions equivalent to electrification of 100% of the State’s building sector by 2030.<sup>67</sup> The fact that the CEC ignores these studies and relies only on E3’s flawed analysis shows it has a pre-determined goal.
- The CEC states, in the Final 2018 IEPR Update,<sup>68</sup> that “[t]here is a growing consensus that building electrification is the most viable and least-cost path to zero-emission buildings.” But diverse stakeholders and scientific experts do not have such a consensus.<sup>69</sup> The CEC’s claim is based only on the like-minded views of pro-electrification panelists and experts convened by the CEC itself.

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<sup>62</sup> California Energy Commission (CEC). *Final 2018 IEPR Update Volume II*, at p. 28. February 2019. Available at: <https://ww2.energy.ca.gov/2018publications/CEC-100-2018-001/CEC-100-2018-001-V2-CMF.pdf>

<sup>63</sup> Energy and Environmental Economics (E3). *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model*. June 2018. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=223785>

<sup>64</sup> ICF International. *Design Principles for a Renewable Gas Standard*. 2017. Available at: <https://www.icf.com/resources/white-papers/2017/design-principles-for-renewable-gas>.

<sup>65</sup> University of California, Davis Institute of Transportation Studies. *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, at p. ix. June 2016. Available at: <https://steps.ucdavis.edu/wp-content/uploads/2017/05/2016-UCD-ITS-RR-16-20.pdf>

<sup>66</sup> U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. *2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy, Volume 1: Economic Availability of Feedstocks*. 2016. Available at: <https://www.energy.gov/eere/bioenergy/downloads/2016-billion-ton-report-advancing-domestic-resources-thriving-bioeconomy>

<sup>67</sup> RNG costs can be driven down over time through a utility procurement requirement that would send signals to the market to promote RNG suppliers to innovate and invest—like the Renewables Portfolio Standard, which helped reduce the costs of wind and solar. CEC. Renewables Portfolio Standard- RPS. Available at: <https://www.energy.ca.gov/programs-and-topics/programs/renewables-portfolio-standard>

<sup>68</sup> CEC. *2018 Final IEPR Update Volume II*, at p. 21. February 2019. Available at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=227391>

<sup>69</sup> The CPUC recently released a ‘Fact vs. Fiction’ document on Building Decarbonization to clarify that there is no mandate that all buildings stop using natural gas. Available at: <file:///C:/Users/emoreno4/OneDrive%20-%20Sempra%20Energy/User%20Folders/Downloads/Building%20Decarbonization%20Fact%20vs%20Fiction.pdf>

These are just a few examples highlighting how the CEC has been increasingly turning its policy support toward all electrification – as opposed to decarbonization – and away from natural gas.

**b) There is no state mandate for all-electrification**

California’s policy goals are focused on emissions reductions to achieve climate goals and to improve air quality. Electrification of end uses is not mandated by law. It is also not the only, nor best solution or pathway to achieve California’s climate and air quality goals.

No one disputes that the State’s policy is to reduce GHG emissions with the end goal of carbon neutrality.<sup>70,71,72</sup> But there are competing policy goals and concerns that belie the CEC’s conclusion that the only way to address GHG emissions goals is through building electrification and dismantling of the natural gas system. First, as SoCalGas has explained, key legislation requires State agencies to consider alternative fuel technologies – directives that have not been consistently followed. Second, various State policies not only assume that the natural gas system will provide cost-effective, reliable gas service to all its customers, but also that the use of natural gas benefits Californians and should be optimized and maximized. These policies include statements on having diverse energy sources to avoid the risks of relying on a sole source system and to protect reliability and resilience. Third, there are related State policy concerns, such as affordable rates and housing, the impact of policies on low-income communities, and the California Environmental Quality Act, that need to be taken into consideration. Some of these policies are referenced here:

|                      |                       |  |
|----------------------|-----------------------|--|
| <b>Renewable Gas</b> | SB 1440 <sup>73</sup> | Authorizes the CPUC to adopt a biomethane procurement program that benefits ratepayers, is cost-effective, and advances the State’s environmental and energy policies. |
|                      | SB 1369 <sup>74</sup> | Specifies green electrolytic hydrogen, as defined, as one of these energy storage technologies to be targeted for  |

<sup>70</sup> California Legislative Information. SB-100 California Renewables Portfolio Standard Program: emissions of greenhouse gases. Available at:

[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180SB100](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100)

<sup>71</sup> Executive Department. State of California. Executive Order B-55-18 To Achieve Carbon Neutrality. Available at: <https://tinyurl.com/yxzpsy77>

<sup>72</sup> California Legislative Information. AB-3232 Zero-emissions buildings and sources of heat energy. Available at: [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180AB3232](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB3232)

<sup>73</sup> California Legislative Information. SB-1440 Energy: biomethane: biomethane procurement. Available at: [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180SB1440](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1440)

<sup>74</sup> California Legislative Information. SB-1369 Energy: green electrolytic hydrogen. Available at: [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180SB1369](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1369)

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|                    |   | increased use. Requires the CPUC, CARB, and CEC to consider it as an eligible form of energy storage, and to consider other potential uses of it.  |
|                    | AB 3187 <sup>75</sup>                           | Requires the CPUC to open a proceeding, no later than July 1, 2019, to consider options to promote the in-state production and distribution of biomethane, including recovery in rates of the cost of interconnection infrastructure investments.  |
| <b>Natural Gas</b> | Public Resources Code (PRC) 25400 <sup>76</sup> | Requires the CEC to “encourage the balanced use of all sources of energy to meet the state’s needs and [to] seek to avoid possible undesirable consequences of reliance on a single source of energy.”   |
|                    | PRC 25704 <sup>77</sup>                         | “The commission shall carry out studies to determine if potential serious shortages of electrical, natural gas, or other sources of energy are likely to occur and shall make recommendations to the Governor and the Legislature concerning administrative and legislative actions required to avert possible energy supply emergencies or serious fuel shortages.”   |
|                    | Public Utilities Code 701.1 <sup>78</sup>       | “(a)(1) The Legislature finds and declares that, in addition to other ratepayer protection objectives, a principal goal of electric and natural gas utilities’ resource planning and investment shall be to minimize the cost to society of the reliable energy services that are provided by natural gas and electricity, and to improve the environment and to encourage the diversity of energy sources through improvements in energy efficiency, development of renewable energy resources, |

<sup>75</sup> California Legislative Information. AB-3187 Biomethane: gas corporations: rates: interconnection. Available at: [https://leginfo.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180AB3187](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB3187)

<sup>76</sup> California Legislative Information. PRC. Division 15. Energy Conservation and Development (2500-25990). Chapter 5. Energy Resources Conservation [25400-25405.60]. Available at: [https://leginfo.ca.gov/faces/codes\\_displayText.xhtml?lawCode=PRC&division=15.&title=&part=&chapter=5.&article=](https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=15.&title=&part=&chapter=5.&article=)

<sup>77</sup> California Legislative Information. PRC. Division 15. Energy Conservation and Development (2500-25990). Chapter 8, Energy Shortage Contingency Planning [25700 – 25705]. Available at: [https://leginfo.ca.gov/faces/codes\\_displaySection.xhtml?lawCode=PRC&sectionNum=25704](https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=25704).

<sup>78</sup> California Legislative Information. Public Utilities Code. Division 1. Part 1. Chapter 5. Article 1. Generally [701-718]. Available at: [https://leginfo.ca.gov/faces/codes\\_displaySection.xhtml?lawCode=PUC&sectionNum=701.1](https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC&sectionNum=701.1).

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|-----------------------------|---|---|
|                             |   | such as wind, solar, biomass, and geothermal energy, and widespread transportation electrification.”  |
|                             | Public Utilities Code 328 <sup>79</sup> | “The Legislature finds and declares both of the following:<br>(a) In order to ensure that all core customers of a gas corporation continue to receive safe basic gas service in a competitive market, each existing gas corporation should continue to provide this essential service.” |
| <b>Clean Transportation</b> | LCFS <sup>80</sup>                      | Reduce CI of transportation fuels by 20% by 2030.   |

As this sampling of policies shows, the CEC needs to support and promote diverse sources of energy supply, including the development of alternative fuels such as RNG and hydrogen, and needs to consider the reliability and resilience of the energy system, impacts on the environment, and effects on affordable housing. SoCalGas recently announced a bold plan to replace 20% of its traditional natural gas supply with RNG by 2030 as part of its vision to be the cleanest natural gas utility in North America.<sup>81</sup> These efforts are admittedly in their initial phases. But that is precisely why the CEC should not take actions that will discourage if not extinguish them. Solar and wind were given enormous State assistance and incentives over decades to encourage their adoption and use. RNG and other alternative fuels merit equal encouragement – particularly when electric power based on all-renewable sources creates serious risks to reliability and resilience issues, among others. The recent wildfires and wide-spread preemptive shutdowns of electric power have tremendous consequences for Californians: huge GHG emissions,<sup>82</sup> potential loss of life, including through loss of power to hospitals, other emergency facilities, or

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<sup>79</sup> California Legislative Information. Public Utilities Code. Division 1. Part 1. Chapter 4.5. Article 2. Natural Gas Pipeline Safety Act of 2011 [955-972]. Available at:

[https://leginfo.ca.gov/faces/codes\\_displaySection.xhtml?lawCode=PUC&sectionNum=963](https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC&sectionNum=963).

<sup>80</sup> CARB. LCFS presentation. Available at: <https://www.arb.ca.gov/fuels/lcfs/background/basics-notes.pdf>

<sup>81</sup> SoCalGas is pursuing regulatory authority to implement a broad RNG procurement program with a goal of replacing 5% of its natural gas supply with RNG by 2022, and has requested that the CPUC allow SoCalGas to offer customers the options of purchasing a portion of their gas as RNG. CPUC. Application of SoCalGas and SDG&E for Renewable Gas Tariff. February 28, 2019. Available at:

[https://www.socalgas.com/regulatory/documents/a-19-02-0xx/Application%20-%20Renewable%20Gas%20\(A.19-02-XXX\)%20-%20Final.pdf](https://www.socalgas.com/regulatory/documents/a-19-02-0xx/Application%20-%20Renewable%20Gas%20(A.19-02-XXX)%20-%20Final.pdf)

<sup>82</sup> U.S. Department of the Interior. New Analysis Shows 2019 California Wildfires Emitted as Much Carbon Dioxide as an Entire Year’s Worth of Electricity. November 30, 2018. Available at: <https://www.doi.gov/pressreleases/new-analysis-shows-2018-california-wildfires-emitted-much-carbon-dioxide-entire-years>



critical life-support equipment;<sup>83</sup> massive damage to structures;<sup>84</sup> and substantial economic losses to both businesses and individuals left without power for extended periods of time.<sup>85</sup> And Pacific Gas & Electric has been up-front in stating that these blackouts will continue for the next decade.<sup>86</sup> In this environment, a single-minded focus on converting to an all-electric system seems short-sighted and contrary to the best interests of Californians.

### 3) CONCLUSION

We ask the CEC to comply with its statutory mandate, produce a thorough, independent, and balanced AB 1257 Report, and support policies and fund research that fairly assess different options for achieving the State's climate goals in a technology- and fuel-neutral manner. The debate thus far has been one-sided. Full compliance with AB 1257 mandates would help ensure a robust debate that considers the role of diverse energy sources and evaluates, in a comprehensive and balanced manner, the impacts on the environment and GHG emissions, the reliability and resilience of the energy system, housing affordability for Californians, consumer choice, and the need to support developing technologies and fuels. SoCalGas is confident that a thorough and even-handed examination will show that it is important for the benefit of Californians to support the natural gas system and its continued improvement and development.

Sincerely,



George Minter  
Regional Vice President, External Affairs & Environmental Strategy  
Southern California Gas Company

Encl.

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<sup>83</sup> California Health Line. September 10, 2019. *California Hospitals and Nursing Homes Brace for Wildfire Blackouts*. Available at: <https://californiahealthline.org/news/california-hospitals-and-nursing-homes-brace-for-wildfire-blackouts/>

<sup>84</sup> Sacramento Bee. December 12, 2018. *These three 2018 California Wildfires caused more than \$9 billion in damage*. <https://www.sacbee.com/news/politics-government/capitol-alert/article222997430.html>

<sup>85</sup> CNBC. October 10, 2019. *PG&E Power Outage Could Cost California More than \$2 Billion*. Available at: <https://www.cnbc.com/2019/10/10/pge-power-outage-could-cost-the-california-economy-more-than-2-billion.html>

<sup>86</sup> CNN. October 19, 2019. *PG&E fire-preventing power shutoffs could continue for a decade, CEO says*. Available at: <https://www.cnn.com/2019/10/19/us/pge-power-shut-off-fires-ten-years/index.html>

**APPENDIX A:**  
**SOCALGAS COMMENT LETTERS TO THE CEC**



**APPENDIX A:**  
**SoCalGas Comment Letters to the CEC**

| <b>Subject Covered</b>                                   | <b>Date</b>       | <b>Workshop/Report</b>   | <b>Link to SoCalGas Comments</b>  |
|--|-------------------|--|---|
| AB 1257 Requirements                                     | May 6, 2019       | 2019 IEPR Commissioner Workshop on Preliminary Natural Gas Price Forecast and Outlook          | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228064&amp;DocumentContentId=59345">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228064&amp;DocumentContentId=59345</a> |
| California Policy Leadership                             | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings                    | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |
| Short-lived Climate Pollutants                           | June 12, 2018     | 2018 IEPR Update, <i>Revised Volume I: Toward a Clean Energy Future</i>                        | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223794&amp;DocumentContentId=53991">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223794&amp;DocumentContentId=53991</a> |
|  | August 1, 2019    | 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689</a> |
|  | August 9, 2019    | Clean Transportation Advisory Committee Meeting  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229365&amp;DocumentContentId=60776">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229365&amp;DocumentContentId=60776</a> |
|  | November 2, 2018  | Draft 2018 IEPR Update Volume II   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
| Replacing Natural Gas Equipment with Electric Heat Pumps | June 13, 2018     | 2018 IEPR Update Workshop on Clean Energy in Low-Income Multifamily Buildings                  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223810&amp;DocumentContentId=54011">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223810&amp;DocumentContentId=54011</a> |
| Affordable Energy  | February 26, 2017 | 2018 IEPR Update Scoping Comments  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|  | March 16, 2018    | Draft Staff Report, <i>Tracking Progress for Energy Equity</i>                                 | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222987&amp;DocumentContentId=31980">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222987&amp;DocumentContentId=31980</a> |

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|                    | February 28, 2019 | 2019 IEPR Scoping Order  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035</a> |
|                    | May 15, 2019      | 2019 IEPR California Energy Efficiency Action Plan and Building Decarbonization Workshop               | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293</a> |
|                    | June 21, 2019     | Draft Results: Future of Natural Gas Distribution in California presentation by E3, CEC Staff Workshop | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170</a> |
| Energy Reliability | February 26, 2017 | 2018 IEPR Update Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                    | July 5, 2018      | 2018 IEPR Update Workshop on Renewable Integration and Electric System Flexibility                     | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224065&amp;DocumentContentId=54298">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224065&amp;DocumentContentId=54298</a> |
|                    | November 2, 2018  | Draft 2018 IEPR Update Volume II   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|                    | February 2019     | Final 2018 IEPR Update Volume II   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268">https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268</a> |
|                    | April 22, 2019    | 2019 IEPR Joint Agency Workshop on Building Decarbonization  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227834&amp;DocumentContentId=59209">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227834&amp;DocumentContentId=59209</a> |
|                    | June 6, 2019      | 2019 IEPR Joint Agency Workshop on Energy Reliability in Southern California                           | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228704&amp;DocumentContentId=59958">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228704&amp;DocumentContentId=59958</a> |
|                    | January 25, 2019  | 2019 IEPR Joint Agency Workshop on Southern California Natural Gas Prices                              | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=226384&amp;DocumentContentId=57159">https://efiling.energy.ca.gov/GetDocument.aspx?tn=226384&amp;DocumentContentId=57159</a> |
|                    | February 26, 2017 | 2018 IEPR Update Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |

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|-----------------------------|-------------------|---|---|
| Resiliency                  | February 26, 2017 | 2018 IEPR Update Scoping Comments   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                             | August 16, 2018   | 2018 IEPR Update Climate Adaptation and Resiliency Workshop                         | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&amp;DocumentContentId=55054">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&amp;DocumentContentId=55054</a> |
|                             | November 2, 2018  | Draft 2018 IEPR Update Volume II  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|                             | May 22, 2018      | 2018 IEPR Update Joint Agency Workshop on Energy Reliability in Southern California | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223536&amp;DocumentContentId=53610">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223536&amp;DocumentContentId=53610</a> |
|                             | February 28, 2019 | 2019 IEPR Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035</a> |
|                             | June 5, 2019      | Forthcoming Solicitation Regarding Natural Gas Sector Climate Resilience Webinar    | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228669&amp;DocumentContentId=59920">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228669&amp;DocumentContentId=59920</a> |
|                             | August 22, 2019   | 2019 IEPR Workshop on Climate Adaptation and Resiliency in the Energy Sector        | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229515&amp;DocumentContentId=60926">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229515&amp;DocumentContentId=60926</a> |
| Customer Choice             | February 26, 2017 | 2018 IEPR Update Scoping Comments   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                             | February 2019     | Final 2018 IEPR Update Volume II  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268">https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268</a> |
| GHG Emissions & Air Quality | February 26, 2017 | 2018 IEPR Update Scoping Order  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                             | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings         | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |

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| Natural Gas and RNG use in Transportation | March 22, 2018    | Proposed Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program                                | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931</a> |
|   | November 30, 2018 | Proposed Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program                                | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931</a> |
|   | February 28, 2019 | 2019 IEPR Scoping Plan   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035</a> |
|   | August 1, 2019    | 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes                                       | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689</a> |
|   | August 9, 2019    | Clean Transportation Advisory Committee Meeting  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229365&amp;DocumentContentId=60776">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229365&amp;DocumentContentId=60776</a> |
| Low-carbon Fuel Production                | November 30, 2018 | Proposed Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program                                | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&amp;DocumentContentId=26931</a> |
| Wildfire Risk                             | August 16, 2018   | 2018 IEPR Update Climate Adaptation and Resiliency Workshop  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&amp;DocumentContentId=55054">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224506&amp;DocumentContentId=55054</a> |
|   | November 2, 2018  | Draft 2018 IEPR Update Volume II   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|   | August 24, 2019   | Draft Solicitation on Demonstrating Innovative Solutions to Convert California's Forest Biomass Resources into Renewable Natural Gas | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224593&amp;DocumentContentId=55149">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224593&amp;DocumentContentId=55149</a> |

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| CHP and Fuel Cells            | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings                    | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |
| Power-to-Gas                  | February 26, 2017 | 2018 IEPR Update Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                               | July 5, 2018      | 2018 IEPR Update Workshop on Renewable Integration and Electric System Flexibility             | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224065&amp;DocumentContentId=54298">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224065&amp;DocumentContentId=54298</a> |
|                               | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings                    | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |
|                               | August 1, 2019    | 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689</a> |
| Natural Gas Energy Efficiency | February 26, 2017 | 2018 IEPR Update Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                               | June 12, 2018     | 2018 IEPR Update, Revised Volume I: Toward a Clean Energy Future                               | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223794&amp;DocumentContentId=53991">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223794&amp;DocumentContentId=53991</a> |
|                               | June 21, 2018     | 2018 IEPR Update Workshop on Doubling Energy Efficiency Savings                                | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223894&amp;DocumentContentId=54110">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223894&amp;DocumentContentId=54110</a> |
|                               | January 31, 2019  | 2019 IEPR Workshop California's Economic and Demographic Outlook                               | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=226433&amp;DocumentContentId=57209">https://efiling.energy.ca.gov/GetDocument.aspx?tn=226433&amp;DocumentContentId=57209</a> |
|                               | May 15, 2019      | 2019 California Energy Efficiency Action Plan and Building Decarbonization Workshop            | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293</a> |

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| Underground Storage      | February 26, 2017 | 2018 IEPR Update Scoping Order  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                          | March 16, 2018    | CEC draft staff report, <i>Tracking Progress for Energy Equity</i>                  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222987&amp;DocumentContentId=31980">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222987&amp;DocumentContentId=31980</a> |
|                          | November 2, 2018  | Draft 2018 IEPR Update Volume II  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|                          | November 30, 2018 | Staff Workshop on Energy Storage Research Needs for California                      | Not yet available online  |
|                          | February 28, 2019 | 2019 IEPR Scoping Plan  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&amp;DocumentContentId=58035</a> |
| Building Electrification | February 26, 2017 | 2018 IEPR Update Scoping Order  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                          | June 13, 2018     | 2018 IEPR Update Workshop on Clean Energy in Low-Income Multifamily Buildings       | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=223810&amp;DocumentContentId=54011">https://efiling.energy.ca.gov/GetDocument.aspx?tn=223810&amp;DocumentContentId=54011</a> |
|                          | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings         | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |
|                          | November 2, 2018  | Draft 2018 IEPR Update Volume II  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|                          | February 8, 2019  | Final 2018 IEPR Update Volume II  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268">https://efiling.energy.ca.gov/GetDocument.aspx?tn=226490&amp;DocumentContentId=57268</a> |
|                          | April 22, 2019    | 2019 Joint Agency Workshop on Building Decarbonization                              | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=227834&amp;DocumentContentId=59209">https://efiling.energy.ca.gov/GetDocument.aspx?tn=227834&amp;DocumentContentId=59209</a> |
|                          | May 15, 2019      | 2019 California Energy Efficiency Action Plan and Building Decarbonization Workshop | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293</a> |



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| Waste Heat                                     | August 6, 2019    | Opportunity to Shape Waste Heat Recovery Research  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229235&amp;DocumentContentId=60642">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229235&amp;DocumentContentId=60642</a> |
|  | September 6, 2019 | Renewable Hydrogen Generation Plant Deployment Roadmap Webinar   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229694&amp;DocumentContentId=61115">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229694&amp;DocumentContentId=61115</a> |
| Proposed Natural Gas Moratorium                | July 6, 2018      | Joint Agency En Banc on the Draft Green Book: an Evaluation of Regulatory Framework Options for an Evolving Electricity Market | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224082&amp;DocumentContentId=54317">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224082&amp;DocumentContentId=54317</a> |
|  | May 15, 2019      | 2019 California Energy Efficiency Action Plan and Building Decarbonization Workshop  | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293</a> |
| Hydrogen                                       | November 2, 2018  | Draft 2018 IEPR Update Volume II   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469">https://efiling.energy.ca.gov/GetDocument.aspx?tn=225796&amp;DocumentContentId=56469</a> |
|  | May 16, 2019      | 2019 IEPR Workshop on the Status of Zero Emission Vehicle Market   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228302&amp;DocumentContentId=59487">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228302&amp;DocumentContentId=59487</a> |
|  | June 21, 2019     | Draft Results: Future of Natural Gas Distribution in California presentation by E3, CEC Staff Workshop                         | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170</a> |
|  | August 1, 2019    | 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes                                 | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689</a> |
| Carbon Capture, Utilization, and Sequestration | August 1, 2019    | 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes                                 | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&amp;DocumentContentId=60689</a> |

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| Electric Costs                    | June 21, 2019     | Draft Results: Future of Natural Gas Distribution in California presentation by E3, CEC Staff Workshop | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170</a> |
| Utilizing Existing Infrastructure | February 26, 2017 | 2018 IEPR Update Scoping Order   | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743">https://efiling.energy.ca.gov/GetDocument.aspx?tn=222750&amp;DocumentContentId=31743</a> |
|                                   | June 21, 2019     | Draft Results: Future of Natural Gas Distribution in California presentation by E3, CEC Staff Workshop | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170">https://efiling.energy.ca.gov/GetDocument.aspx?tn=228835&amp;DocumentContentId=60170</a> |
| Upstream Methane Emissions        | June 28, 2018     | 2018 IEPR Update Joint Agency Workshop on Achieving Zero Emission Buildings                            | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244">https://efiling.energy.ca.gov/GetDocument.aspx?tn=224017&amp;DocumentContentId=54244</a> |
|                                   | May 15, 2019      | 2019 California Energy Efficiency Action Plan and Building Decarbonization Workshop                    | <a href="https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293">https://efiling.energy.ca.gov/GetDocument.aspx?tn=229845&amp;DocumentContentId=61293</a> |



**APPENDIX B:  
STRATEGIES AND OPTIONS  
TO MEET STATUTORY REQUIREMENTS**

## **APPENDIX B:** **Strategies and Options to Meet Statutory Requirements**

### **STRATEGIES AND OPTIONS TO MEET STATUTORY REQUIREMENTS**

The Natural Gas Act requires the California Energy Commission (CEC) to “identify strategies to maximize the benefits obtained from natural gas, including biomethane... as an energy source, helping the state realize the environmental and cost benefits afforded by natural gas.”<sup>1</sup> The CEC “at a minimum” must “identify strategies and options” for 10 specified issues.<sup>2</sup> Southern California Gas Company (SoCalGas) provides the following input on what strategies and options the CEC should consider under each of the 10 areas identified by statute, and that will support the State in realizing the environmental and cost benefits afforded by the use of natural gas and RNG as part of a long-term, diverse energy portfolio.

#### **1. MAKING THE BEST USE OF NATURAL GAS AS A TRANSPORTATION FUEL**

*Statute: Making the best use of natural gas as a transportation fuel, as appropriate, including for movement of freight, vessels, mass transit, and other commercial and passenger vehicle use and identifying methods to develop natural gas refueling infrastructure.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with transportation. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG as a transportation fuel. SoCalGas elaborates on this further below.

Mobile emissions sources are the largest contributors of ozone-forming emissions, such as nitrogen oxide (NOx) and fine particulate matter (PM2.5) as well as GHG emissions. Mobile sources are also significant contributors to toxic diesel particulate matter (DPM) emissions. In California, this source is responsible for 50% of GHG emissions (including emissions from fuel production). It also represents more than 95% of DPM and approximately 80% of smog-forming NOx emissions.<sup>3</sup> Between 2013 and 2017, GHG emissions in the transportation sector have increased each year, despite advances in technologies and substantial incentive funding spent by

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<sup>1</sup> FindLaw. California Public Resource Code. Section 25303.5(b). Available at: <https://codes.findlaw.com/ca/public-resources-code/prc-sect-25303-5.html>

<sup>2</sup> *Ibid.*

<sup>3</sup> CARB. Advanced Clean Trucks (ACT) Fact Sheet. July 2, 2019. Available at: <https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-act-fact-sheet>

the State.<sup>4</sup> Within the mobile source sector, heavy-duty trucks account for 20% of the GHG emissions and like the overall sector, GHG emissions from heavy-duty trucks have also increased each year.<sup>5</sup>

Natural gas and RNG heavy-duty trucks are key to addressing ambient air quality standards and reducing GHG emissions. Due to the current state of development, advanced technologies, such as battery electric Class 7 and 8 trucks, have significant operating limitations, including but not limited to range, cost, charging time, and infrastructure availability. These limitations may be resolved in the future, however there is no certainty of whether or when they will be resolved, which is one reason that total reliance on zero-emission technologies in the heavy-duty sector is not a viable option to resolve today's air quality and climate concerns and needs. Optimizing the use of low- and near-zero emission technologies is a better path.

SoCalGas has submitted comments on the importance of natural gas use in the transportation sector in response to the 2019 IEPR Scoping Order,<sup>6</sup> 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes,<sup>7</sup> the Clean Transportation Advisory Committee Meeting,<sup>8</sup> and the 2019-2020 Investment Plan Update for the Clean Transportation Program (Investment Plan).<sup>9</sup> The Investment Plan states that, "By using biomethane and low-NOx engines, natural gas trucks have the potential for low criteria pollutant emissions and low or even negative GHG emissions."<sup>10</sup> However, the plan was approved with no funding available for natural gas trucks. The Investment Plan explains that this was determined because there are other funding programs from other agencies available for natural gas trucks. However, other agencies are also considering defunding natural gas trucks in specific

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<sup>4</sup> CARB. California Greenhouse Gas Emissions from 200 to 2017. 2019 Edition. Available at: [https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000\\_2016/ghg\\_inventory\\_trends\\_00-16.pdf](https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf)

<sup>5</sup> CARB Greenhouse Gas Emission Inventory - Query Tool for years 2000 to 2017 (12th Edition). Available at: [https://www.arb.ca.gov/app/ghg/2000\\_2017/ghg\\_sector.php](https://www.arb.ca.gov/app/ghg/2000_2017/ghg_sector.php)

<sup>6</sup> SoCalGas Comments. 2019 IEPR Scoping Order. February 28, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=227195&DocumentContentId=58035>

<sup>7</sup> SoCalGas Comments. 2019 IEPR Staff Workshop on Clean Transportation Program (ARVFT) Benefits Report and Successes. August 1, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229283&DocumentContentId=60689>

<sup>8</sup> SoCalGas Comments. Clean Transportation Advisory Committee Meeting. August 9, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229365&DocumentContentId=60776>

<sup>9</sup> SoCalGas Comments. Proposed Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program. March 22, 2018. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=223020&DocumentContentId=26931>

<sup>10</sup> California Energy Commission. 2019-2020 Investment Plan Update for the Clean Transportation Program. August 2019. Available at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=229582>

programs.<sup>11</sup> This remaining funding is not sufficient to incentivize the trucking industry to accelerate the turnover of their diesel fleets. While the CEC did not make funding available for natural gas trucks this fiscal year, the CEC should still support this technology and its inherent GHG emissions reductions and ambient air quality benefits by reinstating funding for low-NOx trucks, by allocating funding specifically for RNG production and infrastructure in future Investment Plans, and by signaling to other agencies to do the same.

**a. Heavy-duty trucks contribute substantially to smog-forming and GHG emissions, and using low NOx trucks fueled by RNG is necessary to meet air quality requirements as well as California’s GHG emissions reduction goals.**

- The South Coast and San Joaquin Valley Air Basins have the worst air quality in the nation. The South Coast Air Basin is designated as “extreme” nonattainment for the federal ozone standard and the San Joaquin Valley is designated as “serious” nonattainment for PM2.5. Reducing NOx emissions is critical to meet these attainment standards. Per the federal Clean Air Act, the South Coast and San Joaquin regions must demonstrate attainment by 2023 and 2024, respectively. Failure to submit an approvable State Implementation Plan (SIP) or failure to implement a SIP could lead to the imposition of federal sanctions, including the loss of federal highway funding and new source review offset ratio sanctions.<sup>12</sup> Additionally, if the air districts cannot demonstrate attainment through emissions reduction measures and submit an approvable plan, the United States Environmental Protection Agency (U.S. EPA) must promulgate a Federal Implementation Plan, which could impose draconian emission reduction strategies.<sup>13</sup>

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<sup>11</sup> CARB considered defunding near-zero (low-NOx) trucks in the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) in the 2019-2020 Fiscal Year Funding Plan for Low Carbon Transportation Incentives (Funding Plan). This was considered at the October 24, 2019 Board Meeting. CARB approved their funding plan with an amendment to include 11.9 liter Low-NOx trucks using instate RNG. Funding Plan available at:

<https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program/low-1>

<sup>12</sup> U.S. Environmental Protection Agency. Clean Air Act Overview. 42 U.S.C. §§ 7509, 7410; CAA §§ 179, 110(m). Available at: <https://www.epa.gov/clean-air-act-overview/clean-air-act-title-i-air-pollution-prevention-and-control-parts-through-d>

<sup>13</sup> U.S. EPA has already begun to threaten California with both federal Clean Air Act sanctions and a Federal Implementation Plan. See the September 24, 2019 letter from Administrator Wheeler to Mary Nichols. Available at: [https://www.epa.gov/sites/production/files/2019-09/documents/california\\_naaqs\\_sip.pdf](https://www.epa.gov/sites/production/files/2019-09/documents/california_naaqs_sip.pdf)

- In the South Coast Air Basin, heavy-duty trucks account for 18% of the NO<sub>x</sub> emissions inventory.<sup>14</sup> In the San Joaquin Valley, heavy-duty trucks account for over 50% of the NO<sub>x</sub> emissions from transportation.<sup>15</sup>
- The cleanest commercially available heavy-duty truck is the Cummins Westport, Inc. engine, which meets the optional low-NO<sub>x</sub> standard.<sup>16</sup> These engines reduce NO<sub>x</sub> emissions by 90% when compared to existing diesel counterparts. Turning over or scrapping diesel-fueled heavy-duty trucks and replacing them with low-NO<sub>x</sub> trucks will achieve significant ambient air quality benefits.
- Both the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD) rely heavily on low-NO<sub>x</sub> trucks meeting the optional low NO<sub>x</sub> standard—only natural gas-powered engines currently meet that standard. Both agencies outlined measures focused on the turnover of the existing fleet to low-NO<sub>x</sub> trucks in their respective attainment plans.<sup>17,18</sup> In a joint letter to the California Air Resources Board (CARB) dated September 13, 2019, the SCAQMD and SJVAPCD state “it is virtually impossible for both air districts to attain the new standards for ozone and particulate matter without the implementation of transformative measures, including significant development and deployment of zero and near-zero emission technologies for mobile and stationary sources.”<sup>19</sup> Further, the SCAQMD is currently developing a Contingency Measures Plan to comply with its ozone planning obligations for the 1997 8-hour

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<sup>14</sup> SCAQMD. Appendix III. Base and Future Year Emission Inventory. 2016 Air Quality Management Plan. March 2017. Available at: <https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-iii.pdf?sfvrsn=6>

<sup>15</sup> SJVAPCD. Appendix B. Emissions Inventory. 2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards. November 15, 2018. Available at: <http://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/B.pdf>

<sup>16</sup> CARB’s optional Low NO<sub>x</sub> Standard is 0.02 grams per brake horsepower- hour (g/bhp-hr).

<sup>17</sup> “The incentive programs will place the highest priority on on-road vehicles that meet the cleanest optional NO<sub>x</sub> emission standard and provide their service to the above facilities in the region and have gross vehicle weight ratings of 26,001 pounds or greater.” South Coast Air Quality Management District (SCAQMD). Final 2016 Air Quality Management Plan (AQMP). Appendix IV-A MOB-08: ACCELERATED RETIREMENT OF OLDER ON-ROAD HEAVY-DUTY VEHICLES, at p.157. Available at: <https://tinyurl.com/y5htfcac>.

<sup>18</sup> San Joaquin Valley Air Pollution Control District (SJVAPCD). *San Joaquin Valley Supplement to the 2016 State Strategy for the State Implementation Plan*. Measure: Accelerated Turnover of Trucks and Buses, at p. 22. October 25, 2018. Available at: <https://tinyurl.com/y2rkzwsn>

<sup>19</sup> Letter to CARB from SCAQMD and SJVAPCD, September 13, 2019. Available at: <https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=fundingplanqip2019>

ozone standard. In order to comply with contingency measures requirements, SCAQMD needs to identify how to reduce 34 tons per day of emissions from on-road heavy-duty trucks by 2023.<sup>20</sup>

**b. The use of RNG as a transportation fuel, particularly in the heavy-duty sector, significantly reduces GHG emissions since RNG has a lower carbon intensity (CI) value relative to electric heavy-duty vehicles.**

- RNG can have a low CI or even negative CI depending on the feedstock and conversion system.<sup>21</sup> CI is expressed in grams of carbon dioxide equivalent per megajoule (g CO<sub>2</sub>e/MJ) of energy provided by that fuel, and takes into account the GHG emissions associated with all the steps of producing, transporting, and consuming a fuel—also known as a complete life cycle of that fuel.<sup>22</sup> For example, AMP Americas, an RNG producer, marketer, and compressed natural gas (CNG) fuel provider for the heavy-duty trucking industry was issued a carbon CI score of -254.94 g CO<sub>2</sub>e/MJ for its dairy waste-to-vehicle fuel pathway.<sup>23</sup> This is the lowest CI score ever issued by CARB for any fuel or technology. For comparison, heavy-duty vehicles that are fueled or charged via California's electric grid do not have the same carbon benefits. California grid electricity used as a transportation fuel has a CI of 91.49 g CO<sub>2</sub>e/MJ, whereas diesel has a CI of 100.45 g CO<sub>2</sub>e/MJ.<sup>24</sup>
- In California, almost 78% of natural gas dispensed for use in transportation and reported under California's Low Carbon Fuel Standard (LCFS) Program was RNG.<sup>25</sup> In the first quarter of 2019, the average RNG CI was 44.26 g CO<sub>2</sub>e/MJ,<sup>26</sup> providing a 51% decrease in GHG emissions compared to diesel.

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<sup>20</sup> SCAQMD AQMP Public Consultation Meeting. Progress and Challenges in Meeting 1997 8-Hour Ozone National Ambient Air Quality Standard in South Coast Air Basin Presentation. July 19, 2019. Available at: <http://www.aqmd.gov/docs/default-source/planning/scab-1997-8-hour-ozone/scab-1997-8-hour-ozone---public-consultation-meeting---presentation.pdf?sfvrsn=6>

<sup>21</sup> This includes anaerobic digestion of manures, food scraps, or biosolids, with a subsequent gas upgrading system to produce RNG.

<sup>22</sup> CARB. LCFS Presentation. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/background/basics-notes.pdf>

<sup>23</sup> CARB. LCFS Pathway Certified Carbon Intensities. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm>

<sup>24</sup> *Ibid.*

<sup>25</sup> CARB. LCFS Reporting Tool Quarterly Summaries. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/lrtqsummaries.htm>

<sup>26</sup> *Ibid.*

**c. Natural gas and RNG can produce a number of low-carbon fuels to reduce petroleum dependency.**

- RNG can be used to produce CNG or liquefied natural gas (LNG), depending on the end user storage needs. RG can also be used to create low-carbon, renewable hydrogen via steam-methane reforming. Depending on the pathway (e.g., hydrogen produced from landfill gas), hydrogen produced from RNG can have a net-negative CI.<sup>27</sup> RNG can be used in commercially available equipment today and potentially transition to zero-emission tailpipe technologies, such as hydrogen, in the future.
- Taking a multi-pathway, balanced approach to fuels is critical in reducing petroleum dependency and use, particularly in uses, such as heavy-duty trucking, which are harder to electrify because of weight and range issues. According to the California Environmental Protection Agency (CalEPA) and CARB, “in order to meet federal health-based air quality standards and our climate change goals, we must cut in half the amount of petroleum we use in our cars and trucks over the next 15 years.”<sup>28</sup> Waiting for a plug-in battery for heavy-duty trucks instead of leveraging today’s technologies, will maintain a heavy reliance on petroleum-based fuels for the foreseeable future.

**d. In addition to heavy-duty trucking, natural gas is a viable option for other transportation sectors, including marine vessels.**

- The International Maritime Organization (IMO) is reducing the global sulfur limit of marine fuels by 85% starting January 1, 2020. This would reduce the global cap in sulfur in marine fuels from the current 3.5-0.5%, meaning all operating vessels would have to use fuels that meet this requirement. LNG is a sulfur-free fuel that meets this new requirement. The marine sector already produces dual (diesel and LNG) fuel engines that operate internationally today. In California, because of the abundance of diesel fuel, there are no LNG bunkering facilities. However, with the upcoming IMO requirements, there is an anticipated shortage of diesel fuel that meets the sulfur requirements, which will force vessel operators to look for alternatives. With the current use of LNG in other

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<sup>27</sup> CARB. LCFS Pathway Certified Carbon Intensities. “Current Lookup Table, Tier 1, Tier 2, and Legacy Fuel Pathway Table, Current Pathways” spreadsheet includes two certified pathways for hydrogen from landfill gas with negative carbon intensities of (-5.28) gCO<sub>2</sub>e/MJ (FPC: HYGLF200L) and (-12.65) gCO<sub>2</sub>e/MJ (FPC:HYGLF201L). Available at:

<https://ww3.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm>

<sup>28</sup> California EPA and CARB. California’s 2030 Climate Commitments, Cutting Petroleum Use in Half by 2030. No date. Available at:

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwiq6Yra3bDIAhVYCTQIHdDGD6YQFjACegQIABAB&url=https%3A%2F%2Fwww.arb.ca.gov%2Fnewsrel%2Fpetroleum\\_reductions.pdf&usq=AOvVaw0\\_7peHc03bsc2Z5pA-d5VM](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwiq6Yra3bDIAhVYCTQIHdDGD6YQFjACegQIABAB&url=https%3A%2F%2Fwww.arb.ca.gov%2Fnewsrel%2Fpetroleum_reductions.pdf&usq=AOvVaw0_7peHc03bsc2Z5pA-d5VM)



countries, it will be examined closely by vessel operators as an alternative to diesel. Additionally, as a non-petroleum fuel, LNG does not produce DPM from combustion. This is particularly important in California, where the three largest ports, Los Angeles, Long Beach, and Oakland, are situated adjacent to disadvantaged communities. The use of LNG would eliminate DPM emissions when transiting to dock power.

**e. The CEC should continue to encourage the use of RNG as a transportation fuel by providing incentive funding for natural gas trucks and supporting infrastructure.**

- The Final 2017 IEPR concludes “that renewable gas produced from anaerobic digestion used as a transportation fuel in near-zero emission, heavy-duty vehicles is the most likely near-term solution. Projects at dairies or using organic waste diverted from landfills offer significant short-lived climate pollutant reductions.”<sup>29</sup> In order to leverage the benefits of renewable gas, there should be CEC (and other state agency) support for both the natural gas infrastructure and natural gas vehicles.
- The State, primarily through the Department of Resources Recycling and Recovery (CalRecycle) and Senate Bill (SB) 1383, has invested over \$600 million in RG projects. In order to follow through on the Final 2017 IEPR recommendation and support the investments made, the CEC can work with investors and RG producers to demonstrate a future in transportation for the low-carbon fuel. This includes identifying strategies to maximize the statewide natural gas infrastructure system.
- Natural gas truck sales are on an overall upward trajectory, gaining 10% month-over-month, 60% compared to May of 2018, and showing 43% improvement against the first five months of last year.<sup>30</sup> Natural gas as a transportation fuel has been gaining momentum and fleets are starting to take notice. While this is encouraging, there is still a lot that needs to be done.
  - Diesel remains the predominant fuel for heavy-duty trucking, and incentives are necessary to drive the continued fleet transition. In the absence of incentive funds, fleets would likely not have adopted natural gas at all and would likely revert back to diesel.
  - The CEC should be on the forefront of the transition to RNG—not stifling it. However, at its recent Business Meeting on September 11, the Commissioners approved the 2019-2020 Investment Plan for the Clean Transportation Program,

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<sup>29</sup> CEC. *Final 2017 IEPR*, at p. 284. Available at:

<https://efiling.energy.ca.gov/getdocument.aspx?tn=223205>

<sup>30</sup> HDT. *Truckinginfo. Natural Gas Truck Sales Are on the Rise*. July 29, 2019. Available at:

<https://www.truckinginfo.com/337132/natural-gas-truck-sales-are-on-the-rise>

which shifts all funding to support zero-emission transportation technologies, eliminates funding for near-zero emission natural gas vehicles, and does not allocate funding specifically for RNG production.<sup>31</sup> As noted above, the SCAQMD and SJVAPCD are relying on the transition to low-NOx technologies as one of, if not the most effective strategies to meet air quality standards because they achieve significant emission reductions and are cost effective. The air districts cannot rely on technologies that are not commercially available to meet aggressive air quality timelines.

- Since the turnover of diesel-fueled to low-NOx heavy-duty trucks is a cost-effective strategy to address ambient air quality standards and reduce GHG emissions, CEC can effectively encourage the construction of additional “heavy-duty accessible” CNG vehicle refueling stations and prioritize incentive funds that replace diesel fueling infrastructure with “heavy-duty” accessible CNG and other alternative fuel (i.e., hydrogen or tri-generation<sup>32</sup>) stations in highly-trafficked transportation corridors.
- A primary concern for any potential CNG-fueled heavy-duty truck owner is the availability of CNG infrastructure. CNG stations are distinct from gasoline and diesel stations because they dispense high pressure natural gas and are built to conform to codes specifically developed for high pressure gas and include unique components such as gas dryers and high-pressure storage systems.<sup>33</sup> In 2018, SoCalGas provided over 121 million gallons of natural gas to 336 CNG refueling stations. And in 2019, SoCalGas served 122 public access CNG refueling stations. Of those public access stations, 39 are “heavy-duty accessible” or designed to serve heavy-duty trucks. Further, SoCalGas has reduced the price of CNG publicly offered by \$0.26 per gallon by returning revenue generated from the sale of LCFS credits to its customers.<sup>34</sup>

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<sup>31</sup> Comments provided by SoCalGas on this issue. See Appendix A.

<sup>32</sup> A tri-generation station provides transportation fueling infrastructure for compressed natural gas (CNG), electric, and hydrogen vehicles at one location. More info available at:

[http://www.aep.uci.edu/research/partnership\\_TRI-GEN.aspx](http://www.aep.uci.edu/research/partnership_TRI-GEN.aspx)

<sup>33</sup> Drive Natural Gas Initiative. CNG Infrastructure Guide. Available at:

[https://www.aga.org/sites/default/files/sites/default/files/media/cng\\_infrastructure\\_guide.pdf](https://www.aga.org/sites/default/files/sites/default/files/media/cng_infrastructure_guide.pdf)

<sup>34</sup> Sempra Energy. *SoCalGas Reduces CNG Price by \$0.26 per Gallon at its Fueling Stations*. March 26, 2019. Available at: <https://www.sempra.com/socalgas-reduces-compressed-natural-gas-price-026-gallon-its-fueling-stations>

## **2. THE ROLE OF NATURAL GAS IN MAINTAINING ELECTRIC RELIABILITY**

*Statute: Determining the role of natural gas-fired generation as part of a resource portfolio, including, but not limited to, combined heat and power, and the impact of that role on meeting greenhouse gas targets.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with electric reliability. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG in natural gas-fired generation as part of a resource portfolio. SoCalGas elaborates on this further below.

Almost half of the electricity generated in California is produced using natural gas.<sup>35</sup> And natural gas generation is even more important than that figure would suggest because of its attributes as a reliable and continuously available energy source. The electricity produced from renewables such as wind and solar varies depending on conditions each hour; the resulting intermittency of availability, as well as over-generation, pose reliability and cost challenges. When electric generation from renewables declines, other generation sources like natural gas-fired power plants are used to meet local reliability needs, to provide emergency system support, and to provide a range of ancillary services needed by the California Independent System Operator (CAISO) to keep the electric system running reliably. Meeting electric reliability is becoming more challenging as the State further increases the portion of electricity generated from renewables since the CAISO must quickly bring on or shut down generation resources to meet an increasing or decreasing electricity demand over a short period of time.

CAISO recently submitted comments to the CPUC on their 2019-2020 Integrated Resource Planning (IRP) rulemaking urging it to focus immediately on developing a comprehensive plan for addressing near-term reliability needs through 2022 since its analysis shows a potential gap of up to 2,000 megawatts (MW) of electricity beginning in summer of 2021 and increasing to 2,500 MW in 2022.<sup>36</sup> Specifically, CAISO requests the CPUC to “work through the appropriate process to extend the State Water Resources Control Board’s once-through-cooling (OTC) regulation compliance dates for gas-fired generating units that are needed to maintain reliability.”<sup>37</sup> Further, the CPUC’s preliminary IRP results highlight concerns with reducing the

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<sup>35</sup> CEC. Total System Electric Generation. Available at:

[https://ww2.energy.ca.gov/almanac/electricity\\_data/total\\_system\\_power.html](https://ww2.energy.ca.gov/almanac/electricity_data/total_system_power.html)

<sup>36</sup> Comments of the California Independent System Operator Corporation (CAISO) on Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements (Rulemaking 16-02-007). Available at: <http://www.caiso.com/Documents/Jul22-2019-Comments-PotentialReliabilityIssues-R16-02-007.pdf>

<sup>37</sup> *Id.*, at p. 2

amount of natural gas generation. The CPUC notes that the “level of gas retention is dependent on the capacity value of battery storage in a grid with relatively abundant solar generation.”<sup>38</sup> However, the CPUC released its IRP proposed reference system portfolio to achieve GHG emissions targets for 2030 and noted that, “ heavy emphasis on solar and battery storage in the selected portfolio may be of concern for several reasons... there is risk associated with the lack of diversification among the selected new resources, or putting all of California’s eggs in a few baskets. Put simply, it is unknown whether there will be enough reliable energy resources to charge the large amount of storage so that it can discharge when needed to provide reliability services... While it is not quantified or necessarily quantifiable, there is certainly some value in resource diversity in resource planning, to manage risk.”<sup>39</sup>

There is a strong need for creative solutions to integrate renewables, increase the electric system’s flexibility, and maintain system reliability. Natural gas and RNG are key flexible energy sources that the CEC can leverage to maintain a reliable and resilient energy supply.

**a. Gas-fired combustion turbines (CT) and combined-cycle (CC) power plants are essential for electric system reliability.**

- Currently available new CTs and CCs are more fuel efficient<sup>40</sup> and more environmentally friendly than existing gas-fired generators built over 15 years ago. The new CTs have heat rate in the low- to mid-8,000 British thermal units per kilowatt hour (Btu/kwh). The new CCs have heat rates in the mid-6,000 Btu/kwh. Lower heat rate means the generator uses less natural gas to generate the same one MWh of electricity than a generator with higher heat rate; less gas burn means less emissions. Additionally, these are designed to have both a short startup time and fast ramp rate. Thus, they are ideal for complementing intermittent renewable wind and solar resources. Additional or repowered CT and CC power plants can help support

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<sup>38</sup>CPUC. 2019-2020 Preliminary Results. CPUC Energy Division. October 4, 2019., at p. 76. Available at: <https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/2019%20IRP%20Preliminary%20Results%2020191004.pdf>

<sup>39</sup> CPUC. Administrative Law Judge’s Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions. November 6, 2019. At p.22-23.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M319/K132/319132053.PDF>

<sup>40</sup> GE Power. LM6000 Power Plants. Specifications for currently available gas turbines. Available at: [https://www.ge.com/content/dam/gepower/global/en\\_US/documents/gas/gas-turbines/aero-products-specs/lm6000-fact-sheet-product-specifications.pdf](https://www.ge.com/content/dam/gepower/global/en_US/documents/gas/gas-turbines/aero-products-specs/lm6000-fact-sheet-product-specifications.pdf)

electric reliability concerns that stem from the retirement of OTC plants throughout the State.<sup>41</sup>

**b. Natural gas provides operational flexibility and stability during grid fluctuations resulting from intermittent renewable energy sources. As such, the CEC must consider the role natural gas plays as a flexible, grid stabilizing energy source in light of the growing reliance on intermittent resources.**

- The rapid rise of solar and wind generation has created challenges with managing the electric grid. In 2018, solar and wind accounted for almost 23% of total system electric generation<sup>42</sup> and the percentage of retail electricity from renewable power is on the rise. CAISO is already facing system reliability difficulties with the large-scale integration of solar photovoltaic (PV) generation on the electric grid.<sup>43</sup> Solar and wind production frequently exceeds electrical demand and since there is limited ability to store surplus energy optimally, this causes ramping challenges since CAISO must bring on or shut down generation resources to meet an increasing or decreasing electricity demand quickly, over a short period of time.<sup>44</sup> CAISO states that to ensure reliability under changing grid conditions, they need resources with ramping flexibility and the ability to start and stop multiple times per day.<sup>45</sup>
- Given this, the CEC should recognize the importance of having flexible resources, such as natural gas CT and CC power plants, to ensure energy reliability under changing grid conditions. The Energy Futures Initiative (EFI), recently released a report titled, *Optionality, Flexibility and Innovation: Pathways for Deep Decarbonization in California*, (EFI Report) which recognizes the variability of renewable energy sources. The EFI Report analyzed the options within the parameters of existing state policy by each sector for meeting California's near- (2030) and long-term (2050) carbon emissions reductions goals, and concluded:<sup>46</sup>

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<sup>41</sup> CEC. Tracking Progress: Once-Through Cooling Phaseout. April 2019. Available at: [https://ww2.energy.ca.gov/renewables/tracking\\_progress/documents/once\\_through\\_cooling.pdf](https://ww2.energy.ca.gov/renewables/tracking_progress/documents/once_through_cooling.pdf)

<sup>42</sup> CEC. Total System Electric Generation. Available at: [https://ww2.energy.ca.gov/almanac/electricity\\_data/total\\_system\\_power.html](https://ww2.energy.ca.gov/almanac/electricity_data/total_system_power.html)

<sup>43</sup> CAISO. *Fast Facts: What the duck curve tells us about managing a green grid*. Available at: [https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables\\_FastFacts.pdf](https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf)

<sup>44</sup> CAISO. *Fast Facts: Impacts of Renewable Energy on Grid Operations*, at p. 1. May 2017. Available at: <https://www.caiso.com/Documents/CurtailmentFastFacts.pdf>

<sup>45</sup> *Ibid.*

<sup>46</sup> Energy Futures Initiative (EFI). *Optionality, Flexibility, and Innovation. Pathways for Deep Decarbonization*. Available at:

- “A system with a high penetration of renewables must anticipate potential monthly or seasonal shortcomings in renewable output because wind, solar, and hydro resource availabilities are not complementary. For instance, recent California solar production was only 1.5 TWh in January 2018 but reached 3.2 TWh in June 2018.”<sup>47</sup>
- EFI also notes that, “natural gas generation will continue to play a role in providing California’s electric grid with operational flexibility and system reliability, while enabling the growth and integration of intermittent renewables.”<sup>48</sup>

**c. Natural gas-fired power generation provides safe, reliable electricity at affordable rates to millions of Californians for many years to come, and it is essential for maintaining electric reliability in the near term.**

- Natural gas has a critical role to play in a high-renewables, low-carbon world. According to the Lawrence Livermore National Laboratory (LLNL):<sup>49</sup>
  - Carbon Capture Utilization and Storage (CCUS) can significantly reduce or eliminate emissions from natural-gas fired power plants. Technology for retrofitting existing plants is available today and technological, efficiency, and cost improvements will follow first-generation retrofit solutions.
  - Natural gas reduces the need for energy storage by allowing for dispatchable generation on a daily or seasonal basis. Although technically feasible, an electric grid composed solely of renewables and a large storage resource would be subject to higher costs relative to a more diverse energy portfolio that takes advantage of extensive, existing natural gas infrastructure to deliver 20% RNG by 2030. This more balanced pathway considers the full extent of costs for supporting infrastructure and wildfire mitigation, not just energy supply costs.
  - Since natural gas and biofuels are easily transportable and storable, they are available upon demand where needed, and can help provide operational flexibility and load-following capabilities that help maintain grid reliability and facilitate growth of intermittent renewables.

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[https://static1.squarespace.com/static/58ec123cb3db2bd94e057628/t/5ced6fc515fcc0b190b60cd2/1559064542876/EFI\\_CA\\_Decarbonization\\_Full.pdf](https://static1.squarespace.com/static/58ec123cb3db2bd94e057628/t/5ced6fc515fcc0b190b60cd2/1559064542876/EFI_CA_Decarbonization_Full.pdf)

<sup>47</sup> *Id.*, at p. 51

<sup>48</sup> *Id.*, at p. XIX

<sup>49</sup> Lawrence Livermore National Laboratory Comments. The Natural Gas Infrastructure and Decarbonization Targets. June 21, 2019. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143>

- The capability of natural gas generation to provide peak reliability was recently assessed by Energy and Environmental Economics, Inc. (E3) in a study for Calpine Company, America's largest generator of electricity from natural gas and geothermal resources and one of the largest retail providers of power.<sup>50</sup> E3's study demonstrated the need for some natural gas electric generation even in a 2050 timeframe.<sup>51</sup> E3 found that:
  - Eliminating natural gas generation entirely is prohibitively expensive;
  - Even with a lot of solar generation and storage, it is generally economic to retain natural gas generation to assure reliability through multi-day periods of low solar generation;
  - Low renewable production in winter requires natural gas generation for reliability; and
  - Significant renewable over-build and storage is required to retire natural gas generation facilities while maintaining reliability.

**d. Given the importance of natural gas generation in maintaining electric, the CEC must support CCUS technologies since this technology will be key in meeting climate targets.**

- Research, development, and demonstration monies from the State and federal governments are needed for carbon capture, utilization, and storage (CCUS) and other sequestration projects to maximize the benefit they can provide to the environment, create demand, and lower prices through innovation and competition.
- According to EFI, if California's natural gas combined cycle plants were retrofitted with CCUS at an assumed 90% capture rate, the emissions reductions would amount to nearly 27.4 million metric tons of CO<sub>2</sub>e.<sup>52</sup> EFI estimates that there are 37 natural gas-fired power plants in California that could be potential candidates for CCUS.<sup>53</sup>
- CCUS technologies can produce high-grade solid carbon, which has a wide range of uses. It can be used to create fuels, chemicals, food products, industrial materials

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<sup>50</sup> Calpine Corporation Website. Available at: <http://www.calpine.com/>

<sup>51</sup> Calpine Corporation. *The very long-term role of gas in the California grid* presentation. May 8, 2019. Available at: [http://www.panc.org/documents/2019\\_Seminar/Barmack\\_Slides.pdf](http://www.panc.org/documents/2019_Seminar/Barmack_Slides.pdf)

<sup>52</sup> EFI. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*, at p.80. May 2019. Available at [https://energyfuturesinitiative.org/s/EFI\\_CA\\_Decarbonization\\_Full-b3at.pdf](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf)

<sup>53</sup> *Ibid.*



etc.<sup>54</sup> CCUS also produces decarbonized hydrogen<sup>55</sup> which, as discussed previously, can be injected into the natural gas grid displacing traditional natural gas.

**e. Natural gas-powered distributed generation resources, like combined heat and power (CHP) systems, natural gas microturbines, and fuel cells, offer energy cost savings, reduced peak electricity demand on grid, leverages existing infrastructure, avoids expensive electric distribution additions, and reduces GHG and criteria air emissions.**

- Distributed generation projects incented by the Self Generation Incentive Program reduced a total of 265,191 metric tons of CO<sub>2</sub> in 2016 and 2017 combined<sup>56</sup> and these systems represent a small fraction of the more than 8,000 MW of distributed generation installed in California.<sup>57</sup>
- CHP systems can achieve total system efficiencies of 60-80% for producing electricity and useful thermal energy. They are increasingly more efficient than the average fossil-fuel plant efficiency of 33%.<sup>58</sup>
- Fuel cells, in particular, offer clear efficiency advantages in comparison to other forms of distributed power generation. A fuel cell uses the chemical energy of natural gas or hydrogen to cleanly and efficiently produce electricity. If hydrogen is the fuel, electricity, water, and heat are the products.<sup>59</sup> If the fuel is natural gas, then CO<sub>2</sub> is generated. However, “because of the high electrical efficiency of fuel cells, the amount of carbon dioxide emitted per kWh of electricity generated is substantially lower than from conventional power generation technologies. The ability of fuel cells to capture and use the high-quality thermal energy further reduces the amount of carbon dioxide emitted, and the ability of fuel cells to operate on biogas results in net zero emission of carbon, and the ability of fuel cells to operate on renewable

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<sup>54</sup> National Energy Technology Laboratory. About Carbon Utilization. Available at: <https://www.netl.doe.gov/coal/carbon-utilization/about>

<sup>55</sup> Hydrogen Europe. Hydrogen Basics. Available at: <https://hydrogeneurope.eu/hydrogen-basics-0>

<sup>56</sup> Itron. *2016-2017 Self-Generation Incentive Program Impact Evaluation*, at p. C-4. September 28, 2018. Available at:

[https://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Public\\_Website/Content/Utilities\\_and\\_Industries/Energy/Energy\\_Programs/Demand\\_Side\\_Management/Customer\\_Gen\\_and\\_Storage/2016-2017\\_Self-Generation\\_Incentive\\_Program\\_Impact\\_Evaluation.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/Customer_Gen_and_Storage/2016-2017_Self-Generation_Incentive_Program_Impact_Evaluation.pdf)

<sup>57</sup> U.S. Department of Energy. CHP Technical Assistance Partnerships. *The State of CHP: California*. Available at: <https://www.energy.gov/sites/prod/files/2017/11/f39/StateOfCHP-California.pdf>

<sup>58</sup> U.S. EPA. Combined Heat and Power (CHP) Partnership. CHP Benefits. Available at: <https://www.epa.gov/chp/chp-benefits>

<sup>59</sup> U.S. Department of Energy. Fuel Cells. Available at: <https://www.energy.gov/eere/fuelcells/fuel-cells>

- hydrogen results in zero emission of carbon.”<sup>60</sup> Further, fuel cell power creates a clean alternative for on-site power that replaces dirtier diesel generators because they “emit virtually zero criteria pollutants including NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>), PM, and carbon monoxide (CO).”<sup>61</sup>
- Distributed energy resources especially CHP, can help communities and critical infrastructure facilities (e.g., hospitals) meet resilience goals and allows electric grids to remain operational regardless of external events.<sup>62</sup> The study found:
    - A natural gas-fueled CHP system that runs consistently is more likely to be operational during an electric grid outage because it is regularly maintained for daily use, operated by trained staff, and has access to a reliable fuel supply.
    - Electric grid outages and power disruptions lead to unexpected costs or revenue losses and, in the case of critical infrastructure facilities, safety, and health risks.
    - The estimated cost of loss of power for medium and large commercial and industrial facilities (>50,000-kilowatt hour/year) ranges from \$12,952 for a momentary outage to \$165,000 for a 16-hour outage.
  - To mitigate wildfire risk and keep communities safe, electric IOUs are turning off power to their customers (referred to as Public Safety Power Shutoff or PSPS). According to the CPUC's de-energization report, these intentional outages have resulted in over 7,500 outage hours from October 2014 through September 2019.<sup>63</sup> Distributed generation can be used to power microgrids to enhance the energy reliability of communities susceptible to PSPS events.
  - Distributed generation can also benefit electric system operators. For example, SunRun, Inc. published a study showing the energy balancing benefits of distributed energy resources on the grid.<sup>64</sup> To summarize:

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<sup>60</sup> University of California, Irvine. Advanced Power & Energy Program. *Assessment of Fuel Cell Technologies to Address Power Requirements at the Port of Long Beach*. Supplemental Report: The Science of Fuel Cells, at p. 8. Available at:

<http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13598>

<sup>61</sup> *Ibid.*

<sup>62</sup> American Council for an Energy-Efficiency Economy. *Valuing Distributed Energy Resources: Combined Heat and Power and the Modern Grid*. April 2018. Available at:

<https://aceee.org/sites/default/files/valuing-der.pdf>

<sup>63</sup> CPUC. De-Energization (PSPS). De-energization Spreadsheet. Available at:

<https://www.cpuc.ca.gov/deenergization/>

<sup>64</sup> SunRun, Inc. Building a More Resilient Grid, Home Solar & Storage Mitigate Wildfire Impacts. March 2019. Available at: <https://www.sunrun.com/sites/default/files/wildfire-mitigation-sunrun.pdf>

- When an electrical circuit heats up (from electrical power flowing through), it will expand proportionately to temperature. This affects how close to the ground that circuit hangs, the “sag.” Too much sag can bring the circuit closer to other objects or circuits resulting in sparks which have potential to cause wildfires.
  - Distributed energy resources help to reduce power flows, and therefore the concomitant risk of wildfires, by picking up the additional load around the network and keep electrical circuits within their power limits (i.e., helps control sag).
- f. Unlike battery storage, local natural gas generation is capable of adequately responding to peak demands or outages that do not deplete or have diminished performance over time or are dependent on unpredictable weather and atmospheric conditions (e.g. smoke).**
- Although battery storage is gaining a foothold in California to provide energy resources from renewables during high demand, large-scale battery storage installations in CAISO’s territory have an average power capacity of 5 MW and an average duration of four hours.<sup>65</sup> At present, therefore, their utility is limited, either in helping reliably cope with variations in demand or in responding to an outage.
  - According to EFI, there are key battery storage challenges that electric grid operators, policy makers, and regulators must address:
    - [The] utility-scale battery storage in CAISO [territory] has relatively limited duration... While storage in CAISO is of longer duration than in PJM [regional transmission organization]<sup>66</sup>(where storage appears to be used for frequency regulation), it is inadequate to support the state’s intermittent renewables when there are periods of seven to ten days when there was little to no wind generation. Lithium-ion batteries, the current technology of choice, are ill-suited for longer duration storage applications, because they experience significant capacity fade when the batteries are deeply cycled (i.e., from full to empty charge).<sup>67</sup>

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<sup>65</sup> U.S. Energy Information Administration. *U.S. Battery Storage Market Trends*, at p. 4. May 2018. [https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery\\_storage.pdf](https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf)

<sup>66</sup>PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.

<sup>67</sup> *Id.*, at p. 60

- “The final challenge, which is not yet acute but could become an issue in the future, relates to the supply chains for battery component materials, including lithium and cobalt. These elements are used in almost all utility-scale batteries and vehicle batteries today.”<sup>68</sup> EFI further notes that global supplies of lithium and cobalt are highly concentrated in a few regions and global demand growth for these materials has far outpaced production, leading to price volatility and fears that resource shortages may appear.
- Local natural gas-fired generators can generate electricity continuously during extended electric transmission line outages, during extended maintenance outages of other large generating resources, during years of low hydro-electric generation, and during unusual weather patterns (multi-days of cloud coverage or lack of wind). For example, the 2011 Southwest Blackout Event affected five utilities, including SDG&E. All of the San Diego area lost power, with nearly 1.5 million SDG&E customers losing power, some up to 12 hours.<sup>69</sup> And with the frequency and destructive capacity of wildfires on the rise, electric utility companies have growing reliability concerns. Natural gas resources also are important to minimize impacts from service disruptions caused by PSPS events in high fire threat areas.<sup>70</sup>

### **3. TAKING THE BEST ADVANTAGE OF NATURAL GAS, RNG, AND HYDROGEN AS LOW-EMISSION RESOURCES**

*Statute: Taking the best advantage of natural gas as a low-emission resource, including potential zero and near-zero greenhouse gas emissions, natural gas, and biogas options, taking into account the impact on electric system operations.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with low-emission resources. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG as a low emission resource. SoCalGas elaborates on this further below.

Natural gas has the potential to reduce GHG emissions by shifting away from higher CO<sub>2</sub> emitting fuels like coal, gasoline, or diesel commonly used in the transportation sector, and for electric generation, RNG is an even lower emission fuel source with greater potential to reduce

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<sup>68</sup> *Id.*, at p. 61

<sup>69</sup> North American Electric Reliability Corporation (NERC). September 2011 Southwest Blackout Event. Available at: <https://www.nerc.com/pa/rrm/ea/Pages/September-2011-Southwest-Blackout-Event.aspx>

<sup>70</sup> SCE. Public Safety Power Shutoffs. Available at: <https://www.sce.com/safety/wildfire/psps>

GHG emissions. RNG is produced from raw biogas typically derived from organic waste streams, such as sewage, landfills, dairies, and agriculture. SB 1383 requires a 40% reduction in methane emissions by 2030.<sup>71</sup> Capturing waste stream biogas emissions and producing RNG is a valuable low-emission resource that will help achieve critical climate change objectives since the majority of methane emissions come from livestock manure management (26%) and landfills (21%). In dismissing RNG as a viable pathway, methane leakage concerns raised by E3's *Deep Decarbonization in a High Renewables Future* (2018) study are unfounded. CARB reports around 39.93 million metric tons (MMT) of carbon dioxide equivalent (CO<sub>2</sub>e) of methane emissions statewide, of which only 4.01 MMT CO<sub>2</sub>e, or 10%, is associated with natural gas transmission and distribution.<sup>72</sup> According to the 2018 CARB and CPUC joint staff report for SB 1371, utility natural gas system emissions were equivalent to only 2.86 MMT CO<sub>2</sub>e in 2017, with around 1.21 MMT CO<sub>2</sub>e coming from SoCalGas' system.<sup>73</sup> Comparing this SB 1371 report data with CARB's scoping plan level emissions reporting SoCalGas' system only represents about 3% of statewide methane emissions, which is approximately 0.3% of the State's total GHG inventory. See Section 6 for further details on SoCalGas' methane emission reduction efforts. Further, CARB's Climate Change Scoping Plan Update identified a number of different approaches for "achieving success in clean energy," including enabling cost-effective access to RNG.<sup>74</sup> An important part of CARB's strategy is putting waste resources to beneficial use, including organic sources of methane from waste streams. Capturing these emissions is integral to lowering methane emissions in California in a reasonable and economic way,<sup>75</sup> and leveraging the existing natural gas infrastructure allows a cost-effective solution to reduce emissions from these sectors by transporting RNG over existing, safe transmission and distribution infrastructure. By committing to deliver 20% RNG to residential and commercial customers by 2030, SoCalGas is maximizing the benefits of RNG as a low-emission resource since capturing fugitive methane emissions from waste streams and beneficially reusing it is a critical GHG mitigation strategy. No other pathway, including an all-electrification strategy, has contemplated

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<sup>71</sup> California Legislative Information. SB-1383 Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills. Available at:

[https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB1383](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383)

<sup>72</sup> CARB. California Methane Inventory for 2000-2017. August 12, 2019. Available at:

[https://ww3.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_scopingplan\\_2000-17ch4.pdf](https://ww3.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2000-17ch4.pdf)

<sup>73</sup> CARB and CPUC. Joint Staff Report-Analysis for the Utilities' June 15, 2018, Natural Gas Leak and Emission Reports. December 21, 2018. Available at:

[https://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Website/Content/Safety/Risk\\_Assessment/Methane\\_Leak/2017%20NGLA%20Joint%20Report%2012-21-18.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Safety/Risk_Assessment/Methane_Leak/2017%20NGLA%20Joint%20Report%2012-21-18.pdf)

<sup>74</sup> CARB. *California's 2017 Climate Change Scoping Plan*, at p. ES-11. November 2017. Available at:

[https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf)

<sup>75</sup> CARB. Introduction to the Phase I Report of the California Methane Survey from the Staff of the California Air Resources Board, October 2, 2017. Available at:

[https://www.arb.ca.gov/research/methane/CA\\_CH4\\_Survey\\_Phase1\\_Report\\_2017.pdf](https://www.arb.ca.gov/research/methane/CA_CH4_Survey_Phase1_Report_2017.pdf)

how to address these significant contributors to methane emissions from agriculture and waste. E3's all-electrification pathway also does not appropriately consider indirect costs of increased electric infrastructure. Further, hydrogen produced from natural gas reforming is a valuable low-carbon fuel that is being used for refining petroleum, treating metals, producing fertilizer, processing foods, and for use in fuel cell electric vehicles. RNG can also be reformed to create renewable hydrogen, which is not only a negative carbon fuel, but also a fuel that has zero criteria air pollutant emissions when combusted. As such, the CEC must continue to encourage the use of natural gas, RNG, and hydrogen to replace higher CO<sub>2</sub> emitting fuels.

**a. Sufficient RNG supplies are available to offset the use of fossil-based natural gas, but policy support is necessary to advance both in- and out-of-state RNG projects.**

- According to a University of California, at Davis research report, almost 100 billion cubic feet per year (Bcf/y) of anaerobically digested RNG is available in California today.<sup>76</sup> If we consider out-of-state supplies, there could be another one trillion cubic feet per year (Tcf/y) available.<sup>77</sup> With both in- and out-of-state supplies, gas corporations could achieve the projected statewide core procurement load of 540 Bcf by 2030;<sup>78</sup> and this does not even count hydrogen produced from electrolysis, steam-methane reformation of biomethane, or traditional natural gas using carbon capture and utilization<sup>79</sup>—all of which can help the State achieve carbon neutrality by 2045 as per the requirement of SB 100.
- There is no doubt that renewable gaseous fuels are in ample supply. The CEC must work with the CPUC, CARB, CalRecycle, and other state agencies to develop strategies that will advance RNG production and use in the State.

**b. The CEC should support technologies that gasify deceased trees in the state's forests to create RNG, as this process could offer considerable benefits for wildfire prevention**

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<sup>76</sup> See *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, UC Davis Institute of Transportation Studies (June 2016) at ix, available at: <https://steps.ucdavis.edu/wp-content/uploads/2017/05/2016-UCD-ITS-RR-16-20.pdf>

<sup>77</sup> ICF International. *Design Principles for a Renewable Gas Standard*, at p.10. 2017. Available at: <https://www.icf.com/resources/white-papers/2017/design-principles-for-renewable-gas>.

<sup>78</sup> 297 Bcf/y for SoCalGas and 243 Bcf/y for PG&E in 2030. California Gas and Electric Utilities. *2018 California Gas Report*, at p. 18. Available at: [https://www.socalgas.com/regulatory/documents/cgr/2018\\_California\\_Gas\\_Report.pdf](https://www.socalgas.com/regulatory/documents/cgr/2018_California_Gas_Report.pdf)

<sup>79</sup> Monolith. *Next Generation Black Carbon Production*. Available at: <https://monolithmaterials.com/innovative-technology/>



**and recovery, renewable energy generation, and GHG and criteria air pollutant emissions reductions.**

- According to a study by GTI<sup>80</sup>:
  - Collecting and converting forest trimmings and slash would add the benefit of reducing the potential of these wastes and dead trees to become potentially polluting and dangerous wildfires that are common in the state of California.
  - RNG production facilities for wood waste conversion will create a means to process these waste streams and virtually eliminate all criteria pollutants associated with existing biomass electricity production facilities.
  - Recently, technologies have become commercially available that can turn wood waste into RNG. Repurposing biomass power plants with these technologies will eliminate almost all criteria air emissions and provide a concentrated CO<sub>2</sub> stream that can be utilized to create more RNG or other by-products. Such a facility would provide a closed loop production system with very low net emissions while creating a storable renewable energy product that can be used like natural gas, delivered through the pipeline, with a very small carbon footprint.

**c. The CEC should promote the production of hydrogen produced via low- to zero-carbon pathways.**

- Today, 95% of the hydrogen produced in the United States is made by natural gas reforming in large central plants.<sup>81</sup> Hydrogen produced via electrolysis (often referred to as power-to-gas—where electricity is used to split water into hydrogen and oxygen) can result in zero GHG emissions if produced using renewable energy. This renewable hydrogen or electrolytic hydrogen can also be converted into synthetic natural gas via methanation and injected into the natural gas pipeline system, which can be used in everything from home appliances to industrial processes, engines, and power plants. Power-to-gas offers opportunities for synergy with renewable power generation since hydrogen and synthetic natural gas can be stored in existing natural gas infrastructure and used for use in transportation or to generate electricity when renewable energy sources are not available—supporting electric grid reliability.<sup>82</sup>

**d. The CEC can/should support the use of RNG and hydrogen in the industrial sector as it is one of the most difficult to decarbonize sectors.**

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<sup>80</sup> GTI. Low-Carbon Renewable Natural Gas (RNG) from Wood Wastes. February 2019. Available at: <https://www.gti.energy/wp-content/uploads/2019/02/Low-Carbon-Renewable-Natural-Gas-RNG-from-Wood-Wastes-Final-Report-Feb2019.pdf>

<sup>81</sup> U.S. Department of Energy. Office of Energy Efficiency & Renewable Energy. Hydrogen Production: Natural Gas Reforming. Available at: <https://www.energy.gov/eere/fuelcells/hydrogen-production-natural-gas-reforming>

<sup>82</sup> Comments provided by SoCalGas on this issue. See Appendix A.



- EFI states that “clean fuels” (e.g., RNG, hydrogen, biofuels) are critical clean energy pathways due to the enormous value of fuels in providing flexibility and reliability for energy systems. The researchers point out that the development of RG has multiple, tangible benefits, not just the fact that it is carbon neutral and diverts methane that would otherwise be released into the atmosphere. Relevant to job development in distressed areas, it enables major emissions reductions from difficult-to-decarbonize sectors, such as manufacturing. RG also leverages existing infrastructure, potentially avoiding stranding these assets and their associated workforces, as well as assets time-consuming and costly replacement.<sup>83</sup>

**e. The CEC should continue to support projects that advance the low-emission resource benefits such as those obtained from RNG, and power-to-gas.**

SoCalGas supports and collaborates on a number of research and development projects to support the State in meeting its climate goals. Some of these projects are highlighted below: the CEC should continue to support or fund, not deprioritize.

- **CR&R Environmental Services (CR&R)**  
CR&R in Perris, California is currently operating the largest anaerobic digestion facility in North America. Their facility accepts organic waste and converts it to RNG and organic compost material for local agricultural uses.<sup>84</sup> RNG from CR&R’s digestion facility fuels about 400 of its waste hauling trucks. In July 2018, RNG produced from CR&R’s anaerobic digestion system was injected into SoCalGas’ pipelines for the first time.<sup>85</sup>
- **Calgren Renewable Fuels, LLC. (Calgren)**  
Calgren collects cow manure from four local dairy farms and processes it through AD to create biogas that is processed and converted to RNG.<sup>86</sup> The project is located in

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<sup>83</sup> EFI. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*, at xix. May 2019. Available at [https://energyfuturesinitiative.org/s/EFI\\_CA\\_Decarbonization\\_Full-b3at.pdf](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf)

<sup>84</sup> CR&R Environmental Services. Anaerobic Digestion. Available at: <http://crrwasteservices.com/sustainability/anaerobic-digestion/>

<sup>85</sup> CISION PR Newswire. *Renewable Natural Gas Produced in California by CR&R Flows into SocalGas Pipelines for First Time*. July 2, 2018. Available at: <https://www.prnewswire.com/news-releases/renewable-natural-gas-produced-in-california-by-crr-flows-into-socalgas-pipelines-for-first-time-300675571.html>

<sup>86</sup> CISION PR Newswire. *SoCalGas and Calgren Announce Completion of Dairy Renewable Natural Gas Facility, Expect to be Largest in U.S.* July 29, 2019. Available at: <https://www.prnewswire.com/news-releases/socalgas-and-calgren-announce-completion-of-dairy-renewable-natural-gas-facility-expected-to-be-largest-in-us-300892656.html>

the Central Valley community of Pixley and is the first of its kind in California. Calgren plans to partner with eight additional dairy farms by the end of 2019, which will make the facility the largest dairy biogas project in the nation. The RNG produced at the facility is injected into SoCalGas' pipelines.

- **National Renewable Energy Laboratory (NREL) Power-to-Gas Project**  
In 2017, SoCalGas joined NREL to launch demonstration projects to create and test a carbon-free power-to-gas system.<sup>87</sup> The project aims to accelerate the commercialization of power-to-gas by further studying its efficiency and performance as a renewable energy storage strategy.
- **UCI Power-to-Gas Project**  
UCI operates a campus microgrid that uses a 19 MW natural gas-fired cogeneration facility to support intermittent solar resources and to produce heating and cooling for campus. A study funded by SoCalGas of their microgrid operation showed that by using hydrogen energy storage (HES) as a resource, the campus could increase the fraction of renewable energy consumed from 3.5% to 35%.<sup>88</sup> The HES system relies on the natural gas turbine to convert hydrogen to power when solar panels are not producing electricity. UCI has demonstrated the capability of “islanding” the campus from the electric grid in case of utility power outage.<sup>89,90</sup> The research team noted that power-to-gas presents a significant advantage over lithium-ion batteries, which store energy for shorter time periods and require extensive construction of battery systems and infrastructure. UCI also demonstrated full-scale hydrogen production and injection into an existing 400 pound per square inch natural gas pipeline that feeds the UCI central power plant. The system ran at full capacity for over 800 hours and produced and injected over 700 kilograms of hydrogen into the gas turbine of the UCI central plant.

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<sup>87</sup> National Renewable Energy Laboratory (NREL). *NREL and Southern California Gas Launch First U.S. Power-to-Gas Project*. Available at: <https://www.nrel.gov/esif/partnerships-southern-california-gas.html>

<sup>88</sup> University of California, Irvine (UCI). Advanced Power and Energy Program Bridging. Annual Report. Volume 5. 2017. Available at: [http://www.apec.uci.edu/Research/publications/ANNUAL\\_REPORTS/Bridging\\_2017\\_APEP\\_082417\\_1\\_030am\\_RedSz.pdf](http://www.apec.uci.edu/Research/publications/ANNUAL_REPORTS/Bridging_2017_APEP_082417_1_030am_RedSz.pdf)

<sup>89</sup> UCI. Samueli School of Engineering. *UCI 'Islands' its Microgrid from Southern California Edison Grid*. February 23, 2018. Available at: <http://engineering.uci.edu/news/2018/2/uci-islands-its-microgrid-southern-california-edison-grid>

<sup>90</sup> University of California, Irvine. *UCI Microgrid*. Available at: [http://www.apec.uci.edu/Research/PDF/Microgrid/UCI\\_Microgrid\\_APEP\\_100518\\_1012am.pdf](http://www.apec.uci.edu/Research/PDF/Microgrid/UCI_Microgrid_APEP_100518_1012am.pdf)

- **NREL Hydrogen-to-Methane Bioreactor**

NREL is hosting a hydrogen-to-methane bioreactor, the result of a partnership with SoCalGas and Electrochaea, LLC., a German company that has erected similar devices overseas.<sup>91</sup> RNG is created through this bioreactor system in a two-step process. First, renewable electricity, generated by the sun, passes through an electrolyzer where water molecules are split into hydrogen and oxygen, storing the renewable electricity as hydrogen gas. The newly-created electrolytic hydrogen is combined with CO<sub>2</sub> and piped into the reactor where Archaea microorganisms produce RNG by consuming hydrogen and CO<sub>2</sub> and emitting methane.

- **Opus 12, Inc.**

Opus 12 is a U.S.-based clean-energy startup incubated in the Cyclotron Road fellowship program at the Lawrence Berkeley National Laboratory. SoCalGas and Opus 12 used a new type of polymer electrolyte membrane electrolyzer to convert CO<sub>2</sub> to methane, showing that instead of wasting the CO<sub>2</sub> in raw biogas, it can be converted to methane in a single electrochemical step.<sup>92</sup> This is a critical improvement in the upgrading of biogas to pipeline quality RNG, and a simpler method of converting excess renewable electricity into storable gas.

#### **4. OPTIMIZING THE ROLE OF NATURAL GAS FOR END USES**

*Statute: Optimizing the role of natural gas as a flexible and convenient end use energy source, including the efficient use of natural gas for heating, water heating, cooling, cooking, engine operation, and other end uses, and the optimization of appliances for these uses.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with end use energy sources. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG as a flexible and convenient end use energy source. SoCalGas elaborates on this further below.

There are many possible avenues that the CEC can support and explore for optimizing the role of natural gas for end uses such as heating, water heating, cooling, cooking, and engine operation. Recently, we announced our vision to be the cleanest natural gas utility in North

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<sup>91</sup> NREL. *NREL Marks Partner Forum With Dedication of Bioreactor*. August 22, 2019. Available at: <https://www.nrel.gov/news/program/2019/nrel-marks-partner-forum-with-dedication-of-bioreactor.html>

<sup>92</sup> Sempra Energy. *SoCalGas and Opus 12 Successfully Demonstrate Technology That Simplifies Conversion of Carbon Dioxide into Storable Renewable Energy*. April 19, 2018. Available at: <https://www.sempra.com/newsroom/press-releases/socalgas-and-opus-12-successfully-demonstrate-technology-simplifies>

America, by committing to displace 5% of gas provided to our residential and commercial customers with RNG by 2022 and 20% by 2030.<sup>93</sup> SoCalGas is maximizing the benefits our customers obtain from our natural gas system by committing to deliver increasingly renewable energy so they can continue to use the fuel source they prefer to heat their homes and cook their food.<sup>94</sup> SoCalGas is already pursuing many innovative ways to optimize the use of natural gas, and these efforts illustrate some of the initiatives and policies that the CEC should be pursuing. SoCalGas continues to be part of the solution to meet California's climate goals.

**a. RNG can supplement the use of natural gas and 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.**

- As mentioned above in Section 1, heavy-duty trucks fueled by diesel is a significant source of criteria air pollutant and GHG emissions. Using natural gas and RNG in the heavy-duty sector significantly reduces these emissions.
- As mentioned above in the Introduction, replacing less than 20% of traditional natural gas with RNG can achieve GHG reductions equivalent to converting 100% electrification of buildings by 2030, *at a significantly lower cost*.<sup>95</sup> Switching out the fuel used in residential and commercial buildings with a renewable option like RNG, rather than switching out infrastructure, also results in less disruption to ratepayers and provides GHG emissions reduction benefits. Consumers can keep their appliances of choice and would not be forced to adopt technologies that are not sensible for their homes or families. Without consumer adoption, building decarbonization strategies cannot succeed. Use of RNG for building decarbonization is discussed in more detail in Section 7 below.

**b. Energy efficiency measures should not be discounted by the CEC as an effective strategy to achieve near-term climate goals.**<sup>96</sup>

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<sup>93</sup> SoCalGas. *California's Clean Energy Future, Imagine the Possibilities*. Available at:

<https://www3.socalgas.com/sites/default/files/1443742344191/scg-vision-paper-04032019.pdf>

<sup>94</sup> NGI's Daily Gas Price Index. California Reports Show Homeowners Prefer Natural Gas Over Electrification. April 25, 2018. Available at: <https://www.naturalgasintel.com/articles/114152-california-reports-show-homeowners-prefer-natgas-over-electrification>

<sup>95</sup> Navigant Consulting. *Analysis of the Role of Gas for a Low-Carbon California Future*. July 24, 2019. Available at: [https://www.socalgas.com/1443741887279/SoCalGas\\_Renewable\\_Gas\\_Final-Report.pdf](https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf)

<sup>96</sup> SoCalGas has submitted comments on this issue. Please see Attachment 1.

- SB 350 requires the CEC to establish energy efficiency targets that achieve a statewide, cumulative doubling of energy efficiency savings in electricity and natural gas end uses by 2030.<sup>97</sup>
- SoCalGas have long been a leader in developing efficient gas technologies and delivering energy efficiency programs that, in turn, deliver meaningful emissions reductions. Between 2014 and 2018, SoCalGas' energy efficiency programs delivered more than 180 million therms in energy savings, enough natural gas to power 403,000 households a year, and reduced GHG emissions by nearly 955,000 metric tons, the equivalent of removing more than 202,000 cars from the road annually. Earlier this year, SoCalGas was recognized by the U.S. EPA for the third time since 2015 with an ENERGY STAR Certified Homes Market Leader Award for 2018.<sup>98</sup> The award acknowledges SoCalGas' commitment to promoting environmental protection and energy efficient construction.<sup>99</sup> SoCalGas also received this award for 2015 and 2017.
- Identifying strategies to achieve greater energy efficiency from the industrial and agricultural sectors will be crucial to meeting the State's climate goals. Combined, these sectors represent the second largest sector in SoCalGas' portfolio of natural gas consuming over 1 billion therms annually<sup>100</sup>—a large opportunity for natural gas energy reductions through energy efficiency.
- Using natural gas is also cost-effective for consumers, which is important when Californians have been struggling with an affordable housing crisis for years, if not decades. These same advances in efficiency have also helped save SoCalGas customers more than \$198 million in utility bill costs. In 2018 alone, SoCalGas' energy efficiency programs saved customers \$57 million.<sup>101</sup>

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<sup>97</sup> California Legislative Information. SB-350 Clean Energy and Pollution Reduction Act of 2015. Available at: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB350](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350)

<sup>98</sup> Sempra Energy. *SoCalGas Named a Leader in Promoting Energy-Efficient Construction by U.S. Environmental Protection Agency*. July 25, 2019. Available at: <https://sempra.mediaroom.com/index.php?s=19080&item=137668>

<sup>99</sup> SoCalGas Website. Available at: <https://www3.socalgas.com/for-your-business/builder-services/california-advanced-homes>

<sup>100</sup> SoCalGas. *Energy Efficiency Business Plan*, at p. 6. January 17, 2017. Available at: [https://www.socalgas.com/regulatory/documents/a-17-01-016/SoCalGas\\_Business\\_Plan-1.17.17-FINAL.PDF](https://www.socalgas.com/regulatory/documents/a-17-01-016/SoCalGas_Business_Plan-1.17.17-FINAL.PDF)

<sup>101</sup> CISION PR Newswire. *In Recognition of Energy Efficiency Day, SoCalGas Shares Tips to Save Energy & Money*. October 1, 2019. Available at: <https://www.prnewswire.com/news-releases/in-recognition-of-energy-efficiency-day-socalgas-shares-tips-to-save-energy--money-300928932.html>

**c. The CEC should encourage projects to optimize the role of natural gas as a flexible and convenient end use energy source.**

- The CEC should continue to support natural gas end uses that improve the efficiency of various residential and commercial systems and appliances, since natural gas is a flexible and convenient energy source for these applications.
- Summarized below are some examples of projects SoCalGas has invested in to optimize the role of natural gas as a flexible and convenient end use energy source for our residential and commercial customers. SoCalGas invests about \$10 million each year on research, development, and demonstration of new and emerging clean, energy-efficient technologies. Our goal is to bring these technologies to residential, commercial, industrial, power generation, and transportation markets to help reduce energy use. These are the types of projects that the CEC should be encouraging with its policies:
  - SoCalGas is working with the CEC to demonstrate a gas-fired adsorption heat pump water heater (in residential and restaurant applications). This technology significantly increases the efficiency of natural gas water heating to ranges above 100%. The water heater has a projected uniform energy factor of 1.3 and ultra-low NO<sub>x</sub> emissions of ≤10 nanograms per joule (ng/J), is undergoing a five-unit field test with prospective Utilization Technology Development (UTD) manufacturing partner Rinnai America Corporation in Southern California. When commercially available, it will be the only residential water-heating technology with a source-energy-based energy factor (EF) ≥1.0.<sup>102</sup>
  - SoCalGas partnered with Williams Furnace Company, a manufacturer located in Colton, California to develop a new gravity wall furnace, *Monterey ESP*, for simple replacement of the many large, existing residential wall furnace stock in California. The new furnace incorporates advanced technologies to improve thermal efficiency from the current 70% standard for new gravity wall furnaces to 82% and significantly reduce flue gas NO<sub>x</sub>, CO<sub>2</sub>, and methane emissions. These technologies also improve furnace operation and control, such that the new furnace is expected to provide greater comfort and satisfaction for residents. The new furnaces also feature sealed combustion for additional safety.<sup>103</sup>

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<sup>102</sup> Utilization Technology Development. Research Project Summaries 2018-2019. No date. Available at: <http://www.utd-co.org/Documents/UTD-Annual-Report-Project-Summaries-2018-2019.pdf>

<sup>103</sup> This furnace is part of a CEC and SoCalGas funded research project “Improving the Performance of Wall Furnaces in California Homes” expected to begin in 2020. See Notice of Proposed Awards in CEC



- SoCalGas worked with the Gas Technology Institute to successfully demonstrate a new industrial drying technology that uses far less energy, reduces GHG emissions, and saves customers money.<sup>104</sup> The new technology can be used for drying or heat processing across a broad spectrum of industrial, agricultural, and commercial applications—including drying livestock feed, textiles, and pharmaceutical ingredients. Compared to existing industrial dryers, the new technology uses 61% to 65% less natural gas, at least 40% less electricity, and recovers a substantial amount of water, all while drying up to 11 tons of wet material per hour. UTD co-sponsored the project along with SoCalGas, and project funding for developing this innovative process was awarded by the CEC.

## **5. ELECTRIC AND NATURAL GAS INDUSTRIES SHOULD WORK TOGETHER TO ENSURE RELIABILITY**

*Statute: Effective methods by which the electric and natural gas industries can facilitate implementation of any of the strategies identified in this section.*

The CEC has failed to identify any strategies or effective methods by which electric and natural gas industries can work together to maximize the benefits of natural gas and RNG. The CEC has failed to consider the amount of evidence supporting how electric and natural gas industries can facilitate the beneficial use of natural gas and RNG. SoCalGas elaborates on this further below.

To make the most of strategies that maximize the benefits of natural gas and RNG in transportation fuel, natural-gas fired generation, end uses, and other applications, the electric and natural gas industries must work together to ensure Californians have a reliable, resilient, and efficient energy system. California benefits from a robust electricity generation system that utilizes many different sources to provide the State with the power it needs. Natural gas is a major component in ensuring that the State's energy needs are met. Research into energy generation trends suggests that natural gas will continue to play a pivotal and growing role in

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GFO-18-503, Advancing Natural Gas Energy Efficiency Research in Existing Buildings and Baking Industry, [https://www.energy.ca.gov/sites/default/files/2019-05/GFO-18-503\\_NOPA.pdf](https://www.energy.ca.gov/sites/default/files/2019-05/GFO-18-503_NOPA.pdf). SoCalGas is also working with Williams Furnace Company to include the technologically advanced furnace in utility energy efficiency and energy savings assistance programs.

<sup>104</sup> Sempra Energy. *New Industrial Drying system Promises to Save Water and Reduce Energy Use by 65 Percent*. September 12, 2019. Available at: <https://sempra.mediaroom.com/2019-09-12-New-Industrial-Drying-System-Promises-to-Save-Water-and-Reduce-Energy-Use-by-65-Percent>



electricity generation for years to come. This means that the interdependency between electricity and natural gas infrastructure is only going to increase.<sup>105</sup>

Currently, California has robust natural gas and electric systems that provide reliable energy to millions of Californians. Given the dynamic interplay between the two energy resources and the pivotal role natural gas plays in electrical generation, it is unwise for the CEC to push for the elimination of natural gas usage.

It is important for the CEC to recognize that decarbonization does not equal electrification, nor is 100% electrification the most effective route to decarbonization. The existing natural gas system has an important role to play in decarbonization alongside electrification efforts. Accordingly, the CEC should be supporting policies that seek to decarbonize in the most effective way possible, regardless of the energy source.

**a. The CEC should take a holistic energy systems approach in pursuing a decarbonization strategy that preserves customer choice and utilizes the resources known to work in tandem with electrification efforts to fight climate change.**

- In the past, both natural gas and electric utilities worked together. Electric utilities have historically relied on natural gas for energy storage. However, regulations on natural gas storage have changed how both types of utilities interact. Regulators have shifted away from natural gas storage toward electric energy storage alternatives. This is a positive development; however, it does not need to mean elimination of the natural gas system. In fact, natural gas infrastructure can be instrumental in storing vast amounts of clean energy for longer durations.
- The German energy agency (Deutsche Energie-Agentur) manages an integrated energy system, which includes power-to-gas usage to manage intermittency challenges with the high penetration of renewables.<sup>106</sup> A similar initiative in California would allow us to reap the full benefit of all energy resources to provide the State with abundant clean energy, the ability to distribute it across sectors, and the capability to store it for long periods of time.

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<sup>105</sup> Odetayo, B., MacCormack, J., Rosehart, W.D., Zareipour, H., and Seifi, A.R. *Integrated planning of natural gas and electric power systems*. International Journal of Electrical Power & Energy Systems. December 2018. Volume 3 pp. 593-602. Available at:

<https://www.sciencedirect.com/science/article/pii/S0142061517331654>

<sup>106</sup> Strategieplattform Power to Gas. Power to Gas Webpage. Available at:

<https://www.powertogas.info/startseite/>

- According to LLNL, “California’s economic and climate goals may be best served by a combination of electrification and dramatic reductions in the carbon intensity of the existing gas network.”<sup>107</sup> Furthermore, LLNL speaks to the wisdom of focusing on a balanced, technology-neutral approach, stating, “...a strategy that hedges against the risks of coming up short on emission reductions does not preselect a single winner to the exclusion of all other contributors, but instead banks on a portfolio of possible solutions.”
- The CEC would do well to incentivize methods, technologies, and fuels that reduce emissions most effectively, without pushing for a single solution to the detriment of all others.

**b. The CEC should support power-to-gas and fuel cell technologies to allow the electric and natural gas industries to work together to optimize the natural gas system’s role in delivering reliable energy.**

- Power-to-gas offers opportunities for synergy with renewable power generation since hydrogen and synthetic natural gas can be stored in existing natural gas infrastructure and used to generate electricity when renewable energy sources are not available, supporting electric grid reliability.
- As discussed earlier in Section 3, fuel cells use natural gas or hydrogen to efficiently produce electricity. Fuel cells are flexible enough to use in every sector in which we need to deploy low- to zero-carbon energy solutions and offer multiple benefits, which include:<sup>108</sup>
  - Reduction or elimination of GHG emissions and SLCPs;
  - Virtually zero emission of air pollutants;
  - Create resilient power that can operate independent of the electric grid for long durations;
  - The ability to operate on renewable gas, hydrogen, and/or natural gas.
  - Increased energy efficiency; and
  - Providing 24/7, load-following power behind-the-meter and at utility-scale.

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<sup>107</sup> Lawrence Livermore National Library (LLNL) Comments. The Natural Gas Infrastructure and Decarbonization Targets. June 21, 2019. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143>

<sup>108</sup> Itron. *2016-2017 Self-Generation Incentive Program Impact Evaluation*, at p. C-4. September 28, 2018. Available at: <https://tinyurl.com/yxand6mb>

## **6. DETERMINE A LONG-TERM POLICY TO ENSURE ADEQUATE INFRASTRUCTURE AND STORAGE**

*Statute: Determining the extent to which a long-term policy is needed to ensure adequate infrastructure and storage and developing strategies for pursuing additional infrastructure development to maintain or enhance pipeline and system reliability, including increased natural gas storage. In developing those strategies, the Commission shall consider needed policies to protect against system capacity constraints, minimize system leakage and related emissions, mitigate investment risk associated with the long-term investment in infrastructure in an evolving energy market, and identify factors that could limit the ability to receive maximum benefits from natural gas as an energy resource.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with ensuring adequate infrastructure and storage. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG in existing infrastructure and storage and developing strategies to maintain or enhance pipeline and system reliability. SoCalGas elaborates on this further below.

When making policy recommendations, the CEC must take into account the critical role natural gas plays in ensuring Californians have a reliable and resilient energy supply. The CEC should support research that looks at how existing natural gas assets can be leveraged to deliver RNG and/or hydrogen to be used in residential, industrial, and transportation applications, and should consider policies that could help expand access to lower cost RNG supplies. This would help address the need for low-carbon gas for Californians while ensuring adequate infrastructure and storage is available to continue to service millions of Californians safely and reliably.

### **a. The natural gas system is critical for providing safe and reliable energy. The CEC must consider the resilience and operational flexibility of natural gas infrastructure in making long-term policy.**

- SoCalGas' natural gas transmission system consists of pipeline and storage facilities spanning an approximately 20,000 square mile service territory. Initially, the SoCalGas transmission system received and redelivered gas from the east to the load centers in the Los Angeles Basin, Imperial Valley, San Joaquin Valley, north coastal areas, and San Diego County. As SoCalGas sought to diversify its sources of natural gas supply, it built interconnections to concurrently accept natural gas deliveries from the north.
- SoCalGas operates four storage fields – Aliso Canyon, Honor Rancho, La Goleta, and Playa del Rey – as an essential part of its integrated transmission system. SoCalGas uses each of its storage fields and flowing pipeline supplies to meet customer demand. These storage fields also provide operational resiliency and flexibility for

the Southern California electric grid. As currently configured, SoCalGas' transmission pipelines and integrated storage system cannot reliably function with only pipeline supply – gas receipt points located at the fringes of the SoCalGas service territory are too far from load centers to fully support customers' changing gas and electric needs throughout the day. Without sufficient natural gas to provide supplies in times of heavy load or low flowing gas availability, SoCalGas loses flexibility and curtailments could occur, which can also affect electric reliability. Therefore, being able to withdraw sufficient gas from a local storage source is absolutely critical to Southern California's energy reliability.

- When making policy recommendations that directly affect natural gas infrastructure the CEC must consider system resiliency (i.e., the ability of the system to withstand planned and unplanned outages of other assets) and operational flexibility (i.e., the ability to serve fluctuating loads and manage issues in real-time across SoCalGas' system).
- Resilience is a critical component of any energy supply. The ability to continue operations unaffected by climate events, such as wildfires, and to quickly resume service is a significant factor. Natural gas performs highly in this regard. In July 2017, the Natural Gas Council released *Natural Gas Systems: Reliable and Resilient*,<sup>109</sup> a report detailing how and why the U.S. natural gas industry is reliable and resilient to weather-related interruption of service, including the ability to compensate for operational issues and to recover quickly. Most notable was the finding that the industry exhibited a 99.79% reliability in fulfilling its firm contract obligations between 2006 and 2016. The Natural Gas Council released another report assessing the resiliency of natural gas infrastructure during natural disasters in 2018. The researchers found that the natural gas system performed extremely well during times of high stress and demand; demonstrating its reliability and resilience in the most challenging weather conditions.<sup>110</sup>
- Similarly, SoCalGas commissioned case studies identifying lessons learned from natural disasters that took place last year: Hurricane Harvey in Texas; Hurricane Irma in Florida; the October wildfires in Northern California; as well as the December wildfire and subsequent mudslides in Southern California.<sup>111</sup> The case studies

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<sup>109</sup> Natural Gas Council. *Natural Gas Systems: Reliable and Resilient*. July 2017. Available at: <https://tinyurl.com/y7ffswse>

<sup>110</sup> Natural Gas Council. *Report: Weather Resilience in the Natural Gas Industry*. August 6, 2018. Available at: [www.naturalgascouncil.org/weather-resilience-in-the-natural-gas-industry/](http://www.naturalgascouncil.org/weather-resilience-in-the-natural-gas-industry/)

<sup>111</sup> ICF International. Case Studies of Natural Gas Sector Resilience Following Four Climate-Related Disasters in 2017. Available at: <https://www.socalgas.com/1443742022576/SoCalGas-Case-Studies.pdf>

summarize damages and disruptions experienced, resilience successes, and lessons learned about opportunities to increase resilience. The key lessons learned are clear:

- Natural gas is a resilient energy resource that provides heat and hot water for homes;
- Natural gas provides back-up generation for hospitals and relief centers via the use of fuel cells and CHP systems; and
- Vehicles such as transit buses, garbage trucks, and others servicing critical infrastructure needs that run on CNG or LNG keep cities moving during emergency response situations.

The case studies highlighted concerns with over-reliance on a single energy source. Having a diverse energy delivery system contributes to greater reliability, community resiliency, and first and foremost, helps ensure public safety. Distributed generation resources, like CHP systems, natural gas microturbines, and natural gas- or hydrogen-powered fuel cells, can provide electricity during critical emergency response situations when the electric grid is down.

- The operational flexibility natural gas provides in maintaining grid reliability was previously discussed under Section 2. However, below we further elaborate on the importance of natural gas storage for energy reliability:
  - For summer operations, SoCalGas uses natural gas storage fields to provide gas supplies during peak electric generation demand periods that occur throughout the day. Peak demand cannot always be met with flowing gas supplies because of the magnitude and unpredictability of electric peaks and the speed at which they occur compared to the speed at which flowing gas supplies can reach gas-fired electric generating facilities – natural gas typically travels through SoCalGas’ transmission system in the range of 20-30 miles per hour. For example, it could take approximately 10 hours for natural gas supplies to travel from the interconnection at Blythe to several power plants located in the Los Angeles basin. By contrast, gas withdrawn from local storage is able to meet demand significantly quicker, within a few hours.
  - For winter operations, natural gas storage provides needed gas supply and storage withdrawal services to support SoCalGas’ customers, including core residential customers. A large supply of readily available natural gas enables SoCalGas to maintain service to customers throughout the winter season. This is particularly true for meeting extreme daily and seasonal weather conditions. Interstate pipeline gas supplies are highly dynamic, especially in the winter months. Interstate pipeline gas supplies can become more expensive and even less available due to upstream supply issues like uncontrollable well freeze-offs that have occurred at natural gas production basins in natural gas producing states. This also holds true when shippers elect to sell their California-bound supplies to other states when prices are higher elsewhere than in California. When these types of events occur, gas

purchasers (including SoCalGas' Gas Acquisition group, which purchases gas only for core customers) rely upon storage supplies to meet their daily gas demand needs on the SoCalGas system. Without natural gas storage, our customers are more likely to be exposed to higher priced and constrained supplies.

- As additional renewable power is added into California's energy mix, electricity generation ramping will further increase. This would sustain a large demand for gas in the electric sector while gas demand for heat peaks, further necessitating storage and reliable natural gas infrastructure.

**b. The CEC's policies must protect against long-term investment risk associated with natural gas infrastructure, which the CPUC has re-affirmed is necessary.**

- The CPUC's Decision<sup>112</sup> for SoCalGas' Test Year 2019 GRC Final Decision re-affirms the State's need for natural gas and associated infrastructure authorizing over \$3 billion for SoCalGas' proposed capital infrastructure investments to operate the SoCalGas transmission, distribution, and storage systems safely and reliably. A summary of SoCalGas' infrastructure investment programs is provided below:
  - SoCalGas operates four underground storage fields; Aliso Canyon, La Goleta, Honor Rancho, and Playa del Rey to provide a reliable and economic supply of gas for customers throughout the service territory, especially during periods of high demand. Investments in storage infrastructure to enhance the efficiency and responsiveness of storage operations while maintaining compliance with applicable regulatory and environmental regulations.
  - SoCalGas' Storage Integrity Management Program (SIMP) is designed to provide a proactive, methodical, and structured approach, using state-of-the-art inspection technologies and risk management disciplines to address storage field and well integrity issues. SIMP includes physical well inspections, risk management, and data management of the activities of the Underground Gas Storage Program.
  - Through our Transmission Integrity Management Program (TIMP) and Distribution Integrity Management Program (DIMP), SoCalGas continually evaluates the transmission and distribution pipeline systems, ranks associated risks, and proactively takes action through inspections, replacements, and other remediation activities to improve safety and reliability by reducing overall system risk.

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<sup>112</sup> CPUC. Decision 19-09-051 Addressing the Test Year 2019 General Rate Cases of Sand Diego& Electric Company and Southern California Gas Company. October 2019. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M316/K704/316704666.PDF>

- TIMP manages risk reduction through assessments and remediation of transmission pipelines in populated areas on a recurring schedule.
      - DIMP implements a process of continual safety enhancement by proactively identifying and reducing pipeline integrity risks for distribution pipelines.
    - Under the Pipeline Safety Enhancement Plan (PSEP), SoCalGas is replacing or pressure testing transmission pipelines for which reliable records are not available or that have not been tested in accordance with modern standards. Automatic shutoff valve/remote control valve infrastructure is also being installed to accelerate SoCalGas and SDG&E's ability to identify, isolate, and contain escaping gas in the event of a pipeline rupture. The primary objectives of PSEP are to enhance public safety, comply with CPUC directives, minimize customer impacts, and maximize the cost-effectiveness of safety investments.
  - SoCalGas is making investments to maintain operational reliability, system resiliency, and also to comply with environmental regulations. The availability and reliability of SoCalGas' nine gas transmission compressor stations are at the core of our operational success. Two large projects are underway to replace the Blythe and the Ventura compressor stations.
    - SoCalGas' gas distribution system consists of a network of over 100,000 miles of interconnected gas mains, services, and associated pipeline facilities. Capital investments in SoCalGas' gas distribution system include:
      - Connecting new residential, commercial, and industrial customers;
      - Maintaining system reliability and service for all customers as new load is added;
      - Replacing distribution lines due to leakage, defects, corrosion, and deterioration of pipes to sustain operational reliability and mitigate risks associated with public safety;
      - Upgrading, relocating, and replacing regulator stations to mitigate risks associated with public safety, system reliability, and infrastructure integrity; and
      - Implementing a Distribution Operations Control Center as the single point of coordination to operate the gas distribution system and to enhance SoCalGas' ability to prevent and acknowledge events, to support emergency response, to provide reliable service to customers, and to improve distribution system knowledge, integrity, and planning.
- c. The CEC should promote policies that maintain adequate natural gas infrastructure and support modernization efforts that continue to reduce upstream emissions.**
- SoCalGas' natural gas system has one of the lowest methane emission rates in the country. Using the findings of a major Washington State University study, published



by the scientific journal *Environmental Science & Technology* in March 2015, SoCalGas' system's current emission rate is estimated to be 0.12% of all-natural gas delivered in 2011.<sup>113</sup>

- Pursuant to SB 1371, SoCalGas submits a Natural Gas Leakage Abatement Report to the CPUC annually.<sup>114</sup> This report provides a comprehensive summary of SoCalGas' efforts to reduce fugitive methane emissions from our system. As discussed earlier in Section 3, SoCalGas' gas system only represents about 3% of statewide methane emissions, which is approximately 0.3% of the State's total GHG inventory.
- Some of the most effective steps SoCalGas has taken to modernize our system, which also reduces leakage, include:
  - Eliminating cast iron pipe from our system;
  - Modernizing equipment in our metering and regulating facilities to utilize zero or lower emitting devices than previously available;
  - Implementing the Vintage Plastic Replacement Program;
  - Implementing the Bare Steel Replacement Program;
  - Implementing DIMP;
  - Implementing operational procedures to minimize gas vented to the atmosphere during routine maintenance and other operational activities; and
  - Prioritizing the replacement of pipe that does not meet current anti-corrosion standards.
- The modernization of equipment, the use of best management practices and technology to minimize emissions during maintenance and operational procedures, and the prioritized replacement of pipeline without current corrosion control technologies continues today. In addition, SoCalGas takes many steps to reduce emissions across its system, from transmission pipelines and underground storage facilities, to distribution lines and customer meter sets. These initiatives include:
  - Performing accelerated leak surveys on certain pipelines on an annual and bi-annual basis;
  - Repairing leaks in our non-hazardous leak inventory;
  - Lowering pipeline pressure when feasible during planned natural gas releases;
  - Using a methane capture system when feasible to collect gas during pipeline maintenance and reinject it back into the system; and

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<sup>113</sup> Lamb, et. al. *Direct measurement Show Decreasing Methane Emissions from natural Gas Local Distribution Systems in the United States*. Environ. Sci. Technol. 2015, 49, 8, 5161-5169 March 31, 2015. Available at: <https://doi.org/10.1021/es505116p>

<sup>114</sup> SoCalGas. Natural Gas Leakage Abatement Rulemaking. Available at: <https://www.socalgas.com/regulatory/R1501008.shtml>

- Identifying and replacing certain pneumatic devices with lower-emissions devices.
  - SoCalGas' has upgraded nearly six million natural gas meters across our service territory with advanced meters that automatically read and transmit hourly gas usage information through a two-way communication network to our customer service and billing center. Safety is at the heart of everything SoCalGas does and, in areas where the advanced meter communications network is fully deployed, SoCalGas is leveraging advanced meter-enabled data analytics to support the continued safe and reliable delivery of natural gas to its customers. These enhanced data analytics enable identification of unusual gas consumption patterns at customer facilities. Additional customer and safety benefits enabled by these advanced analytics include quicker detection of higher-than-usual gas usage allowing earlier investigation of possible problems.
    - The more granular awareness of energy data utilization has produced additional customer and safety benefits, including:
      - Faster identification of abnormally high gas usage enabling SoCalGas to speed up its ability to identify, investigate, and respond to potential safety situations in days rather than weeks.
      - Earlier discovery of abnormally high gas usage and associated customer notification of suspected appliances in use for extended periods of time to reduce the financial burden on customers, while at the same time saving energy and improving air quality.
      - Identification of hot water leaks indicated by unusual high gas usage in support of conservation efforts for both gas and water.
  - In 2018, SoCalGas' advanced meter analytics team identified, for further investigation and resolution by a customer services field operations technician, 4,952 customer facilities with highly unusual gas consumption undetected by customers. Typically, these are facilities where no one is around to smell gas, or the customer is unaware that appliances were unintentionally left on. Every year our advanced meter analytics improves by the on-going evaluation, identification, and investigation of unusual gas consumption patterns and tamper alarms. These efforts to reduce pipeline emissions will help contribute to the decarbonization of infrastructure that is upstream from customer facilities.
- d. Independent analysis by the California Council of Science and Technology validates the importance of underground storage for energy reliability.<sup>115</sup> The CEC must consider this when developing policy recommendations for natural gas storage.**

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<sup>115</sup> SoCalGas has provided comments on this issue. See Attachment 1.

- Policy recommendations made by the CEC must be guided by technical analysis such as the California Council of Science and Technology (CCST) report, especially when assessing the energy needs of a region as large and as diverse as Southern California.
- In 2016, the Governor called for CCST to prepare an independent and scientific assessment of the long-term viability of all natural gas storage facilities in California, to “inform how the state will rethink all natural gas storage facilities in California.”<sup>116</sup> That independent assessment should prompt the CEC to reconsider how it views natural gas storage facilities in the State, including Aliso Canyon – a facility that, before the current restrictions imposed by the CPUC, accounted for approximately 23% of the natural gas storage inventory in California and 64% in Southern California.
- The CCST report was created by numerous scientific experts and research institutions consulting with the CPUC, CEC, CARB, and the Division of Oil, Gas, and Geothermal Resources.
- The CCST report ultimately determined that California needs natural gas and underground gas storage to run reliably, and that without such storage, California would be unable to consistently meet winter demand for natural gas.<sup>117</sup> In fact, that CCST report assessed the need for natural gas in the near– (2020), mid– (2030), and long-term (2050), and determined:
  - “We could not identify a technical alternative gas supply system that would meet the 11.8 Bcfd extreme weather peak day demand forecast and allow California to eliminate all underground gas storage by 2020.”<sup>118</sup> “No ‘silver bullet’ can replace underground gas storage in the 2020 timeframe.”<sup>119</sup>

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<sup>116</sup> CEC letter to CPUC. Energy Commission Chair Releases Letter Urging the Future Closure of Aliso Canyon. July 19, 2018. Available at:

[http://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Public\\_Website/Content/News\\_Room/News\\_and\\_Updates/2017-07-19-energy-commission-chair-releases-letter-ailso-canyon\\_nr.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/2017-07-19-energy-commission-chair-releases-letter-ailso-canyon_nr.pdf)

<sup>117</sup> California Council on Science & Technology (CCST). *Long-Term Viability of Underground Natural Gas Storage in California: An Independent Review of Scientific and Technical Information*, p. 9 (Conclusion SR-2); and, p. 496 (Conclusion 2.1). February 5, 2018. Available at:

<https://tinyurl.com/y9xwzdb8>

<sup>118</sup> *Id.*, p. 547, Conclusion 2.16

<sup>119</sup> *Id.*, p. 547, Conclusion 2.16

- “California’s climate change policies for 2030 are likely to reduce total gas in California, however, they are also likely to require significant ramping in our natural gas generation to maintain reliability.”<sup>120</sup>
- “California has not yet targeted a future energy system that would meet California’s 2050 climate goals and provide energy reliability in all sectors. California will likely rely on underground gas storage for the next few decades as these complex issues are worked out.”<sup>121</sup>

## **7. THE ROLE OF NATURAL GAS IN ZERO NET ENERGY BUILDINGS**

*Statute: Determining the role that natural gas can play in the development of zero net energy buildings, as appropriate.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with zero net energy (ZNE) buildings. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG in the development of ZNE buildings. SoCalGas elaborates on this further below.

Natural gas and RNG have an important role to play in moving toward ZNE buildings. ZNE is defined as the ability of a building to generate as much energy as is consumed on-site, using renewable on-site generation, such as PV solar panels which will be required for all new low-rise buildings as of January 1, 2020. The CEC is tasked under AB 1257 with determining the role of natural gas in ZNE buildings, and it therefore should be investigating demonstration programs that show the role natural gas can play in ZNE design and should be including natural gas and RNG in analyzing the possibilities for ZNE. The CEC should reconsider its apparent rejection of any role for natural gas in decarbonizing buildings and reducing overall GHG emissions.

### **a. The CEC should continue to support or fund projects that advance the low-emission resource benefits obtained from using natural gas and RNG in buildings.**

- Natural gas and RNG both have a positive role to play in building decarbonization that can help the State reach its climate goals. Because residential and commercial buildings account for 12% of total statewide GHG emissions,<sup>122</sup> SoCalGas supports the use of RNG in buildings to meet our climate goals. This supports a building decarbonization strategy that allows the State to maintain a diverse portfolio of energy options that still offers customers choice in their preferred appliances for

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<sup>120</sup> *Id.*, p. 547, Conclusion 3.8

<sup>121</sup> *Id.*, p. 547, Conclusion 3.12

<sup>122</sup> CARB. GHG Emission Inventory Graphs. Available at:  
<https://ww3.arb.ca.gov/cc/inventory/data/graph/graph.htm>

heating their homes or businesses and for cooking: it also helps maintain affordability.

- Solutions to lower emissions from buildings should be practical in terms of cost and adoption to effectuate consumer acceptance. Natural gas provides valuable, low-cost energy to customers. It also allows consumer choice in types of appliances. Many Californians prefer the use of natural gas for heating and cooking in all regions of the State and they overwhelmingly oppose mandates to get rid of their natural gas appliances, with particular concerns about energy costs and choice.<sup>123</sup>
- Building decarbonization efforts will be most successful if it can be done in a way that is affordable to consumers and preserves consumer choice. Forcing a switch to all-electric buildings is neither cost-effective, consumer friendly, nor environmentally beneficial.
- As mentioned above in the Introduction and in Section 4, and explained in more detail here, replacing less than 20% of traditional natural gas with RNG can achieve GHG reductions equivalent to converting 100% electrification of buildings by 2030, *at a significantly lower cost.*<sup>124</sup> In March 2018, the California Building Industry Association funded Navigant Consulting, Inc. (Navigant) to study the potential costs customers could incur from switching from a mixed-fuel home to an all-electric one.<sup>125</sup> In Phase I of the study, Navigant looked at existing single-family homes in several Southern California locations. They found:<sup>126</sup>
  - In homes with natural gas appliances, swapping those appliances for all electric alternatives would cost the average household in Southern California more than \$7,200 to upgrade wiring and electrical panels and purchase new appliances.
  - This, along with higher electricity bills, could increase energy costs up to \$877 per household each year. Across Southern California's seven million single-family homes, the total cost increase is \$4.3-6.1 billion per year.

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<sup>123</sup> California Building Industry Association. *California Natural Gas Poll*. January 2018. Available at: [https://cbia.org/uploads/5/1/2/6/51268865/2018\\_energy\\_choice\\_survey\\_exec\\_summary\\_and\\_analysis.pdf](https://cbia.org/uploads/5/1/2/6/51268865/2018_energy_choice_survey_exec_summary_and_analysis.pdf)

<sup>124</sup> Navigant Consulting. *Analysis of the Role of Gas for a Low-Carbon California Future*. July 24, 2018 Available at: [https://www.socalgas.com/1443741887279/SoCalGas\\_Renewable\\_Gas\\_Final-Report.pdf](https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf)

<sup>125</sup> This analysis does not include the cost of necessary infrastructure upgrades to the local and statewide electricity grid to accommodate the additional load on the system.

<sup>126</sup> California Building Industry Association Comments. Navigant Study: Impacts of Residential Appliance Electrification. September 20, 2018. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=224761>

- While Title 24 specifications require solar PV on all new low-rise buildings, they do not address how to decarbonize *existing* buildings. Asking customers to make major renovations to their homes and businesses for new equipment could create challenges in adopting the new technologies, which is a significant barrier for change. SoCalGas requested an analysis by Navigant to look at how the use of more efficient natural gas appliances and RNG can help to achieve carbon emissions reductions in buildings. In the first phase of the study, Navigant looked at the amount of RNG to achieve emissions reductions comparable to electrification of residential appliances. The analysis showed that California can achieve comparable carbon reductions to building electrification by introducing increasing amounts of RNG into the natural gas supply. The study found:<sup>127</sup>
  - If SoCalGas replaces 16-20% of traditional natural gas supply with RNG by 2030, we can achieve GHG emissions reductions equivalent to converting 100% of buildings to electric-only energy.
  - If we use a mix of both in- and out-of-state RNG resources, a RNG solution is expected to be up to two to three times more cost-effective in reducing GHG emissions rather than eliminating and replacing gas appliances in homes and commercial buildings.

**b. SoCalGas’ support of the development of advanced, high-efficiency energy systems for a variety of different buildings and uses shows the positive role of natural gas in moving toward ZNE buildings.**

- SoCalGas has led the development and demonstration of advanced, high-efficiency building and energy systems for a variety of different buildings and uses, including mixed-use commercial and residential applications, including:
  - **ABC Green Home 3.0**<sup>128</sup>  
SoCalGas has provided support and technical design for the ongoing, multi-year ABC Green Home demonstration program that showcases mixed-fuel, high-efficiency net zero residential design. The most recent home developed was in Fullerton, California, and was completed in April 2017. The two-story, four-bedroom single-family home received the Grand Award for “Best Zero Net Energy Home Design” at the 2017 Gold Nugget Awards, presented at the Pacific

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<sup>127</sup> Navigant Consulting. *Analysis of the Role of Gas for a Low-Carbon California Future*. July 24, 2018. Available at: [https://www.socalgas.com/1443741887279/SoCalGas\\_Renewable\\_Gas\\_Final-Report.pdf](https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf)

<sup>128</sup> SoCalGas. *Balanced Approach Helps ABC Green Home 3.0 Achieve Zero Net Energy Efficiency Goals*. Available at: <https://www3.socalgas.com/1443740917074/SoCalGas---ABC-Green-Home-Event-Flyer-Updated-for-Web---Remediated.pdf>

Coast Builders Conference. The home features a 3.7 kW rooftop PV electricity generation system along with high-efficiency natural gas appliances and achieves an energy design rating of -0.61. As designed, the home produces more electricity than it consumes. The energy design rating also affirms the results of a study commissioned by SoCalGas that found builders could install smaller-sized PV systems on ZNE homes that include natural gas, helping to reduce upfront costs, and to provide a cost-effective home for residents to live in while still reducing energy consumption.<sup>129</sup> Because the current 2019 Title 24 building code requires sufficient solar PV production capability only to offset on-site electricity use, and does not require an offset of the use of natural gas (including heating, cooking, etc.), a mixed-fuel home design can help to reduce the required size of the on-site solar PV system, and thus reduce costs for the construction of the home.

- **The Resort at Playa Vista**<sup>130</sup>

The Resort at Playa Vista is a 25,000-square-foot state-of-the-art community recreational facility providing complimentary services and healthy lifestyle programming for the residents of Playa Vista, California. Three-year field test results<sup>131</sup> demonstrated a near-net zero energy case study, using a combined solar PV- and natural gas-powered CHP system designed to power a 25,000 square foot public health club and meeting venue and utilize the waste heat from the power generation to heat the on-site pools and spa. The roof area is not sufficient for a full capacity solar PV, similar to many California commercial and high-rise buildings. The CHP system dynamically and actively supplements the passive and renewable energy from a 62.5 kW on-site solar PV system. The CHP technology enables highly efficient, continuously available, low-emission, natural gas-powered heat and electricity from the 75 kW TecoGen, Inc. power generation system. The facility demand reduction is significant, consistent, and beneficial to the electric grid. The use of the technology package demonstrates both the technical and economic feasibility of integrating solar PV and natural gas power generation technology into a modern, mixed use facility, showcasing efficiency, low-emissions, and resiliency in the final design. The CHP contributed significantly to time dependent value reduction as well as carbon reduction for the entire campus, including the process heating load, which Title 24 compliance does not address, and which dominates in many commercial and industrial

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<sup>129</sup> Navigant Consulting. *Strategy and Impact Evaluation of Zero-Net-Energy Regulations on Gas-Fired Appliances*. July 15, 2015. Available at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=204626-2>

<sup>130</sup> SoCalGas. *The Resort at Playa Vista: Approaching Zero Net Energy with Sustainable design and Emerging Technology*. Available at: [https://www3.socalgas.com/1443739831642/N16J0080A\\_Playa-Vista-Web-Redesign-v3.pdf](https://www3.socalgas.com/1443739831642/N16J0080A_Playa-Vista-Web-Redesign-v3.pdf)

<sup>131</sup> SoCalGas. *Case Study-A Near-ZNE Commercial Building Using CHP* presentation. March 12, 2019. Available at: <https://aceee.org/sites/default/files/pdf/conferences/hwf/2019/1d-shiau.pdf>



facilities. The facility continues to provide a highly visible, public education opportunity for the role of natural gas in this context. The positive results can be scaled up to hundreds of commercial and residential swimming and gym facilities immediately.

## **8. NATURAL GAS AND RNG FACILITATE JOBS DEVELOPMENT**

*Statute: Optimizing the methods by which the pursuit of these strategies can facilitate jobs development in the private sector, particularly in distressed areas.*

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with the facilitation of jobs development. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG to facilitate jobs development in the private sector, particularly distressed areas. SoCalGas elaborates on this further below.

Natural gas and RNG are cost-effective energy sources that are crucial to existing jobs in California and to the development of additional jobs. Displacing natural gas with more expensive energy pathways will have an adverse impact on jobs both directly in the natural gas sector and indirectly in the commercial and industrial sectors as employers may delay or cancel expansions or hiring due to increased costs. Conversely, promoting the use of natural gas and RNG has the potential to create jobs both directly in the natural gas and RNG sector, and indirectly in industries that rely on an affordable and reliable source of energy. The CEC should take these effects into consideration and recommend strategies to facilitate jobs maintenance and development, especially in distressed areas for industrial and manufacturing business owners and customers that are most sensitive to energy cost and reliability.

**a. Innovation is key to reducing the cost of decarbonization for manufacturing processes in California, perhaps more than in any other sector. The CEC must support an “all of the above” approach with maximum flexibility and technology-neutral policies in order to spur emissions reductions for California’s diverse industrial sector.**

- California has the largest manufacturing sector in the U.S. and manufacturing and heavy industrial uses rely on natural gas. According to the National Association of Manufacturing, there were 1.3 million manufacturing jobs in California in 2018, with an average annual compensation of approximately \$105,000 in 2017.<sup>132</sup> The industrial sector uses natural gas as a fuel for process heating, in CHP systems, and as

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<sup>132</sup> National Association of Manufacturers. 2019 California Manufacturing Facts. Available at <https://www.nam.org/state-manufacturing-data/2019-california-manufacturing-facts/>

a raw material (feedstock) to produce chemicals, fertilizer, and hydrogen. Some manufacturing processes require combustion and therefore cannot readily make use of solar- or wind-generated renewable electricity. These processes include cement manufacturing, food processing, glass production, and steel fabrication, which together produce about \$40 billion in direct industry output in California alone.<sup>133</sup>

- Industrial processes are energy intensive. If energy or regulatory environmental compliance costs increase significantly for industrial business, operation may no longer be viable at their current location. Because many industrial and manufacturing processes are hard to electrify (especially those that require high-temperature heat to make steel or cement),<sup>134</sup> eliminating the use of natural gas in this sector could result in “leakage,” which occurs when businesses move their facilities or production across state borders or to other countries.
- Policies that result in pushing industries out of California to regions with less stringent environmental regulations will not result in a net decrease of GHG emissions; rather, it would likely cause a net increase in total national emissions while also adversely impacting California’s economy. Not only would this directly harm employment and labor income in the State’s industrial and manufacturing sector, but it would also negatively impact indirect employment and labor income across upstream and downstream sectors.

**b. Natural gas benefits jobs development in the private sector, including in heavy-duty transportation and potentially in the industrial and agricultural sectors.**

- The Los Angeles County Economic Development Corporation’s (LAEDC’s) Institute for Applied Economics released a study titled, “Natural Gas Moratorium: Los Angeles County.” It examined the potential economic implications of a proposed CPUC moratorium on all new natural gas service connections in Los Angeles County for commercial and industrial users. The moratorium (which was not enacted) was proposed to start on January 11, 2018 and continue until the CPUC lifted the abeyance or on March 31, 2018, whichever occurred first.

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<sup>133</sup> *Ibid.*

<sup>134</sup> Vox. *This climate problem is bigger than cars and much harder to solve.* October 10, 2019. Available at: <https://www.vox.com/energy-and-environment/2019/10/10/20904213/climate-change-steel-cement-industrial-heat-hydrogen-ccs>

- The LAEDC concluded that the moratorium would have had the following estimated economic and job impacts for January 11 through March 31, 2018:<sup>135</sup>
  - 5,160 fewer total jobs would be created;
  - \$879.5 million lost in future economic output;
  - \$323.9 million lost in future labor earnings; and
  - \$119.7 million lost in future federal, state, and local tax revenues, of which \$13.3 million and \$5.8 million would be lost in tax revenues to Los Angeles County and local cities, respectively.
- In addition, the study found that the temporary suspension of new commercial and industrial natural gas connections in Los Angeles County, “...could make electric connections much more expensive for business and real estate development, leading potentially to the suspension or termination of current development contracts as well as the postponement of new commercial projects,” further impacting jobs.<sup>136</sup>
- According to a 2017 ICF study titled, *Economic Impacts of Deploying Low NOx Trucks fueled by Renewable Natural Gas*, deployment of natural gas trucks, CNG fueling infrastructure, and California RNG production will produce a total of 81,000 – 134,000 cumulative jobs to California’s economy from 2018-2030.<sup>137</sup>
  - These jobs have an expected labor income of nearly \$68,500 per job created, more than twice the median salary in California today. These jobs are created in sectors such as construction, fabrication, manufacturing, engineering services, waste management, and service industries (e.g., restaurants).<sup>138</sup>
  - For every job created through investment in low-NOx natural gas trucks, natural gas fueling infrastructure, and RNG production facilities, about two jobs are created in supporting industries (direct) and via spending by

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<sup>135</sup> Los Angeles County Economic Development Corporation Institute for Applied Economic, “Natural Gas Moratorium: Los Angeles County, An Executive Summary,” at p. 2. January 9, 2018. Available at: [https://laedc.org/wp-content/uploads/2018/01/Gas-Moratorium-Review\\_20180109.pdf](https://laedc.org/wp-content/uploads/2018/01/Gas-Moratorium-Review_20180109.pdf)

<sup>136</sup> *Id.*, p. 1

<sup>137</sup> ICF International. *Economic Impacts of Deploying Low NOx Trucks Fueled by Renewable Natural Gas*, at p. 4. May 2017. Available at: [https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/590767ce59cc68a9a761ee54/1493657553202/ICF\\_RNG+Jobs+Study\\_FINAL+with+infographic.pdf](https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/590767ce59cc68a9a761ee54/1493657553202/ICF_RNG+Jobs+Study_FINAL+with+infographic.pdf)

<sup>138</sup> *Ibid.*

employees that are directly or indirectly supported by these industries (induced).<sup>139</sup>

- According to a study by GTI that looked at the potential to create RNG from wood wastes, “there are many benefits to the conversion of biomass, including reducing the volume of material that is landfilled, reducing forest fire hazards, generating renewable energy, creating jobs, and reducing GHG emissions.”<sup>140</sup> Further, “producing more RNG from additional sources in California can save existing and create new jobs while providing a fuel that can be used in existing and future low NO<sub>x</sub> CNG engines and other current natural gas applications.”

## **9. STATE AND FEDERAL POLICY SUPPORT CAN FACILITATE DEVELOPMENT OF NATURAL GAS AND RNG STRATEGIES**

*Statute: Optimizing the methods by which state and federal policy can facilitate any of the proposed strategies.*

The CEC has failed to identify any strategies that state and federal policy can maximize the benefits of natural gas and RNG. The CEC has failed to consider the amount of evidence available to inform state and federal policymakers to advance the beneficial use of natural gas and RNG.

State and federal policy support is critical for implementation of strategies that maximize the benefits of natural gas and RNG in various end uses and energy reliability applications. If we are to achieve deep economy-wide decarbonization, state and federal policy must help assist and accelerate our efforts. Both California and U.S. policymakers have a tremendous number of policy tools at hand to support the development, distribution, and utilization of RG fuels. Regulation, incentives, research, and market-based programs such as cap-and-trade programs have all contributed to the ability to take great strides forward as we reduce GHG emissions. We ask that the CEC set policies in the Final 2019 IEPR and work with other state and federal agencies to advance the adoption of RNG and hydrogen as a decarbonization pathway to meet our climate goals.

- g. The CEC should support policies to help renewable gas achieve parity with other renewable technologies.**

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<sup>139</sup> *Ibid.*

<sup>140</sup> GTI. Low-Carbon Renewable Natural Gas (RNG) From Wood Wastes. February 2019. Available at: <https://www.gti.energy/wp-content/uploads/2019/02/Low-Carbon-Renewable-Natural-Gas-RNG-from-Wood-Wastes-Final-Report-Feb2019.pdf>

- A renewable gas standard should be adopted. Like the Renewables Portfolio Standard (RPS) for electric resources, a similar program for renewable gas could be jump-started through utility procurement. The utilities are best positioned to invest in biomethane projects due to their experience with large infrastructure projects and access to lower-cost capital. Utilities can help drive the demand for biomethane and create market pull that will simultaneously increase supply and lower the overall cost. Utility procurement of in-state sources of biomethane also has the potential to create in-state jobs and increase in-state economic activity, especially for disadvantaged rural and agricultural regions of the State. The construction and ongoing operation and maintenance of biomethane facilities will require skilled labor on-site at dairies, wastewater treatment plants, and diverted organic waste facilities. Many of these facilities fall within communities identified as disadvantaged by the State, especially many of those within the San Joaquin Valley. These regions will benefit from the increased economic activity associated with biomethane in addition to local environmental quality improvements.
- An investment tax credit for biomethane production projects that inject into the existing natural gas system should be established. Providing tax incentives to biomethane production facilities can help grow the industry by reducing tax liability for those producers. This can also have the added benefit of reducing the overall price of the fuel which can reduce costs for ratepayers who might be obligated to purchase the fuel. Most importantly, these types of policies are a clear indication that the government supports these technologies and believes that they should be a part of the energy discussion moving forward. That direction will help stimulate private investment and bring more minds to the table.
- The CEC must continue to allocate research and development monies for power-to-gas, thermal conversion, and carbon capture and utilization projects as it “stimulates California’s economic growth by attracting and developing businesses, and by creating and supporting jobs, yields long-term benefits to natural gas ratepayers by developing technologies and products that provide clean, diverse, and environmentally sound energy systems, and provides safe, reliable natural gas services by prioritizing the integrity and safety of natural gas infrastructure.”<sup>141</sup>

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<sup>141</sup> CEC. Natural Gas RD&D Program. Available at: [https://ww2.energy.ca.gov/naturalgas\\_research/](https://ww2.energy.ca.gov/naturalgas_research/)

- In 2002, SB 1078 created the State's RPS program by requiring 20% of electricity retail sales come from renewable resources by 2017.<sup>142</sup> This was followed in 2006 by SB 1,<sup>143</sup> which brought about the Million Solar Roofs Initiative. Both SB 1078 and SB 1 sought to make solar energy cheaper and proliferate its use throughout California. Research demonstrates that these goals have been achieved.<sup>144</sup>

**h. The CEC must make policy recommendations that promote the in-state production and distribution of RNG and hydrogen, including a program specifically designed to incentivize residential customers and developers to use RNG.**

- SB 1440, chaptered into the California Code on September 23, 2018, requires the CPUC to consider adopting specific biomethane procurement targets for each gas corporation.<sup>145</sup> These proceedings have not (yet) occurred, but this is an opportunity for state policy to promote the benefits of natural gas through the use of RNG. The bill requires the CPUC, in consultation with CARB to consider adopting specific biomethane procurement targets or goals for gas corporations. There is demonstrated proof that this type of regulation is effective, and it is most evident right here in California.
  - A biomethane procurement target can yield the same success for the RNG market. SB 1440's goal is to spur growth and demand for RG fuels by directing gas corporations to enter into long-term off take agreements with producers. These off-take agreements are an important step in the overall process because they facilitate private financing. Without them, it is extremely difficult to get projects built. As with solar and wind, a procurement target can help drive technological innovation and competition and ultimately create market demand that will simultaneously increase supply and lower the overall cost. Additionally, utility procurement of in-state sources of biomethane also has the potential to create in-state jobs and increase in-state economic activity, especially for rural and agricultural regions of the State. The construction and ongoing operation and maintenance of biomethane facilities will require skilled labor on-site at dairies, wastewater treatment plants, and diverted organic waste facilities. Many of these facilities fall within communities identified as disadvantaged by the State,

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<sup>142</sup> California Legislative Information. SB-1078 Renewable energy: California Renewables Portfolio Standard Program. Available at:

[https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=200120020SB1078](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=200120020SB1078)

<sup>143</sup> California Legislative Information. SB-1 Electricity: solar energy: net metering. Available at:

[https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=200520060SB1](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=200520060SB1)

<sup>144</sup> Environment California. Research and Policy Center. *California's Solar Success Story: How the Million Solar Roofs Initiative Transformed the State's Energy Landscape*. July 7, 2015. Available at: [https://environmentcalifornia.org/sites/environment/files/reports/CA\\_Solar\\_Success\\_scrn\\_FINAL\\_7-7-2015.pdf](https://environmentcalifornia.org/sites/environment/files/reports/CA_Solar_Success_scrn_FINAL_7-7-2015.pdf)

<sup>145</sup> California Legislative Information. SB-1440 Energy: biomethane: biomethane procurement. Available at: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180SB1440](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1440)

especially many of those within the San Joaquin Valley. These regions will benefit from the increased economic activity associated with biomethane in addition to local environmental quality improvements.

- The CEC must encourage policymakers to increase supply, drive demand, and lower costs of RNG. One part of this is by expanding the definition of biogas and biomethane to include other forms of RNG – such as gasified dead trees and hydrogen/synthetic natural gas derived from curtailed renewable electricity.
- Injection of biomethane into utility pipelines gives it access to the broadest possible market, facilitating the most diverse and flexible end-use opportunities. Research from EFI concludes that meeting emissions reductions targets while managing the costs of renewable energy development will require just this type of technology optionality, flexibility, and innovation.<sup>146</sup>
- Support from the CEC for continued incentives for heavy-duty natural gas vehicles (as discussed in Section 1) can work alongside a biomethane procurement mandate to further a transportation sector market to utilize RNG supply.
- The CEC, rather than focusing only on electrification, should support developing multiple technologies, including RNG. An example of such a program is AB 1143,<sup>147</sup> the passage of which would create the Renewable Gas Building Program, an initiative specifically designed to incentivize residential customers and developers to use RNG to decarbonize their thermal load. Currently, there are no incentive programs for RNG use in residential stationary sources. In fact, SB 1477, which created two programs designed to reduce emissions from the building sector, has the potential to include RNG. SoCalGas has requested both Commissions consider the inclusion of RNG<sup>148,149</sup> but the

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<sup>146</sup> EFI. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*. May 2019. Available at [https://energyfuturesinitiative.org/s/EFI\\_CA\\_Decarbonization\\_Full-b3at.pdf](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf)

<sup>147</sup> California Legislative Information. AB-1143 Energy: Renewable Gas Building Program. Available at: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201920200AB1143](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB1143)

<sup>148</sup> SoCalGas Comments. Administrative Law Judge's (ALJ) Ruling Seeking Comment on Staff Proposal for Building Decarbonization Pilots. August 13, 2019. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M311/K582/311582393.PDF>

<sup>149</sup> SoCalGas Reply Comments on ALJ Ruling Seeking Comment on Staff Proposal for Building Decarbonization Pilots. August 20, 2019. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M311/K581/311581560.PDF>



CEC and CPUC's draft proposal<sup>150</sup> for implementation focuses solely on electric technologies.<sup>151</sup>

- Almost two-thirds of California households use gas for home heating<sup>152</sup> and even if the State is determined to compel them all to electrify, it will still take decades to achieve that. Policymakers should allow and encourage customers to proactively reduce GHG emissions from their homes and save households thousands of dollars per home in unnecessary retrofits by incentivizing residential RNG use.
- i. **State support is necessary for SoCalGas' ongoing efforts to support the advancement of RNG.**
- On February 28, 2019, SoCalGas filed an application<sup>153</sup> with the CPUC for a voluntary RNG tariff for residential customers, as well as commercial and industrial customers for whom SoCalGas purchases gas. Residential customers who participate in the program will be able to choose how much of their gas will be supplied by renewable sources by selecting from set dollar amounts.<sup>154</sup> Commercial and industrial customers for whom SoCalGas purchases gas will be able to select either from set dollar amounts or a percentage of their total gas load.<sup>155</sup> CPUC approval of this tariff would allow SoCalGas to enter into procurement contracts to buy RNG from producers and correspondingly reduce the amount of fossil gas that is brought into the system.
- j. **Policy support is necessary to establish injection standards for hydrogen into the natural gas pipeline network.**
- Hydrogen is widely seen as a pivotal component of the future clean energy economy. It has the potential to provide emissions-free sustainable energy in a variety of end uses,

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<sup>150</sup> CEC. CPUC. Draft Staff Proposal for Implementation of SB 1477 Pilots. July 16, 2019. Available at: <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442462255>

<sup>151</sup> California Legislative Information. SB-1477 Low-emissions buildings and sources of heat energy. Available at: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180SB1477](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1477)

<sup>152</sup> U.S. Energy Information Administration. California State Profile and Energy Estimates. November 15, 2018. Available at: <https://www.eia.gov/state/analysis.php?sid=CA>

<sup>153</sup> SoCalGas. A.19-02-015 Renewable Natural Gas (RNG) Tariff. Available at: <https://socalgas.com/regulatory/A19-02-015.shtml>

<sup>154</sup> SoCalGas and SDG&E Application for Renewable Natural Gas Tariff. February 28, 2019. [https://www.socalgas.com/regulatory/documents/a-19-02-xxx/Application%20-%20Renewable%20Gas%20\(A.19-02-XXX\)%20-%20Final.pdf](https://www.socalgas.com/regulatory/documents/a-19-02-xxx/Application%20-%20Renewable%20Gas%20(A.19-02-XXX)%20-%20Final.pdf)

<sup>155</sup> *Ibid.*

such as fuel cell electric vehicles, stationary power for buildings, backup power, and distributed generation.<sup>156</sup>

- Blending hydrogen into the existing natural gas pipeline network has been proposed by many associations such as Hydrogen Europe as a means of increasing the output of renewable energy systems.<sup>157</sup> If implemented with relatively low concentrations, less than 5–15% hydrogen by volume, this strategy of storing and delivering renewable energy to markets appears to be viable without significantly increasing risks associated with using the gas blend in end-use devices.<sup>158</sup>
- However, the appropriate blend concentration may vary significantly between pipeline network systems and natural gas compositions and must therefore be assessed on a case-by-case basis. Any introduction of a hydrogen blend concentration would require extensive study, testing, and modifications to existing pipeline monitoring and maintenance practices.<sup>159</sup>
- State and federal support for this testing, as well as regulatory limits on how much hydrogen by volume is blended with natural gas, will be necessary to utilize the full potential of hydrogen safely and effectively.

**k. The usage of power-to-gas as a viable solution to the State’s long-term clean energy storage problem should be accelerated.**

- Renewables such as solar and wind have intermittency issues – sometimes they are not available, so they do not provide a reliable, continuous power supply. Conversely, sometimes too much power is produced when consumers do not need it. Hydrogen produced via power-to-gas can be stored in the extensive natural gas pipeline network and saved for when we need electricity.<sup>160</sup> SoCalGas’ system can potentially store

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<sup>156</sup> Melaina, M.W., Antonia, O., and Penev, M. *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*. NREL. January 3, 2013. <https://www.osti.gov/servlets/purl/1068610>

<sup>157</sup> Hydrogen Europe. *Hydrogen Europe Vision on the Role of Hydrogen and Gas Infrastructure on the Road Toward a Climate Neutral Economy*. April 2019. Available at: [https://hydrogeneurope.eu/sites/default/files/2019\\_Hydrogen%20Europe%20Vision%20on%20the%20role%20of%20Hydrogen%20and%20Gas%20Infrastructure.pdf](https://hydrogeneurope.eu/sites/default/files/2019_Hydrogen%20Europe%20Vision%20on%20the%20role%20of%20Hydrogen%20and%20Gas%20Infrastructure.pdf)

<sup>158</sup> *Ibid.*

<sup>159</sup> *Ibid.*

<sup>160</sup> Colbertaldo, P., Agustin, S.B., Campanari, S., and Brouwer, J. Impact of hydrogen energy storage on California electric power system: Towards 100% renewable electricity. Volume 44, Issue 19. April 12, 2019. Pp. 9558-9576. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0360319918336449?via%3Dihub>

massive amounts of hydrogen for long periods of time, so all that excess renewable energy does not go to waste or get purchased for other states during low demand periods. In 2015, the CAISO curtailed more than 187 Gigawatt hours (GWh) of solar and wind generation.<sup>161</sup> In 2016, the curtailment rose to more than 308 GWh.<sup>162</sup> In 2017, California curtailment rose again to 380 GWh of solar and wind generation.<sup>163</sup> The curtailment rates have continued to increase, and as of June 1 of this year wind and solar curtailments rose to 679 GWh.<sup>164</sup> When demand is high, it is a simple matter of converting the hydrogen back to electricity and distributing it back across the network.

- Policy makers should help accelerate the usage of power-to-gas by:
  - Establishing long-term storage targets for this technology, just like what the State and CPUC did for batteries – mandate utilities to procure energy that can be drawn off the grid and placed back on after months of storage.
  - Providing access to wholesale electric rates to the hydrogen market. Overgeneration and curtailments of renewable energy often create expensive or negative electricity prices.<sup>165</sup>
  - Providing a comprehensive hydrogen energy storage and energy repurposing solution using only low-priced curtailed energy for short durations, which creates lower and thus more cost-effective utilization of the storage facilities.
- These policies create incentives for electrolytic hydrogen production facilities to not only use curtailed energy during times of overgeneration, but also to have continued access to grid electricity at wholesale prices during non-curtailment hours.

## **10. EVALUATE THE ECONOMIC COSTS AND ENVIRONMENTAL IMPACTS OF PROPOSED NATURAL GAS STRATEGIES**

*Statute: Evaluating the incremental beneficial and adverse economic cost and environmental impacts of proposed strategies, including life-cycle greenhouse gas emissions from production, transportation, and use of natural gas, based on authoritative, peer-reviewed, and science-based analysis or in consultation with the State Air Resources Board.*

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<sup>161</sup> CAISO. Managing Oversupply. Oversupply and Curtailments Data. Available at: <http://www.caiso.com/informed/Pages/ManagingOversupply.aspx>

<sup>162</sup> *Ibid.*

<sup>163</sup> *Ibid.*

<sup>164</sup> *Ibid.*

<sup>165</sup> Utility Dive. *Prognosis negative: How California is dealing with below-zero power market prices.* May 11, 2017. Available at: <https://www.utilitydive.com/news/prognosis-negative-how-california-is-dealing-with-below-zero-power-market/442130/>

The CEC has failed to identify any strategies that maximize the benefits of natural gas and RNG in connection with cost and environmental impact. The CEC has failed to consider the amount of evidence supporting the beneficial use of natural gas and RNG when evaluating incremental beneficial and adverse economic cost and environmental impacts. SoCalGas elaborates on this further below.

The CEC should take into account how the pursuit of certain policies could impact strategies that maximize the benefits of natural gas and RNG. For example, proposals that would lead to the abandonment of natural gas infrastructure would unwisely eliminate an energy delivery system that could be leveraged to transport RNG or hydrogen and excludes a real solution to addressing climate change. Relatedly, while the CEC appears to favor all-electrification, it should consider whether other routes to decarbonization that use natural gas and RNG among multiple energy sources would be environmentally preferable. Likewise, the CEC must consider the economic costs of proposed strategies. The costs will affect public uptake, which will in turn affect efficacy. A high-cost strategy could cause the status quo to remain in place longer with worse environmental outcomes.

**a. When considering the relative benefits and disadvantages of the cost of natural gas strategies and systems, a fair and comprehensive comparison to electric costs is necessary to put costs in perspective, including the significant infrastructure investments required to build new electric transmission and distribution systems and to protect against wildfires**

- Energy affordability and equity must remain paramount given the significant increases in electric rates Californians are expected to experience in the near future as discussed in Section 2. It is not advisable to eliminate an entire energy infrastructure system that delivers affordable energy to customers today and which can be a vital part of the solution for delivering decarbonized energy in the future.<sup>166</sup> Leveraging existing carbon infrastructure could accelerate and improve performance of the energy sector's transition to a deeply decarbonized economy.

**b. In order to fully evaluate the beneficial and adverse environmental impacts of the natural gas system, the CEC should perform a fair and comprehensive assessment of the electric grid in order to have a neutral and balanced comparison.**

- A fair valuation of both energy systems' costs, reliability, and environmental benefits/risks needs to be conducted before making policy recommendations that favor one energy delivery system over another. For example, what transmission and distribution investments will be required statewide to support increased electric loads if the State were to pursue an all-electric strategy, and at what cost and impact to the

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<sup>166</sup> Comments provided by SoCalGas on this issue. See Appendix A.

environment? Does the electric grid yield a GHG emissions reduction benefit when you take into consideration impacts from wildfires, construction of large-scale transmission and renewable energy generation facilities?

- Wildfires release GHGs into the atmosphere, contributing to climate change. For example, "...according to data analyzed by the U.S. Geological Survey (USGS), the 2018 wildfire season in California is estimated to have released emissions equivalent to roughly 68 million tons of carbon dioxide. This number equates to about 15 percent of all California emissions, and it is on par with the annual emissions produced by generating enough electricity to power the entire state for a year."<sup>167</sup>
- Echoing these concerns, in June 2019 comments filed as part of the CEC's Decarbonization of the Natural Gas System docket, AdTra, Inc. (AdTra) characterized GHG emissions effects from wildfires linked to utility electrical equipment as '*fire-caused attributable indirect ghg emissions*' (fikai ghg emissions) and stated that implications of these emissions "...are profound and wide-ranging because electricity is a major input to many fuel pathways."<sup>168</sup>
  - "In general, AdTra analysis suggests that in the 2035 to 2050 period, when ficai ghg emissions are accounted for in California electricity pathways, about 165 million metric tons of CO<sub>2</sub> emissions are added to the state's ghg inventory with the levels of building electrification modeled in the E3 study, and relevant electrification studies."<sup>169</sup>
  - AdTra concludes that, "Fikai ghg emissions need to be duly considered. Based on our analysis, it is our view that any credible assessment of policy actions and measures to decarbonize California's economy cannot ignore fire-caused attributable indirect ghg emissions."<sup>170</sup>
- The CEC must consider the GHG emissions reductions associated with displacing traditional natural gas with RNG and hydrogen. While transportation of these alternative fuels has similar emissions levels, their use is neutral under the Cap-and-Trade program regulations.

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<sup>167</sup> U.S. Department of the Interior. *New Analysis Shows 2018 California Wildfire Emitted as Much Carbon Dioxide as an Entire Year's Worth of Electricity*. November 30, 2018. Available at <https://www.doi.gov/pressreleases/new-analysis-shows-2018-california-wildfires-emitted-much-carbon-dioxide-entire-years>

<sup>168</sup> AdTra Inc. Comments. Decarbonization of Natural Gas System., at p. 1. June 24, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=228838&DocumentContentId=60175>

<sup>169</sup> *Id.*, p. 2

<sup>170</sup> *Ibid.*