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**SoCalGas Comments SB 100**

*Additional submitted attachment is included below.*



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**Subject: Comments on the SB 100 Kick Off and Regional Scoping Meetings, Docket #19-SB-100**

The Southern California Gas Company (SoCalGas) appreciates the opportunity to comment on the scope of the Senate Bill (SB) 100 Report to be developed by the Joint Agencies.<sup>1</sup> SoCalGas appreciates the Joint Agencies' efforts to obtain a broader perspective by conducting regional workshops in Fresno, Redding, and Southern California. The demographics and energy requirements in each region create unique challenges for achieving the goals of SB 100. For example, at the Southern California workshop, the representative from the Port of Long Beach illustrated the unique challenges of charging electric heavy-duty trucks at the Port consistent with the operating requirements of the fleets. The required sharp ramp-up over a short period could impact regional energy reliability. These sorts of industry-specific, regional requirements are an important consideration in developing strategies to achieve the objectives of SB 100 within the framework of other initiatives, such as transportation electrification.

To help inform the scoping of the SB 100 Report, SoCalGas offers the following information:

1. Natural Gas Infrastructure Will Play an Important Role in Meeting SB 100 Goals
  - a. *Natural Gas System is Reliable, Resilient, & Flexible*
  - b. *Carbon Capture, Utilization, & Sequestration (CCUS) Technologies*
  - c. *Gas Distributed Energy Resources*
  - d. *Power-to-Gas Technologies*
2. Renewable Natural Gas Supports SB 100 Goals
3. Hydrogen Supports SB 100 Goals
4. Storage Supports SB 100 Goals
5. Recommendations to Meet SB 100 Goals
  - a. *Include Additional Stakeholder Feedback*
  - b. *Include Scenario-based Analysis*

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<sup>1</sup> Pursuant to SB 100, the California Energy Commission, California Public Utilities Commission, and California Air Resources Board must develop a joint-agency report on the progress to achieve "100 Percent Clean Energy Act of 2018" (de León, Chapter 312, Statutes of 2018)

- c. *Maintain Optionality & Flexibility*
- d. *Consider CCUS, Gas Distributed Energy Resources, and Power-to-Gas Technologies*

## **1. Natural Gas Infrastructure Will Play an Important Role in Meeting SB 100 Goals**

“For the near term, natural gas generation will continue to play an important role in integrating renewable resources and ensuring reliability.” – Draft 2019 Integrated Energy Policy Report, p.2

To help meet the goals of SB 100, this section includes information on how the natural gas system supports energy reliability and flexibility as well as how carbon capture, utilization, sequestration technologies (CCUS); combined heat and power technologies, such as microturbines and fuel cells; and power-to-gas technology can help decarbonize the natural gas sector.

### *A. Natural Gas System is Reliable, Resilient, & Flexible*

The electric and natural gas systems work in an integrated fashion today to provide safe, reliable, and affordable energy. The dispatchability of natural gas power plants to respond to changes in supply and demand has been an important way of integrating more renewables into the electric supply mix in California. With this in mind, California should through the SB 100 process, work to reduce emissions from both systems, not just the electric sector.

The Energy Futures Initiative (EFI) report titled, *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California* rightly points out that “[p]olicies that affect natural gas in some sectors (e.g., building electrification) may have unintended impacts on other sectors that consume and rely on natural gas. These impacts include price volatility; relatively higher infrastructure costs for sectors that have limited near-term options for decarbonization; and reduced resource availability.”<sup>2</sup> Additionally, the researchers state that “[n]atural gas generation will continue to play a key role in providing California’s electric grid with operational flexibility and enabling the growth and integration of intermittent renewables.”<sup>3</sup>

Natural gas generation provides the capability to maintain energy reliability during all periods of time, across all seasons. This flexibility is, and will be an important resource to balance the energy system when the electricity supply and load is changing rapidly. Recently, the California Independent System Operation (CAISO) submitted comments asking the California Public Utilities Commission (CPUC) to extend the use of natural gas power plants to address a potential shortfall of 2500 MW in 2022 and to look at long-term need for flexible resources.<sup>4</sup>

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<sup>2</sup> Energy Futures Initiative. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*. Summary for Policy Makers. 2019. A p. xiii. Available at: <https://energyfuturesinitiative.org/>

<sup>3</sup> *Ibid.*

<sup>4</sup> CPUC Rulemaking 16-02-007. Comments of CAISO, July 22, 2019. Available at: <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=310226799>

In a recent comment letter to the California Energy Commission (CEC), Lawrence Livermore National Laboratory (LLNL) presents several other compelling reasons why California should maintain and decarbonize natural gas infrastructure, including:<sup>5</sup>

1. Natural gas-fired electricity generation can be decarbonized through efficiencies.
2. Existing natural gas distribution infrastructure could provide a platform to broaden the use of carbon-neutral or carbon-negative renewable gas and clean hydrogen.
3. California has the largest renewable gas potential of any state and reducing short-lived climate pollutants is key to reach climate goals.
4. California already has the largest number of natural gas refueling stations in the nation and this number is expected to grow.
5. Existing natural gas infrastructure, coupled with a renewable gas supply, can help decarbonize hard-to-electrify sectors, such as industry and transportation.
6. Natural gas reduces the need for energy storage by allowing for flexible, dispatchable generation.

The importance of natural gas power plants for resiliency was highlighted by Dan Beans from Redding Electric Utility at the Redding Scoping workshop. He spoke about the value of their natural gas-fired powerplant during a disaster. He said, the plant kept water flowing and kept hospitals and evacuation centers operating. The community was also able to manage waste water and provide energy from the power plant to the local airport. This is just another example of the natural gas system in California as being safe, reliable, and resilient to climate-related disasters. It is essential for reliable 24-hour electric service, particularly for public safety facilities and vulnerable customers—a point recently made by CPUC Commissioner Shiroma at the September 12, 2019 CPUC meeting.<sup>6</sup>

Also at the Redding meeting, Delphine Hou from CAISO recommended the Joint Agencies consider during the SB 100 process, “[s]trategically maintain[ing] gas fleet as alternatives develop and are proven to meet the system operational needs.”<sup>7</sup>

For these reasons, SoCalGas asks the Joint Agencies not to disregard natural gas as part of the solution to reduce emissions in California and meet the goals of SB 100.

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<sup>5</sup> Information summarized from Lawrence Livermore National Laboratory Comments in response to the CEC’s Workshop on The Natural Gas Infrastructure and Decarbonization Targets. At p.2. June 21, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=228811&DocumentContentId=60143>

<sup>6</sup> CPUC Commissioner Shiroma at September 12, 2019, CPUC Commission Meeting. Available at minute 2:20 at: [http://www.adminmonitor.com/ca/cpuc/voting\\_meeting/20190912/](http://www.adminmonitor.com/ca/cpuc/voting_meeting/20190912/). She said, “we do not yet in 2019, have 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 rate customers, and so forth...”

<sup>7</sup> CAISO. Presentation by Delphine Hou. At p.6. October 24, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230343&DocumentContentId=61895>

## B. Carbon Capture, Utilization, & Sequestration (CCUS) Technologies

CPUC Commissioner Shiroma during her opening comments at the Redding workshop noted CCUS, along with other technologies, needed to be an “essential part of the plan.”<sup>8</sup> Several recent studies and comments support CCUS. For example Melanie Kenderdine with EFI, at the California Air Resource Board’s (CARB) Workshop on Carbon Neutrality: Scenarios for Deep Decarbonization held on August 15, 2019, said she did not see current options for deep decarbonization in some industries, the largest being that section of manufacturing that cannot get high quality heat from electricity; thus CCUS is best option to decarbonize parts of the manufacturing sector.

EFI estimates there are 37 natural gas-fired power plants in California that could be potential candidates for CCUS.<sup>9</sup> “The necessity [for CCUS] stems from the need to mitigate emissions from difficult-to-decarbonize sectors that may lack other suitable decarbonization options (e.g., heavy industry) and also the need for carbon dioxide removal from the environment at the scale of 100 to 1,000 GtCO<sub>2</sub> by 2100.”<sup>10</sup>

LLNL recommends the Joint Agencies do the following in the SB 100 Report: 1) explicitly define zero-carbon resource to include CCUS; 2) review and summarize existing literature on CCUS; 3) explore and document further benefits of CCUS could yield in the industrial sector; 4) consider up-to-date CCUS costs in the integrated resource planning process; and 5) review policy/permitting/regulatory barriers to the deployment of CCUS.<sup>11</sup> SoCalGas supports these recommendations.

The benefits of utilizing CCUS include utilizing the existing gas grid, contributing to grid resiliency, facilitating vehicle grid integration, and meeting climate goals like SB 100.

## C. Gas Distributed Energy Resources

Gas-powered distributed energy resources (DER), such as combined heat and power technologies and fuel cells, can provide a range of efficiency and reliability benefits. More so when deployed in strategic and appropriate ways, such as microgrids. For example, gas-fired DER generation technologies can be integrated with solar photo voltaic to provide right-sized community scale distributed generation systems that avoid long-distance electrical transmission losses associated with the traditional grid. Further, utilizing renewable natural gas (RNG) in these systems will allow these microgrids to deliver carbon-neutral or carbon negative energy for transportation and electricity.

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<sup>8</sup> CPUC Commissioner Shiroma, opening comments. Redding Scoping Workshop. October 25, 2019.

<sup>9</sup> EFI. *Optionality, Flexibility, & Innovation. Pathways for Deep Decarbonization in California*. 2019. At p.70. Available at: [https://energyfuturesinitiative.org/s/EFI\\_CA\\_Decarbonization\\_Full-b3at.pdf](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf)

<sup>10</sup> *Id.*, at p. xiv

<sup>11</sup> Lawrence Livermore National Laboratory Comments- SB 100 Joint Agency Report. September 9, 2019. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=229802&DocumentContentId=61246>

Additionally, a community scale distributed generation system can provide local energy reliability in case of power grid failure or shut offs (e.g., public safety power shutoffs) or excessive load demands. Local power generation systems integrating distributed renewable resources with gas DER can supply power during all hours of the day or variable weather conditions and can be called upon to support increased load demands. Community-scale distributed generation provides economies of scale for the installation, operation, and maintenance requirements of larger equipment and reduces individual operating and maintenance requirements and the potential for less than optimal operation.

Microgrids provide an opportunity to improve the resiliency of the energy system, decarbonize the energy supply and improve local air quality. There have been a number of compelling projects that utilize gas DER technologies in microgrid applications, primary power for critical loads, emergency backup, and dispatchable load following. In California, we have seen large commercial applications at universities, hospitals, and other business. For example, the University of California, Irvine installed a fuel cell at their medical center that produces 30% of the facility's power and produces high quality useable heat captured by an absorption chiller and used for facility air conditioning.<sup>12</sup> The Sierra Nevada Brewery in Chino, California, has four 250 kW fuel cells operating off natural gas and biogas providing base load energy with the waste heat used in the brewing process and other heating applications at the facility.<sup>13</sup> SoCalGas urges the Joint Agencies to further evaluate these commercial and food processing applications to identify opportunities for expanding their use in the industrial sector and for incorporation into larger-scale microgrid applications where benefits can be expanded to communities or other end-users.

Fuel cells are combustion free and are flexible enough to use to decarbonize the electricity and transportation sectors, and when used for on-site power generation, it can further reduce carbon of buildings. They offer multiple benefits, which include:<sup>14</sup>

- Reduction or elimination of greenhouse gas emissions when using RNG;
- Near zero criteria air pollutants including NO<sub>x</sub> and SO<sub>x</sub>;
- Create resilient power that can operate independent of the grid for long durations;
- The ability to operate on a variety of fuels including renewable gas, hydrogen and natural gas;
- Increased energy efficiency; and
- Providing 24/7, load-following power behind-the-meter and at utility-scale.

#### *D. Power-to-Gas Technology*

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<sup>12</sup> National Fuel Cell Research Center. UC Irvine Medical Center's Fuel Cell Now in Operation. May 3, 2016. Available at: <https://tinyurl.com/yxfdnm93>

<sup>13</sup> Pacific region CHP Application Center. Sierra Nevada Brewery. Available at: <https://tinyurl.com/y3lggffv>

<sup>14</sup> 2016-2017 Self-Generation Incentive Program (SGIP) Impact Evaluation Report. Submitted by Itron to Pacific Gas & Electric Company and the SGIP Working Group, September 28, 2018. Available at: <https://tinyurl.com/yxand6mb>

Today, 95% of the hydrogen produced in the United States is made by natural gas reforming in large central plants.<sup>15</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 greenhouse gas 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 can be used for use in transportation or to generate electricity when renewable energy sources are not available to support electric grid reliability.<sup>16</sup>

## **2. Renewable Natural Gas Supports SB 100 Goals**

Capturing methane from the agricultural and waste sectors and delivering carbon-neutral renewable gas through the existing natural gas pipeline is the single most-effective way to reduce short-lived climate pollutant (SLCP) emissions from organic waste, to create synergies with rural and disadvantaged communities, as well as to implement CARB’s SLCP Reduction Strategy and Climate Change Scoping Plan Update.

At the Southern California meeting, Frank Caponi from Los Angeles County Sanitation made comments on benefits of RNG. He asked that RNG’s role in decarbonization of the natural gas system be addressed more thoroughly through the SB 100 process. SoCalGas agrees.

The Bioenergy Association of California’s (BAC) SB 100 comments identify a number of strategies to enhance the in-state RNG market. BAC further states “[t]he SB 100 Report should consider reduction of the most damaging climate pollutants and other co-benefits such as wildfire and landfill reduction, as well as energy reliability and affordability. Bioenergy can play an important role in maintaining reliability... The SB 100 Report should recommend specific policy changes to accelerate small-scale bioenergy development that reduces climate pollution and provides grid reliability services.”<sup>17</sup>

SoCalGas agrees with the multiple parties that have commented on the importance of RNG in achieving carbon neutral electricity. With appropriate policies and incentives, we have already seen a dramatic transition of RNG into the transportation sector due to the incentives for vehicles and the Low Carbon Fuel Standard. The Joint Agencies should consider policies that can expand the use of RNG into other sectors, including pipeline injection and the various forms of power generation.

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<sup>15</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>16</sup> SoCalGas Website. Available at <https://www.socalgas.com/smart-energy/presentations-webinars/decarbonizing-the-pipeline>

<sup>17</sup> Bioenergy Association of California SB 100 Comments, at p. 1. October 1, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229895&DocumentContentId=61349>



### **3. Hydrogen Supports SB 100 Goals**

SoCalGas believes California should prioritize hydrogen development—produced from low- or zero-carbon feedstocks—to facilitate meeting the goals of SB 100. To do this, hydrogen will need to be produced from steam reformation using CCUS; from renewable sources; and by utilizing RNG from landfills and dairy feedstocks.

At the Southern California meeting, Mark Abramowitz, an environmental consultant, specifically pointed out the need to incorporate hydrogen in that workshop as it was not a topic of discussion. He explained the benefits of hydrogen, and asked staff to review the California Hydrogen Business Council’s (CHBC) comments closely. SoCalGas agrees. Specifically, CHBC’s following recommendation should be considered: “[i]n the SB 100 report, the joint agencies should: 1) clearly identify zero carbon hydrogen as a key technology for meeting the state’s goals and as defined in statute, 2) consider inter-sectoral opportunities and needs, including opportunities to utilize zero carbon hydrogen to not only meet the power sector goals of SB 100, but also to help achieve equitable reductions in all other sectors, and 3) commit to collective and agency-specific actions to accelerate development of this key technology.”<sup>18</sup>

### **4. Storage Supports SB 100 Goals**

At the SB 100 Kick Off meeting the Independent Energy Producers said we need a diversity of storage options and pointed out the importance of the natural gas system. SoCalGas agrees and would like to echo the California Energy Storage Alliance’s SB 100 comments which recommend the Joint Agencies:

- 1) Consider the relevance and importance of energy storage, in all its forms and applications, to support the path towards a cleaner, more reliable grid;
- 2) Establish market rules and valuation approaches that enable energy storage resources to maximize the services delivered to the grid and, as a result, deliver increased value to ratepayers;
- 3) Examine current market participation to determine whether the pathways and incentives are in place to procure and deploy the types of resources needed;
- 4) In the building sector, consider the role that energy efficiency and thermal storage systems play in decarbonization;
- 5) Consider the interplay between the electric sector with other sectors (e.g., transportation, building, gas) with further research on these interactions;
- 6) Consider the significant investments already made in natural gas infrastructure, and the potential for super bulk storage capabilities from renewable hydrogen storage; and
- 7) Consider energy storage as a no-regrets investment that increases the optionality and flexibility of the grid. Energy storage assets are able to respond and adapt to changing

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<sup>18</sup> California Hydrogen Business Council’s SB 100 comments. September 19, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229797&DocumentContentId=61242>

grid conditions, allowing operators to use these resources in a variety of ways, thereby increasing the flexibility, reliability, and resiliency of the overall system.<sup>19</sup>

## 5. Recommendations to Meet SB 100 Goals

SoCalGas offers the following recommendations to inform the SB 100 process and Report.

### A. *Include Additional Stakeholder Feedback*

At the Kick Off meeting, Commissioner McAllister asked, “[w]hat other stakeholders really need to be systematically brought to the table to have these discussions?”<sup>20</sup> SoCalGas recommends joint agency staff include discussions with experts in the manufacturing and agricultural sectors as they are large energy users and experience unique energy challenges. Additionally, SoCalGas urges the Joint Agencies to continue to seek feedback regionally throughout the SB 100 process.

### B. *Include Scenario-based Analysis*

SoCalGas echoes San Diego Gas & Electric’s comments,<sup>21</sup> which recommend the initial SB 100 Report be not only focused on process and framework, but also include scenario-based analysis on the reliability and financial impact of the policy, as well as the costs and benefits of alternative scenarios. All technology should be considered and, lessons learned from existing policy should be included in the SB 100 Report.

### C. *Maintain Optionality & Flexibility*

Because we do not know how we will meet California’s mid-century greenhouse gas emissions goals, the state must maintain optionality and flexibility. This point was supported by Jose Torres, of the California Environmental Justice Alliance, who emphasized at the Southern California meeting that there is no one solution. He said, “we need more options, not less.”<sup>22</sup> The Clean Air Task Force provided written comments along the same lines, stating “...the joint agency report on implementing SB 100 should remain firmly rooted in the principle of technology-inclusiveness and optionality, and explore ways to make diverse options real in the mid-century time frame and after.”<sup>23</sup>

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<sup>19</sup> California Energy Storage Alliance’s SB 100 comments. September 19, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229793&DocumentContentId=61237>

<sup>20</sup> CEC. Commissioner McAllister’s question after presentations. SB 100 Kick Off Meeting. October 25, 2019.

<sup>21</sup> SDG&E comments in response to joint agency SB 100 meeting. September 19, 2019. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229798&DocumentContentId=61241>

<sup>22</sup> Southern California SB 100 Scoping Meeting. Jose Torres Introduction. *California Environmental Justice Alliance* Presentation. October 29, 2019. Available at:

<sup>23</sup> Clean Air Task Force SB 100 comments, at p. 1. Available at:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=229800&DocumentContentId=61244>

With this in mind, SoCalGas recommends joint agency staff review the video recording of the CARB’s Workshop on Carbon Neutrality: Scenarios for Deep Decarbonization held on August 15, 2019.<sup>24</sup> The meeting hosted a panel of representatives from Energy + Environmental Economics, Inc. (E3), EFI, the California Institute of Technology, and the Center for Climate and Energy. These experts presented their research and held a robust discussion with their different perspectives about achieving deep decarbonization in California. The panelists agreed that we need to keep technology, policies, and other options available to meet future climate goals. For example, Brad Townsend (Center for Climate and Energy Solutions) said, “decarbonization requires that every tool in tool box is available, including technology and policy; we really can’t afford to take anything off the table.”<sup>25</sup> Nate Lewis (Caltech) said “[t]here’s a danger of premature judgement that... digs us in hole from which it will be more costly than it would have been if we maintained optionality.”<sup>26</sup>

*D. Consider CCUS, Gas Distributed Energy Resources, and Power-to-Gas Technologies*

As explained above, SoCalGas believes the Joint Agencies should consider, research, and analyze these technologies to help meet the state’s SB 100 goals.

**6. Conclusion**

Moving forward, California’s focus should maintain optionality and flexibility as well as on decarbonizing both gas and electric supplies. The Joint Agencies, through the SB 100 process and Report should support an inclusive energy strategy—including natural gas—that objectively considers all options and encourages and allows for current and future innovation. Specifically, SoCalGas urges the Joint Agencies to support policies and projects to increase the investment in a portfolio of options such as CCUS, microturbines and fuel cells, and power-to-gas technology; as well as RNG, hydrogen, and storage.

SoCalGas’ subject matter experts are eager to work with staff so the Joint Agencies have a better understanding of the opportunities and challenges associated with decarbonizing all sectors of the economy by 2045.

Sincerely,

*/s/ Tim Carmichael*

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<sup>24</sup> CARB Workshop on Carbon Neutrality: Scenarios for Deep Decarbonization. August 15, 2019. Meeting recording available at: <https://www.youtube.com/watch?v=b1TTNvUrLTk&feature=youtu.be>

<sup>25</sup> *Ibid.* Brad Townsend (Center for Climate and Energy Solutions) statement

<sup>26</sup> *Ibid.* Nate Lewis (Caltech) statement