DOCKETED	
Docket Number:	19-SB-100
Project Title:	SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future
TN #:	240589
Document Title:	Southern California Gas Company Comments - SoCalGas Comments on the SB 100 Non-Energy Benefits, Social Costs, and Reliability Workshop
Description:	N/A
Filer:	System
Organization:	Southern California Gas Company
Submitter Role:	Public
Submission Date:	11/12/2021 4:29:12 PM
Docketed Date:	11/12/2021

Comment Received From: Southern California Gas Company
Submitted On: 11/12/2021
Docket Number: 19-SB-100

SoCalGas Comments on the SB 100 Non-Energy Benefits, Social Costs, and Reliability Workshop

Additional submitted attachment is included below.

Kevin Barker
Senior Manager
Energy and Environmental Policy
555 West 5th Street
Los Angeles, CA 90013
Tel: (916) 492-4252
KBarker@socalgas.com

November 12, 2021

The Honorable Siva Gunda
Vice Chair, California Energy Commission
Docket Unit, MS-4
Docket No. 19-SB-100
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Comments on the SB 100 Joint Agency Implementation: Planning for SB 100 Analysis of Non-energy Benefits, Social Costs, and Reliability Workshop

Dear Vice Chair Gunda:

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide comments on Senate Bill (SB) 100 Joint Agency Implementation: Planning for SB 100 Analysis of Non-energy Benefits, Social Costs, and Reliability Workshop held by the California Energy Commission (CEC) and California Public Utilities Commission (CPUC) on November 1, 2021.

As California makes the transition to carbon neutrality by 2045, it is in the public interest to not only understand the societal benefits and costs of this transition, but to also measure its effects on the reliability of the integrated energy system. SoCalGas recently released The Role of Clean Fuels and Gas Infrastructure in Achieving California's Net Zero Climate Goal Strategy.[1] One of the key findings of the whitepaper is that dispatchable, just-in-time energy provided by the gas system plays a vital role in supporting the deployment of renewables in the electric grid thereby enabling greenhouse gas emissions reductions. In fact, our analysis shows that the more renewables are integrated into the system, the more dispatchable resources are needed. Clean fuels, such as renewable natural gas (RNG), green hydrogen, synthetic natural gas, and biofuels, will be needed to act as this dispatchable resource, which will bolster peak reliability and provide the critical resiliency needed for climate-caused extreme weather event adaptation. SoCalGas envisions a "clean fuels network" to be one that repurposes the existing natural gas pipeline for transporting clean fuels such as green hydrogen which is integrated with electricity and renewable energy.

[1] "SoCalGas Clean Fuels," last modified November 9, 2021, https://www.socalgas.com/sustainability/clean-fuels.

With the above context, our comments focus on three areas: 1) Maintaining high-paying jobs in the energy transition - like those provided by the clean fuels network - is critical; 2) Resilience is a vital non-energy benefit for all communities that should be monetized; and, 3) A request that build rates for solar, wind, and battery storage capacity follow the same metric.

1) **Maintaining high-paying jobs in the energy transition like those provided by the clean fuels network is critical.**

As CPUC Commissioner Genevieve Shiroma and Tony Reames of the U.S. Department of Energy (DOE) Office of Economic Impact and Diversity pointed out during the workshop, ensuring the availability of high-quality clean energy jobs in the future is of utmost importance.[2] Changes to the State's energy systems will most likely influence the working conditions and well-being of employees. As such, completing a robust job quality analysis is critical to monitoring labor market changes and their effects on working conditions and well-being of employees, as well as evaluating the effectiveness of the State's policies. To capture job quality indices, the joint agencies should consider 1) the skill sets necessary for the clean energy jobs of the future; 2) what skill gaps exist with the current workforce; 3) the number of jobs that will be created, measured against the number of jobs that will be displaced; 4) the longevity and potential career trajectory of new clean energy jobs; and, (5) the quality of jobs in terms of pay, benefits, and whether the jobs will be unionized.

As the gas and electric grids continue to become increasingly interdependent, the existing gas system and clean fuels network will continue to play a critical role in providing the means to maintain high-pay and long-term jobs. The proposed analysis should consider that the jobs that will support a clean fuels infrastructure will include infrastructure maintenance and operations; construction of new infrastructure, such as hydrogen pipelines; and, other positions that will likely require the same skill sets needed and employed today by SoCalGas' utility workforce. As a result, experienced workers have the potential to be able to transition to jobs supporting the clean fuels infrastructure with an extensive amount of training, thereby mitigating displacement of the workforce. If the workforce transition is to succeed as the State achieves its decarbonization goals, the quality of earnings for the workforce must be at the forefront of policymaker agendas.

Additionally, consideration must also be given to new and current third-party jobs that support the gas and electric grids. For instance, the gas system workforce supports a diverse demographic and ecosystem of suppliers and contractors. In 2020, SoCalGas spent $884.2 million with more than 550 minority, women-owned, service-disabled veteran or LGBT-owned businesses. This total represents 42 percent of the company's spending last year and marks the 28th consecutive year SoCalGas exceeded the CPUC goal of procuring 21.5 percent of total goods and services from diverse suppliers.[3]

---

[2] "Joint Agency Workshop, Senate Bill 100 Implementation: Planning for SB 100 Analysis of Non-Energy Benefits, Social Costs, and Reliability," CEC, November 1, 2021, available at: https://www.energy.ca.gov/event/workshop/2021-11/joint-agency-workshop-planning-senate-bill-100-analysis-non-energy-benefits.

[3] SoCalGas, "Support for Diverse Businesses Yields $884 Million in Spending for 2020," March 10, 2021, https://newsroom.socalgas.com/stories/support-for-diverse-businesses-yields-884-million-in-spending-for-2020.

Lastly, 92 percent of our diverse suppliers are located in California.[4] Given the importance of ensuring the availability of high-quality clean energy jobs in the future, the joint agencies should continue to consider the role of the existing gas and clean fuels network workforce, as well as the third-party jobs that support the network as these trained individuals could aid in reducing displacement that may arise as a result of changes to the State's energy system.

2) Resilience as a critical non-energy benefit for all communities that should be monetized.

One of the fundamental non-energy benefits outlined in SB 100 is resilience. Per the CPUC, "resilience measures impacts to humans."[5] Resilience metrics are useful tools for quantifying, valuing, and monetizing impacts on overall system resilience. According to the National Renewable Energy Laboratory (NREL), currently, the most common metric for valuing resilience is the value of lost load (VoLL).[6] We suggest that the CPUC use VoLL as a metric to measure resiliency.

Figure 1: VoLL Varies by Customer and Time[7]

VoLL "describes costs associated with electric grid outages and represents an approximate price that consumers are willing to pay for uninterrupted electricity."[8] As shown in Figure 1 (above), the VoLL varies by customer class and time. Figure 1 shows that an outage would most immediately impact a Grocery Store as supplies begin to diminish and the VoLL levels off eventually. Whereas a National Guard center might be affected lightly during the beginning of an outage event, but after several days, more National Guard service members would need to be deployed, and therefore the impact would increase in the longer-term.

Resiliency metrics are context-specific, and resiliency is generally less understood and harder to quantify prior to an event as different customer segments and customer behaviors require additional consideration. By way of example, Table 1 below provides monetization values of avoiding energy disruptions. Since a clean fuels network consists mostly of underground transmission and distribution

[4] "SoCalGas 2020 Supplier Diversity and 2021 Annual Plan," Sempra Energy, March 2021, p. 1.
[5] See Resiliency & Microgrids Working Group – Value of Resiliency – Overview of 4 Pillar Methodology, May 5, 2021, CPUC.
[6] See Valuing Resilience in Electricity Systems, NREL, available at https://www.nrel.gov/docs/fy19osti/74673.pdf.
[7] Ibid.
[8] Ibid.

infrastructure, which is inherently resilient to climate impacts, gaseous energy can be delivered just in time directly to the various energy users within the system, reducing energy interruption.[9] Through a review of regulatory proceedings and peer-reviewed literature, research published by the Electricity Journal demonstrated that interruption costs significantly vary across different customer/stakeholder groups.[10] For example, a large industrial customer could incur substantial costs from a short-duration interruption due to loss of production, whereas a residential customer may not experience a significant cost or inconvenience by the same short-duration interruption. Further, a person who works in an external office environment may experience little to no customer interruption cost (CIC) compared to an investment banker working from home.[11] The research also concludes that "[t]here is a need to better collect and share infrastructure damage and associated societal impact data after extreme weather events to assess the effectiveness of resilience measures."[12]

Table 1: Summary of Resiliency Benefit Values Found in Literature[13]

Benefit Type	Benefit Amount
Avoided Legal Liabilities	$87,100 per mile - reduced litigation from fewer contact fatalities and serious accidents
Avoided Vegetation Management Costs	$3000 - $12,000 per mile for distribution; $300 - $9000 per mile for transmission
Avoided Revenue Loss	$0.09-$0.32 per kWh (Range of System Average Rates Across U.S.; average SAR = $0.13)
Avoided Short-Duration Customer Interruption Costs: Medium/Large C&I (> 50,000 annual kWh)	$12-$37 per unserved kWh (interruptions lasting 30 minutes - 16 hours)
Avoided Short-Duration Customer Interruption Costs: Small C &I (< 50,000 annual kWh)	$214-$474 per unserved kWh (interruptions lasting 30 min - 16 h)
Avoided Short-Duration Customer Interruption Costs: Residential Customers	$1.3-$5.9 per unserved kWh (interruptions lasting 30 min - 16 h)
Avoided Long-Duration Customer Interruption Costs	$1.20/kWh (for high priority services) to $0.35 (for low priority services) (interruptions lasting 24 h; Allegheny County, PA) $190M-$380 M (24 -h interruption) $4.4B-$8.8B (7-week interruption) (downtown San Francisco)
Safety: Avoided Injuries and Fatalities	Fatality: $7.4 million ($2006) Injury: up to $7.4 million ($2006)
Avoided Aesthetic Costs	Avoided loss in property values due to overhead electricity being undergrounded: 5-20% increase in property value
Ecosystem Benefits	Depends on ecosystem, location and other factors.
Avoided Emissions	$5800 per ton - SO_2 from coal plants $1600 per ton - NOx from coal plants $460 per ton - PM-10 from coal plants

Resiliency to earthquakes and/or extreme weather events must be considered by policymakers as a critical feature of the overarching non-energy benefit provided for all communities. Allowing for a flexible energy system will help the State to maintain grid nimbleness. There are inherent resilient benefits of the gas system because of its dependable attributes. Due to the high-strength steel or polyethylene plastic from which pipelines are constructed,[14] the gas system is resilient to natural

[9] See The Role of Clean Fuels and Gas Infrastructure in Achieving California's Net Zero Climate Goal, SoCalGas, available at: https://www.socalgas.com/sites/default/files/2021-10/Roles_Clean_Fuels_Full_Report.pdf.

[10] Zamuda et. al., "Monetization methods for evaluation investments in electricity system resilience to extreme weather and climate change," The Electricity Journal, Available at: https://toolkit.climate.gov/sites/default/files/Monetization%20methods%20for%20evaluating%20investments%20in%20electricity%20system%20re....pdf.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] See Powerful Calif. Earthquakes test resilience of gas pipeline system, S&P Global Market Intelligence, available at: https://www.spglobal.com/marketintelligence/en/news-insights/trending/2fpRhrfyU6o1baK8BTa9Kw2.

disasters, such as earthquakes and subsequent aftershocks. As documented in the aftermath of the 1994 Northridge California earthquake, approximately 120,000 people had their natural gas service interrupted due to the natural disaster, compared to 2,500,000 customers who lost electric service.[15]

Power outages, especially those that are long-duration and system-wide, are costly and affect millions of Californians. For example, in October 2020 a large-scale power outage in Northern and Central California impacted 2.7 million people and cost $2.5 billion.[16] The recent increase of power outages caused by wildfires and efforts to manage outages also increased the use of diesel back-up generators (BUGs) statewide. Nearly one million people were affected by a public safety power shutoff event in October 2019 and utilized 125,000 diesel BUGs for electrical power.[17] The California Air Resources Board (CARB) estimated that diesel BUGs used during this time emitted 9 tons of diesel soot, or the equivalent of about 29,000 heavy-duty diesel trucks driving on California's roadways for one month.[18] In California, diesel soot emissions account for about 70 percent of known cancer risk from Toxic Air Contaminants (TAC) emissions.[19]

Additionally, a reliable and resilient energy system allows for essential services to maintain the safety and health of their respective populations. It is important that these facilities benefit from enhanced resiliency via their energy delivery systems. Hospitals, for instance, cannot afford to go without power for a short period of time during planned or unplanned grid outages and therefore have specialized needs when it comes to energy usage. Seth Baruch, National Director for Energy and Utilities at Kaiser Permanente, stated that when Kaiser hospitals and/or medical offices rely on fuel cells that use natural gas during a power outage, all surgeries proceed because of the high level of energy reliability that fuel cells using natural gas provide.[20] In contrast, Kaiser facilities using diesel generators will only perform surgeries on patients with life-threatening conditions and will reschedule all other surgeries until power is fully restored.[21]

There is no singular fuel source that will fit the needs of resiliency and reliability for every Californian community. This is not more evident than at the Marine Corps Air Station (MCAS) Miramar. The Department of Defense requires a microgrid to island from the electrical grid for fourteen consecutive

---

[15] See Natural Gas Pipeline Systems: Delivering Resiliency, Resilience White Paper, American Gas Association (AGA). Available at: https://www.energy.gov/sites/prod/files/2015/04/f21/AGA%20QER%20Comments%20-%20System%20Resiliency.pdf.

[16] Stevens, P., "PG&E power outage could cost the California economy more than $2 billion," CNBC, October 10, 2019, available at: https://www.cnbc.com/2019/10/10/pge-power-outage-could-cost-the-california-economy-more-than-2-billion.html.

[17] "Emission Impact: Additional Generator Usage Associated with Power Outage," California Air Resources Board, January 30, 2020. Available at https://ww2.arb.ca.gov/sites/default/files/2020-01/Emissions_Inventory_Generator_Demand%20Usage_During_Power_Outage_01_30_20.pdf.

[18] *See* "Summary: Diesel Particulate Matter Health Impacts," California Air Resources Board, 2021. Available at https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts#:~:text=Diesel%20engine%20emissions%20are%20believed,is%20a%20known%20health%20hazard.

[19] Ibid.

[20] Seth Baruch, "IEPR Commissioner Workshop on Assessing the Future Role for Microgrids in California Session 2," Panel 1: Resilience Impacts on the Microgrid Market, July 9, 2020.

[21] Ibid., 11.

days.[22] This is achievable because the military base leverages all onsite resources that include renewables as well as landfill, thermal energy, natural gas and even diesel. Per Mick Wasco, Utilities & Energy Management at MCAS Miramar, "there is tremendous opportunity and benefits in using clean natural gas."[23] Overall, the extent of resiliency can vary across different evaluated customer scenarios, however, an existing fuels network that can continue to support an electric network, would ensure that diverse customer segments continue to have access to resiliency benefits.

3) SoCalGas requests build rates for solar, wind, and battery storage capacity follow a uniform metric.

The 2021 SB 100 Joint Agency Report found that California's solar and wind build rates would need to triple based on a ten-year average and the battery storage build rate would need to increase eightfold based on 2020 build to meet the 2045 target.[24] The use of two different metrics to calculate the build rates needed for solar, wind, and battery storage suggests the build rates presented may not be comparable. SoCalGas respectfully requests that the CEC consider a single, standardized build rate for all renewable and battery resources so it is easier to comprehend the magnitude of new renewable and battery resource capacity that will be needed over the next 25 years.

The 2021 SB 100 Joint Agency Report indicates that solar, wind and batteries build rates are 2.8 GW/year, 0.9 GW/year, and 2.0 GW/year, respectively.[25] To put these figures into perspective, SoCalGas examined available data to determine the average build rates of solar, wind, and batteries over the last five years, finding the rates are approximately 0.8 GW/year, 0.06 GW/year, and 0.09 GW/year.[26,27] Using a consistent metric of the past four-year build rate averages (a split between the ten-year and one-year rates used by CEC staff - we used four years rather than five because wind capacity actually declined from 2015 to 2020 and it resulted in a negative build rate), annual build rates for solar will need to increase by 2.8 times, wind will need to increase by 11.5 times, and battery storage will need to increase by 23.3 times. This means that consistently 15 times more wind capacity will need to be built year over year for the next 25 years. A summary of the build rates mentioned is shown in Table 2.

---

[22] Mick Wasco, "IEPR Commissioner Workshop on Assessing the Future Role for Microgrids in California Session 1," Panel 1: What is working and Why for Microgrids: Design Considerations and Operational lessons Learned, CEC, July 7, 2020.
[23] Ibid., 14.
[24] "2021 Joint Agency SB 100 Report Summary," CEC, March 2021, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239588&DocumentContentId=73021.
[25] "2021 SB 100 Joint Agency Report, Achieving 100 Percent Clean Electricity in California: An Initial Assessment," CEC, pg. 10. Available at: https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity
[26] Calculation for solar and wind based on CEC date, "Electricity Generation Capacity and Energy," CEC. Available at: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/electric-generation-capacity-and-energy.
[27] "Form EIA-860 detailed data with previous form data (EIA-860A/860B)", U.S. EIA, available at: https://www.eia.gov/electricity/data/eia860/.

Table 2: Summary of Renewable Resource Build Rates

Resource	CEC Build Rate (GW/Year)	Average Build Rate Over Past Five Years (GW/Year)	Magnitude Greater Build Rates Over the Previous 4 Year Average
Solar	2.8	1.0*	2.8*
Wind	0.9	0.08*	11.5*
Battery Storage	2.0	0.09**	23.3**

*Approximations were calculated using the cited CEC data, see reference 26
**Approximations were calculated using the cited U.S. EIA data from 2016 and 2020, see reference 27

Conclusion

As we collectively pursue California's energy system decarbonization goals, the difficult-to-quantify, yet important topics of non-energy benefits, social costs, and reliability should continue to be prioritized in SB 100 planning efforts. The clean fuels network will continue to play a critical role in providing the means to maintain high-pay and long-term jobs and achieve the non-energy benefit of resiliency. SoCalGas also respectfully encourages the CEC to utilize a universal methodology to forecast build rates in future periods for the State. SoCalGas looks forward to collaborating with the CEC, CPUC, sister agencies, and contributing to the discussion of these topics and helping to shape an energy future that is both decarbonized and equitable for all Californians.

Respectfully,

/s/ Kevin Barker

Kevin Barker
Senior Manager
Energy and Environmental Policy

cc: Karen Douglas, CEC Commissioner
Clifford Rechtschaffen, CPUC Commissioner
Darcie Houck, CPUC Commissioner
Genevieve Shiroma, CPUC Commissioner