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Solar Energy Industries Association

Comments on the August 30, 2021, *IEPR Commissioner Workshop on Natural Gas Market and Demand Forecasts*

I. Introduction and Summary

The Solar Energy Industries Association (SEIA)[1] appreciates the opportunity to comment on the forecasts presented at the California Energy Commission's (CEC) *IEPR Commissioner Workshop on Natural Gas Market and Demand Forecasts*, held on August 30, 2021. The IEPR natural gas forecast is a critical input into the work of the CEC and the California Public Utilities Commission (CPUC). SEIA participated in the August 30, 2021 workshop, and has reviewed the models that the CEC staff used to forecast natural gas commodity and transportation costs. SEIA has a strong interest in these issues as a result of its ongoing involvement in the CPUC's Integrated Resource Planning (IRP) and Integrated Distributed Energy Resource (IDER) proceedings, both of which make use of the IEPR burner-tip natural gas forecast for electric generators (EGs). The IEPR gas forecast for EGs is used in modeling for electric resource planning and in evaluations of the cost-effectiveness of demand-side programs. Accordingly, our comments focus on the draft IEPR burner-tip gas forecast for EGs.

II. Long-term Escalation in Natural Gas Transportation Rates

SEIA supports the CEC's effort in this IEPR to include a realistic long-term escalation rate for intra-California gas transportation rates. We provide comments below on the long-term escalation rate for intrastate gas transportation rates that the CEC should use, in response to the staff's request at the workshop for parties to provide input on this important assumption.[2] The staff's initial proposal of 2.3% per year real escalation in intrastate transportation rates is a starting point, but, for the reasons set forth below, is too low to reflect accurately the impact on these rates of the state's ambitious goals to reduce greenhouse gas (GHG) emissions.

There are important reasons why gas transportation rates will escalate substantially faster than inflation in the future:

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[1] SEIA is the national trade association of the United States solar industry. The views contained in these comments represent the position of SEIA as an organization, but not necessarily the views of any particular member with respect to any issue.

[2] See https://www.energy.ca.gov/event/workshop/2021-08/iepr-commissioner-workshop-natural-gas-market-and-demand-forecasts , including Slide 23 of the staff's preliminary natural gas market results (at https://efiling.energy.ca.gov/getdocument.aspx?tn=239504), which asks if 2.3% real escalation is too conservative.

- Achieving California's goals to reduce GHG emissions to 40% below 1990 levels by 2030, and to be carbon neutral by 2045, will result in a significant drop over time in natural gas use among all types of gas customers. The *2020 California Gas Report* (*2020 CGR*) forecast for the California gas system shows gas throughput declining from 5.21 Bcf per day in 2020 to 4.34 Bcf per day in 2035, a decline of 17% or 1.2% per year over this period. EG throughput is forecasted to decline even more rapidly from 2020 to 2035, from 5.21 Bcf per day in 2020 to 1.00 Bcf per day in 2035, a decline of 2.6% per year.[3]

- At the same time, gas revenue requirements have been increasing sharply as PG&E and SoCalGas continue to make investments to improve the safety and reliability of their gas transmission and storage infrastructure, in the wake of the San Bruno explosion in 2010 and the Aliso Canyon methane leak in 2015. For example, PG&E's adopted revenue requirement for its gas transmission and storage facilities has increased from $462 million in 2010[4] to the $1,580 million that the Commission authorized for 2022 in D. 19-09-025, the final decision in the most recent PG&E Gas Transmission & Storage rate case.[5] This is an average increase of 10.8% per year over 12 years. From this historical perspective, the staff's assumption of gas revenue requirements growing at 2.3% above inflation is conservative.

Gas transportation rates are calculated with the costs of the pipeline and storage infrastructure (i.e., the gas revenue requirement) in the numerator and gas throughput in the denominator. With the numerator rising due to safety-related costs and the denominator decreasing as the result of programs to reduce carbon emissions (such as the growth of renewable electric generation), the result has been dramatic escalations over the last decade in PG&E and SoCalGas gas transportation rates. We include **Attachment A** showing the increases PG&E's gas transportation rates for EGs located on both PG&E's backbone and local transmission systems, based on historical rate information posted on PG&E's website.[6] The escalation in gas transportation rates is particularly important for the EG burner-tip forecast, because intrastate gas transportation costs now comprise a significant portion – up to about one-third (34%) for EG plants on the PG&E local transmission system[7] – of the burnertip cost of natural gas, and this percentage is highly likely to increase in the future.

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3 See the *2020 California Gas Report*, at Tables 3 and 4.

4 See D. 11-04-031, at p. 16.

5 See D. 19-09-025, at Appendix E, Table 1.

6 See https://www.pge.com/tariffs/EG.pdf and https://www.pge.com/tariffs/EG_Backbone.pdf for PG&E historical rate information.

7 As an example using public data, in PG&E's current short-run avoided cost (SRAC) posting of QF energy prices, intrastate gas transportation costs presently comprise 34% of the posted burnertip cost of gas. See, for example, PG&E's September 2021 SRAC posting, which has a bidweek border commodity gas price of $4.40 per Dth (66%) and an intrastate transportation cost of $2.28 per Dth (34%). Available at https://www.pge.com/pge_global/common/word_xls/for-our-business-partners/energy-supply/prices-for-qualifying-facilities-and-eligible-combined-heat-and-power-facilities/20210910SRAC.xlsx.

The CEC staff's EG burner-tip forecast model assumes that gas revenue requirements will increase at 2.3% above inflation, but also assumes that EG throughput will be flat through 2030.[8] This is unrealistic given the substantial further growth of renewable generation expected over the next decade. As noted above, the *2020 CGR* forecast expects EG throughput to decline at 2.6% per year from 2020 to 2030. Combined with a 2.3% per year increase in the revenue requirement, this suggests that intrastate gas transportation rates for EG customers will increase at a real escalation rate of 5.0% per year.

The CEC staff also should consider several studies released in 2019 that examined quantitatively how meeting the state's 2045 GHG goals will impact the long-term trajectory of gas transportation rates. The first is a study that the consultants from Energy and Environmental Economics (E3) performed for the CEC under a PIER grant. The second is the Gridworks report, *California's Gas System in Transition: Equitable, Affordable, Decarbonized and Smaller*. **Attachment B** summarizes these studies; both of these analyses support a long-term escalation in EG gas transportation rates on the order of 5% per year above inflation.

For these reasons, SEIA recommends that the CEC use a real escalation rate of 5.0% to grow the intrastate transportation rates in its EG burner-tip gas cost forecast.

III. Technical Comments on the Burner-tip Gas Model

1. Use a Single Commodity Forecast at the PG&E City-gate for PG&E EGs

The staff's burner-tip gas model correctly recognizes that EG plants on the PG&E system pay one of two significantly different intra-state transportation rates, depending on whether a plant connects directly to PG&E's backbone pipeline system or takes service from the PG&E smaller-diameter local transmission ("local T") system that is downstream of the backbone pipelines. The staff forecast also uses different gas commodity costs for these two types of plants. For backbone-level plants, the staff forecasts the burner-tip cost by using the average of the gas commodity costs in the California border markets at Malin (the Northern California/Oregon border) and Topock (the Southern California/Arizona border), plus the tariffed backbone rates. For the local T plants, the draft forecast uses the PG&E City-gate commodity cost of gas, plus the PG&E Schedule G-EG transportation rate. The PG&E City-gate is the virtual market point downstream of the PG&E backbone pipelines, wherever gas leaves the backbone system.

All EG plants on the PG&E system – including those connected directly to the backbone – have access to the PG&E City-gate market, and it is our experience and understanding that most EG plants – including the backbone-level plants – procure their gas supplies in the PG&E City-gate market. Thus, it would make the most sense for the burner-tip gas forecast to use a

[8] See cells K27:K46 of the "CA Transportation Rate" tab in the CEC's preliminary burnertip[model (at https://www.energy.ca.gov/sites/default/files/2021-09/2021%20IEPR%20Preliminary%20Burner%20Tip%20Model_9-9-21_ADA.xlsm), which shows constant EG demand of 1,442 MMtherms.

single commodity cost of gas at the PG&E City-gate for all PG&E EG plants. This would avoid the issue of having to forecast the relative proportions of natural gas that EG plants purchase at Malin versus Topock. In addition, with the use of the PG&E City-gate commodity price, the only intrastate rate on the PG&E system that needs to be forecasted is the PG&E Schedule G-EG rate for transportation to EG plants downstream of the City-gate.

2. Include the PG&E G-EG Rate for Backbone-level EGs

Backbone-level EG plants on the PG&E system pay a small rate for transportation downstream from the PG&E City-gate under PG&E's Schedule G-EG tariff, even if a plant purchases its gas commodity in the PG&E City-gate market.[9] It is unclear whether the draft staff burner-tip forecast includes the G-EG backbone-level (BB) rate in the burner-tip cost of gas for backbone-level EG customers.[10] The G-EG BB rate recovers certain transportation costs that have been allocated to all EG customers as well as specific regulatory balancing accounts applicable to all EG customers. Because the balancing accounts fluctuate over time, this rate also fluctuates. A history of this rate, from the PG&E historical rate data on its website, is shown in the orange line in Figure 1 of Attachment A. The burner-tip cost of gas for backbone-level EG customers on the PG&E system should include this rate.

3. Correct the Conversion from Therms to MMBtu

The CEC forecast of gas transportation rates should multiply, not divide, by a factor of 10 to convert gas transportation rates from $ per therm values to $ per MMBtu values.[11] By dividing rather than multiplying by 10, the CEC gas rate forecast is too low by a factor of 100.[12]

4. Include Shrinkage (if necessary) and the Municipal Surcharge

Another reason to use the PG&E City-gate commodity cost of gas is that it includes the natural gas "shrinkage" (compressor fuel costs and losses) that is included in backbone transportation rates. However, if the CEC continues to use a border price (e.g., Malin or Topock) for certain EG plants, backbone shrinkage should also be included in the backbone transportation rate. For example, PG&E's monthly Short Run Avoided Cost postings apply 1.2% shrinkage under Gas Rule 21, in computing a burner-tip gas cost based on California

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[9] See https://www.pge.com/tariffs/assets/pdf/tariffbook/GAS_SCHEDS_G-EG.pdf. The backbone-level G-EG rate posted in Schedule G-EG includes GHG cap & trade allowance costs that most if not all large EG customers pay separately. The backbone-level G-EG rate is small once those GHG costs are removed.

[10] Cells R48:R58 of the "CA Transportation Rates" tab of the Preliminary Burner-tip Model show a 2021 backbone system average rate of $0.0079 per MMBtu in 2021. This does not appear to be an EG-class specific rate.

[11] For example, see cells O48:O58 of the Preliminary Burner-tip Model.

[12] For example, if gas costs a certain $ per therm amount to transport, then 10 therms would cost 10 times as much to transport, i.e. $1 per therm is equivalent to $10 per Dth. Given a therm is equivalent to 100,000 Btu, a Dth is equivalent to 1,000,000 Btu or 1 MMBtu. This error appears to be the reason that intrastate transportation is only 0.2% of the total cost of gas (e.g. a 2021 average cost of $3.217 per MMBtu at PG&E City-gate plus $0.006 per MMBtu end-use transportation, for a total cost of $3.223 per MMBtu).

border prices. Again, the use of the City-gate commodity cost should solve this issue, assuming that shrinkage is properly modeled within NAMGas.

In addition, electric generators pay a "municipal surcharge" to cover the franchise fees associated with the cost of the gas commodity. The gas utilities collect these surcharges,[13] which should be should be included as part of the transportation rate. For example, the PG&E September 2019 SRAC posting indicates a G-SUR rate of $0.02534 per MMBtu.

5. Start with Currently-applicable Tariffed Rates

The staff's burner-tip gas model estimates transportation rates for EG customers by dividing a revenue requirement by a throughput assumption. Although the resulting rates are in the ballpark of current EG transportation rates, they are not exact and are difficult to verify against currently-applicable rates from the gas utility tariffs. To be more accurate, we recommend that the model start with currently-applicable transportation rates directly from current tariffs, then apply an escalation rate.

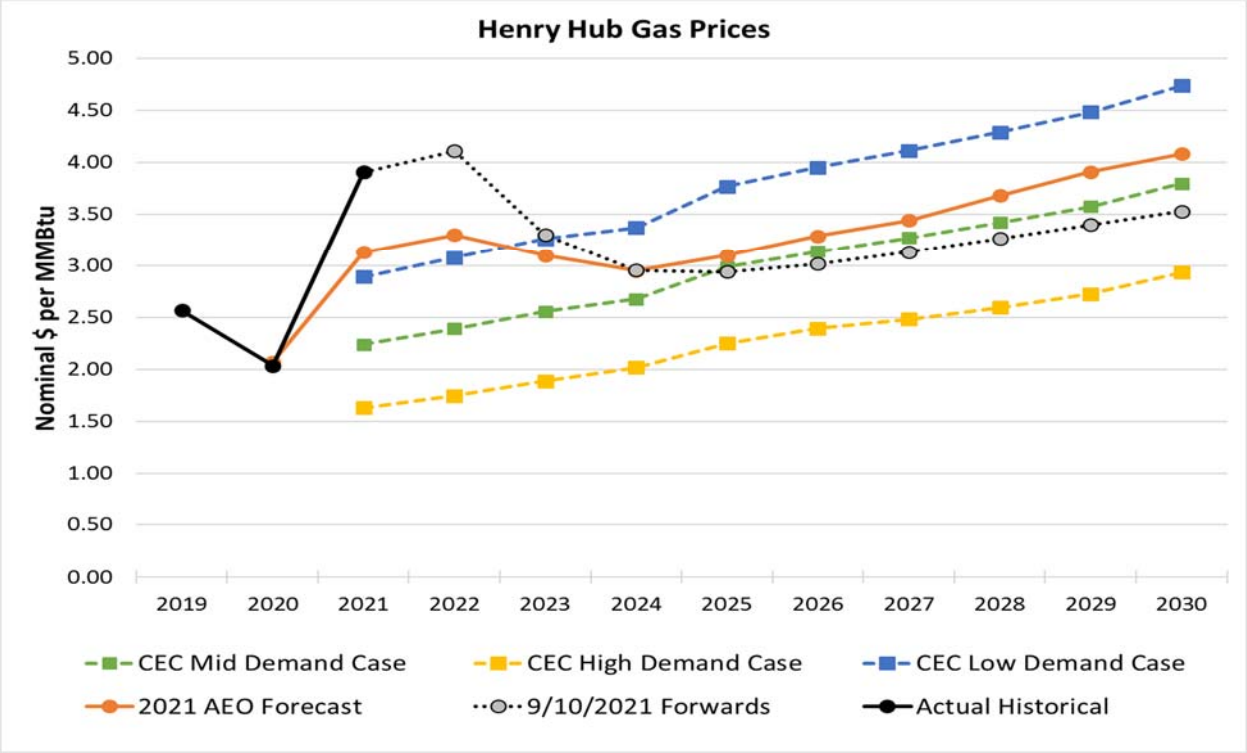
IV. Reflect the Recent Rebound in Henry Hub Market Prices

SEIA believes that the NAMGas model produces a reasonable long-term forecast of gas commodity costs under "business-as-usual" conditions, except for the next several years as discussed below. We will comment in Section V on whether "business-as-usual" is a reasonable long-term assumption, given the state's GHG reduction goals.

Gas commodity prices at the benchmark Henry Hub were low in 2020 as a result of reduced demand as the economy faltered from the Covid-19 pandemic. But prices have rebounded sharply in 2021 as the economy has improved and as the result of supply disruptions from the Texas cold snap in February 2021 and, more recently, Hurricane Ida on the Gulf Coast. Henry Hub prices are on track to average about $4.00 per MMBtu in 2021, about double the level of 2020. The forward market and other forecasts such as the Energy Information Administration's 2021 *Annual Energy Outlook* also show significantly higher forecasts for natural gas commodity prices in 2022 and 2023, as illustrated in **Figure 1** below. SEIA recommends that the CEC should recognize that its IEPR forecast is based on analysis at a specific point in time, and that near-term prices in particular can and will change quickly. As a result, the Commission should encourage the use of other projections, including the deeply-traded initial two years of the gas forward market, for projecting near-term prices over the next two years.

[13] See PG&E's G-SUR schedule, SoCalGas's G-MSUR schedule, and SDG&E's GP-SUR tariff.

Figure 1



V. Assume Low Demand in the Base Commodity Cost of Gas Forecast

The Mid-Demand case for the NAMGas commodity price forecast assumes almost flat natural gas demand in California over the next decade, with demand dropping just 0.18% per year from 2020 to 2030.[14] Although this may be a reasonable "business-as-usual" scenario,[15] we do not think that it represents adequate progress toward decarbonizing the California economy. We have similar concerns about whether the *2020 CGR* forecast represents a reasonable trajectory toward meeting the state's 2045 goals, but even the *2020 CGR* shows gas throughput declining by 1.2% per year from 2020-2035, as noted above. Gas demand reductions of 1.2% per year are greater than what is assumed in the Low-Demand case for the NAMGas commodity price forecast (-0.75% per year from 2020 to 2030).[16] Given the state's climate goals, including the acceleration of those goals that the Governor has asked state agencies to consider,[17] the Commission should use the Low-Demand NAMGas commodity price forecast as the Base Case for the 2021 IEPR gas price forecast. The CEC should look at the *2020 CGR*'s gas demand reductions of 1.2% per year as the basis for a Low Demand Case for the 2021 IEPR forecast.

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14 See Slide 8 of the Preliminary Natural Gas Market Results presented on August 30, 2021.

15 *Ibid*., at Slide 6.

16 *Ibid*., at Slide 8.

17 See https://www.gov.ca.gov/2021/07/09/governor-newsom-holds-virtual-discussion-with-leading-climate-scientists-on-states-progress-toward-carbon-neutrality/.

VI. Conclusion

SEIA respectfully asks the Commission to adopt a final IEPR gas forecast that includes a realistic escalation of 5.0% per year (real) in future intrastate gas transportation rates. The California natural gas industry is facing major changes as the state moves to limit substantially the emissions from burning fossil fuels, including natural gas. Gas throughput will be declining, and gas transportation rates will continue to escalate sharply, as they have for the last decade.

We also hope that the technical points discussed above will make the final IEPR gas forecast more accurate.

Finally, the Commission should encourage the use of other projections, including the deeply traded initial two years of the gas forward market, for projecting near-term gas commodity prices for 2022 and 2023, and should use the Low-Demand NAMGas commodity price forecast as the Base Case for the 2021 IEPR gas price forecast.

We appreciate the CEC's consideration of these comments.

Respectfully submitted,

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Consultant to SEIA

Attachment A

Historical PG&E Intrastate Gas Transportation Rates for Electric Generation

PG&E's website provides data on historical intrastate transportation rates, both for Schedule G-EG rates from the City-gate to the bunertip, and for backbone transportation from the border to the City-gate. The following figures indicate the level these rates from 2009 through 2022.

We note that the annual average Schedule G-EG D/T rate for EG plants on the local transmission system, net of the cap and trade allowance costs embedded in rates, is approximately $1.25 per MMBtu in 2021 (i.e. $1.986 per MMBtu G-EG rate, less the $0.737 per MMBtu GHG adder). PG&E expects this rate to grow in 2022 to about $1.73 per MMBtu (i.e. $2.56 per MMBtu EG-LT rate, less $0.83 per MMBtu GHG adder).

The G-EG backbone-only "BB" rate, net of the GHG adder, is about $0.16 per MMBtu in 2021 (i.e. $0.894 per MMBtu G-EG BB rate, less $0.737 per MMBtu GHG adder), growing to about $0.50 per MMBtu in 2022 (i.e. $1.333 per MMBtu G-EG BB rate, less $0.83 per MMBtu GHG Adder).

The rates in **Figure 1** below show the cost (net of the GHG fees paid by generators directly to ARB) for intrastate transportation on the PG&E system from 2009 to 2022 for local T EG plants (blue line) and backbone-level EG plants (orange line), assuming the gas commodity was purchased at the PG&E Citygate. The figure shows that PG&E G-EG rates grew during the period at +7.6% and +9.4% per year, for G-EG LT and G-EG BB customers, respectively.

Figure 1: *PG&E Schedule G-EG Rates ($/MMBtu)*

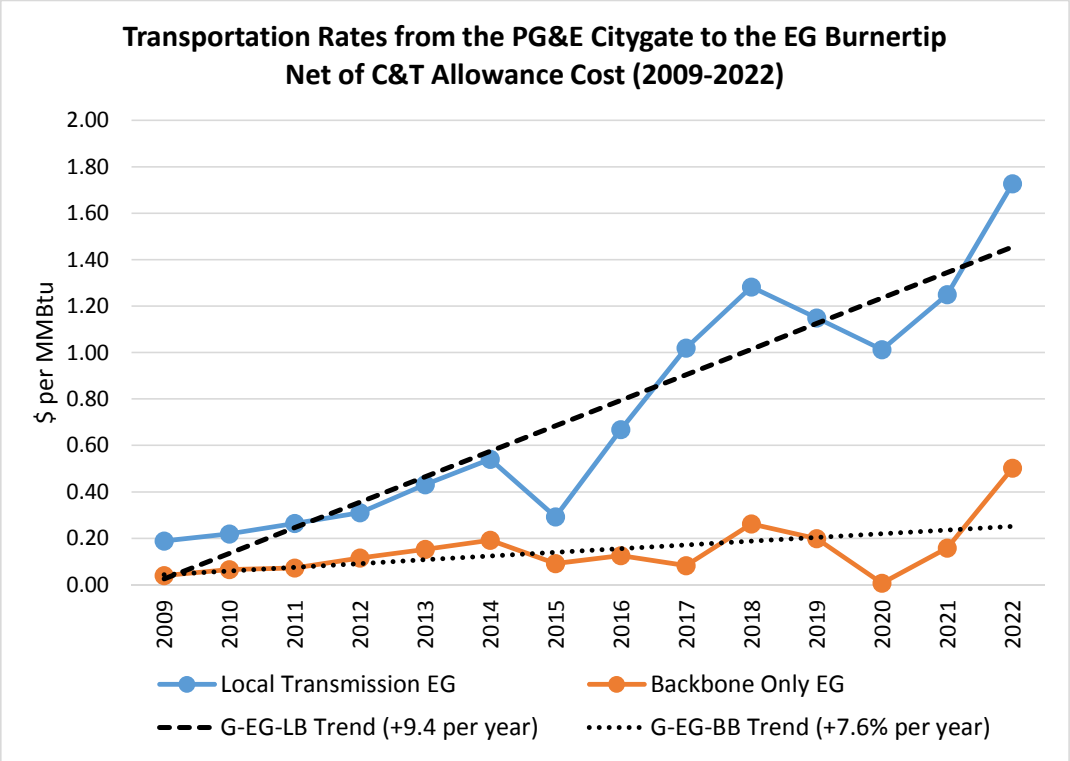
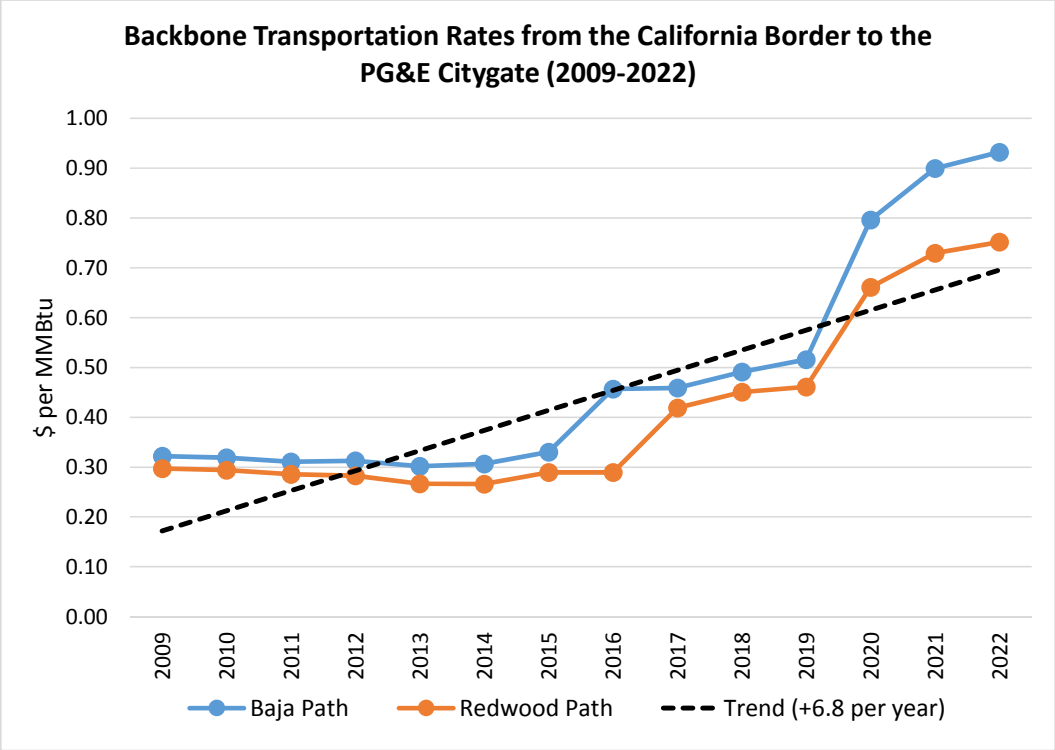


Figure 2, below, indicates the additional intrastate transportation costs (excluding shrinkage) that would apply if gas is purchased at the California border and transported to the PG&E City-gate. These rates are adopted in PG&E's Gas Transmission and Storage (GT&S) rate cases. Baja Path (for transportation from Topock to the PG&E City-gate) and Redwood Path (for transportation from Malin to the PG&E City-gate) backbone rates have increased from 2009 to 2022 at +6.8% per year (using the firm annual rates and assuming a 100% load factor). The average backbone rates in 2021 were about $0.73 per MMBtu and $0.90 per MMBtu, on the Redwood and Baja paths, respectively.

Figure 2: *PG&E Backbone Annual Firm On-system Rates ($/MMBtu)*



Attachment B

Two Recent Studies of Natural Gas Rates in a Carbon-constrained World

Two recent studies have provided quantitative analysis of the impact of California's long-term GHG reduction goals on future gas transportation rates in California.

E3 Gas Study for the CEC. At a California Energy Commission (CEC) workshop on June 6, 2019, the consultants from Energy and Environmental Economics (E3) presented analysis of the impact of California's carbon reduction goals on future natural gas rates in California, as part of a Public Interest Energy Research (PIER) grant.[1] The purpose of the study was to evaluate the implications of a low-carbon future in California for the customers of the natural gas system, including both economic and health impacts. This study reached the following major conclusions:

- Continuing to use fossil natural gas in buildings at today's levels of consumption will not meet the state's carbon reduction goals.
- Using renewable natural gas (RNG) to decarbonize buildings, by replacing fossil methane with RNG, would maintain gas throughput and could meet the state's climate goals, but would be an expensive strategy for the state.
- Building electrification is a lower-cost strategy to achieve the state's climate goals.
- Building electrification will further reduce gas throughput and raise rates for remaining gas customers, in addition to the expected declines in EG gas use due to electric sector programs such as the RPS.
- A gas transition strategy is needed to reduce the costs of the gas system and protect consumers from high future rates.
- Building electrification improves air quality and health outcomes in urban centers.[2]

E3's study projects continued sharp increases in the revenue requirements for the gas utilities of 5% real per year (i.e. 5% above inflation) through 2025, due to continuing safety-related investments, then increasing at 1% real thereafter through 2050. See **Figure 2** below, which is Slide 22 from the E3 Gas Study. At the same time, in the favored high building electrification case, overall throughput on the gas system declines at about 3.5% per year from 2020-2050, with EG throughput dropping at 5% per year in all scenarios. See **Figure 3**, which is Slide 16 from the E3 Gas Study.

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[1] E3, "Draft Results: Future of Natural Gas Distribution in California," presented at the CEC Staff Workshop for CEC PIER-16-011 on June 6, 2019. Hereafter, "E3 Gas Study." Available at https://ww2.energy.ca.gov/research/notices/2019-06-06_workshop/2019-06-06_Future_of_Gas_Distribution.pdf.

[2] E3 Gas Study, at Slides 6 and 15.

Figure 2: *Slide 22 from the E3 Gas Study*

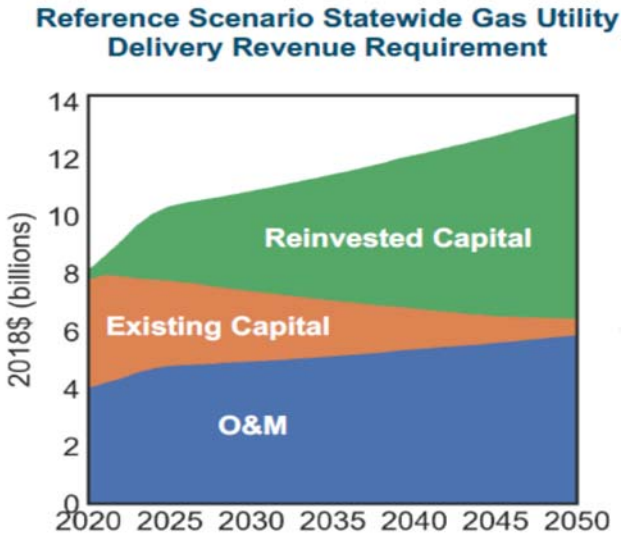
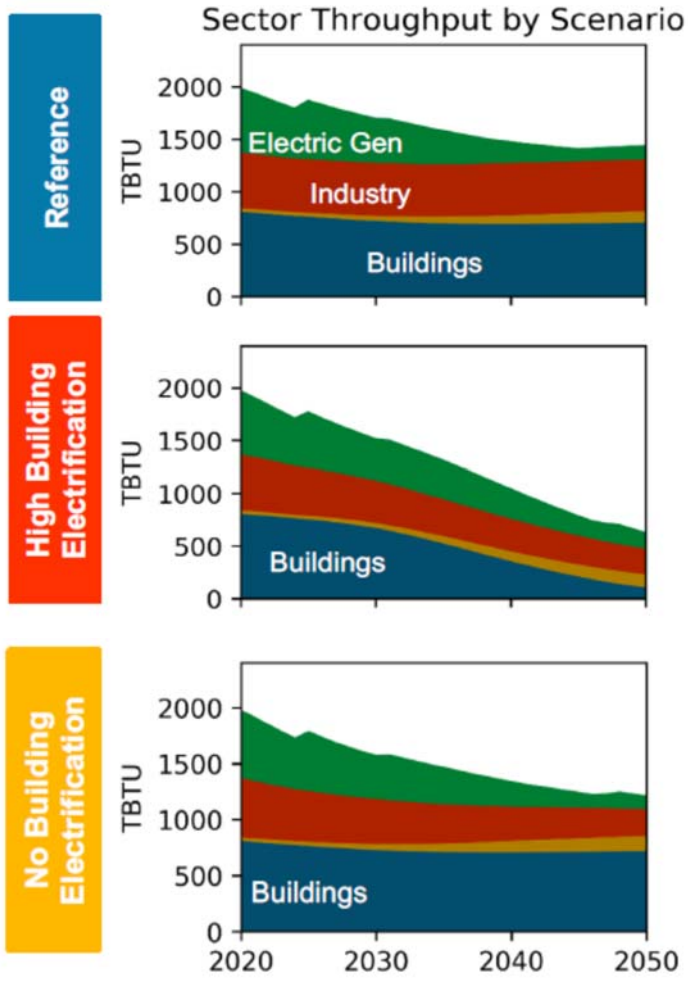


Figure 3: *Slide 16 from the E3 Gas Study*



Assuming that EG customers' share of the overall revenue requirement changes in proportion to their share of the overall throughput, the E3 results suggest a long-term real escalation in EG rates in excess of 10% per year through 2025 (continuing the trend since at least 2010) and 5% to 10% per year after 2025, unless steps are taken to reduce future gas system revenue requirements. The E3 study suggests a number of steps that could be taken (but have yet to be adopted) to mitigate future rate increases, including the accelerated depreciation or targeted retirement of gas assets.

Gridworks Gas Study. On September 19, 2019, Gridworks released a study, *California's Gas System in Transition: Equitable, Affordable, Decarbonized and Smaller.* The lead author of this study is former CPUC commissioner Mike Florio.[3] This work focuses on the transition strategies that could be used to mitigate the rapidly-growing gas rates that will result from the steep decline in gas throughput from widespread building electrification. The Gridworks Study's participants reviewed in detail and accepted the conclusion of the E3 Gas Study that a high building electrification scenario will be the least-cost way to meet the state's goals to reduce carbon emissions.[4] The study succinctly summarizes the challenge that the state faces with keeping future gas rates affordable:

> *The simple fact is that meeting California's GHG reduction goals, a statewide priority and absolute necessity to combat climate change, inevitably means a substantial decline in gas throughput in the state.*
>
> *At the same time that gas demand is projected to decline over time, the costs of operating a safe and reliable gas delivery system in California have been increasing.*[5]

The study shows that intrastate gas rates will increase significantly for all classes of gas customers, including EG plants, and that it is the remaining residential gas customers who will face the largest increases, unless the state adopts a comprehensive, carefully-planned set of mitigation measures. The report emphasizes that, as gas rates increase, this will only increase the incentive for residential customers to adopt electrification measures, further reducing gas throughput.[6] The Gridworks Study provides an in-depth discussion of a range of possible mitigation strategies that state policymakers could pursue to lower future rates for small customers, including accelerated depreciation, reduced investments and targeted retirements, securitization, and cost allocation and rate design changes for gas distribution costs. The Gridworks Study shows that these mitigations could have a significant impact to reduce the escalation in future rates for residential and other small customers, but would not have a major impact in reducing the escalation in EG rates.[7]

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[3] Available at https://gridworks.org/initiatives/cagas-system-transition/, hereafter "Gridworks Study." This study was funded jointly by PG&E and the Energy Foundation, with technical input from E3 and a broad group of stakeholders, including Tom Beach of Crossborder Energy, a consultant to SEIA who assisted in the preparation of these comments.

[4] See Gridworks Study, at pp. 1 and 4-5.

[5] *Ibid*., at p. 1.

[6] *Ibid*., at pp. 1-2 and 9-10.

[7] The Gridworks Study acknowledges, at page 14, that the severe increases in residential rates could generate future pressure to shift costs from small customers to large users such as EG plants, further

increasing EG rates. The Gridworks Study states that such a re-allocation of costs would need to be "carefully considered" given that it would increase electric rates and could shift carbon emissions to out-of-state EG plants.