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ATTACHMENT A

Aliso Canyon I.17-02-002: Staff Proposal for Portfolio and Next Steps

By Staff of the California Public Utilities Commission
SEPTEMBER 23, 2022

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1. Staff Proposal to Phase Out Aliso Canyon

1.1. Executive Summary

This staff proposal outlines a potential plan to reduce or eliminate the need for the Aliso Canyon natural gas facility (Aliso Canyon). Staff propose that non-gas electricity generation and storage, energy efficiency, and building electrification be the resources used to replace Aliso Canyon. Rather than specifying the proportions of these resources in more detail, staff seek input on this question, particularly from utilities. Implementing these targets would be left to later in this or other proceedings, such as the Integrated Resource Plan (IRP) proceedings, which oversee electric generation and storage. The proposal identifies the forecast total Southern California electricity and gas capacity need in 2027. By comparing this with current system capacities and the capacity that could be served without Aliso Canyon, the proposal identifies the amount of additional gas and/or electricity demand to be filled or eliminated annually after 2023 in order to eliminate reliance on Aliso Canyon by 2027. This annual amount is 214 million metric feet per day (MMcfd) of gas capacity or 1,084 megawatts (MW) of electricity capacity.

Because the gas and electricity systems and demand are constantly evolving, this proposal also suggests a biennial assessment process. As part of this process, staff from the California Public Utility Commission (CPUC) and California Energy Commission (CEC) (together Joint Agency staff) would use updated supply and demand information to model the gas system and consider whether gas demand reductions are on track with proposed targets. If not, staff will consider whether those targets should be changed. If gas demand is declining on pace to meet or exceed targets, staff would recommend whether the maximum storage inventory at Aliso Canyon should be reduced. These recommendations would be proposed to the CPUC as staff resolutions and potentially adopted. This process would continue every other year until Aliso Canyon is phased out.

The staff proposal concludes with questions for utilities and other parties. All parties are invited to comment on the staff proposal. Utilities are directed to provide tables and other information addressing how they would implement the staff proposal if directed to do so and what recommendations they have to implement aspects of the plan not under their jurisdiction.

1.2. Replacement Portfolio

The Aliso Canyon I.17-02-002 Phase 3 Report by FTI Consulting, Inc. (Phase 3 Report)[1] analyzes four distinct approaches to reducing gas demand and enabling the closure of Aliso Canyon by 2027 or 2035. These approaches are: 1) increasing non-storage gas infrastructure; 2) reducing gas demand; 3) increasing non-gas-fired electricity resources; and 4) increasing electricity transmission into Southern California. The report provides cost-benefit analyses of specific "portfolios" of activities representing each of these approaches. It also analyzes a fifth set of portfolios which

[1] FTI Consulting, Inc and Gas Supply Consulting, Inc, "Aliso Canyon I.17-02-002 Phase 3 Report: Assessment of Portfolio Solutions for Eliminating the Use of the Aliso Canyon Natural Gas Storage Facility by 2027 or 2035," January 2022, https://www.cpuc.ca.gov/regulatory-services/safety/gas-safety-and-reliability-branch/aliso-canyon-well-failure/aliso-canyon-well-failure-order-instituting-investigation.

combine several of these approaches. In all portfolios, Aliso Canyon was assumed to be unavailable, and all gas and electric demand was met.

For portfolios implemented by 2027, all portfolios, except new gas infrastructure, resulted in net benefits and net GHG reductions. For 2035, some portfolios produced net benefits while others had net costs.

Based on the Phase 3 Report findings, staff proposes using a Portfolio 5 approach for purposes of planning for the elimination of the Aliso Canyon facility that consists of electricity generation and storage resources, building electrification, and energy efficiency. These resources are the most feasible of the options available and the most consistent with California goals, as detailed in the proposal. Specific amounts of each activity are not proposed but are to be informed by party testimony.

1.2.1. Background: Summary of the Five Portfolios Analyzed in the Phase 3 Report

Portfolio 1: Gas Infrastructure

This portfolio considered increasing the ability to supply gas to Southern California by building new gas pipeline segments parallel to and alongside certain existing segments within the region and upgrading the Quigley Regulator Station to increase its horsepower. Two variations on the gas infrastructure were considered, located in SoCalGas' Northern Zone and Wheeler Ridge Zone, respectively. Because they are more expensive than retaining Aliso Canyon but provide no additional benefits as considered in the study, both variations on this portfolio were found to have net costs.

Portfolio 2: Gas Demand Reduction

The gas demand reduction portfolio combined three distinct approaches to reducing consumption of gas: energy efficiency, building electrification, and commercial and industrial gas demand response. The quantity of electric energy efficiency was based on the "high total resource cost" case from the 2021 Energy Efficiency Potential and Goals Study.[2] Building electrification was based on commercial and residential space and water conditioning increases in the "Moderate Electrification" case of the California Building Decarbonization Assessment (August 2021), conducted by the Energy Commission in compliance with AB 3232 (2018). The "Moderate Electrification" case runs to 2030 and assumes that by then, new construction will be all-electric, half of gas appliances will be replaced with electric appliances at the end of their useful life and 5 percent will be replaced earlier. For 2027, these amounts taken together did not meet the forecast shortfall left by the closure of Aliso Canyon. A new commercial and industrial gas response program was proposed to meet the remaining shortfall. Like interruptible gas prices, this program would allow noncore gas customers to receive financial benefits in exchange for allowing their gas supply to be interrupted on peak days. This concept is also related to a similar program in New York state. For 2035, the additional volumes of building electrification and energy efficiency would more than meet the shortfall left by

[2] Gas energy efficiency was not included in the portfolio because it was assumed to not increase beyond the amount already included in the baseline.

Aliso Canyon's closure. This portfolio was found to have the second highest cost-benefit ratio and GHG emissions reductions in 2027.

Portfolio 3: Electricity Resources

This portfolio represents increasing renewable electricity generation and storage resources beyond the quantities already ordered by the Commission in 2021. Because gas-fired power generation uses more gas than the shortfall, the study finds that Aliso Canyon could be replaced by providing enough new electricity to replace that generation. Since the highest gas demand occurs on cold winter days, the electric system is typically not operating at maximum capacity at that time. Thus, the Phase 3 Report found that during much of the day, the lost generation can be filled with electricity imported from outside California, leaving the highest shortfall at 10 PM. Therefore, solar generation was excluded from the mix of resources in Portfolio 3. Wind power, geothermal power, 10-hour storage (hydroelectric) and four-hour (battery) battery storage were included in proportions based on recent forecasts. Although it had the highest investment costs, this portfolio showed the highest benefits of any portfolio, reflecting the benefits of using these electricity resources throughout the year.

Portfolio 4: Electric Transmission

This portfolio modeled an increased ability to import electricity into Southern California, representing an increase in electric transmission. Because of the complexity of modeling, a specific route or transmission proposal was not identified. Two variations were modeled, one increasing transmission only into the California Independent System Operator's (CAISO's) territory at Southern California points of entry and one assigning some of the increase to CAISO and some to the Los Angeles Department of Water and Power (LADWP). Unlike the other portfolios, Portfolio 4 was modeled only for 2035, due to long planning horizons for electric transmission. The analysis found this portfolio to have net benefits, but it has greater uncertainty than the other portfolios since actual costs would depend on specific routes and power flow studies which were not conducted here. This portfolio was also found to increase gas-fired electric generation outside California.

Portfolio 5: Combinations

Portfolio 5 was originally envisioned to represent a combination of the best of Portfolios 1-4 and was expanded to provide cost-benefit analysis of six different variations. All variations represent building electrification and energy efficiency achievements defined as percentages of their amounts in Portfolio 2, with the remaining shortfall filled by other means. For 2027, building electrification and energy efficiency achieved at 100, 50, or 25 percent of the amounts in Portfolio 2 were combined with enough electricity generation resources (as in Portfolio 3) to fill the shortfall. The first of these combination portfolios had the highest net benefits of all portfolios considered. This combination portfolio also had the lowest investment costs of all portfolios, except for Portfolio 1: Gas Infrastructure, which itself had no measured benefits. For 2035, building electrification and energy efficiency achieved at 40, 20 or 10 percent of the amounts in Portfolio 2 was combined with new electric transmission to fill the shortfall, resulting in lower costs than Portfolio 2 for 2035.

1.2.2. Proposal: The Portfolio of Resources to Replace the Services Provided by Aliso Canyon

After evaluating the five portfolios and party comments, staff proposes that a Portfolio 5 approach be used—including electricity generation and storage, combined with a feasible amount of building electrification and electric energy efficiency—as the plan to replace the services provided by Aliso Canyon. Subsequent analysis may indicate whether new electric transmission is necessary to support the generation and storage.

Evaluation of Portfolio 1: Gas Infrastructure
Portfolio 1: Gas Infrastructure would represent an additional investment in the gas system and is more expensive than maintaining use of Aliso Canyon. While low in up-front costs, it has the lowest net benefits and does not contribute towards reducing demand on the gas system. The new pipeline segments proposed under this portfolio would typically be expected to have a useful lifetime of at least 50 years, with ratepayer costs spread over this period. This portfolio is inconsistent with the state's goal to achieve carbon neutrality by 2045 and with minimizing ratepayer costs during the transition. Therefore, staff decline to propose gas infrastructure as part of the plan to replace Aliso Canyon. However, staff notes that the modeling in this proceeding assumes some upgrades to gas infrastructure by 2027, so if those do not occur, the quantities of activities to replace Aliso Canyon may increase. Staff also notes that if gas system upgrades are needed for reliability purposes, they may be considered via other proceedings such as each utility's General Rate Cases.

Evaluation of Portfolio 2: Gas Demand Reduction
Portfolio 2: Gas Demand Reduction consists of three components that can be considered separately. These components are building electrification, electric energy efficiency, and commercial and industrial gas demand response.

California is addressing building electrification in a variety of different venues. In compliance with SB 1477 (2018), R.19-01-011 was opened to establish building electrification pilot programs using Cap-and-Trade auction revenues. The Energy Commission's 2021 Integrated Energy Policy Report (IEPR) identifies building decarbonization as critical to meeting the state's decarbonization goals.[3] More recently, the Air Resources Board's draft Scoping Plan identified a Proposed Preferred scenario including the phase out of gas-fired home appliance sales by 2035 and gas-fired commercial appliance sales by 2045.[4] The Commission's proceeding R.20-01-007 is wrestling with how building decarbonization goals will interact with long-term planning for the natural gas system. The California Building Decarbonization Report finds that within building decarbonization, efficient electrification of space and water heating in California's buildings (combined with refrigerant leakage reduction) presents the most readily achievable pathway to a greater than 40 percent reduction in

[3] California Energy Commission, "ADOPTED Final 2021 Integrated Energy Policy Report Volume I Building Decarbonization," February 2022, https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2021-integrated-energy-policy-report.
[4] California Air Resources Board, "Draft 2022 Scoping Plan: Appendix F: Building Decarbonization," May 2022, https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp-appendix-f-building-decarbonization.pdf, p. 1.

buildings' greenhouse gas emissions by 2030.[5] This report also notes that electric appliance characteristics like efficiency and load flexibility can have a substantial impact, as also noted in Sierra Club's comments regarding the March 30, 2022 workshop. Staff concludes that building electrification, although challenging, has substantial potential to reduce gas demand and should be included in activities to minimize the need for Aliso Canyon. Building electrification and energy efficiency programs should be designed to include load shifting; stand-alone electricity demand response activities also may be included.

Energy efficiency continues to play a significant role in achieving California's policy objectives. Because utilities already have energy efficiency programs, these also represent a potential implementation approach using existing processes. Staff recommends that energy efficiency should be included in activities to reduce the need for Aliso Canyon.

The third prong of Portfolio 2, commercial and industrial gas demand response, represents a new market-based approach wherein volunteering customers would be paid in advance and their gas curtailed when needed, without that curtailment being considered a reduction in reliability. Thus, this concept is similar to interruptible gas rates but may follow a different cost and regulatory structure. This approach is also similar to some parties' requests for a lowered reliability standard, in that it would allow for increased curtailment rather than requiring new infrastructure, but distinct because customers would opt in. This idea is also distinct from existing electric and gas demand response programs, particularly because once customers have opted in, their response would not be dependent on their capability or readiness to drop load because the utility would be able to physically shut off their gas. Similar to a current program in New York, such a commercial and industrial gas demand response program represents a potentially cost-effective concept to reduce demand during peak hours. However, it does not provide energy services when not in use because it is not designed for daily use and is not an infrastructure investment. Staff does not specifically recommend such a program at this time, but utilities may include it in their proposals so long as it can be shown to have ratepayer benefits and contribute to the gas transition.

Evaluation of Portfolio 3: Electric Generation and Storage

The Electric Generation and Storage Portfolio produced the highest net benefits and highest GHG reductions in 2035 of the portfolios considered in the Phase 3 Report. New renewable electricity resources would contribute to the electric system throughout the year and support California's climate goals. Electric generation and particularly storage can be built more quickly than transmission and are less uncertain in their output than energy conservation measures. For these reasons, electricity generation and/or storage need to be among the resources procured to reduce the need for Aliso Canyon. Regarding the potential for existing or already-planned batteries to reduce the shortfall, utilities may incorporate their own analysis of this question into their proposals.

[5] California Energy Commission, "California Building Decarbonization Assessment," CEC-400-2021-006, August 2021, https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment.

Evaluation of Portfolio 4: Electric Transmission
Portfolio 4: Electric Transmission represents additional electric transmission into CAISO's southern areas and potentially into the LADWP service territory. Staff considers that it would be premature to direct new interstate transmission to reduce the need for Aliso Canyon without further cost analysis and specification of the generation sources whose output would be transmitted. Moreover, the Commission does not typically recommend transmission alone but to support new generation. Rather than focusing on new transmission into the LA Basin as a stand-alone means to reduce reliance on Aliso Canyon, analysis should be conducted in existing processes, such as the CPUC's Integrated Resource Plan (IRP), the CAISO's Transmission Planning Process (TPP), or elsewhere, to determine if new transmission solutions are necessary to support the new resources required.

Evaluation of Portfolio 5: Combinations
Portfolio 5 explored three different combinations of building electrification and energy efficiency from Portfolio 2 with electric generation and storage from Portfolio 3. Staff finds this combination of approaches the most appropriate. Several parties also endorsed this approach. For 2035, Portfolio 5 focused on electric transmission instead of generation. Staff agrees that transmission could not be built by 2027 but concludes that its purpose should be to support additional generation rather than the stand-alone transmission envisioned in the Phase 3 Report.

Proposed Portfolio
Staff proposes that non-gas-fired electricity generation and storage, combined with building electrification and energy efficiency, should be used to replace the services provided by Aliso Canyon. There is a possibility that new transmission into or within the LA Basin will be needed to support this portfolio. Rather than specifying the procurement process and amounts of each activity at this time, the Commission should direct utilities to submit proposals on these matters as discussed below. The Commission should give additional implementation direction in a subsequent decision after receiving feedback from parties.

In order to ensure some contribution from building electrification and energy efficiency, the combined reduction from electrification and energy efficiency in each utility's proposal must be at least as much as given in Portfolio 5c, which is 25 percent of the building electrification and energy efficiency quantities in Portfolio 2. This quantity is about 21 percent of the total shortfall of 395 MMcfd.

The portfolio quantities are defined in comparison to what was forecast for 2027 in the Phase 3 Report analysis. For electricity generation and storage, this includes the amount of resources ordered in the Integrated Resource Plan (IRP) Mid-Term Reliability Decision D.21-06-035. For building electrification, this is the levels of building electrification and energy efficiency, including electricity demand response, as reflected in the 2021 IEPR's adopted forecast.

1.2.3. Party Comments on Portfolios

The Phase 3 Report was published via ruling on January 19, 2022. Parties were invited to comment on their preferred portfolio selection by March 1 and provide reply comments by March 15, 2022.

Staff's proposal to focus on gas demand reduction (Portfolio 2) and electricity resources (Portfolio 3), which are combined in the 2027 variations in Portfolio 5, aligns with many parties' comments.

Comments were received from the Southern California Gas Company (SoCalGas), San Diego Gas and Electric (SDG&E), Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), the CAISO, the Southern California Generation Coalition (SCGC, reply comments only), the Utility Ratepayer Network (TURN), the California Advocates Office (CalAdvocates), the California Energy Storage Alliance (CESA), the Protect Our Communities Foundation (PCF), and the Indicated Shippers.

Comments on Portfolio 1: Gas Infrastructure

Cal Advocates and the Indicated Shippers commented that Portfolio 1: Gas Infrastructure is not cost-effective and runs counter to the Commission's proactive decommissioning goals in Rulemaking (R.) 20-01-007. SoCalGas stated that Portfolio 1 underestimates costs and assumes reliable gas supplies from PG&E. PG&E stated that it does not have the excess gas supplies that Portfolio 1 may be relying on. Protect Our Communities (PCF) notes SoCalGas' cost concerns, states that the new infrastructure would become a stranded asset and urges rejection of Portfolio 1.

Comments on Portfolio 2: Gas Demand Reduction

Several commenters expressed concerns regarding the expense and funding sources for building electrification, the first component of Portfolio 2. Nevertheless, commenters expressed support for the concept and its alignment with California's goals. TURN recommended its inclusion, using building or appliance codes and standards and funding any end-user subsidies using the state's general fund rather than ratepayer funds. Cal Advocates noted the value of electrification in improving local air quality and contributing to the state's decarbonization goals, while expressing concern that the proposed strategy is not commercially viable but encouraged the reduction of gas demand regardless of Aliso Canyon goals. SCE also recommended inclusion of building electrification and recommended extrapolating the quantity out to 2035, whereas the Phase 3 Report uses the value for 2030 from the California Building Decarbonization Assessment for 2035. Protect Our Communities commented that CPUC has limited means with which to encourage fuel-switching.

The second component of Portfolio 2 is electric energy efficiency. Few parties commented directly about energy efficiency. Southern California Edison (SCE) recommended recalculating its benefits using the avoided carbon cost used in the Integrated Distributed Energy Resources (IDER) proceeding, rather than the (lower) federal social cost of carbon used in the Phase 3 Report. SCE also suggested removing gas energy efficiency from the baseline in order to align with the concept of ending non-cost-effective gas energy efficiency subsidies under discussion in proceeding R.13-11-005. PG&E questioned why this portfolio used a "high" amount of energy efficiency rather than the adopted reference amount.

The third component of Portfolio 2 is commercial and industrial gas demand response. PCF opposes this concept because it would constitute payments to the fossil fuel industry, although they state it could be implemented quickly. SoCalGas states that the concept is unsubstantiated, although

they are now pursuing both residential and commercial and industrial demand response programs using federal funds.[6] Indicated Shippers notes that even without further action, industrial gas demand, especially for enhanced oil recovery, may decline in response to declining fossil fuel use, compared to the assumptions used in the Phase 3 Report.

Comments on Portfolio 3: Electric Generation

Portfolio 3: Electric Generation received the most supportive comments. TURN, CAISO, SCE, and CESA expressed support for a portfolio including electric generation and storage. CAISO and SCE commented that more accurate forecasting of battery dispatch may reduce or eliminate the shortfall. CESA supported examination of this question, and PCF supported batteries as their preference among all the portfolio activities suggested. CESA indicated that this portfolio overestimates battery costs compared to the values used in Integrated Resource Plan modeling, while SoCalGas indicated that this portfolio underestimates costs, including the cost of battery dispatch coordination. Cal Advocates expressed concern that the Phase 3 Report overestimates the benefits of this portfolio. TURN, Cal Advocates, CAISO, CESA, SoCalGas, and the Indicated Shippers all expressed support for CAISO power flow analysis of the local reliability implications of the proposed electric resources.

Comments on Portfolio 4: Electric Transmission

SCE recommends focusing any interstate transmission activities on bringing wind and solar generation into California, while noting that the Phase 3 Report lacks detail and may underestimate costs. TURN and Cal Advocates agree that benefits may be overestimated while CAISO and PG&E indicate that specific transmission proposals would be required for less uncertain analysis. Similarly, CESA states that power flow analysis would be required for such a proposal to be accurate and viable. CAISO and TURN describe this portfolio as a distraction from the local reliability analysis needed to support increased generation considered in other portfolios. PCF recommends against this portfolio, finding that building local solar generation would be cheaper. Nevertheless, PG&E suggests that existing transmission expansion plans may contribute to reducing the need for Aliso Canyon, and Indicated Shippers states this is their preferred portfolio. PG&E and SCE, and PCF for different reasons, note that existing transmission may not be fully utilized in the Phase 3 Report's analysis.

Comments on Portfolio 5: Combinations

Comments on Portfolio 5 focused on its 2027 variations (5a, 5b and 5c), which combined electric generation with gas demand reduction. SCE recommends adopting this approach, although not relying solely on results from the Phase 3 Report. TURN also recommends adopting a building electrification, energy efficiency, and electricity resources combination as the preferred approach to reducing or eliminating the need for Aliso Canyon. TURN endorses Portfolio 5a, which consists of all the building electrification envisioned in the Building Decarbonization Report's "Moderate

[6] SoCalGas will receive $2.5 million for "Natural Gas Demand Response Program for Residential, Commercial, and Industrial Customers of SoCalGas," funded with $2.5 million in Department of Energy funds and $5 million of other funds, as announced at National Energy Technology Laboratory, "DOE Invests $3.5 Million for Programs to Improve Natural Gas Infrastructure and Lower Greenhouse Gas Emissions," April 2022, https://netl.doe.gov/node/11705.

Electrification" case, all the energy efficiency in the Potential and Goals study's high case, and enough electric generation and storage to fill the remaining shortfall. TURN suggests authorizing SCE to procure resources to implement Portfolio 5a and concurrently conducting workshops to define progress milestones and consider modifications. Strategies could be adjusted on an ongoing basis based on their costs and efficacy, and Aliso Canyon would not be closed until it is no longer essential for reliability. SCE suggests a similar process of adopting a hybrid portfolio; requesting IOUs to assess their system needs and implement the portfolio; and making ongoing refinements through CPUC, CAISO, and CEC planning processes after concluding Phase 3 of this proceeding.

1.3. Portfolio Implementation

Staff proposes biennial evaluation, commencing in 2024, of the conditions necessary for reduction in the use of Aliso Canyon, for closure as early as 2027. Planning targets for use in relevant electricity generation and storage, energy efficiency, and building electrification programs, including planning any necessary transmission, would be set based on a linear progression from currently forecast conditions in 2023 to zero use of Aliso Canyon in 2027. Using this biennial report, the Commission should determine via biennial staff-initiated resolutions whether Aliso Canyon's use can be reduced and whether the targets should be accelerated or decelerated. More details on the biennial process are provided in Section 1.3.3.

1.3.1. Use a 2027 Phaseout Date as the Initial Planning Target

The Aliso Canyon leak occurred in 2015-2016. In 2016, the Legislature directed the CPUC to "determine the feasibility of minimizing or eliminating use of the Aliso Canyon natural gas storage facility located in the County of Los Angeles while still maintaining energy and electric reliability for the region.". The Phase 3 Report's scope originally focused on 2027 and 2045 and as revised, identified 2027 and 2035 as planning horizons for consideration.[7] Time horizons for study were also discussed in Phase 3 Workshop 1.

In light of the goal to plan for the phase out Aliso Canyon and the time necessary to bring replacement resources online, staff proposes biennially evaluating the conditions necessary for providing gas and electric reliability without Aliso Canyon, with the expectation of phasing out Aliso Canyon between 2027 and 2035. The initial gas and electric resources targets used for system planning can be based on a potential closure date of 2027. These planning targets can be adjusted biennially by future Commission actions if conditions change.

1.3.2. Identify Initial Gas and Electricity Capacity Targets

The Phase 3 Report by FTI Consulting, Inc. identifies the quantity of gas demand which could reliably be served in 2027 or 2035 without Aliso Canyon.[8] The report also identifies the additional

[7] "Assigned Commissioner's Amended Phase 2 and Phase 3 Scoping Memo and Ruling," July 2021, https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M392/K346/392346667.PDF.

[8] The Phase 3 Report at 20-21 assumes higher pipeline capacity in the Northern Zone than the currently available 1,250 MMcfd. Given current pipeline status and a receipt point utilization of 85 percent, the expected Northern Zone gas receipts would be 1,062.5 MMcfd rather than the 1,250 MMcfd assumed by FTI, a difference of 187.5 MMcfd. If the capacity of the Northern Zone pipelines is not increased, the identified shortfall may be larger than predicted.

gas needed if the difference between this supply and winter 1-in-10 peak day demand were to be met entirely with new gas resources, known as the "shortfall." Similarly, the electricity shortfall is the additional electricity resources needed if the gas shortfall were met entirely with electricity generation and storage. Summing the shortfall with the amount of gas supplies available or with installed electric capacity provides the amount of gas or electricity generation potentially needed. These existing supplies, shortfall, and total supplies potentially needed are shown in the table below.

Note that the electric shortfall is a potential means to fill the gas shortfall, so the gas and electric shortfalls are not additive.

Table 1: Winter 1-in-10 Peak Day Energy Requirements from Phase 3 Report

Year	Gas Supply Without Aliso Canyon (MMcfd)	Gas Shortfall (MMcfd)	Total Gas Supply Needed (MMcfd)	Electricity Capacity Available Without Aliso[9] (MW)	Electricity Shortfall Capacity[10] (MW)	Total Electricity Capacity Needed (MW)
2027	4,121	395	4,516	53,268	4,334	57,602
2035	4,121	323	4,443	58,497	3,922	62,419

Thus, the Phase 3 Report identifies a need in 2027 for 4,516 MMcfd of total gas supplies, or the equivalent in gas supplies plus gas demand reduction or electricity supply increase, without Aliso Canyon. As described in the Phase 3 Report, this amount is based on SoCalGas' forecasts in the 2020 California Gas Report and the Phase 3 Report's modeling of the Western Electricity Coordinating Council (California and other western states) electricity system.

The Phase 2 Additional Modeling Report[11] identifies the amounts of gas resources necessary without Aliso Canyon using different methods. Examining daily gas supply and demand from a stochastically constructed future year, it finds a shortfall of 672 MMcfd during a highly variable cold and dry 2027 year if Aliso Canyon is unavailable and substitute resources are not added to the system. The total gas supply needed on this day is based on extrapolation from the 2020 California Gas Report, rather than modeling electric demand separately.

[9] The Phase 3 Report's projected installed capacity for SCE, SDG&E and LADWP was 53,268 MW for 2027 and 58,497 MW for 2035, see "FTI Detailed Power Market Modeling Inputs and Results.xlsx," tab "Base Generating Unit Characteristics," available in "FTI Final Report Supporting Materials" at https://www.cpuc.ca.gov/regulatory-services/safety/pipeline-safety/aliso-canyon-well-failure/aliso-canyon-well-failure-order-instituting-investigation.
[10] The Phase 3 Report projects the shortfall without Aliso Canyon would be 3,176 MW at 10 PM on a winter peak day in 2027, and 2,875 MW for 2035, see Phase 3 Report, p. 25. The capacity necessary to fill these shortfalls is 4,334 MW in 2027 and 3,922 MW in 2035, see Phase 3 Report, Tables 28 and 29, using the resource mix assumed in the report. Different electric generation sources (wind, solar, geothermal, etc.) have different capacity factors and therefore imply different amounts of capacity needed to fill a given hourly shortfall.
[11] CPUC staff, Aliso Canyon I.17-02-002 Phase 2: Additional Modeling Report, February 2, 2022, issued by ruling February 10, 2022.

Table 2: Winter 1-in-10 Peak Day Energy Requirements from Phase 2 Additional Modeling Report

Target Year	Gas Supply Without Aliso Canyon	Gas Shortfall[12]	Total Gas Supply Needed[13]
2027	4,238 MMcfd	672 MMcfd	4,910 MMcfd

Since these modeling reports were published, the gas utilities have published the 2022 California Gas Report, which provides a third estimate of the total gas supply needed in 2027 and one that is significantly lower than the utility's previous estimates: 4,383 MMcfd. The Gas Report does not estimate the shortfall without Aliso Canyon. Thus, three results are available for the amount of gas needed in 2027: 4,516 MMcfd, based on the Phase 3 Report, 4,910 MMcfd, based on the Phase 2 Additional Modeling Report, or 4,383 MMcfd based on the 2022 California Gas Report. While the California Gas Report represents the most recent estimate calculated by the gas utility, the Phase 3 Report incorporates more detailed electricity modeling and is slightly more conservative since it is a higher estimate. The California Gas Report also does not provide estimates of the amount of gas that can be served without Aliso Canyon.

Staff proposes using the middle estimate—4,516 MMcfd of gas capacity on a winter 1-in-10 peak day, or its equivalent when gas demand reductions or increased electricity capacity is included—as the initial 2027 target which must be used in proposed implementation plans to close Aliso Canyon. For example, 57,602 MW of electric generation capacity in Southern California would also meet the target if the gas supply assumptions hold. Staff proposes this target should be reassessed as part of biennial reassessments of progress towards Aliso Canyon phase-out.

Staff proposes using the same source, the Phase 3 Report, to estimate how much gas supply could be served in 2027 without Aliso Canyon: 4,121 MMcfd. This estimate is slightly lower than the Phase 2 Report found and is therefore also conservative. This target represents the level to which gas demand must be reduced in order to allow Aliso Canyon to be phased out.

In order to assess progress towards these targets, staff proposes the following annual interim targets. These are based on linear progress from the forecast in 2023 to the goals in 2027. If these targets are met and the CPUC determines that reliability is not threatened, the Aliso Canyon maximum inventory level should be reduced to the levels shown. It is prudent to reduce the inventory gradually to avoid a sudden change to the system.

[12] Aliso Canyon I.17-02-002 Phase 2: Additional Modeling Report, p. 23.
[13] Aliso Canyon I.17-02-002 Phase 2: Additional Modeling Report, p. 22.

Table 3: Winter 1-in-10 Peak Day Energy Requirements in Interim Years

Target Year	Cumulative Gas Demand Reduction Needed (MMcfd)	Remaining Gas Demand (MMcfd)	Cumulative Additional Electric Generation Needed (MW)	Total Electric Generation Needed (MW)	Aliso Canyon Maximum Inventory Level (Bcf)
2023	0	4,975[14]	0	46,688	41.2
2024	214	4,762	1,084	49,417	30.9
2025	427	4,548	2,167	52,145	20.6
2026	641	4,335	3,251	54,873	10.3
2027	854[15]	4,121	4,334	57,602	0

The "Remaining Gas Demand" shown above shows a linear trajectory from forecast 2023 gas demand to intended 2027 gas demand in the Southern California Gas territory.

Staff notes that the 4,975 MMcfd of peak gas demand shown above was forecast by SoCalGas in its 2020 California Gas Report, which was a data source for the Phase 2 and Phase 3 analyses. Therefore, it is used in the 2023 row of this table for consistency with forecasts underlying the estimates used in the 2027 row of this table. However, in August 2022, the 2022 California Gas Report forecast that peak gas demand in 2023 will be 4,612 MMcfd.[16] The difference between these forecasts points to the importance of updating forecasts regularly, which is a reason staff recommend biennial progress assessments as discussed in the next section.

The "Total Electric Generation Needed" in Table 3 above shows a linear trajectory from staff's 2023 forecast (46,688 MW) to 2027 need from the Phase 3 Report (57,602 MW). The 2023 forecast was calculated by summing the 43,710 MW online by 2023 in Southern California areas[17] reflected in the Mid-Term Reliability Decision D.21-06-035 baseline with 2,978 MW of incremental generation expected online by 2023.[18] The 2027 electricity need is based on results from the Phase 3 Report, California Gas Report, and Phase 2 Additional Modeling Report and assumes that resources directed by the Mid-Term Reliability Decision will be available.

A combination of electricity resources and gas demand reduction may mean that the gas and electricity targets are each partially met, resulting in effectively meeting the target for that year.

[14] 1-in-10 Peak Day demand forecast numbers from the 2020 California Gas Report, Table 30, available at https://www.socalgas.com/regulatory/cgr.
[15] Note that this value, 854 MMcfd, is the change from the 2023 forecast and is higher than the 395 MMcfd value shown in Table 1 because 395 MMcfd is the change from the 2027 forecast.
[16] 1-in-10 Peak Day demand forecast numbers from the 2022 California Gas Report, Table 29, available at https://www.socalgas.com/regulatory/cgr.
[17] Defined as generation serving LADWP, the Imperial Irrigation District, Southern California Edison or San Diego Gas and Electric Company.
[18] As compiled by CPUC staff from confidential Integrated Resource Plan Proceeding filings, as submitted by LSEs on February 1, 2022, pursuant to D.19-11-016, D.20-12-044, and Staff Data Request. Confidential information has been analyzed and aggregated by staff. These figures include resources reported in SCE and SDG&E territories, but do not cover LADWP's territory.

Meeting electricity targets may entail new electricity resources serving retail customers of LADWP and the Imperial Irrigation District (IID) as well as the territories of SCE, SDG&E and PG&E. The Phase 3 Report identified the impacts to electric utilities as shown in Table 4 below. In making these calculations, the Phase 3 analysis directed the gas available to the most efficient gas plants (plants with lowest heat rates).

Table 4: Winter 1-in-10 Peak Day Use of Gas for Electricity Requirements by Service Area in 2027 from Phase 3 Report (MMcfd)[19]

	Use of Gas for Electricity Generation if Available	Gas Available for Electricity Generation Without Aliso Canyon	Shortfall in Gas Available to Electricity Generation	Percentage of Shortfall
SCE	324	183	141	36%
SDG&E	150	0	150	38%
LADWP	79	43	36	9%
PG&E	26	0	26	7%
IID	41	0	41	10%
Total	621	226	395	100%

Recognizing that these targets may not be sufficiently detailed for planning purposes, staff anticipates that the Commission would provide further direction to utilities in subsequent decisions in this and other proceedings regarding how targets will be met. This may entail refining the targets based on further analysis; parsing them among utilities; and specifying penalties if they are not met.

1.3.3. Biennially Assess Progress and Consider Reducing Aliso Canyon Usage

Under this staff proposal, every other year (starting in 2024) the CPUC will consider whether to reduce the maximum storage level at the Aliso Canyon facility and whether to change the target trajectory for reducing the storage level in future years. This consideration will be based on a biennial joint CPUC-CEC staff report analyzing the extent to which the Aliso Canyon storage level can be reduced while maintaining safety and reliability, using updated information about gas and electricity supply and demand. Since supply and demand may change faster or slower than expected, reassessing every two years will allow Aliso Canyon usage to be reduced over time while maintaining safety and reliability. CPUC staff will conduct this analysis jointly with the CEC and in consultation with the CAISO, the California Geologic Energy Management Division (CalGEM), and LADWP. The resulting report will recommend a new storage level and, if gas system developments are not on track to meet the previously set storage level targets, will assess how far off track they are, propose changes to slow down the adopted storage level trajectory, and propose the amount of gas demand reduction or electric generation supply increase necessary to meet the new trajectory. The CPUC will determine whether to adopt these recommendations and direct any actions necessary to accomplish

[19] Generation NG demand shown in FTI Phase 3 Final Report Supporting Materials, "Summary Gas Demand Table with Curtailments - Final Shortfall Models – Prepared for CPUC.xlsx"

the new trajectory through a resolution of the Commission. The first such analysis will be published in 2024 to form a baseline, and the process will repeat every other year until Aliso Canyon is phased out.

The main analyses in these CPUC-CEC (joint agency) staff reports will be two analyses of gas sufficiency to meet forecasted demand: daily gas balance analyses of the summer and winter seasons, and hydraulic flow modeling of winter and summer peak days. Both of these analytical approaches reflect utility requirements to serve all demand unless it is above 1-in-10-year forecasts and utilize methods already used in this proceeding. Daily gas balances were used in the Feasibility Assessment sections of the Phase 2 Modeling Report[20] and Phase 2 Additional Modeling Report.[21] Daily gas balances represent a more detailed version of the monthly gas balance previously used in Winter and Summer Reliability Assessments.[22] Hydraulic flow modeling of peak days was used in the 1-in-10, 1-in-10 Simulation 5 Sensitivity, and 1-in-35 Scenarios Modeling sections of the Phase 2 Modeling Report and Additional 1-in-10 Scenarios Modeling sections of the Phase 2 Additional Modeling Report. The Phase 3 Report also included a monthly gas balance and hydraulic modeling conducted by FTI Consulting, Inc.

The CPUC's Energy Division, working jointly with CEC staff, will analyze gas system sufficiency using a model that represents daily future gas supply and demand, described in previous work as a Feasibility Assessment. This daily gas balance approach forecasts demand each day during the winter season using (stochastic) random draws from a demand distribution. This distribution uses historical and forecast data and is designed to represent a cold and dry year, not an average year. The model then seeks to fill that daily demand with gas supplied each day using gas forecast to be available from pipelines and storage. Any day on which demand exceeds supply is identified as an imbalance day. This model is run 100 times and the results are averaged.

The California Gas Report, produced biennially by gas utilities with a supplement in the off years, provides annual and peak demand forecasts that serve as key modeling inputs. The CEC also forecasts average annual demand but does not produce peak demand forecasts. The CEC plans to develop peak demand forecasts. In preparation, the agency will host meetings during 2022 to discuss improvements to its current suite of gas forecasting activities.[23]

Joint agency staff will also perform hydraulic flow modeling to assess gas sufficiency on a 1-in-10 peak day in the upcoming summer and winter without Aliso Canyon and at various levels of Aliso Canyon inventory. The same set of input assumptions will be used, with the peak day assumed to occur on February 15, near the end of the season when inventory is low.

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[20] Phase 2 Modeling Report, CPUC Energy Division, issued as Attachment A to March 8, 2021 Ruling, https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/natural-gas/aliso-canyon/i_1702002_phase2modelingreport_3-8-21_unredacted.pdf.

[21] Phase 2 Additional Modeling Report, issued as Attachment A to February 10, 2022 Ruling, https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M449/K511/449511926.PDF.

[22] Winter and summer reliability assessments are available here: https://www.cpuc.ca.gov/alisoassessments/.

[23] https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2021-integrated-energy-policy-report, "2021 IEPR Volume III - Decarbonizing the State's Gas System," p. 121.

The primary inputs to this model are as follows:

Table 5: Gas Sufficiency Analysis Inputs

Row	Input	Source	Input Used For:
1	Forecast peak day demand (non-electric)	California Gas Report, potentially switching to CEC forecast when available, using the Summer High Demand Day for summer and 1-in-10-Year Cold Day for winter. Use the actual highest peak day in the last three years instead, if it was higher than the forecasts, which it has been for summer.	Identifying demand targets
2	Forecast peak day demand for gas to serve electric generation	CPUC gas-fired electric generation forecast for summer peak day; California Gas Report or other source for 1-in-10-Year Cold Day for winter, in consultation with CEC, CAISO and LADWP	Identifying demand targets
3	Date of peak demand	Summer: August 15, winter: February 15	Identifying available gas supply
4	Demand variation	Standard deviation of daily gas demand (including for electricity), calculated for each calendar month using historical data from 2010-2019, then used to create a higher standard deviation based on a 95% (1-in-20) confidence interval for the standard deviation itself, thus representing the *most variable* year in 20 years. Alternative values may be used for comparison or basis years updated after 2024.	Identifying demand targets
5	Decline in annual average demand (non-electric)	California Gas Report, potentially switching to CEC forecast when available	Identifying demand targets
6	Annual demand decline/increase for gas to serve electric generation	CPUC forecast for summer peak day; California Gas Report or other source for 1-in-10-Year Cold Day for winter, in consultation with CEC, CAISO and LADWP	Identifying demand targets
7	Hourly demand shape (non-electric)	CPUC forecast, potentially switching to CEC forecast when available	Identifying demand targets (for hydraulic modeling only)

Row	Input	Source	Input Used For:
8	Hourly demand shape for gas to serve electric generation	CPUC forecast, in consultation with CEC, CAISO and LADWP, potentially switching to CEC forecast when available	Identifying demand targets (for hydraulic modeling only)
9	Pipeline capacities (constraints on gas pipelines within Southern California)	Actual operating capacities, as reported in advice letters regarding pipeline capacity submitted in compliance with D.22-07-002, less unplanned outage of 101.5 MMcfd for peak day modeling, less planned outages reported by SoCalGas in twice annual data requests for daily mass balance analysis.	Identifying available gas supply
10	Receipt point capacity (constraints on gas entering Southern California)	For peak day modeling, 85% of the nominal capacity of the Northern and Southern Zones and 100% of the nominal capacity of the Wheeler Ridge Zone. For daily mass balance analysis, 100% of SoCalGas' firm contracted capacity.	Identifying available gas supply
11	Gas in storage at beginning of season	Actual gas in storage at beginning of the season, for summer, and for winter, estimate based on preceding year and any changed conditions	Identifying available gas supply
12	Maximum gas withdrawal and injection rates for each gas storage field	Annual data request to SoCalGas for forecast daily or monthly withdrawal and injection rates, which vary based on number of wells out of service for maintenance and other storage facility conditions. Current model approach uses monthly rates but may be changed to use daily, since many maintenance activities last 1-3 weeks with specific scheduled dates.	Identifying available gas supply
13	Gas storage field maximum and minimum inventories for non-Aliso Canyon fields	Utility-defined levels, stated in annual confidential data request responses. Below the minimum inventory, there is still gas in storage but withdrawal rates are lower.	Defining gas supply
14	Aliso Canyon maximum inventory	Varying from current level in steps of approximately 5 Bcf, to level proposed in existing Aliso Canyon phase out trajectory, as needed to find a level where model succeeds	Defining policy options to be assessed by model

Row	Input	Source	Input Used For:
15	Future years modeled	Upcoming summer and winter seasons and five years later	
16	Maximum allowed imbalance days	<1 day	Defining model success

Modeling of the future gas system sufficiency in the Phase 3 Report takes into account partial outages of lines 3000, 235-3 and 4000 and receipt point utilization of 85 percent except in the Wheeler Ridge Zone (100 percent), resulting in an estimated system capacity of 3,115 MMcfd.[24] The current capacity of the SoCalGas system absent short-term maintenance work is around 3,065 MMcfd. Pipeline capacity will be considered in progress assessments. If pipeline capacity does not increase from its current level, targets may increase, or other changes may be needed. This proceeding does not expect to direct pipeline repairs or capacity increases but anticipates they will be addressed via other proceedings such as the SoCalGas' General Rate Case.

Using this approach, joint agency staff will assess the sufficiency of the gas system to meet winter reliability requirements and serve demand on a winter or summer peak day and throughout the summer and winter seasons. The resulting hydraulic modeling and stochastic gas balance analyses will be included in the biennial report.

Joint agency staff will also annually verify utility achievement of targets by comparing progress to date, using the format in Appendix A, with the most recent goals set using that format. The biennial report will include these comparisons. Recommended adjustments to the electricity, building electrification, and energy efficiency targets may be included in this report or addressed in other proceedings as discussed below.

1.3.4. Set Schedule to Consider Aliso Canyon Adjustments

The biennial report discussed in section 1.3.3 will be submitted to the CPUC for consideration of its recommendations by June 15 every two years. This will allow use of data from the preceding winter gas season that ends on March 31 and electricity data finalized in the spring. An October voting date will enable the utilities to use the winter gas season, starting in November, to prepare for implementation by the following spring.

These steps would follow the schedule below:

[24] FTI Report, https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/natural-gas/aliso-canyon/fti-aliso-canyon-i1702002-phase-3-report.pdf, p. 20. For comparison, see the 3,115 MMcfd used in Phase 2 Modeling Report, https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/natural-gas/aliso-canyon/i_1702002_phase2modelingreport_3-8-21_unredacted.pdf, p. 38.

Table 6: Schedule

Joint agency staff gather modeling inputs	Feb-April
CPUC staff issue the draft report for informal comment from parties via service on relevant service lists; CEC staff issue the draft report for comment in a relevant CEC docket	June
Joint agency staff publish biennial report and draft resolution	August
CPUC votes on resolution	October
New maximum Aliso inventory level goes into effect	April 1

1.3.5. Direct Progress Towards Targets

After receiving proposals from utilities, staff anticipates that the CPUC will provide further direction in this proceeding regarding how the targets will be split among electricity generation and storage, building electrification, and energy efficiency. These amounts may be updated based on the biennial report.

Staff proposes that the resulting electricity targets be added to the electricity procurement ordered by the Integrated Resource Planning (IRP) proceeding, R.20-05-003, and successor proceedings. After these orders, past progress towards electricity generation and storage targets will also be considered via that proceeding. Any additional transmission needed to support the electricity targets will be addressed via existing CPUC and CAISO processes, including the Integrated Resource Plan oversight and the Transmission Planning Process.

Staff proposes that energy efficiency and building electrification targets and methods to achieve them be considered in subsequent decisions in this proceeding. This may include coordination with the building electrification proceeding, R.19-01-011, the energy efficiency proceeding R.13-11-005, and/or other energy efficiency or electrification activities overseen by the Energy Commission.

2. Party Input and Proposals

2.1. Request for Input on Staff Proposal

Staff encourages input and recommendations from all parties regarding the staff proposal described in Section 1: Staff Proposal to Phase Out Aliso Canyon. Utilities and other parties are invited to address the following questions in their testimony:

1. In section 1.3.3, staff proposes a biennial review process.
   a. Please comment on the model inputs described in Table 5, including demand and supply assumptions.
   b. Please comment on the proposed schedule in Table 6, to be repeated biennially starting in 2024.
   c. Please comment on the process of using a joint agency report and subsequent Commission resolution to make decisions on progress, target adjustments (if necessary), maximum inventory levels and eventual closure.

2. In general, what targets (e.g., clean energy investments) should the plan to reduce our reliance on Aliso Canyon include?
3. Are there ways that the achievement of these targets and thus the closure timeline could be expedited?

2.2. Request for Utilities to Provide Implementation Proposals

Rather than propose a precise implementation process and allocation of the target among resource types and over time, staff seeks utility input on these topics. Utilities are directed to address the following questions in their testimony; testimony from other parties is also encouraged.

1. What are the quantities of a) electricity generation and storage, b) building electrification, c) electric energy efficiency and optionally, d) commercial, and industrial demand response that the utility proposes should combine to meet the target? At least 82 MMcfd of the target must be met by a combination of b) and c).[25]
   a. Why is this the appropriate mix?
   b. Should the Commission specify in this proceeding how a) will be subdivided between generation and storage?
   c. Should the Commission require certain generation or storage characteristics in this proceeding?
2. Regarding electricity generation and storage:
   a. How should the required quantity of generation or storage be allocated among LSEs? For example, should it be based on the "Winter 1-in-10 Peak Day Energy Requirements by Service Area from Phase 3 Study" results shown above?
   b. What entities should be responsible for conducting the procurement?
   c. What new transmission into or within the LA Basin, if any, should be considered to support the additional generation and storage identified?
   d. How should the CPUC and LADWP coordinate to determine LADWP's milestones for phasing out Aliso Canyon?
   e. How much will LADWP's achievement of its own objectives, including GHG reduction, contribute to these milestones?
3. Regarding building electrification, energy efficiency, and gas demand response:
   a. How should the required quantities be allocated among LSEs or other implementers?
   b. How will the Commission verify reduced gas demand from installed building electrification and energy efficiency?
   c. If proposing to include commercial and industrial gas demand response in Question 1, how should it be implemented, including ensuring availability when needed?
4. How much of each of the activities a), b), c) and d) as described in Question 1 should be implemented by the responding utility vs. other utilities vs. other entities such as CCAs or third-party implementers, and how would any other entities be selected and funded?

[2525] This amount is based on portfolio 5c, the portfolio with the lowest non-zero amount of building electrification and electric energy efficiency.

5. For those activities conducted or funded through the responding utility, what programs and processes would implement these activities and how would they be funded?
6. Provide a schedule for how much of each of these activities would be expected to be online each year, following the format in Appendix A.
7. Which of the actions and investments would require an application, and which will require an advice letter?
    a. How soon could the utility be prepared to submit such an application?
    b. What showings and data are required for these applications (e.g., impact on rate base, accounting, ratemaking treatment, rate recovery for portfolio implementation, rate design)?
8. How should implementation of these actions and investments be monitored and enforced?
9. If the utilities are not on track to meet the targets or gas demand reductions are not on target to meet the targets, by what process and calculations should the targets be adjusted?
10. What should be the relationship between the decisions being made in this proceeding and other CPUC proceedings, and how should the CPUC coordinate? Include:
    a. Whether the electricity generation and storage procurement should be handled in IRP proceedings, and
    b. Whether building electrification and electric energy efficiency should be handled in the building electrification (R.19-01-001 and any subsequent) and/or energy efficiency (R.13-11-005 and any subsequent) proceedings.

Appendix A. Utility Proposal Template

Year	Additional Electric Generation and Storage (MW)	Additional Electric Generation and Storage (MMcfd)	Additional Building Electrification (BE)	Additional Energy Efficiency (EE) (Electric)	C&I Gas Demand Response	Exogenous Increase or Decrease in Shortfall	Cumulative Gas Demand Reduction Achieved
2023							
2024							
2025							
2026							
2027	3,433 MW	313 MMcfd	38 MMcfd	44 MMcfd	-	459 MMcfd	854 MMcfd

Sample values are provided in italics, based on Portfolio 5c, forecast to achieve a total of 395 MMcfd of intentional reduction, with an exogenous reduction of 459 MMcfd as a result of demand declining from the 2023 forecast of 4,975 MMcfd to the 2027 forecast of 4,516 MMcfd..[26] The sum must add up to 854 MMcfd equivalent in 2027.

(END OF ATTACHMENT A)

[26] Phase 3 Report, Tables 20, 35, 36, 38.