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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions.	Rulemaking 13-02-008 (Filed February 13, 2013)

SOUTHWEST GAS COPORATION (U 905 G)
RENEWABLE GAS PROCUREMENT PLAN

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December 28, 2022

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Pursuant to Ordering Paragraph 31 of Decision 22-02-025, issued February 25, 2022, Southwest Gas Corporation (Southwest Gas or Company) respectfully submits its Renewable Gas Procurement Plan (RGPP).

The RGPP, which is attached as **Exhibit 1**, provides Southwest Gas' processes, mechanisms, and guidelines on how the Company will work with the industry to meet its biomethane targets and evaluates the feasibility of achieving the established targets. The RGPP also estimates Southwest Gas' specific procurement levels of biomethane to be purchased to meet the aforementioned procurement targets.

DATED this 28th day of December, 2022.

Respectfully submitted,

SOUTHWEST GAS CORPORATION

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Exhibit 1

Southwest Gas Corporation
(U 905 G)

Renewable Gas Procurement Plan

In compliance with:
Decision 22-02-025

December 28, 2022

SOUTHWEST GAS CORPORATION

I. Introduction

a. Background and purpose

On February 24, 2022, the California Public Utilities Commission (Commission or CPUC) approved Decision (D). 22-02-025 (Decision), implementing Senate Bill (SB) 1440 by setting biomethane (renewable natural gas (RNG) and/or bio-synthetic natural gas (bio-SNG)) procurement targets for the gas utilities' core customers to meet short-lived climate pollutant (SLCP) emissions reduction goals established by SB 1383 (Lara, 2016).[1] The Decision established short-term and medium-term procurement targets, adopted provisions to achieve additional co-benefits, and established procurement target timetables for the four largest gas utilities in California – Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), Southern California Gas Company (SoCalGas), and Southwest Gas Corporation (Southwest Gas or Company), (collectively the Gas Utilities). D.22-02-025 also directs the Gas Utilities to: 1) develop a Renewable Gas Procurement Plan (RGPP) outlining the approach for achieving biomethane procurement targets to be filed no later than January 1, 2023; 2) establish a Standard Biomethane Procurement Methodology (SBPM) to evaluate the cost-effectiveness of biomethane purchases; and 3) create individual, utility-specific Procurement Advisory Groups (PAG) to provide consultation on the biomethane procurement program purchases to meet the established targets. On May 20, 2022, the Gas Utilities submitted a joint advice letter providing a template outline for their respective RGPPs.[2] Subsequently on July 5, 2022, the Gas Utilities submitted a joint advice letter requesting approval of their SBPM which was approved effective December 22, 2022.[3]

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[1] D.22-02-025, at pg. 3.

[2] Southwest Gas Advice Letter No. 1213-G, et al. A copy of the Advice Letter may be found here: https://www.swgas.com/rate/1409213706077/SWG_AL-1213_Renewable-Gas-Procurement-Plan-Template-per-Decision-No.-22-02-025.pdf. The Commission's Energy Division approved the Advice Letter effective May 20, 2022.

[3] PG&E Advice Letter No. 4626-G, et al (Southwest Gas Advice Letter No. 1222-G). A copy of the Advice Letter may be found here: https://www.swgas.com/rate/1409214147241/SWG_AL-1222_Joint-IOU-Advice-Letter-4626-G-et-al--Public-.pdf.

Southwest Gas has prepared and is submitting its RGPP in compliance with Ordering Paragraph (OP) 31 in D.22-02-025, which states in pertinent part:

- "[Gas Utilities] respective RGPPs shall evaluate feasibility and provide guidance on compliance mechanisms necessary to successfully meet the short-term targets;
- Include estimated procurement levels of biomethane to be purchased to meet short-term targets to be reviewed and approved by the Commission."[4]

Utilizing the RGPP outline approved in the Gas Utilities' joint advice letter, the RGPP provides Southwest Gas' processes, mechanisms, and guidelines on how the Company will work with the industry to meet its biomethane targets and evaluates the feasibility of achieving the established targets.

b. Environmental and social justice

Southwest Gas is committed to the principles of environmental and social justice through investments that improve the quality of life for its employees, customers, and communities it serves. As an enduring part of the Company's legacy, Southwest Gas has adopted environmental and sustainable commitments that guide our responsible business practices, while being careful stewards of our natural resources.

Southwest Gas takes a proactive approach towards the maintenance, monitoring, leak-detection, damage prevention, and public awareness programs of its pipeline systems and associated facilities, including interconnections with RNG facilities. Through these principles and the social cost of the greenhouse gases (GHG) calculation captured in the SBPM, Southwest Gas will be able to incorporate into its project evaluation the costs to society, as a whole, resulting from the life-cycle GHG emissions of conventional and biomethane purchases, prioritizing biomethane producing projects with shared environmental and social justice values.

[4] D.22-02-025 at pgs. 63-64.

In many of its operational practices, Southwest Gas goes above and beyond mandated pipeline safety requirements to maintain the integrity of the Company's infrastructure and ensure the safe and reliable delivery of natural gas to its customers. Using baselines established in 2015, Southwest Gas' goal is to achieve an overall 20 percent reduction in GHG emissions by the year 2025 from its fleet and building facilities and pursue other initiatives such as purchasing carbon offsets for emissions that are difficult to abate.

c. Disclaimers – Applicable non-compete and confidentiality rules

As Southwest Gas works to procure biomethane to meet the set short-term and medium-term targets, the Company will operate within the bounds of any applicable non-compete or confidentiality agreements. Southwest Gas generally uses standardized or bilateral contracting and non-disclosure agreements when working with suppliers to ensure all market sensitive and confidential information is protected to help maintain competitive operations.

As an example, Southwest Gas and its natural gas suppliers generally operate under the terms set forth in the North American Energy Standards Board (NAESB) Base Contract for Sale and Purchase of Natural Gas (NAESB Base Contract) for administering natural gas and biomethane purchases. Confidentiality provisions are captured within the NAESB Base Contract terms with any additional transaction specific terms or exceptions captured in the accompanying Transaction Confirmation.

In addition to confidentiality provisions related to biomethane transacting, Southwest Gas' PAG, established in conformance with the Decision, may be privy to the Base Contract, Transaction Confirmation, and other market sensitive proprietary information. Any resulting sharing of confidential contracting or market sensitive information will be subject to a non-disclosure agreement signed among participating parties. Southwest Gas will provide participating PAG members a Non-Disclosure Agreement the parties must execute if the parties intend to enter discussions during which Southwest Gas or third parties engaged by Southwest Gas may discuss, share, or furnish to PAG members confidential, non-public, and/or proprietary information. The Non-Disclosure Agreement will help safeguard the confidentiality of information provided by Southwest Gas and/or third parties to PAG members and the

confidentiality of any discussions between the parties during the biomethane procurement process.

II. Procurement Targets

a. Biomethane procurement targets[5] – Short-term 2025

The Decision establishes short-term and medium-term procurement targets for the Gas Utilities to reduce SLCP emissions. For the short-term procurement target, the Decision requires Gas Utilities to collectively procure biomethane produced from eight million tons of diverted organic waste by 2025.[6] The eight million tons of organic waste converts to 17.6 Bcf annually.[7] To meet the recommended short-term procurement targets, each gas utility is responsible for diverting a percentage of the eight million tons of organic waste equal to its Cap-and-Trade allowance share.[8] For Southwest Gas, the percentage is 1.63 percent or approximately 0.286 Bcf per year. To achieve this procurement target, Southwest Gas will attempt to procure 0.0953 Bcf of biomethane by December 31, 2023, 0.1906 Bcf by December 31, 2024, and 0.286 by December 31, 2025. In addition, Southwest Gas will be responsible for tracking its share of the diverted organic waste through tipping fees paid to biomethane production facilities. Southwest Gas' share of the eight million tons of diverted organic waste responsibility is 130,400 tons.

b. Biomethane procurement targets – Medium-term 2030

For the medium-term target, D.22-02-025 requires Gas Utilities to collectively procure 72.8 Bcf of biomethane annually by 2030 and beyond. The 72.8 Bcf equates to approximately 12.2 percent of the Gas Utilities' 2020 annual bundled core demand, excluding compressed natural gas (CNG) vehicle demand.[9] Southwest Gas' share of the medium-term target is approximately 1.63 Bcf calculated using 12.2 percent of the Company's own share of 2020 annual bundled core customer natural gas demand, excluding CNG vehicle demand. The medium-term target includes the biomethane it procured for the short-term target and all bio-SNG procurement, if applicable. In

[5] Per each individual IOU's targets (i.e., % and volumes)
[6] D.22-02-025, OP 14, at pg. 60.
[7] *Ibid*.
[8] *Ibid*, at pgs. 30-31 and OP 16 at pg. 60.
[9] *Ibid*, OP 18, at pgs. 60-61.

addition to the 0.286 Bcf of short-term biomethane purchases, Southwest Gas plans to procure an incremental 0.268 Bcf in 2026, 0.537 Bcf in 2027, 0.805 Bcf in 2028, 1.073 Bcf in 2029, and 1.344 Bcf in 2030 to meet its medium-term target. The Company will limit the amount of non-dairy or other livestock derived biomethane to four percent of the medium-term target level as directed by the Decision.[10] Furthermore, Southwest Gas will not procure eligible biomethane for its medium-term target obligation until Southwest Gas has demonstrated it has diverted its 130,400 ton share of the eight million tons of organic waste responsibility.[11]

c. Discussion of target level adjustments

D.22-02-025 requires that procurement in any year shall first be applied to that year's annual procurement target and allows excess procurement to make up a prior year's deficit.[12] In addition, any eligible excess procurement from one year can be applied to subsequent years' procurement targets. Also, utilities will be allowed to carry over an annual deficit of 25 percent to a subsequent three-year period without explanation.[13] Furthermore, if Southwest Gas meets its 2025 short-term target ahead of schedule, Southwest Gas will pursue procurement from other eligible biomethane feedstocks to meet its medium-term target procurement goal.

d. Other mechanisms to meeting procurement targets

Southwest Gas anticipates it will have limited access to eligible biomethane sources within its Northern California and Southern California service territories given its system footprint and system size limitations. The Decision permits utilities "to trade excess supplies among themselves and to procure on behalf of each other".[14] Southwest Gas will coordinate with other California Gas Utilities to explore options for procuring the needed biomethane to meet its short-term and medium-term targets. Southwest Gas will also work with the other California utilities to coordinate optimizing the use of the utilities' transportation systems to promote access to biomethane. The

[10] *Ibid*, OP 19, at pg. 61.
[11] *Ibid*, at pg. 30.
[12] *Ibid*, OP 24, at pg. 62.
[13] *Ibid*, OP 25, at pg. 62.
[14] *Ibid*, at pg. 31 and OP 26 at pg. 62.

Gas Utilities will develop a more detailed approach and terms for consideration during the 2025 review process, if needed.

e. Market feasibility

The RNG market continues to be a highly illiquid market albeit its growth and continued development throughout the country. At the mid-point of 2021, there were 176 operational RNG facilities and 220 facilities that were under construction or planned, with capacity in 2021 at nearly 74 trillion BTU's[15]. As a local distribution company with limited footprint in California, locational proximity to these facilities is highly deterministic of being able to access RNG supplies. Southwest Gas' California footprint comprises limited parts of northern and southern California with two distinct and separate service territories. Areas served in the Company's Northern California service territory include North Lake Tahoe, South Lake Tahoe, and Truckee. In its Southern California service territory, Southwest Gas serves Big Bear, Needles, Barstow, Victorville, and other surrounding cities in the high desert area.

Southwest Gas is currently interconnected with the Victor Valley Wastewater Reclamation Authority (VVWRA) RNG production facility located in Victorville, California. The facility converts raw biogas made from anaerobically digesting food waste along with municipal sewage from VVWRA's wastewater treatment process, to create pipeline quality gas. Southwest Gas can accept this pipeline quality gas through its interconnection with the facility. Given the current commercial relationship with the facility operators, Southwest Gas is exploring potential opportunities for adding biomethane into its system to meet the established SB 1440 targets. Southwest Gas is also exploring several additional opportunities for biomethane sources in its Northern and Southern California service territories.

Southwest Gas conducted a preliminary evaluation of potential sites for sourcing biomethane including existing landfill sites in or near the Company's California service areas. There are several planned landfill gas (LFG) to biomethane projects near the Company's Southern California service territory that may already have offtake agreements in place with these LFG projects purposed for electricity

[15] 2021 RNG volumes and operational facility data are provided by the RNG Coalition; https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/61ba25c889b4fb7566404e6c/1639589328432/RNG+Jobs+Study.pdf

generation and hydrogen production. In its preliminary review, Southwest Gas identified one small landfill within the Company's Southern California service territory that is a potential LFG to biomethane candidate and two smaller landfills that have a low potential for LFG to biomethane projects. Southwest Gas will continue to monitor these projects for potential development.

In Southwest Gas' Northern California service territory, in and around South Lake Tahoe, most waste is diverted to landfills outside of the Company's service area. Additionally, several landfills in or near the Company's service area in northern California already have LFG to electricity facilities in place.

Southwest Gas is also evaluating opportunities to source biomethane generated from diverted food waste. One potential option the Company is exploring is the addition of biomethane supplies in southern California which will utilize local diverted food waste as feedstock to produce biomethane. The food waste will go through an anaerobic digestion process and will be cleaned and upgraded to pipeline quality standards for injection into the Company's existing system. Southwest Gas is evaluating its system takeaway capacity requirements to assess the feasibility of bringing the additional supplies onto its system. The details of the system planning stage are described in further detail under Section III – Procurement Methodology. The anticipated project injection start time is in 2027.

Another option Southwest Gas is assessing in southern California is an anaerobic digestor construction project. This potential project will utilize organic material from local waste haulers and local landscapers to produce biomethane that could potentially be injected into the Company's existing southern California gas system. Southwest Gas is at the beginning stages of discussions and analysis for the aforementioned project. Based on the Renewable Gas Supplier Interconnection Project Fact Sheet (RNG Fact Sheet)[16] provided to Southwest Gas, the developer is currently site selecting for their project with an anticipated start date within the next

[16] The RNG Fact Sheet is an information gathering tool used by Southwest Gas provided to potential RNG interconnection suppliers. A copy of the RNG Fact Sheet may be found here. https://www.swgas.com/en/california-rates-and-regulation.

several years. This developer is new to the Southwest Gas Southern California service territory.

A third option under preliminary review by the Company is with a developer who will partner with retailers working to solve the food waste crisis by trucking in pallets and bins of food waste to newly constructed anaerobic digestors. Southwest Gas is coordinating relevant information from the RNG Fact Sheet provided by the developer in preparation for internal feasibility review. The anticipated timeline for the project is still being finalized. The potential site location for the project is also within Southwest Gas' Southern California service territory.

When additional biomethane supply sources request access to the Company's infrastructure, Southwest Gas conducts systems planning feasibility studies which evaluate, on an hourly basis, system capacity and capacity limitations all along its system. Southwest Gas recently evaluated its southern California system and has determined that due to the lack of offtake demand, its system is constrained during the summer months and is unable to take significant amounts of biomethane supplies. As such, Southwest Gas may explore options to use nearby Gas Utilities' systems to reroute or store excess supplies for use during times of higher demands.

III. Procurement Methodology

a. General description on procurement methodology

Southwest Gas uses established natural gas purchasing policies, processes, and procedures to provide a framework and guidelines for prudent gas supply purchases. Southwest Gas will follow comparable processes and guidelines to ensure prudency of purchased biomethane to meet the Company's SB 1440 biomethane procurement targets. Typical procurement processes and procedures will be enhanced with cost-effectiveness elements and project evaluation methodologies for procuring biomethane as set forth in D.22-02-025.

Southwest Gas' biomethane procurement methodology will follow similar guidelines as routinely used for solicitations to purchase conventional natural gas supplies for its core customers. Typically, Southwest Gas utilizes a Request for Proposal (RFP) or a competitive solicitation process for purchasing gas supplies. These solicitations identify market areas, receipt locations, purchasing periods,

desired pricing benchmarks, as well as any other purchasing requirements. Once Southwest Gas receives the offers from interested parties, the Company reviews and ranks the offers according to the required elements outlined in the RFP and the best-priced supply option. The ranked deals are then presented to Southwest Gas senior management for final review and to receive authorization for making the agreed upon purchase.

Using a similar approach, Southwest Gas will issue an RFP to purchase biomethane to meet the SB 1440 biomethane procurement targets. As part of the solicitation process, Southwest Gas will incorporate approved project prerequisites described in the Decision within a Term Sheet outlining the RFP requirements. Examples of SBPM elements[17] to be included in the Term Sheet are the required project prerequisites, the respondents' ability to comply with the prerequisites in the form of attestations, detailed project information including project feedstock sources, quality, estimated production and production timeline, and a Statement of Qualifications demonstrating project development history and background, as well as references of similarly provided services. Southwest Gas will review all RFP responses and conduct an independent verification of supporting project documentation for the required qualifications. A summary of the presented offers will then be reviewed in consultation with the PAG (Southwest Gas' PAG is discussed further in Section III.g). At the conclusion of the RFP process, Southwest Gas will review offered projects and prioritize the short-listed projects using the approved SBPM.

The SBPM captures many of the attributes of the cost-effectiveness test and compares the cost of procuring a quantity of RNG from a qualified[18] project and the cost of procuring the same amount of natural gas from conventional sources. Additionally, the SBPM considers RNG project Carbon Intensity (CI), costs to society at large, compliance costs under California's Cap-and-Trade Program, and other

[17] Appendix A provides the redacted filed copy of the SBPM detailing a complete list of project requirements.

[18] The SBPM is only applied to projects meeting a set of requirements specified in the Decision. References follow: D.22-02-025, OP 9, 10, 14, 19, 20, 22, 33, 35, 37, 38, 39, 40, 49. D.22-02-025 at pg. 33 requires that landfill projects must "stop accepting new organic waste and implement advanced landfill gas capture automation and monitoring technology to decrease fugitive methane emissions".

environmental and non-monetary factors over the delivery period of the proposed RNG contract, which may be up to 15 years per the Decision. The scores developed using the SBPM result in a final cost-effectiveness score for the project which will help prioritize projects during the project evaluation phase of Southwest Gas' SB 1440 procurement effort. The PAG can review this process, as well as the RFP process itself to assess alignment with Decision requirements.

Based on the RFP process and prioritized projects, Southwest Gas will select the projects from which it will purchase biomethane to meet the SB 1440 procurement targets. Details of prerequisites, method of verification, and attestation frequency are detailed in the SBPM and will be captured in contracting terms to ensure the projects' continued compliance with established requirements in the Decision.

b. Project priorities and evaluation: SBPM cost–effectiveness

Southwest Gas will utilize the SBPM to perform a cost-effectiveness evaluation of potential eligible biomethane projects from which Southwest Gas will purchase biomethane to meet its short-term and medium-term targets. Southwest Gas' cost-effectiveness evaluation will incorporate natural gas market analyses for both its Northern and Southern California service territories, as Southwest Gas anticipates all its biomethane procurement will need to be allocated to both service territories. This is because each service area will have limited access to available biomethane supply sources, especially Southwest Gas' Northern California service area. Also, Southwest Gas anticipates it will rarely risk-adjust its natural gas market forward prices, Cap-and-Trade forward obligation costs, and forward social cost of carbon and methane when performing cost-effectiveness analyses. Incorporating risk-adjusted pricing in the SBPM analyses makes the pricing of potential biomethane supplies more attractive and may not reflect the actual market conditions. Therefore, Southwest Gas plans to incorporate unadjusted risk forward pricing data into its SBPM analyses that are available at the time the analyses are performed for potential biomethane supply sources.

c. Project priorities and evaluation: environmental and non-economic benefits

The Decision requires the Gas Utilities to collectively procure biomethane produced from eight million tons of diverted organic waste by 2025 and collectively

procure 72.8 Bcf annually of biomethane by 2030 and beyond reducing SLCP emissions. Capturing biomethane at its source and combusting the methane results in CO_2 emissions that have a lower Global Warming Potential (GWP) than methane emissions.[19] Methane released into the atmosphere has a GWP 25 times greater than CO_2 over a 100-year period and 84 times greater than CO_2 over a 20-year period.[20] Capturing the methane, cleaning and upgrading it to pipeline quality standards, and combusting the resulting biomethane provides long-term benefits to society as opposed to allowing methane to escape into the atmosphere. In addition, D.22-02-025 directed the Gas Utilities to pursue biomethane sources that would provide environmental and non-economic benefits to the state in nearby communities where the biomethane sources are located. The following are environmental and non-economic benefits that will be included in Southwest Gas' SBPM evaluation of potential biomethane sources:

1. Priority will be given to biomethane producers who demonstrate their waste byproduct will be used to reduce GHGs rather than putting them in landfills. Example: turning waste byproduct into soil amendment;[21]
2. Priority will be given to biomethane producers whose waste byproduct has perfluoroalkyl or polyfluoroalkyl substances removed from it;[22]
3. Priority will be given to producers who demonstrate waste haulers delivering to their biomethane production facility will abide by the same prospective exclusive use of near zero emission or zero emission vehicles that the facilities themselves are required to adhere to;[23]
4. Priority will be given to biomethane producers who use Carbon Capture and Use or Storage projects to prevent CO_2 from escaping into the atmosphere;[24]
5. The prioritization of projects that are in remote locations; and

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[19] R.13-02-008, *Administrative Law Judge's Ruling Directing Parties to File Comments on Phase 4A Staff Proposal and Related Questions*, dated June 3, 2021, Attachment 1, R.13-02-008 Phase 4A Staff Proposal (Draft), at pg. 7.
[20] *Ibid*.
[21] D.22-02-025, OP 4 at pgs. 57-58 and OP 42, at pg. 67.
[22] *Ibid*, OP 4 at pgs. 57-58.
[23] *Ibid*, OP 5 at pg. 58.
[24] *Ibid*, OP 8 at pg. 58 and OP 41 at pg. 67.

6. The prioritization of projects that are new or an expansion of an existing project.

Project prioritization will also include CI analysis. The Decision directed the Gas Utilities to "report CI scores in their Advice Letters seeking approval of a procurement contract". The CI score for purposes of SB 1440 procurement will be used for contract review and procurement decisions."[25] The CI scores will be calculated using a modified California-specific Greenhouse Gases, Regulated Emissions and Energy Use in Transportation (GREET) Model. The CA-GREET Model is a California-specific version of Argonne National Laboratory's GREET life-cycle model which is used to calculate GHG emissions under the LCFS [Low Carbon Fuel Standard].[26] Southwest Gas, along with other Gas Utilities, is in the process of contracting with Argonne National Laboratory to develop the modified GREET model. The modified model will reflect the CI more accurately for use by utility's end users and will reflect the conditions related to SB 1440 (e.g., utility application, California parameters, methane leakage, transportation using near-zero-emission or zero-emission trucks, and biomethane quality). The modified GREET is expected to be completed by end of 2023. In the interim, while the modified GREET model is being developed, Southwest Gas will use a preliminary cost-effectiveness test that estimates the SLCP reduction and life-cycle carbon emissions. Southwest Gas will use CI scoring for project prioritization in the context of other SBPM elements and project prerequisites as outlined in the SBPM. Final CI calculations will be provided to the Energy Division in the Advice Letters seeking approval of procurement contracts.

d. Project viability, uptime, and accuracy of biomethane deliverability

Southwest Gas has an established process for assessing RNG deliveries and interconnecting RNG facilities with Southwest Gas' system and will leverage this approach when considering biomethane purchases from potential SB 1440 projects. Southwest Gas works closely with project developers and/or operators through various stages of project development to ensure specific project information is accurately captured and validated when assessing project viability. After the project

[25] *Ibid,* at pg. 36.
[26] https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation

passes initial review using the SBPM and upon Southwest Gas' approval of its procurement contract by the Commission's Energy Division, the Company will conduct an Interconnection Screening for the project. This step will include a feasibility analysis, such as the review of potential system takeaway capacity and maximum allowable operating pressure, among other items outlined in Southwest Gas' Rule No. 22 – Standard Renewable Gas Interconnections to the Utility's Pipeline System (Rule No. 22).[27]

Southwest Gas will use its California Rule No. 22 as a guideline during project progression: screening, engineering, procurement, and construction. These steps have been developed to provide transparency to project stakeholders and to enable interconnection and procurement process efficiency.

1. Interconnector application and qualification process

As the initial step in assessing project viability, when connecting to the Southwest Gas system, the interconnector is required to complete and submit the RNG Fact Sheet providing Southwest Gas information and data on the proposed project. Following receipt of the RNG Fact Sheet, the interconnector provides Southwest Gas a written request to complete each scope of work, including, but not limited to screening, engineering, procurement, and construction.

The RNG Fact Sheet should specify the anticipated gas quality, composition, and the source of the biogas supply, such as landfill (non-hazardous), dairy, or water/sewage treatment plants. The interconnector will also need to specify the duration of the contract, the forecasted operating profile, forecasted maximum and minimum flow rate, and pressure requirements or limitation for their facility or equipment. Some of the elements of the RNG Fact Sheet will be used in developing the RFP Term Sheet for biomethane procurement, combining the typically requested information from RNG projects enhanced with project

[27] Southwest Gas Rule No. 22 may be found here: https://www.swgas.com/1409181853334/RULE_22---AL-1197_Renewable-Gas-Specification_Eff-April-13-2022.pdf.

prerequisites as captured with the SBPM. The RNG Fact Sheet is then used for system planning, design, construction, and testing.

Historically, Southwest Gas has worked with interconnectors to complete this data thoroughly enough to proceed to the next step of the project process. Typically, this step takes between one to two months, depending on the responsiveness of the interconnector and the stage of the project. There have also been instances where the parameters of the production (or other details of the project) change, which caused a new RNG Fact Sheet to be generated and additional coordination between parties. It is imperative that interconnectors consider all factors that may contribute to possible downtime and production loss when estimating the annual flow rate. In a recent RNG project, Southwest Gas learned of additional obstacles that impacted operations, causing non-performance issues with unexpected downtime. Changes in anticipated feedstock sources and production, feedstock quality variations, delays in start-up times, as well as downtime for maintenance could impact flow rates, which could result in potential variations of biomethane purchases.

2. Preliminary Design/ Interconnector Planning Study

Following receipt of the interconnector information in the RNG Fact Sheet, the system planning study is prepared, taking approximately three to four weeks to complete. Additional time for coordination efforts is required if the interconnection facilities are injecting into a non-Southwest Gas system before delivering back into Southwest Gas' system. The planning study includes a complete capacity review to determine the feasibility for supplier gas delivery into the Southwest Gas distribution or transmission system, at the agreed point of receipt. The study also entails determining the capability of the downstream system to absorb the proposed biomethane injection, analyzing the tap hourly flow data for hydraulic capabilities, and alternatives if the selected point of receipt is not viable.

Preliminary design options, locations, associated cost estimates, and project schedules for anticipated new facilities and system modifications/improvements are prepared at this stage. These options (if more than one) are assessed and discussed with the project owners for consideration. Design Costs and

Preliminary Design Agreement are prepared and presented to the project developer for design work to begin. The timing for this varies, depending on the project developer's timeline to advance the project, as well as execution of the Preliminary Design Agreement and submittal of the engineering advance to Southwest Gas.

This step in the process is a pivotal point when the project is deemed viable. Southwest Gas has experienced several unrealized projects due to estimated project costs associated with capacity/takeaway scope being higher than anticipated and/or long projected project schedules (based on construction costs, material procurement, permitting, etc.). Due to the various costs of the proposed project, delayed schedules, and regulatory requirements, developers might seek other sites (even in other states), project scope changes, other investors, and/or termination of the proposed project. Additionally, depending on the proposed project location, Southwest Gas may have limited system capabilities to bring additional supplies onto its system, which might result in significant system improvement costs and longer lead-times necessary for project development.

3. Design and cost estimate

Once the preliminary design agreement has been executed and the associated design costs collected, Southwest Gas will obtain site plans and prepare appropriate work requests for design to begin. Southwest Gas will prepare a full engineering design, including, but not limited to, right-of-way and easement requirements, conduct field surveys, and prepare preliminary environmental impact and permitting assessments. Typically, the design process takes between six and eight months. If there is a tap design required as well, design coordination with the upstream pipeline must occur and may require additional design time.

Due to the detailed information required for full engineering designs, Southwest Gas works closely with the project lead/developer to obtain project data related to the construction footprint, other utility installations, computer-aided design (CAD) files, schedules, and other data. The coordination efforts are not concurrent with the gas design, which potentially causes project design delay.

4. Permitting and material acquisition

Permitting and environmental assessments are conducted during the design phase. Once these assessments have been performed, Southwest Gas will work with the appropriate entities to initiate the permitting requirements, as applicable. This includes local municipality permitting, Bureau of Land Management, Tribal, etc. While the timing for each entity differs, it is anticipated that timing can take anywhere between two and fourteen months.

Southwest Gas will begin material acquisitions, especially with projects identified with long-lead times. Project funding timeline greatly impacts this step regarding the project development.

5. Certifications and testing, and start-up

Once the facility is operational, an Interconnector Renewable Gas Source Certification is required. Testing shall be determined according to the source feedstock and pursuant to Southwest Gas' Rule No. 22, Section K.5 Testing.

The Project output must meet gas quality standards in accordance with Rules No. 2 and No. 21. In addition, RNG suppliers must meet the Health Protective and Pipeline Integrity constituent requirements in Section K of Rule No 22. Southwest Gas has developed biomethane standards for gas quality testing with the purpose of protecting the health of employees and customers, the integrity of Southwest Gas pipelines and facilities, and the integrity of customer end-use equipment. If the project is designed to flow from Southwest Gas into any other transmission system or from any upstream supplier, the gas quality standards will be modified to incorporate the most stringent test limits from each of its upstream suppliers. In addition to the testing outlined in the tariff, Southwest Gas will also install, own, and monitor real-time gas quality measurement equipment at each biomethane injection site.

Source Feedstock Based Testing and Pre-Injection Testing can vary from approximately three weeks to several months. The longer durations occur when constituencies exceed the acceptable limit during laboratory testing and can result in equipment replacement, process changes, or additional calibration and

adjustments of conditioning and upgrading equipment. Additionally, if gas qualities are found to be outside of acceptable levels during operations and the flows are interrupted, the facility may undergo restart testing that could take similar durations for pre-injection testing. Generally, Southwest Gas has seen project start-up delays ranging from a few weeks to a month due to testing issues. However, delays can take even longer if the interconnector has trouble meeting the required constituent specifications.

In addition to a typical review, Southwest Gas will assess project viability to determine each project's ability to convert raw biogas into pipeline quality biomethane and to achieve minimum operating lifespans of at least 15 years,[28] with biomethane deliveries not to extend beyond 2040, as directed by the Decision. Southwest Gas will seek project uptimes of at least 90% online availability throughout a calendar year unless unforeseen maintenance, operations, or regulatory events occur. All biomethane volumes will be metered and analyzed in accordance with Southwest Gas' Rule No. 22 and other applicable tariff provisions. This metering will be used to verify the accurate deliverability of the volume of biomethane for any project injecting into Southwest Gas' facilities to meet SB 1440 targets.

e. Additionality and verifiability

The Decision directs the Gas Utilities to ensure that biomethane for the program is in addition to existing production so as not to divert RNG from existing and operational uses. Southwest Gas does not currently source any RNG from any existing facilities that meet SB 1440 requirements. Southwest Gas will apply the same prudent information gathering, planning study, and start-up certification process to assess any facility meeting SB 1440 requirements as well as any expanded feedstock to the already reviewed projects. Any additional feedstock to the project will undergo a new SBPM assessment to ensure all increases in supplied biomethane meet the project prerequisites including demonstratable reductions in SLCP as directed by the Decision. Southwest Gas will incorporate specific additionality and verifiability requirements as outlined in the SBPM within its contracting terms. The established

[28] D.22-02-025, OP 56, at pg. 72.

project and feedstock review process and provided attestations by the developers as required by contracts will demonstrate additionality and verifiability.

f. Contract approval process

Upon completion of the solicitation process and project selection, Southwest Gas will negotiate purchasing agreements for biomethane procurement. Once an agreement is reached with the biomethane supplier, procurement contracts will be submitted to the Commission's Energy Division according to Advice Letter Tiers as determined by the agreed upon price and according to the approval process outlined in the Decision:

> The Commission's Energy Division will process individual contracts to procure biomethane through a three-tier advice letter approval process:
>
> - Tier 1 for contract prices up to $17.70/MMBtu;
> - Tier 2 for contract prices between $17.70 and $26/MMBtu;
> - Tier 3 for contract prices above $26/MMBtu.[29]

Upon approval, Southwest Gas will use its Rule No. 22 as guidance for each scope of work as described in Section III.d.

g. Procurement Advisory Group

The Decision directed the Gas Utilities to establish a PAG, whose members will provide consultation on the project selection process. In accordance with the Decision, Southwest Gas established a process for its PAG to provide consultation for the biomethane procurement associated with meeting SB 1440 targets. PAG members must be non-market participants who do not have a financial interest in the outcome of any solicitations. Southwest Gas conducted outreach with eligible member organizations to establish a PAG. Southwest Gas developed a PAG Charter that outlines specific PAG member roles and responsibilities to be included as part of its consultation. Examples of PAG member activities will include reviewing projects against the SBPM during the prioritization process and reviewing final project selection to validate the project selection process meets the requirements provided in D.22-02-

[29] D.22-02-025, OP 13 at pg. 59.

025. Southwest Gas will set up a meeting cadence with the PAG to provide on-going consultation during the outlined solicitation process, as well as during the project review and selection process. Additional details on PAG member roles and responsibilities are outlined in the PAG Charter which is shared with the PAG members along with a PAG Non-Disclosure Agreement.

IV. Risk Environment

The availability and pricing of biomethane purchases available to meet SB 1440 targets are subject to several risks that will need to be monitored. RNG markets remain in the nascent stage with no uniform regulatory oversight. There is little transparency in transacted quantities and pricing. Most RNG currently flows to the transportation fuel market under the United States Environmental Protection Agency's Renewable Fuel Standard (RFS) Program. Pricing for the RFS program's Renewable Identification Number (RIN) credit prices are affected by regulatory uncertainty in the setting of annual obligation volumes for RNG for obligated parties. Additionally, California's LCFS, operated by the California Air Resources Board (CARB) also provides credits when RNG flows to the California transportation fuel market. The LCFS regulates fuel used in the California transportation sector. The evolving electric vehicle adoption rate and mandates for GHG reduction past 2030 is generating uncertainty in the LCFS credit pricing. Moreover, the revised CARB 2022 Scoping Plan for Achieving Carbon Neutrality that expands on earlier emissions reduction mandates to "a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045"[30] creates additional demand and volatility in the market. The uncertainty from both the RFS and LCFS markets is being exacerbated by additional stakeholders' participation in the RNG marketplace from the voluntary market as well as recently established mandates by several states. Consequently, the uncertainty in demand for RNG in the RFS and LCFS markets combined with new RNG demand being driven by voluntary markets and state mandates exerts a challenge in pricing RNG and financing projects.

In addition to regulatory risk driving project feasibility and biomethane price uncertainty, project development is subject to financial risk given current economic

[30] https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf (pg.1)

climate, project viability, and construction challenges. As described in the detailed project review process in Section III.d that Southwest Gas uses as guidelines for interconnecting with RNG projects, in its limited exposure, Southwest Gas experienced how changes to the developer's project scope can quickly evolve into cost overruns and delays in startup times. Additionally, given some of the project prerequisites in the Decision, such as limitation on contract length to 15 years and feedstock limitations at landfills, some developers have expressed concerns for project surety to develop these without the full backing from the utility for cost recovery. Southwest Gas will use a holistic approach when evaluating the competitiveness of the proposed projects it solicits during the detailed RFP process as outlined in Section III.a, through a lens of these additional risks to ensure the evaluation of potential biomethane purchases to meet SB 1440 procurement targets.

V. Cost Control Mechanisms

Southwest Gas believes its RGPP Cost Control Mechanisms (RGCCM) must account for both the price paid for purchased biomethane as well as the impact to customer bills of such purchases. In general, Southwest Gas will evaluate multiple factors relating to selected biomethane suppliers' product quality and then evaluate the cost impact to customers of various biomethane supply cost inputs and associated quantities of biomethane purchased. The overarching goal of Southwest Gas' RGCCM is to ensure the optimal portfolio of biomethane (i.e., a combination of source quality, project prerequisites, reliability, geographic advantages/system access, and affordability) is procured; and that the purchase of said biomethane does not place an undue burden on customers. Southwest Gas believes the ultimate measure of affordability is captured by the impact of biomethane purchases on customer bills. This means there is an inverse relationship between the price per unit of biomethane supply and the volume Southwest Gas can purchase without adversely impacting customers.

Southwest Gas proposes that its biomethane purchasing strategy as related to costs will recognize the long-term value to customers. Southwest Gas will evaluate biomethane purchases using the approved SBPM:

> …the SBPM cost-effectiveness score consists of two main parts: the first part quantifies costs using key factors such as RNG contract price,

> the price of conventional natural gas, cap-and-trade compliance costs, carbon intensity, social cost of greenhouse gas (GHG) emissions, and natural gas transportation costs. The second part captures other environmental and non-monetary factors such as the environmental benefits of carbon capture, use and storage (CCUS), waste hauler zero-emission vehicles, and other benefits raised in the Decision and the SBPM workshop. The scores from each part are then combined to arrive at a final cost-effectiveness score for the project which will help prioritize projects during the project evaluation phase of SB 1440 procurement efforts.[31]

Southwest Gas believes the SBPM, along with annual reporting of costs and customer bill impacts, provides sufficient controls for affordability analysis of biomethane procurement in the short-term. The current market for biomethane commodity costs is not a liquid market, and as such, Southwest Gas does not have adequate access to biomethane prices to develop a cost specific cap on potential biomethane purchases made to meet SB 1440 procurement targets. Therefore, Southwest Gas proposes to review its approach to the RGCCM in 2025 when additional Decision elements are re-evaluated once progress is made toward achieving the short-term procurement target and improved market information is available.

Southwest Gas proposes to evaluate the affordability of its proposed biomethane purchases annually using the approved SBPM, in conjunction with information received through the RFP process. Southwest Gas proposes to recover the above market costs of biomethane purchases as part of the monthly cost of gas applicable to core sales customers.[32] Consequently, the evaluation of affordability will include residential and all other core sales customer classes to ensure customer impacts are not excessive. Southwest Gas will calculate the estimated change in cents per therm to its monthly cost of gas associated with incremental biomethane

[31] PG&E Advice Letter No. 4626-G, et al., at pgs. 3-4.
[32] On December 15, 2022, the Commission approved D.22-12-057, *Order Instituting Rulemaking to Address Biomethane Procurement Cost Allocation* to consider cost allocation between core and noncore customer classes for biomethane procured under D.22-02-025.

purchases; and will then determine the percentage change in the average customer bill for all core sales schedules in its analysis of affordability to determine an acceptable range of customer impact.

Southwest Gas will include the full results of its affordability analyses including the RGCCM approach when reporting on the results of its annual biomethane purchases to meet the SB 1440 procurement targets, including why it believes its proposal results in a balanced result for customers.

VI. General Contract Requirements

Southwest Gas will use a standardized process as guidelines for contracting biomethane purchases as those typically used for Southwest Gas conventional supplies. Southwest Gas may enter into: 1) a NAESB Base Contract; 2) a Transaction Confirmation; and/or 3) a bilateral agreement for the purchase of biomethane to meet procurement targets established by D.22-02-025. The standard NAESB Base Contract agreement typically used for Southwest Gas' conventional natural gas supplies can provide guidelines on counterparty risk, credit risk, delivery assurance, and confidentiality that can then be used for developing biomethane purchasing agreements. The biomethane purchasing agreement, whether a typical Transaction Confirmation or a bilateral agreement, is conditioned upon the Tiered Advice Letter process as outlined in Section III.c and will not become effective until the Advice Letter is approved.

a. Decision-specific contract requirements

As part of the SBPM, the Gas Utilities captured specific project prioritization elements that will require supplier attestation. These outlined elements included in the SBPM will be captured within the general contract requirements per the Decision and will be incorporated into the purchasing agreement. The Decision also directed utilities to include specific contracting elements across its procurement contracts. The elements include the following as directed by applicable Decision OPs:

- OP 37: Any contract between a project developer and an investor-owned utility shall specify how tipping fees may modify contract terms, if at all.[33]

[33] D.22-02-025, at pgs. 65-66.

- OP 38: …producers that contractually agree that any Class 8 trucks purchased or leased for use in the production of biomethane after the effective date of this decision shall be near-zero emissions (NZE) or zero-emissions (ZE) vehicles.[34]
- OP 39: …production facilities that agree to prospectively cap on-site combustion generation of electricity using their own biogas beyond current generation levels.[35]
- OP 50: …shall require biomethane producers to track volumetric injections of biomethane into pipelines through the Midwest Renewable Energy Tracking System (M-RETS) platform or other platform resulting from the workshop in Ordering Paragraph 1 above.[36]
- OP 56: Biomethane procurement contracts shall be for a maximum of 15 years, with biomethane deliveries not to extend beyond 2040.[37]

Southwest Gas will modify its Transaction Confirmation or develop a bilateral agreement specific for biomethane purchases to capture the project prerequisite elements, supplier attestation requirements to comply with the project prerequisites, and the abovementioned Decision procurement contract requirements. The agreements will capture all project requirements as well as pricing and will be provided to the Energy Division for approval.

b. Standardized elements of contracts

The NAESB Base Contract is an enabling agreement that contains terms and conditions that are applicable to future gas sales or purchases that can be memorialized in subsequent procurement transactions. While the NAESB Base Contract does not contain the commercial terms that are specific to Southwest Gas' proposed purchases of biomethane, it does provide key contracting elements for party obligations. Southwest Gas can leverage certain NAESB Base Contract conditions reflecting industry standards such as performance obligations terms, financial responsibility, limitations and indemnification, and billing and payment terms. In addition to the NAESB Base Contract, a more detailed Transaction Confirmation or a

[34] *Ibid*, at pg. 66.
[35] *Ibid*, at pgs. 66-67.
[36] *Ibid*, at pg. 71.
[37] *Ibid*, at pg. 72.

bilateral agreement will capture commercial terms that are specific to Southwest Gas' proposed biomethane purchases. The Transaction Confirmation or a bilateral procurement agreement will be used to enforce any project specific prerequisites and attestations as required by the Decision.

Specific purchasing requirements will be based on the Decision-specific contract requirements which may include major commercial terms such as: 1) the contracting term becoming effective upon Commission approval for a primary term of up to 15 years per D.22-02-025; 2) the contract price for the biomethane; 3) the facility producing biomethane shall meet the project prerequisites and annual attestation obligations as detailed in the SBPM. If the facility does not meet the outlined requirements within the procurement agreement, then the biomethane will not be purchased by Southwest Gas.

In the event the facility is physically interconnected with the Southwest Gas system, in addition to the NAESB Base Contract and a Transaction Confirmation and/or a bilateral agreement for purchasing the biomethane, Southwest Gas will also work with the project interconnector to enter into a Standard Renewable Gas Interconnector Agreement (SRGIA).[38] Terms of the SRGIA have been standardized across the Gas Utilities for interconnectors producing renewables in California and seeking to interconnect with the Gas Utilities. Elements of SRGIA include the following:

- Attachment A - Renewable Gas Interconnect Fact Sheet (and copy of Tariff)
- Attachment B - Services Agreement and Attachment
- Attachment C - Standard Renewable Gas Interconnection
- Attachment D - Agreement to Transfer Ownership
- Attachment E - Data Access Agreement

Project prerequisites as outlined in the SBPM will be captured across the procurement related contracts, the Transaction Confirmation, and the SRGIA. Any operational requirements such as those related to biomethane quality will be captured

[38] A copy of the SRGIA may be found here: https://www.swgas.com/1409184639731/FORMS_Agreements-Apps-Contracts---AL-1220_CARE-Categorical-Eligiblity_Eff-June-1-2022.pdf.

within the SRGIA, whereas attestations to contracting requirements such as use of NZE vehicles will be captured within the Transaction Confirmation or a bilateral procurement agreement. Specific supplier obligations to provide annual attestations as required per the SBPM will be captured within the Transaction Confirmation or a bilateral procurement agreement.

VII. Annual Reporting

The Decision directed the Gas Utilities to develop annual reporting as part of the progress review in meeting SB 1440 short-term and medium-term targets. Per D.22-02-025, the Gas Utilities must:

> include details of actual biomethane procurement levels, ratepayer bill impacts, incremental capital infrastructure and/or operations and maintenance costs for the prior year compared to the estimated levels that were approved in their respective RGPPs.[39]

Southwest Gas provides the below table as an example of estimated levels for each of the requested elements. The estimates were developed using the following assumptions:

a. Annual estimated biomethane targets are based on the required short-term and long-term targets. Any potential revisions to these will be evaluated in 2025 when the Commission expects to revisit the procurement targets and adjust them, as necessary, in response to market conditions.[40]
b. The total annual estimated core ratepayer bill impact is the estimated incremental cost of purchasing biomethane for all Southwest Gas core customer classes weighted across the Company's three rate jurisdictions: Southern California, Northern California, and South Lake Tahoe. The cost of biomethane is based on the Tier 3 estimated pricing for biomethane of $26/MMBtu, escalated based on the social cost of methane escalator. The estimated core ratepayer bill impact assumes a constant baseline using the 2022 currently effective rates and gas commodity costs.

[39] *Ibid*, OP 31 at pgs. 63-64.
[40] *Ibid*, at pg. 5.

c. Southwest Gas assumes all incremental capital infrastructure and Operational and Maintenance (O&M) costs will be captured in the contract price of the purchased biomethane.

	Annual Estimated RNG Procurement, MMcf	Annual Estimated Total Ratepayer Bill Impact, $/therm	Incremental Capital Infrastructure and/or O&M Costs) $/therm
2023	95	$0.0147	0
2024	191	$0.0259	0
2025	286	$0.0406	0
2026	554	$0.0821	0
2027	823	$0.1272	0
2028	1,091	$0.1756	0
2029	1,359	$0.2274	0
2030	1,630	$0.2830	0

Southwest Gas will include the estimates in its annual reporting requirements as compared to actual purchases. Southwest Gas will file annual reports starting May 1, 2024 with the following reporting requirements pursuant to D.22-12-057:

> ...details of actual biomethane procurement levels; ratepayer bill impacts; incremental capital infrastructure and/or operations and maintenance costs for the prior year compared to the estimated levels that were approved in their respective RGPPs; impacts on disadvantaged communities; related vehicle emissions; emissions regarding carbon monoxide, carbon dioxide, and hydrogen sulfide; water and air quality impacts from a state or local regulatory agency on nearby communities; air and water pollution and purpose-grown crops control standards attestation; waste byproducts used; and methane leaks and related information.[41]

[41]D.22-02-025, OP 31 at pgs. 63-64 and D.22-12-057 at pg. 16 and OP 2 at pgs. 66-67.

Southwest Gas will reevaluate its approach to calculating and capturing the required estimates and make modifications as needed to accommodate program requirements.

Attachment A

Standard Biomethane Procurement Methodology

Table of Contents

A. CPUC Decision Requiring the Creation of a Standard Biomethane Procurement Methodology (SBPM)

On February 24, 2022, the California Public Utility Commission (CPUC) issued Decision (D.) 22-02-025[1] (henceforth, the Decision) implementing Senate Bill (SB) 1440 (Hueso, 2018). The Decision ordered Southern California Gas Company, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southwest Gas Corporation (henceforth, the Joint Utilities) to hold a workshop on cost-effectiveness and to establish an SBPM, a model for assessing the cost-effectiveness of renewable natural gas (RNG) supplies, addressing feedback received at the workshop.[2] The Joint Utilities have developed the SBPM described in this document to satisfy this order, addressing workshop feedback and various requirements of the SBPM described in the Decision.

B. The Joint Utilities' SBPM

The Joint Utilities have developed an SBPM capturing many of the attributes of the cost-effectiveness test developed by NW Natural for its 2018 Integrated Resource Plan.[3] As in NW Natural's cost-effectiveness test, the SBPM compares the cost of procuring a quantity of RNG from a qualified[4] project and the cost of procuring the same amount of natural gas from conventional sources. Additionally, the SBPM considers RNG project carbon intensity (CI), costs to society at large, compliance costs under California's Cap-and-Trade regulation, and other environmental and non-monetary factors over the delivery period of the proposed RNG contract, which may be up to 15 years per the Decision.

Overall, the SBPM cost-effectiveness score consists of two main parts: the first part quantifies costs using key factors such as RNG contract price, the price of conventional natural gas, cap-and-trade compliance costs, carbon intensity, social cost of greenhouse gas (GHG) emissions, and natural gas transportation costs. The second part captures other environmental and non-monetary factors such as the environmental benefits of carbon capture, use and storage (CCUS), waste hauler zero-emission vehicles, and other benefits raised in the Decision and the SBPM workshop. The scores from each part are then combined to arrive at a final cost-effectiveness score for the project which will help prioritize projects during the project evaluation phase of SB 1440 procurement efforts. The final step in the selection of projects for procurement will be based on the criteria described in each investor-owned utility's (IOU's) Renewable Gas Procurement Plan (RGPP).

C. SBPM Prerequisites: Mandatory Conditions

Prior to being evaluated for cost-effectiveness, projects must meet all the following requirements specified in the Decision which will be enforced contractually:

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[1] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M454/K335/454335009.pdf
[2] D.22-02-025, Ordering Paragraph (OP) 1 and 2.
[3] https://edocs.puc.state.or.us/efdocs/HAH/um2030hah144246.pdf
[4] The SBPM is only applied to projects meeting a set of requirements specified in the Decision. References follow: D.22-02-025, OP 9, 10, 14, 19, 20, 22, 33, 35, 37, 38, 39, 40, 49. D.22-02-025, p. 33 requires that landfill projects must "stop accepting new organic waste and implement advanced landfill gas capture automation and monitoring technology to decrease fugitive methane emissions".

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Prerequisites	Method of Verification	Frequency
Livestock and dairy biomethane facilities that contract with a gas IOU shall operate in a manner that does not cause adverse impacts to water and air quality (OP 9)	Officer attestation that facility complies with all applicable federal, state, and local air and/or water pollution control standards or requirements, describing any incident of noncompliance, the cause, and when and how it was resolved.	Annual
Producers shall track volumetric injections of biomethane into pipelines through M-RETS (OP 10)	Officer attestation providing active M-RETS account number.	One Time
Biomethane procurement volumes procured and delivered up to 2025 will be produced from organic waste, including wood waste, diverted from landfills (OP 14)	Officer attestation that biomethane must be produced from organic waste, including wood waste, diverted from landfills.	One Time
Biomethane procurement volumes procured and delivered after 2025 may include production from a Dairy facility as long as its operation commenced after December 31, 2021 (OP 19)	Officer attestation with facility's first flow date.	One Time
Biomethane procurement volumes produced from a dairy facility and delivered after 2025 must not have an unresolved citation for violation of rules or requirements for protection of air or water quality from state or local regulatory agencies (OP 20)	Officer attestation that facility complies with all applicable federal, state, and local air and/or water pollution control standards or requirements, describing any incident of noncompliance, the cause, and when and how it was resolved.	Annual
Biomethane is not produced from purpose-grown crops (OP 22)	Officer attestation that biomethane is not produced from purpose-grown crops.	Annual
Producer agrees to limit hydrogen sulfide in gathering lines to 10 parts per million (OP 35)	Officer attestation that hydrogen sulfide is limited to 10 parts per million in gathering lines.	One Time
Producer agrees to specify in contract how tipping fees may modify contract terms, if at all (OP 37)	Officer attestation that modifying tipping fees may modify contract terms.	One Time
Producer agrees that any Class 8 trucks purchased or leased for use in the production of biomethane after the effective date of the Decision are near zero-emission (NZE) or zero-emission (ZE) vehicles (OP 38)	Officer attestation and requirement that producer will provide notification and information about new Class 8 trucks.	Annual

Producer agrees to prospectively cap on-site combustion-based generation of electricity using their own biogas beyond current generation levels (OP 39)	Officer attestation that on-site combustion generation of electricity using their own biogas is capped at current generation levels.	One Time
If facility has yet to purchase or plan and construct electric generation infrastructure, facility shall agree to use only non-combustion technologies for on-site electric generation (OP 40)	Officer attestation that only non-combustion technologies will be used for on-site electric generation.	One Time
Producer agrees to include a methane leak standard in CI accounting (OP 49)	Officer attestation showing methane leak factor included in validated CI calculator.	One Time
Medium-term (2030) procurement only: landfill facility does not accept new organic waste and is implementing advanced landfill gas capture automation and monitoring technology to decrease fugitive methane emissions (Decision, p. 33)	Officer attestation that landfill facility does not accept new organic waste and is implementing advanced landfill gas capture automation and monitoring technology to decrease fugitive methane emissions.	Annual

A project that does not meet all the pre-requisites as outlined in table above will be deemed as not qualified per the Decision and will be excluded from the contract evaluation process.

D. SBPM, Part A: Comparing Monetary Costs

Part A[5] of the SBPM scores the degree of cost-effectiveness of a project based on quantifiable, economic factors. This score is calculated as a ratio of the desired contract price of the supplier and a calculated break-even price:

$$score_A = \frac{Contract\ Price}{Break\text{-}Even\ Price}$$

The break-even price is obtained by balancing the all-in cost of RNG against the all-in cost of conventional natural gas.

$$All\text{-}In\ Cost\ of\ RNG = All\text{-}In\ Cost\ of\ Conventional\ NG$$

where the all-in costs of each include the following:

Components of All-In Cost of RNG:

1) Contractual fixed price of the RNG
2) Variable transportation costs to deliver the RNG to IOU systems
3) IOU infrastructure investment costs
4) Social Cost of GHG (based on CI)

Components of All-In Cost of Conventional Natural Gas:

1) Baseload prices of conventional natural gas for the equivalent term of the RNG contract

[5] A full explanation of the methods used in Part A is presented in the appendix.

2) Variable transportation costs to deliver conventional natural gas to IOU systems
3) Cap and trade compliance costs
4) Social Cost of GHG (based on CI)

This scoring method compares the cost of purchasing RNG from a project to the cost of alternatively purchasing conventional natural gas. As a ratio, the score also allows for the comparison of the cost-effectiveness of projects with a variety of feedstocks, carbon intensities, and sizes. Lower scores indicate the project is relatively more cost-effective than projects with higher scores.

The Decision states, "The true cost of gas procurement includes the costs to society at large due to the environmental impacts of its production."[6] The SPBM utilizes the social cost of GHG emissions, which represents the additional cost to society at large based on life-cycle analyses of each fuel, and the monetary costs of the emissions of each fuel provided by the United States Government's Interagency Working Group on Social Cost of Greenhouse Gases (IWG).[7]

E. SBPM, Part B: Other Environmental & Non-Monetary Factors

RNG production yields other costs and benefits which, although not easily quantified, are still relevant for cost-effectiveness. Part B of the SBPM accounts for the factors listed below, which receive [redacted]. The references are to ordering paragraphs in the Decision and the SBPM Workshop (WS).[8]

- Waste byproduct for any GHG-reducing use instead of landfill, e.g., soil amendment (OP 4, 42)
- Perfluoroalkyl or polyfluoroalkyl substances removed from waste byproduct (OP 4)
- Waste haulers delivering to facility use near-zero emission or zero emission vehicles (OP 5)
- CO_2 emissions into atmosphere prevented by Carbon Capture and Use or Storage projects or technology (OP 8, 41, WS)
- Project in a remote location (OP 3, 32, WS)
- Is a new project, or an expansion to an existing project (WS)

The Part B score for a project, $score_B$, decreases as a project possesses more of these benefits. Since all the benefits are [redacted] this decrease occurs in [redacted]. Thus, lower scores are preferred, indicating more benefits and therefore more cost-effective.

F. SBPM Project Score (P-Score)

Once the scores from both parts of the SBPM have been obtained, their weighted sum is the project score, the *P-Score*:

$$P\text{-}Score = [redacted] \times score_A + [redacted] \times score_B.$$

[6] D.22-02-025, p. 53, Findings of Fact 12
[7] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf
[8] See Section G.2 (Appendix: SBPM, Part B) and Attachment B to this Advice Letter.

The *P-Score* is the final output of the SBPM. A lower score, closer to zero, indicates more cost-effectiveness. These final scores are be compared between different RNG projects to prioritize procurement. All other things being equal, prioritizing supplies with lower *P-Scores* leads to more cost-effective RNG procurement. Note that the cost-effectiveness scoring provided by the SBPM is meant to serve as a key element of the contract evaluation criteria. Project feasibility, viability, and other considerations not captured by the SBPM will be considered in final contracting decisions. Any such considerations will be detailed in the respective RGPP submitted by each IOU.

G. Appendix

For clarity and ease of understanding, the previous description of the SBPM described the essentials of the methodology. This appendix provides a full description with references to supporting materials.

1. Appendix: SBPM, Part A

Part A of the SBPM scores the degree of cost-effectiveness of a project based on quantifiable, monetary factors. The components used to calculate this score are described first followed by the calculations used to combine them into $score_A$, the Part A score.

a. RNG/Biomethane Costs (RNG Cost)

The cost of RNG over the delivery period of the RNG contract can be expressed as the sum of any associated fixed costs to the IOU, contracted costs of the RNG supply, and variable transport costs to deliver gas to the IOU's system[9] as follows,

$$R(P^*) = X + \sum_t (P^* + Y_t^{RNG}) Q_t,$$

where R is the cost of RNG over the delivery period of the RNG contract, X(\$) is the IOU infrastructure investment cost over the delivery period of the RNG contract (if applicable), P^*(\$/MMBtu) is the contractual fixed price of the RNG to be solved for, Y_t (\$/MMBtu) is the short-term variable transport cost to deliver RNG to IOU's system over the delivery period of the RNG contract, Q_t (MMBtu/month) is the contractual quantity of RNG supplied per month over the delivery period, and t is the index of time in months.

b. Conventional Natural Gas Costs (Conventional NG Cost)

The cost of conventional natural gas can be expressed as the sum of the costs of the natural gas supply, the variable transport costs to deliver the gas to the IOU's system, and the sum of the costs of emissions compliance under California's Cap and Trade regulation (costs of California Carbon Allowances (CCAs)) as follows,

$$C = \sum_t (V_t + Y_t^{conv} + NG_t) Q_t,$$

where C(\$) is the cost of conventional natural gas over the delivery period of the RNG contract, V_t (\$/MMBtu) is the short-term price of the baseload conventional natural gas over the delivery period of the RNG contract, Y_t (\$/MMBtu) is the short-term variable transport cost to deliver conventional natural gas to IOU's system over the delivery period of the RNG contract, N(0.05307 MT CO_2e/MMBtu) is the GHG emissions from combusting a unit of natural gas per Cap-and-Trade rules, G_t (\$/MT CO_2e) is the short-term price of CCAs over the delivery period of the RNG contract, Q_t (MMBtu/month) is the contractual quantity of the RNG supplied over the delivery period, and t is the index of time in months.

Where appropriate, the SBPM risk-adjusts the conventional natural gas prices and CCA prices. Market prices for conventional natural gas and CCAs have quantifiable risks of deviations from their

[9] No costs associated with compliance with California's Cap and Trade Regulation are calculated here. RNG supplies from within California are exempt from California's Cap and Trade regulation.

expected values (i.e., forward curves). When performing risk adjustment, we model these prices as random variables and calculate the [redacted] percentile of the overall cost of the conventional natural gas supply from their probability distributions.[10] This [redacted] percentile cost is then combined with the expected cost in a weighted sum to arrive at the risk-adjusted conventional natural gas cost as,

$$rC = (1-p) * C + p * [redacted]\,percentile\ of\ prob.dist.of\ C$$

where $p \epsilon [0,1]$ is the weight of the risk adjustment. For reference, NW Natural uses a similar risk adjustment approach with $p = 0.25$. In the SBPM, each individual IOU selects a weight of the risk adjustment based their own risk assessment process.

c. Social Cost of GHG

There are costs associated with natural gas that are beyond the market-based costs found in contracts for RNG and conventional natural gas transactions. This is recognized in the Decision, which states, "The true cost of gas procurement includes the costs to society at large due to the environmental impacts of its production."[11] The Social Cost of GHG represents the costs to society as a whole resulting from the life-cycle GHG emissions of conventional and renewable natural gas.

The Social Cost of GHG can be used in the SBPM, as presented in the main body of this document, by adding it to both the RNG and conventional natural gas costs to get the all-in costs for both. Since, by definition, RNG will always have a CI that is lower than conventional natural gas,[12] we can take the difference of the social costs of conventional natural gas and RNG to express the benefit of displacing conventional gas with renewable gas as so,

$$Social\ Cost\ of\ GHG = \underset{Social\ Cost\ of\ GHG}{Conventional\ NG} - \underset{Social\ Cost\ of\ GHG}{RNG}.$$

In this form the Social Cost of GHG is interpreted as the life-cycle benefit to society from displacing conventional natural gas with RNG.[13]

To calculate this form of the Social Cost of GHG for a given year, the difference in the carbon intensity between conventional natural gas supply and the candidate RNG supply is calculated in terms of metric tons of CO_2 equivalent ($MTCO_2e$) emissions per dekatherm. For a project without a CI score, the current CA-GREET model for the LCFS program can calculate an indicative CI using the various simplified CI calculators. The calculated CI of the project can then be compared to the respective CI of conventional natural gas (Lookup Table Pathways (Table 7-1)[14]) for comparison. As stated above, the difference of the two CI's represents the life-cycle benefit to society of the displacement of conventional natural gas by RNG. This benefit is then multiplied by the quantity of RNG to be supplied to arrive at the

[10] These distributions can be calculated via Monte Carlo methods or other methods such as historical simulation.
[11] D.22-02-025, p. 53, Findings of Fact 12
[12] American Gas Foundation, "Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment", p.1, https://gasfoundation.org/wp-content/uploads/2019/12/AGF-2019-RNG-Study-Full-Report-FINAL-12-18-19.pdf
[13] https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation
[14] California Air Resources Board Lookup Table Pathways (Table 7-1) available at https://www.arb.ca.gov/fuels/lcfs/ca-greet/lut.pdf?_ga=2.82944479.836877858.1654481394-1461991828.1648240563.

reduction in GHG emissions, measured in $MTCO_2e$. The dollar impact of this reduction is calculated by applying the social cost of CO_2 emissions per $MTCO_2$ as provided by the U.S. Government's Interagency Working Group on Social Cost of Greenhouse Gases (IWG).[15] The social costs calculated by the IWG assume a [redacted] discount rate is used and risk-adjusted. For candidate contracts beginning later than the IWG base year, the social costs are adjusted for inflation using the annual GDP Implicit Price Deflator.

The calculation of the risk-adjusted Social Cost of GHG (SC-GHG) for year *T* is,

$$rSC\text{-}GHG_T = (CI^{CONV} - CI^{RNG}) \times \left[\begin{matrix} conversion \\ factor \end{matrix} : \frac{gCO_2e}{MJ} \rightarrow \frac{MTCO_2e}{Dth} \right] \times Q_T \times r(SC\text{-}CO_2)_T$$

where CI (gCO_2e/MJ) is the carbon intensity, Q_T (MMBtu/year) is the contractual quantity of the RNG over the delivery period, and $r(SC\text{-}CO_2)$ ($/MT CO_2) is the risk-adjusted IWG social cost of CO_2, adjusted for inflation.

Landfills are not able to capture all their methane emissions. Both the EPA and the current CA-GREET model assume that 75% of this methane is captured. More recent data on methane point sources suggests that the capture rate may be lower.[16] Consequently, the social cost of methane will be used to quantify the additional societal benefit of the avoided methane venting from [redacted] of the RNG volume produced from a landfill's diverted organic waste. To capture this benefit, the calculation of the risk-adjusted Social Cost of GHG (SC-GHG) for year *T* is the following:

$$rSC\text{-}GHG_T = (CI^{CONV} - CI^{RNG}) \times \left[\begin{matrix} conversion \\ factor \end{matrix} : \frac{gCO_2e}{MJ} \rightarrow \frac{MTCO_2e}{Dth} \right] \times Q_T \times r(SC\text{-}CO_2)_T + [redacted] \times Q_T \times r(SC\text{-}CH_4)_T.$$

Note that this equation only applies to diverted organic waste feedstock and only until a new GREET model has been developed to capture the benefit.

As with conventional natural gas supply, risk-adjustment may be applied to the social cost calculations. The risk-adjusted IWG social cost of both CO_2 and CH_4 are given by,

$$r(SC\text{-}GHG)_T = (1-p) * (SC\text{-}GHG)_T + p * [redacted]\ percentile\ of\ freq.dist.of\ (SC\text{-}GHG)_T$$

where,

$$SC\text{-}GHG = \begin{cases} SC\text{-}CO_2\ for\ carbon\ dioxide\ emissions \\ SC\text{-}CH_4\ for\ methane\ emissions \end{cases}.$$

[15] Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, p. 24, Table 1 and Table 2. https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

[16] Duren, R.M., Thorpe, A.K., Foster, K.T. et al. California's methane super-emitters. Nature 575, 180–184 (2019). https://doi.org/10.1038/s41586-019-1720-3

The [redacted] percentiles of the social costs of GHGs are taken from the IWG's table for social costs of the GHGs and represent the [redacted] percentile of the IWG estimates based on a [redacted] discount rate.[17] Because the IWG provides yearly social costs of the GHGs that are adjusted to year 2020 values while all other values in the SBPM are in their nominal/future-valued (FV) forms, the IWG social costs of these GHGs are adjusted to their future values. These adjustments are made using inflation forecasts of the annual GDP Implicit Price Deflator.[18] These values are then summed to arrive at the risk-adjusted Social Cost of GHG as,

$$rSC\text{-}GHG = \sum_T FV(rSCGHG)_T.$$

d. SBPM, Part A Score Calculation

The final calculation of Part A of the SBPM combines the previously described components to calculate the degree of cost-effectiveness of the candidate RNG supply. The degree of cost-effectiveness is calculated by solving the below equality for the break-even RNG contract price *P**,

$$R(P^*) = rC + rSC\text{-}GHG.$$

Using the proposed RNG contract price *P*, and the break-even RNG contract price *P**, the cost-effectiveness score for Part A can be calculated by,

$$score_A = \frac{P}{P^*}.$$

RNG supplies with lower proposed contract prices relative to their calculated *P** have lower scores, indicating more cost-effectiveness. As a ratio, the score also allows for the comparison of the cost-effectiveness of projects with a variety of feedstocks, carbon intensities, and sizes. Like prices for consumers, lower scores are better, indicating increased cost-effectiveness compared to higher scores.

2. Appendix: SBPM, Part B

RNG production may yield important benefits which, although not easily quantified, are still relevant for cost-effectiveness and procurement prioritization. Part B of the SBPM accounts for the below set of such benefits and [redacted].

SBPM Part B	Method of Verification	Frequency
Waste byproducts are used for any GHG-reducing use instead of landfill, e.g., soil amendment (OP 4, 42)	Officer attestation with regulatory reports on waste byproducts	Annual

[17] Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, p. 24, Table 1 and Table 2. https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

[18] The annual GDP Implicit Price Deflator values in the U.S. Bureau of Economic Analysis' (BEA) NIPA Table 1.1.9 are a part of the inflation adjustment.

Perfluoroalkyl or polyfluoroalkyl substances removed from waste byproduct (OP 4)	Officer attestation with regulatory reports on Perfluoroalkyl or polyfluoroalkyl substances	Annual
Waste haulers delivering to facility use near-zero emission or zero emission vehicles (OP 5)	Officer attestation that waste haulers delivering to facility use near-zero emission or zero emission vehicles	Annual
CO_2 emissions into atmosphere prevented by Carbon Capture and Use or Storage projects or technology (OP 8, 41, WS)	Officer attestation with regulatory reports on Carbon Capture and Use or Storage projects or technology	Annual
Project in a remote location (OP 3, 32, WS)	Officer attestation that the project is not within an HCA (per 49 CFR § 192.903) replacing 1000m for the distance	One Time
Is a new project, or an expansion to an existing project (WS)	Officer attestation that the facility is new or an expansion project	One Time

The weighted values of the benefits provided by an individual project are then summed to arrive at a score for the project, S. The maximum weighted possible score (i.e., maximum possible value of S) is denoted by S_{max}. Part B then calculates as,

$$score_B = 1 - \frac{S}{S_{max}}.$$

$score_B$ can range from 1, for projects with none of the above benefits, to 0, for projects with the maximum number of the above benefits. A lower score indicates more benefits and therefore, a higher degree of cost-effectiveness. [redacted] of $score_B$.

3. Appendix: SBPM Project Score (P-Score)

Once the scores from both parts of the SBPM have been obtained, their weighted sum is the project score, the *P-Score*:

$$P\text{-}Score = [redacted] \times score_A + [redacted] \times score_B .$$

The *P-Score* is the final output of the SBPM. A lower score, closer to zero, indicates more cost-effectiveness. The *P-Scores* can be compared for different RNG supplies to prioritize contracting. Note that the cost-effectiveness scoring provided by the SBPM is meant to serve as key element of the contract evaluation criteria. Project feasibility, viability and other considerations not captured by the SBPM will be considered in final contracting decisions. Any such considerations will be detailed in the respective RGPP submitted by each IOU.