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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Oversight of Electric Integrated Resource Planning and Related Procurement Processes.	R.25-06-019 (Filed June 26, 2025)

CLEANPOWERSF 2026 INTEGRATED RESOURCE PLAN

(PUBLIC VERSION)

DAVID CHIU
City Attorney
THERESA L. MUELLER
WILLIAM ROSTOV
Deputy City Attorneys

Attorneys for:
CITY AND COUNTY OF SAN FRANCISCO
1 Dr. Carlton B. Goodlett Place, Room 234
San Francisco, CA 94102-4682
Telephone: (415) 554-4700
Facsimile: (415) 554-4763
Email: william.rostov@sfcityatty.org

Dated: August 10, 2026

In compliance with the January 16, 2026 California Public Utilities Commission's ("Commission") *Administrative Law Judge's Ruling Setting Requirements for Individual Integrated Resource Plan Due June 1, 2026,* and the March 3, 2026 *Administrative Law Judge's Ruling Correcting Table in January 16, 2026 Filing Requirements Ruling and Confirming August 10, 2026 Integrated Resource Plan Due Date*, CleanPowerSF hereby submits its 2026 Integrated Resource Plan ("IRP") and related documents to the Commission for certification. Attached to this filing is CleanPowerSF's 2026 IRP (Narrative Template) and its two Appendices: 1) Appendix A – CleanPowerSF Resource Data Template; and 2) Appendix B – CleanPowerSF Clean System Power Calculator.

CleanPowerSF appreciates the opportunity to participate in the Commission's planning process, support statewide electric reliability, and contribute to achieving California's greenhouse gas reduction goals for the electric sector. CleanPowerSF respectfully requests the Commission certify its 2026 IRP.

Dated: August 10, 2026

Respectfully submitted,

DAVID CHIU
City Attorney
THERESA L. MUELLER
Chief Energy and Telecommunications Deputy
WILLIAM ROSTOV
Deputy City Attorney

By: /s/
WILLIAM ROSTOV

Attorneys for
CITY AND COUNTY OF SAN FRANCISCO
City Hall Room 234
1 Dr. Carlton B. Goodlett Place
San Francisco, California 94102-4682
Telephone: (415) 554-4700
E-mail: william.rostov@sfcityatty.org

VERIFICATION

I, Cheryl Taylor, am authorized to make this Verification on behalf of CleanPowerSF. I declare under penalty of perjury that the statements in the foregoing 2026 CleanPowerSF Integrated Resource Plan Compliance Filing are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

Executed August 10, 2026, at San Francisco, California.

By: _____

Cheryl Taylor
Operations Manager
CleanPowerSF
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 7th Floor
San Francisco, CA 94102
Email: ctaylor@sfwater.org





CleanPowerSF

2026 INTEGRATED RESOURCE PLAN

August 10, 2026

(Public Version, Redacted)

I. Executive Summary 3
II. Study Design 6
a. Objectives 8
b. Methodology 9
i. Modeling Tool(s) 9
ii. Modeling Approach 10
iii. Alternative Assumptions 12
III. Study Results 16
a. Conforming and Alternative Portfolios 16
b. Preferred Conforming Portfolio 27
c. GHG Emissions Results 31
d. Local Air Pollutant Minimization and Disadvantaged Communities 32
i. Local Air Pollutants 32
ii. Focus on Disadvantaged Communities 33
e. Cost and Rate Analysis 42
f. System Reliability Analysis 44
g. Existing Resource Planning 46
h. Hydro Generation Risk Management 47
i. Long-Duration Storage Planning 48
j. Clean Firm Power Planning 49
k. Non-CAISO, including Out-of-State, Wind Planning 54
l. Offshore Wind Planning 55
m. Transmission Planning 56
IV. Action Plan 58
a. Proposed Procurement Activities and Potential Barriers 58
i. Resources to meet IRP mandated procurement requirements, including D.21-06-035 and D.23-02-040: 60
ii. Plans for resources that are currently non-candidate in CPUC's IRPs not described above 63
iii. Other renewable and/or zero carbon resources not described above 63
iv. Other energy storage not described above 63
v. Other demand response not described above 63
vi. Other energy efficiency not described above 63
vii. Other distributed generation not described above 63

viii. Transportation electrification, including any investments that correspond to different levels than what is included in Integrated Energy Policy Report (IEPR) 63
ix. Building electrification, including any investments that correspond to different levels than what is included in Integrated Energy Policy Report (IEPR) 64
x. Potential Centralized Procurement, pursuant to AB-1373 64
xi. Other 65
b. Disadvantaged Communities (DACs) 65
c. LSEs' Tribal Customers 66
d. Procurement Products 66
e. Commission Direction of Actions 67
V. Lessons Learned 68

I. Executive Summary

The City and County of San Francisco (City or San Francisco) has long championed clean energy, adopting numerous policies and programs to advance its climate and clean-energy goals. The San Francisco Public Utilities Commission (SFPUC) is the City's department responsible for managing energy supplies.[1] CleanPowerSF is the City's Community Choice Aggregation (CCA) program operated by the SFPUC.

When it launched CleanPowerSF, the SFPUC adopted the following goals for the development and operation of the program:

1) Provide affordable and reliable service;
2) Offer cleaner energy alternatives;
3) Invest in local renewable projects and jobs; and
4) Ensure long-term rate and financial stability.

Today, CleanPowerSF serves nearly 390,000 customer accounts and provides San Francisco with an annual energy requirement of approximately 3,000 gigawatt-hours (GWh). CleanPowerSF currently offers three levels of supply service: (1) Green, the default service, which contains at least 60 percent California Renewables Portfolio Standard (RPS)-eligible renewable energy; (2) SuperGreen, a premium option, which offers 100 percent RPS-eligible renewable energy, and (3) SuperGreen Saver, CleanPowerSF's branded Disadvantaged Communities-Green Tariff (DAC-GT) Program, which offers qualified customers a 20 percent discount on 100 percent RPS-eligible renewable energy. The San Francisco Environment Code directs the SFPUC to continue providing San Franciscans with a 100% renewable and/or greenhouse gas (GHG)-free electricity supply.[2]

This Integrated Resource Plan (IRP) will guide CleanPowerSF's resource development and procurement activities for achieving its program goals. It also fulfills CleanPowerSF's obligation to prepare and file an IRP for review by the California Public Utilities Commission (CPUC). The adopted portfolio meets the requirements set by the Administrative Law Judge's Ruling on January 16, 2026 which set load forecasts, GHG benchmarks, and filing requirements for the 2024–2026 IRP cycle.[3]

For this IRP, CleanPowerSF developed one Conforming Portfolio, referred to as the "100% Renewable Case," and evaluated two additional time-coincident clean-energy sensitivities beginning in

[1] San Francisco Charter, Sec 4.112.

[2] San Francisco Environment Code, Sec 902. CleanPowerSF achieved its 100% renewable and/or GHG free electricity goal by 2023, a goal it continues to achieve in 2024, and 2025. In 2025, CleanPowerSF's Green product contained 84% RPS-eligible electricity. For details, please review CleanPowerSF's Draft 2026 Renewables Portfolio Standard Procurement Plan at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M608/K733/608733912.PDF. [accessed July 30, 2026]

[3] Administrative Law Judge's Ruling Setting Requirements for Individual Integrated Resource Plans Due June 1, 2026, Jan. 16. 2026 (ALJ Jan. 16, 2026 Ruling). https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M595/K085/595085015.PDF. [accessed on July 30, 2026]

2030 and 2035. On July 14, 2026, the San Francisco Public Utilities Commission approved CleanPowerSF's 2026 Integrated Resource Plan, including adoption of the 100% Renewable Case as CleanPowerSF's Preferred Conforming Portfolio.[4]

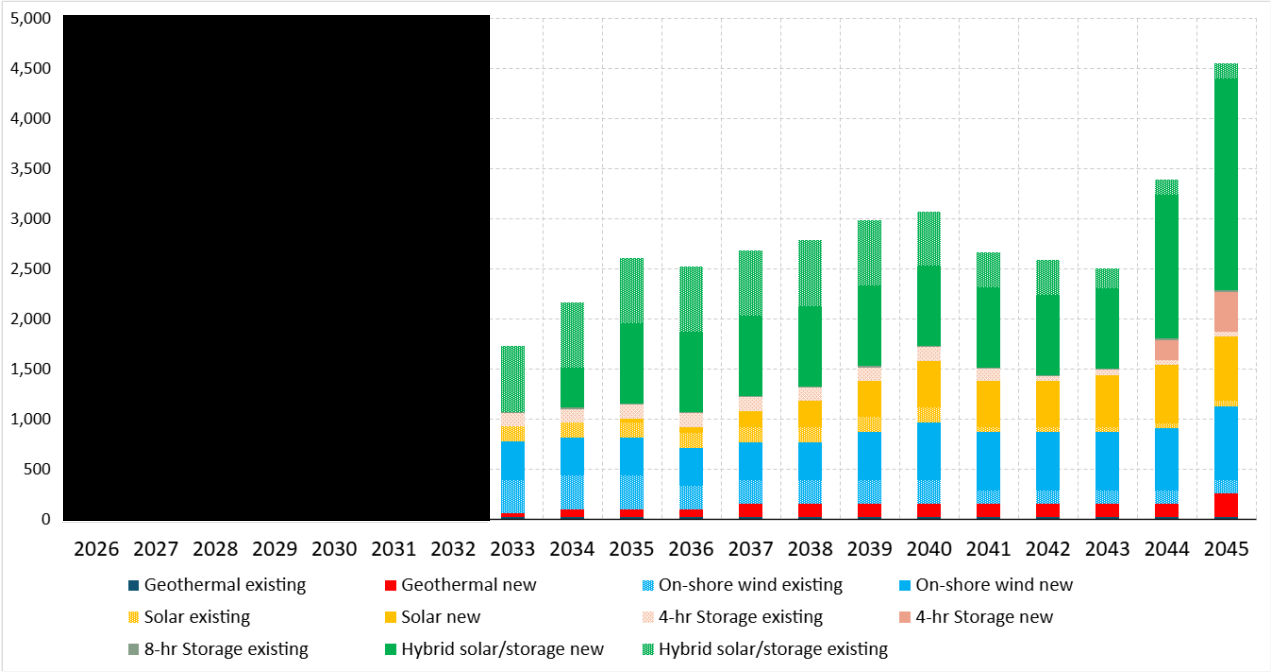
All three cases used the CPUC-assigned load forecast and were designed to satisfy applicable state requirements and City clean-energy goals. The sensitivities required at least 90 percent hourly matching of retail demand with RPS-eligible or zero-GHG-emitting supply, including 100 percent matching during applicable peak hours. CleanPowerSF selected the 100% Renewable Case as its Preferred Conforming Portfolio ("PCP") because it provided the best balance of affordability, clean-energy performance, reliability, local-resource opportunities, procurement feasibility, and long-term rate stability. The sensitivities are not submitted as separate Conforming or Alternative Portfolios and their results are discussed only to explain the selection of the PCP.

The portfolio adopted by this IRP identifies 4,140 MW of prospective new capacity through 2045— [redacted] classified as Review and [redacted] classified as Planned New—and a diverse mix of resources to meet the IRP's requirements. Solar and four-hour battery storage constitute the majority of the modeled additions, while the PCP also includes substantial quantities of onshore wind and geothermal, particularly through 2035. Figure 1 summarizes the timing of the modeled portfolio capacity.

The scale and pace of procurement identified in this plan represent a significant increase from prior CleanPowerSF IRPs. Near-term procurement is driven primarily by rapid growth in CleanPowerSF's CPUC-assigned load forecast, while medium- and long-term procurement is driven increasingly by more stringent GHG emissions requirements and the need to replace expiring contracts.

4 SFPUC Resolution 26-0113, July 14, 2026.
https://sfpuc.sharefile.com/share/view/sacfc86b9dc8f4b418323ab9f8aaea0b4. [accessed on July 30, 2026]

Figure 1: CleanPowerSF 100% Renewable Preferred Portfolio Total Capacity by Year (MW)



As shown in Figure 1, cumulative prospective new additions reach [redacted] by 2030, 1,300 MW by 2035, and 1,980 MW by 2040. Approximately 51 percent of the 4,140 MW buildout occurs in 2044 and 2045, which are required to meet CleanPowerSF's GHG benchmark. The PCP results in a net-cost net present value of approximately $4.903 billion and an average net portfolio cost of approximately $91.66/MWh over the planning horizon.

The Clean System Power Calculator results show that the PCP remains below CleanPowerSF's assigned GHG emissions benchmark in each applicable benchmark year. After evaluating the effective capacity of its Online, Development, Review, and Planned New resources, behind-the-meter photovoltaic capacity, and applicable capacity allocations, the analysis shows CleanPowerSF will meet its annual reliability requirements.

The Action Plan describes the activities CleanPowerSF will pursue to implement the PCP. These activities include issuing a solicitation by the end of 2026 and continuing to evaluate Bay Area solar and local storage opportunities on City-owned property in San Francisco and throughout the nine Bay Area counties. The PCP also identifies potential future additions of in-state solar, paired and standalone energy storage, in-state and out-of-state wind, and geothermal resources. CleanPowerSF will reassess the timing and quantity of later-year additions through future IRPs and procurement processes as load, costs, project availability, transmission conditions, and regulatory requirements evolve. The Action Plan also describes CleanPowerSF's progress toward its D.21-06-035, D.23-02-040, and D.26-02-057

procurement obligations, other planned procurement activities, and programs serving disadvantaged communities.

Section II describes CleanPowerSF's planning objectives, modeling tools and approach, and alternative assumptions. Section III presents the PCP and its GHG, local air-pollutant, disadvantaged-community, cost, rate, and reliability results, and planning considerations for existing resources, hydro generation, long-duration storage, clean firm power, out-of-state wind, offshore wind, and transmission. Section IV identifies procurement activities and barriers for mandated procurement, other supply and demand-side resource categories, transportation and building electrification, and potential centralized procurement, and also addresses disadvantaged communities, tribal customers, procurement products, and Commission-directed actions. Section V summarizes lessons learned and how they will inform future resource planning and procurement.

The IRP is a cyclical process, and all load-serving entities (LSEs) including CCAs such as CleanPowerSF are required to update their IRP on a timeline as required by the CPUC. CleanPowerSF will update this IRP and adapt its procurement preferences to future changes in technology, market conditions, regulatory requirements and other factors to ensure it is able to consistently offer its customers clean, reliable, and affordable electricity supply services.

II. Study Design

CleanPowerSF evaluated resource portfolios over the 2026 through 2045 planning horizon to identify a reliable, cost-effective, and procurement-feasible portfolio that meets applicable state requirements and supports San Francisco's clean energy objectives. CleanPowerSF used CPUC-provided forecasts, inputs, and assumptions where required and CleanPowerSF-specific assumptions where permitted by the IRP filing requirements.

This section describes CleanPowerSF's assigned load forecast and GHG emissions benchmark, planning objectives, modeling tools and analytical process, principal modeling requirements and constraints, and assumptions that differ from the CPUC's 2025 Inputs and Assumptions.

Load Assignments for each LSE

CleanPowerSF used the annual energy, peak demand, and behind-the-meter photovoltaic (BTM PV) forecasts assigned by the CPUC pursuant to the ALJ's Jan. 16, 2026 Ruling finalizing load forecasts and GHG emissions benchmarks for the 2026 IRP cycle. These assigned values establish the annual energy volumes, peak demand, and BTM PV assumptions used in CleanPowerSF's Conforming Portfolio analysis. Table 1 summarizes CleanPowerSF's assigned annual load forecast used for IRP modeling.

Table 1: CleanPowerSF Assigned IRP Load Forecast, 2026–2045

Year	CPUC Load Assignment (GWh)
2026	3,382
2027	3,509
2028	3,839
2029	4,029
2030	4,249
2031	4,448
2032	4,669
2033	4,900
2034	5,140
2035	5,382
2036	5,575
2037	5,749
2038	5,904
2039	6,047
2040	6,175
2041	6,287
2042	6,398
2043	6,495
2044	6,566
2045	6,625

CleanPowerSF retained the CPUC-assigned annual energy, peak demand, and BTM PV values for its Conforming Portfolio. CleanPowerSF developed a custom hourly load shape, however, to better reflect the expected composition and operating characteristics of its assigned load. The custom shape changes only the hourly distribution of the assigned demand; it does not change CleanPowerSF's assigned annual energy or peak-demand values.

The final hourly profile reflects CleanPowerSF's historical customer demand, anticipated building and transportation electrification, weather sensitivity, and the portion of the CPUC-assigned forecast attributed to data center demand. The methodology and data sources used to develop this profile are described in Section II.b.iii, Alternative Assumptions.

Required and Optional Portfolios

CleanPowerSF is submitting one Conforming Portfolio: its 8 million metric tons (MMT) by 2045 PCP. The submitted portfolio uses CleanPowerSF's CPUC-assigned load forecast and is designed to achieve emissions equal to or below CleanPowerSF's assigned share of the statewide 8 MMT by 2045 GHG planning target.

CleanPowerSF evaluated additional modeling sensitivities to understand the cost, reliability, market-exposure, and procurement implications of alternative clean-energy requirements and implementation schedules. These sensitivities informed the selection of the Preferred Conforming Portfolio but are not being submitted as separate Conforming or Alternative Portfolios. The sensitivities included cases requiring at least 90 percent time-coincident clean-energy matching beginning in either 2030 or 2035. Under each case, portfolio supply was required to serve at least 90 percent of retail demand with RPS-eligible or zero-GHG-emitting electricity beginning in the applicable year. All cases began with the same CPUC-assigned annual energy and peak-demand forecast. Differences among the cases were limited to the hourly load treatment or additional portfolio constraints described in Sections II.b.ii and II.b.iii.

CleanPowerSF is submitting the required Narrative Template, Resource Data Template (RDT), and Clean System Power (CSP) Calculator for its PCP.

GHG Emissions Benchmark

The ALJ Jan. 16, 2026 Ruling assigned CleanPowerSF a GHG emissions benchmark of 0.1495 MMT CO_2 per year based on the CPUC's statewide electric-sector planning target of 8 MMT by 2045. The benchmark represents the maximum level of portfolio emissions allowable for CleanPowerSF under the CPUC's IRP planning framework.

CleanPowerSF used the CSP Calculator methodology to estimate portfolio GHG emissions over the planning horizon. The CSP Calculator accounts for emissions associated with system power and other applicable supply categories, including CleanPowerSF's allocated share of CAISO-wide in-front-of-the-meter combined heat and power (IFM CHP) generation. The PCP's GHG emissions results and comparison with CleanPowerSF's assigned benchmark are presented in Section III.c.

a. Objectives

CleanPowerSF's resource planning is guided by applicable state requirements, policies established by the City and County of San Francisco, and the SFPUC's adopted program goals for CleanPowerSF.

The SFPUC established four overarching goals for the CleanPowerSF program:

1. Lead with affordable and reliable service.
2. Provide cleaner electricity alternatives.
3. Invest in local renewable projects and local jobs, where cost-effective.
4. Provide for long-term rate and financial stability.

San Francisco has also adopted policies supporting a transition to a renewable and GHG-free electricity supply. These include the City's fossil-free and zero-GHG electricity goals, the SFPUC's

renewable-energy targets for CleanPowerSF's retail products, and the City's objective of serving CleanPowerSF customers with 100 percent renewable and/or GHG-free electricity on an annual basis.[5]

Within this policy framework, CleanPowerSF's principal analytical objectives for the 2026 IRP were to:

- serve the annual energy and peak demand assigned to CleanPowerSF by the CPUC;
- meet or remain below CleanPowerSF's assigned 8 MMT by 2045 GHG emissions benchmark;
- satisfy applicable renewable-energy and long-term contracting requirements, including the 60 percent RPS requirement by 2030 and the statutory requirement applicable to long-term RPS procurement;
- contribute CleanPowerSF's fair share toward near- and long-term system reliability;
- support CleanPowerSF's annual renewable and/or GHG-free electricity objective;
- identify a diverse and commercially feasible mix of resources;
- minimize unreasonable customer cost impacts and exposure to volatile market purchases or sales; and
- preserve flexibility to respond to changes in load, project availability, technology costs, transmission conditions, and regulatory requirements.

The analysis was intended to identify a long-term planning portfolio rather than to predetermine individual procurement decisions. Specific procurement will continue to be evaluated through CleanPowerSF's established solicitation, risk-management, financial-review, and public-approval processes.

b. Methodology

i. Modeling Tool(s)

CleanPowerSF used the PowerSIMM modeling platform developed by Ascend Analytics to develop and evaluate its PCP. PowerSIMM version 5.12.0 was used to represent CleanPowerSF's existing and potential future resource portfolio over the 2026 through 2045 planning horizon.

PowerSIMM's Automated Resource Selection (ARS) module was used for capacity-expansion analysis. ARS evaluates candidate resource additions and identifies a cost-minimizing portfolio that satisfies the inputs, requirements, and constraints specified by the modeler. CleanPowerSF and Ascend configured ARS using CleanPowerSF's assigned load, existing and contracted resources, candidate resource options, market and resource-cost assumptions, operating characteristics, and applicable regulatory and CleanPowerSF-specific planning constraints.

After ARS identified candidate resource portfolios, CleanPowerSF and Ascend used PowerSIMM's chronological hourly dispatch and production-cost capabilities to evaluate portfolio operations. The hourly analysis represented renewable generation, storage charging and discharging, customer demand, market purchases and sales, resource performance, and portfolio cost over the planning horizon.

[5] San Francisco Environment Code, Sec 902.

PowerSIMM's ARS module is similar to the CPUC's RESOLVE model in that both tools optimize future resource selections while satisfying modeled planning requirements. The principal difference is the scale and application of the analysis. RESOLVE is used by the CPUC to evaluate systemwide resource needs and generally represents operations using selected representative periods. CleanPowerSF configured PowerSIMM to evaluate its individual load and supply portfolio using chronological hourly operations. This structure provides additional visibility into the relationship among CleanPowerSF's hourly load, renewable-generation profiles, storage dispatch, market transactions, and CleanPowerSF-specific constraints.

The CPUC uses the Strategic Energy Risk Valuation Model (SERVM) to evaluate system reliability and production-cost outcomes after a portfolio has been developed through RESOLVE. PowerSIMM was used for a comparable post-selection purpose at the LSE level by evaluating hourly operations, production costs, and portfolio performance under varying weather and market conditions. PowerSIMM should therefore be understood as an LSE-specific planning framework used to supplement—not replace—the CPUC's systemwide RESOLVE and SERVM analyses.

ii. Modeling Approach

CleanPowerSF and Ascend used an iterative modeling process consisting of input development, capacity expansion, hourly portfolio evaluation, sensitivity analysis, and post-processing.

First, CleanPowerSF and Ascend developed the inputs needed to represent CleanPowerSF's assigned load, existing and contracted resources, candidate resource technologies, generation profiles, storage characteristics, resource costs, market-price forecasts, transmission and import assumptions, reliability needs, and applicable policy requirements.

Second, Ascend used PowerSIMM's ARS to identify new resource additions that minimized the cost of procuring and operating CleanPowerSF's portfolio while satisfying the modeled requirements and constraints. Existing and contracted resources were represented according to their expected online dates, capacity, operating characteristics, and contract terms.

Third, CleanPowerSF and Ascend evaluated the portfolios using chronological hourly dispatch and production-cost analysis. This analysis assessed portfolio operations during periods of high load, low renewable production, and other conditions relevant to cost, reliability, storage operation, and market exposure.

Fourth, CleanPowerSF evaluated sensitivity cases to understand the implications of alternative hourly load shapes, more restrictive time-coincident clean-energy requirements, and different implementation schedules. These cases were used to assess tradeoffs among cost, reliability, clean-energy performance, procurement feasibility, and over- or under-procurement risk.

Finally, CleanPowerSF and Ascend post-processed the model outputs to develop annual and cumulative portfolio-cost metrics, resource-build summaries, market-purchase and market-sale results, emissions inputs, reliability information, and the data needed for the RDT, CSP Calculator, and Narrative Template. The principal fixed inputs used to develop the PCP are summarized in Table 2.

Table 2: Principal Fixed Modeling Inputs

Requirement, Input, or Constraint	Classification	Treatment in CleanPowerSF's Analysis
CPUC-assigned annual energy forecast	Fixed input	Annual retail load was fixed to the values assigned in the January 16, 2026 ALJ ruling for each study year.
CPUC-assigned peak demand and BTM PV	Fixed inputs	Assigned peak-demand and BTM PV values were retained for the Conforming Portfolio.
Data Center Adjusted hourly load shape	CleanPowerSF-specific assumption	Assigned annual energy and peak values were distributed hourly using CleanPowerSF's custom load profile, as described in Section II.b.iii.
Existing resources currently online	Fixed input	Online resources were represented according to contracted capacity, operating characteristics, and remaining contract term.
Contracted resources under development or not yet online	Fixed input / committed resource	Contracted and in-development resources were represented according to expected capacity, online date, operating characteristics, and contract term.

Portfolio Cases and Sensitivities

CleanPowerSF developed one PCP for submission in this IRP. The portfolio was developed using CleanPowerSF's assigned annual load and peak demand, the Data Center Adjusted hourly load profile, existing and contracted resources, candidate-resource assumptions, and the regulatory and CleanPowerSF-specific requirements described above.

During portfolio development, CleanPowerSF evaluated several sensitivities to test how alternative assumptions and more aggressive clean-energy requirements could affect resource selection, portfolio

cost, market exposure, reliability, and procurement feasibility. These analyses were used to evaluate tradeoffs, identify key portfolio drivers, and support selection of the submitted PCP.

The sensitivities included cases requiring at least 90 percent time-coincident clean-energy matching beginning in either 2030 or 2035, in addition to the applicable peak-hour clean-energy requirement. CleanPowerSF also evaluated sensitivities such as extending existing contracts, different resource limits and availability, as well as additional time-coincident constraint parameters.

The sensitivity results indicated that more restrictive time-coincident portfolios required additional resource development, and on a more aggressive timescale. This resulted in increased portfolio costs by 24 to 31 percent and increased exposure to market sales. CleanPowerSF considered these results, together with emissions, reliability, resource diversity, procurement feasibility, and exposure to over- or under-procurement, when finalizing the PCP. The sensitivity analyses are not submitted as separate Conforming or Alternative Portfolios.

iii. Alternative Assumptions

CleanPowerSF used CPUC-provided inputs and assumptions where required. The principal CleanPowerSF-specific assumptions that differ from, or provide additional detail beyond, the CPUC's 2025 Inputs and Assumptions relate to:

- development of a custom hourly load shape, including treatment of data center demand within the assigned load forecast;
- hourly renewable-generation profiles;
- resource-cost forecasts; and
- forecasts of wholesale energy prices and the value of resource adequacy, renewable energy credits, and other market products.

These assumptions were used to better represent CleanPowerSF's customer demand characteristics, the operating profile of available resources, current procurement conditions, and the market costs and revenues relevant to CleanPowerSF's portfolio. They did not change the annual energy, peak demand, behind-the-meter photovoltaic, or GHG benchmark assigned by the CPUC.

Hourly Load Shape Assumptions

CleanPowerSF developed a custom hourly load profile rather than relying exclusively on the default CSP Calculator shape. CleanPowerSF derived the profile from internal load-forecasting methodology and used this to distribute the CPUC-assigned annual demand across the hours of each study year.

CleanPowerSF's internal forecast begins with a baseline demand forecast developed using rate-class-specific hourly regression models. These models evaluate the relationship between customer demand and explanatory variables including month, day of week, holidays, daylight-saving time, temperature, and precipitation. The models were generally trained using the most recent one to two years of actual CleanPowerSF hourly demand data.

The baseline forecast reflects anticipated customer and system growth absent substantial additional electrification. For the earlier planning years, CleanPowerSF calibrated growth using recent weather-normalized program demand. For the later planning years, CleanPowerSF used growth informed by the

California Energy Commission's (CEC) IEPR forecast, adjusted to avoid double-counting demand separately represented through the electrification forecast.

CleanPowerSF's hybrid load forecast adds anticipated building and transportation electrification to the baseline forecast. The electrification component was informed by CleanPowerSF's May 2025 electrification analysis and includes fuel switching in existing buildings, electric demand from new construction, light-duty vehicle charging by San Francisco residents and commuters, and medium- and heavy-duty vehicle charging.

CleanPowerSF also developed weather variants based on historical conditions observed at San Francisco International Airport. The released internal forecast used an Elevated weather case representing approximately a 20 percent chance of exceedance, providing additional planning conservatism for peak demand.

This internal methodology was used to develop the non-data-center portion of the hourly profile. It did not replace or reduce the CPUC-assigned annual energy or peak-demand forecast.

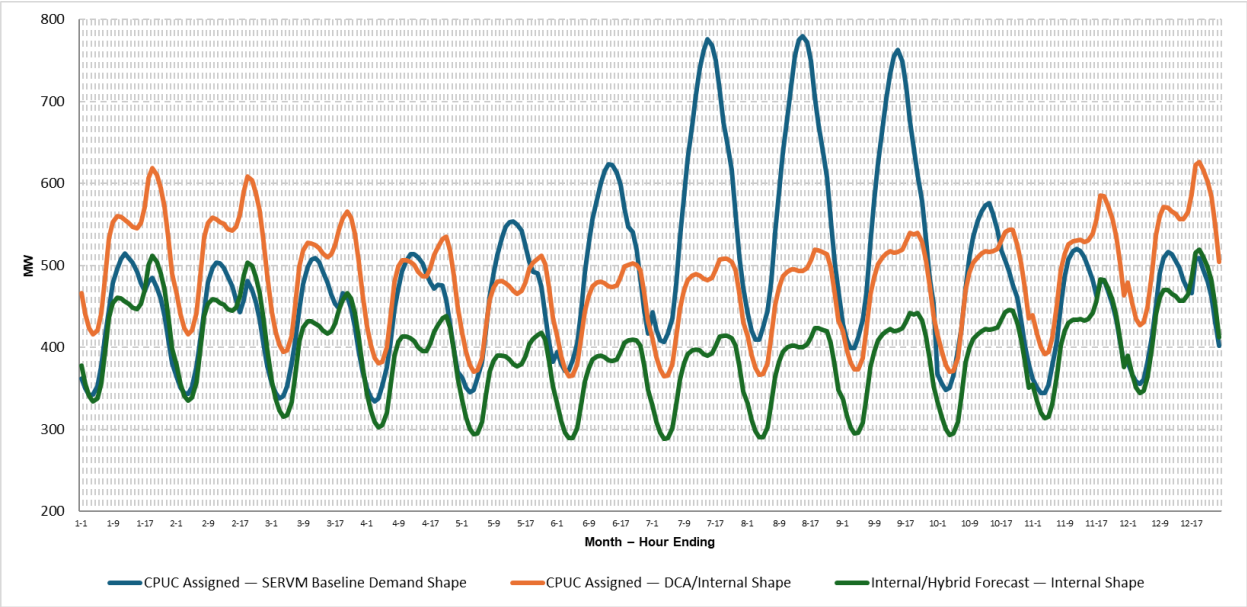
Data Center Adjusted Load Profile

The CPUC-assigned load forecast includes substantial data center demand over the planning horizon. CleanPowerSF has not observed near-term large-load applications in San Francisco consistent with the schedule and magnitude of data center growth incorporated into the assigned forecast. CleanPowerSF nevertheless retained the CPUC-assigned annual energy and peak-demand values as required for a Conforming Portfolio.

To represent the expected hourly characteristics of the assigned demand more accurately, CleanPowerSF developed a Data Center Adjusted hourly profile. The profile treats the portion of the assigned forecast attributed to data center demand as a comparatively flat, baseload-oriented load. The remaining assigned demand follows CleanPowerSF's internally developed hourly profile.

The Data Center Adjusted profile preserves the CPUC-assigned annual energy and peak demand, does not remove or reduce the assigned data center load, and changes only the hourly distribution of the assigned demand. The portion of the assigned forecast treated as data center demand was based on the 2024 IEPR and CPUC Inputs & Assumptions data.

Figure 2 – CPUC-assigned, Data-Center Adjusted, and CleanPowerSF Internal Load Forecast Comparison for CY 2030



The adjustment changes the hourly net-load profile and therefore may affect the modeled value and timing of renewable generation, storage, clean firm resources, and market purchases and sales. It does not affect CleanPowerSF's annual load obligation or assigned GHG benchmark.

Renewable-Generation Profile Assumptions

CleanPowerSF used hourly renewable-generation profiles developed by Ascend Analytics. Ascend developed technology- and location-specific profiles using historical generation and weather data mapped to the locations represented by the modeled resources.

These profiles were used to represent the hourly production patterns of existing and candidate renewable resources, including differences attributable to resource technology, geography, and weather conditions. The hourly profiles affect the coincidence of renewable production with CleanPowerSF's demand, storage charging and discharging, renewable curtailment, market purchases and sales, and the relative portfolio value of candidate resources.

Resource-Cost Assumptions

CleanPowerSF used resource-cost forecasts developed by Ascend Analytics rather than relying exclusively on the CPUC's default resource-cost assumptions. CleanPowerSF considered these forecasts more representative of the prices and commercial terms likely to be encountered through current and future resource solicitations.

Ascend's near-term forecasts are informed by regional market prices, recent requests for proposals, publicly available regulatory filings, market reporting, and consultation with technology-specific experts. Storage-component costs are also informed by Bloomberg market data.

For longer-term cost evolution, Ascend uses capital-cost trajectories and learning curves informed by the National Renewable Energy Laboratory's Annual Technology Baseline. Ascend's forecasts also

account for tax-credit changes, land and labor costs, supply-chain conditions, and other technology- and market-specific developments through 2050.

Compared with the CPUC's applicable mid-case assumptions, Ascend's resource-cost forecasts are generally higher. Conventional geothermal, offshore wind, and near-term long-duration storage are exceptions for which Ascend's assumptions are lower. The use of these assumptions affected the relative attractiveness, quantity, and timing of candidate-resource additions and the resulting portfolio cost.

CleanPowerSF recognizes that technology-cost forecasts remain uncertain and may change due to policy, macroeconomic conditions, supply chains, financing conditions, labor and land costs, and technological development.

Market Price and Product-Value Assumptions

CleanPowerSF used forecasts developed by Ascend Analytics for wholesale energy prices and the value of portfolio products including resource adequacy (RA) and renewable energy credits (RECs). These forecasts were used to estimate the cost of market purchases, the value of market sales, the net cost of existing and candidate resources, and the value of capacity and renewable-energy attributes over the planning horizon.

Ascend's forecasts reflect its outlook for regional electricity supply and demand, resource additions and retirements, fuel and carbon prices, transmission conditions, regulatory requirements, and other factors affecting CAISO and western electricity markets. Use of a consistent set of resource-cost and market-value assumptions allowed CleanPowerSF to evaluate both the costs and potential revenues associated with each modeled resource.

Differences between Ascend's forecasts and the CPUC Inputs and Assumptions may affect candidate-resource economics, the timing and quantity of new resource additions, market-purchase and market-sale results, and total net portfolio cost.

Other Alternative Assumptions

CleanPowerSF did not impose a mandatory procurement quantity or minimum build for resources that may be subject to centralized procurement. The applicable resource was available to PowerSIMM as a candidate resource and could be selected based on its modeled economics and portfolio value. It was not selected for the PCP under the assumptions evaluated.

Portfolio Evaluation

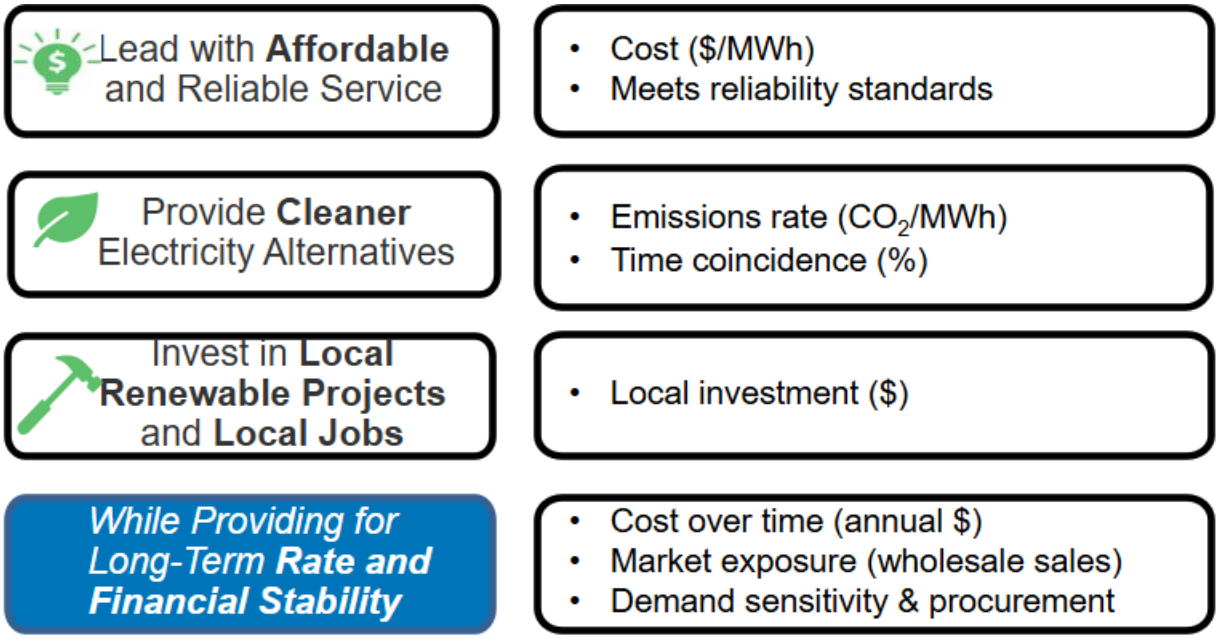
CleanPowerSF evaluated the portfolios using a set of metrics tied to CleanPowerSF program goals shown in Figure 3. The PCP meets all state requirements and local policy targets while providing less market exposure and better rate control and stability than the two sensitivity cases.

CleanPowerSF evaluated two time-coincident clean-energy sensitivities against the PCP. The sensitivities modeled the same CPUC-assigned load forecast, Data Center Adjusted hourly load profile, existing and contracted resources, candidate-resource assumptions, and other planning constraints. The only material change was the addition of a time-coincident clean-energy requirement beginning in either 2030 or 2035.

Under the time-coincident constraint, the modeled portfolio was required to serve 100 percent of customer demand with time-coincident clean portfolio supply during peak hours, defined as HE18 through HE21, and at least 90 percent of demand with time-coincident clean supply during all other hours.

The sensitivities improved hourly clean-energy matching but required additional or earlier resource development, increased excess generation and net market sales, and created greater procurement and implementation risk. The 2035 sensitivity increased modeled net-cost NPV from approximately $4.903 billion for the PCP to approximately $6.069 billion, an increase of about $1.166 billion, or 24 percent. The 2030 sensitivity increased modeled net-cost NPV to approximately $6.458 billion, an increase of about $1.555 billion, or 32 percent.

Figure 3: CleanPowerSF IRP Portfolio Evaluation Criteria



III. Study Results

a. Conforming and Alternative Portfolios

CleanPowerSF selected the 100% Renewable Case as the PCP because it was designed to satisfy the applicable GHG, renewable-energy, and reliability requirements at substantially lower cost and with less exposure to over-procurement and wholesale market sales. CleanPowerSF determined that the incremental improvement in time coincidence provided by the sensitivities did not justify their additional cost and implementation risk.

The PCP includes resources currently serving CleanPowerSF, new resources under contract or development, identified geothermal development opportunities classified as Review, and planned new resource additions identified through the capacity-expansion analysis (Planned New resources). Table 3

summarizes the portfolio using the contract-status categories reported in the Resource Data Template. The complete resource-level portfolio, including capacity, contract status, location, and expected online date, is provided in the RDT.

Table 3: Preferred Conforming Portfolio Summary by Resource Status

Resource Category	Capacity	Description
Online	855.4 MW	Online existing generation, storage, and capacity resources currently serving CleanPowerSF.
Development	647.2 MW	Contracted new resources that are under development or otherwise not yet online.
Review	[redacted]	Projects either shortlisted or under review
Planned Existing	0.0 MW	No future procurement from existing resources is represented as a MW-based planned resource in the PCP.
Planned New	[redacted]	New generation and storage additions identified in the PCP.

The Planned New resources include utility-scale solar, four-hour battery storage, in-state and New Mexico wind, and geothermal generation. The portfolio did not select additional long-duration storage or offshore wind. Section III.b describes the selected resource quantities, timing, portfolio functions, and selection rationale in greater detail.

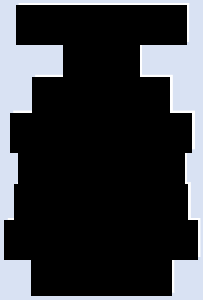
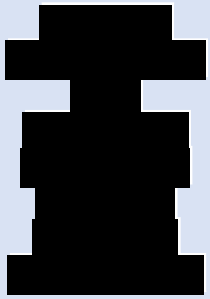
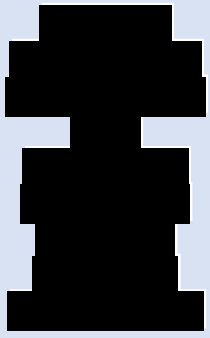
Table 3A provides a narrative summary of the contracted and planned resources reported in the RDT, including each resource's status, capacity, technology, location, and role in the PCP.

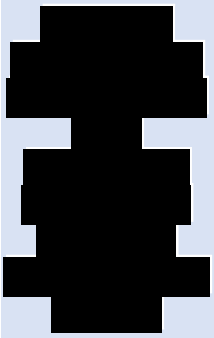
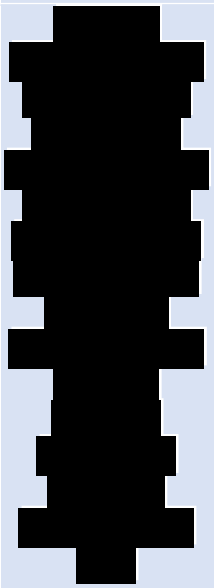
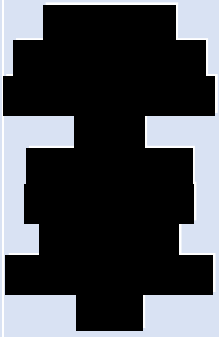
Table 3A: Contracted and Planned Resources Included in the Preferred Conforming Portfolio

Resource	RDT Status	Capacity	Technology	Location	Description
Antelope Solar 2 San Pablo	Online	100 MW	Utility-scale solar	Los Angeles County; Big Sky Substation	Existing online solar resource; commercial operation began August 2, 2019.

Dracker Solar Unit 4 and BESS	Online	62.5 MW solar + 47 MW storage	Solar and four-hour battery storage	Riverside County; Colorado River 230 kV Substation	Existing paired resource. Solar began operation September 11, 2020, and storage began operation October 1, 2022.
Point Wind 1	Online	47.49 MW	Onshore wind	Kern County; Vincent 230 kV Substation	Existing in-state wind resource; commercial operation began March 30, 2021.
Oasis Power Plant Eastwind	Online	57.14 MW	Onshore wind	Kern County; Vincent 230 kV Substation	Existing in-state wind resource; commercial operation began October 12, 2021.
Almasol Generating Station 6 and Maverick 6 Storage	Online	100 MW solar + 50 MW storage	Solar and four-hour battery storage	Riverside County; Red Bluff 220 kV Substation	Existing paired solar and storage resource; commercial operation began December 1, 2021.

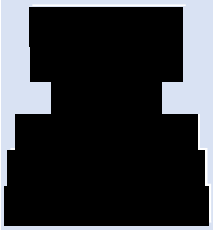
Paulsell Solar Energy Center and BESS	Online	20 MW solar + 15 MW storage	Solar and four-hour battery storage	Stanislaus County; Crow Creek 60 kV Substation	Existing paired solar and storage resource; commercial operation began June 20, 2024.
Calpine Geysers	Online	50 MW	Geothermal	Sonoma County; NP15	Existing geothermal resource; CleanPowerSF deliveries began May 1, 2018.
Tumbleweed Energy Storage	Online	12.045 MW contracted share	Eight-hour battery storage	Kern County; Whirlwind 230 kV Substation	Existing contracted share of a long-duration storage resource; commercial operation began June 1, 2026.
SunZia Wind North and South	Online	100 MW total	New Mexico onshore wind	New Mexico; Pete Heinrich Switchyard	Two contracted out-of-state wind resources totaling 100 MW.

Fish Lake Geothermal	Development	2.436 MW contracted share	Geothermal	Nevada; Silver Peak 55 kV Substation	Contracted CC Power geothermal resource under development, with expected commercial operation in July 2027.
Ormat geothermal portfolio, including Dogwood and Truckhaven	Development		Geothermal		
Corby Energy Storage	Development	75 MW	Four-hour battery storage	Solano County; Vaca-Dixon 230 kV Substation	
Aramis	Development	75 MW solar + 75 MW storage	Solar and four-hour battery storage	Alameda County; Cayetano 230 kV Substation	

Gonzaga Ridge Wind Farm and BESS	Development	129.8 MW wind + 50 MW storage	Onshore wind and four-hour battery storage	Merced County; Los Banos 70 kV Substation	
Gonzaga Ridge Dinosaur Point	Development	17.7 MW wind	Onshore wind	Merced County; Dinosaur Point Tap on the Los Banos-Pacheco 70 kV line	
IP Darden III and IV	Development		Solar and four-hour battery storage	Fresno County; Harlan 500 kV Switching Station	

Willow Rock	Development	11.5 MW contracted share	Eight-hour advanced compressed-air energy storage	Kern County; Whirlwind 230 kV Substation	Contracted long-duration storage resource under development, with expected commercial operation by December 2030.
IP Easley II Solar Project	Development	50 MW	Utility-scale solar	Riverside County; Red Bluff 500 kV	Contracted solar resource under development, with expected commercial operation in January 2027.
Identified CC Power geothermal opportunities	Review	[redacted]	Geothermal	[redacted]	[redacted]

CC Power strategic geothermal opportunities	Review	[redacted]	Geothermal	[redacted]	[redacted]
Generic geothermal additions	Planned New	[redacted]	Geothermal	Location not specified	[redacted] and 100 MW in 2045.
Standalone solar — NP15	Planned New	200 MW	Utility-scale solar	NP15/PG&E area	Generic standalone solar additions comprising 40 MW in 2035 and 40 MW annually during 2037–2040.
Standalone solar — SP15	Planned New	440 MW	Utility-scale solar	SP15/SCE-SDG&E area	Generic standalone solar additions beginning in 2036 and continuing during 2037–2040 and 2043–2045.

Paired solar and storage — NP15	Planned New	260 MW solar + 260 MW storage	Solar and four-hour battery storage	NP15/PG&E area	Generic paired additions comprising 120 MW in 2044 and 140 MW in 2045.
Paired solar and storage — SP15	Planned New	800 MW solar + 800 MW storage	Solar and four-hour battery storage	SP15/SCE-SDG&E area	Generic paired additions comprising 200 MW in each of 2034, 2035, 2044 and 2045.
Standalone four-hour storage	Planned New	400 MW	Four-hour battery storage	Location not specified	Generic standalone storage additions comprising 200 MW in 2044 and 200 MW in 2045.
New Mexico wind	Planned New	200 MW	Out-of-state onshore wind	New Mexico	
In-state wind — NP15	Planned New	140 MW	Onshore wind	NP15/PG&E area	Generic in-state wind additions comprising 40 MW in 2044 and 100 MW in 2045.

In-state wind — SP15	Planned New	400 MW	Onshore wind	SP15/SCE-SDG&E area	[redacted]00 MW in 2039 and 2040, and 20 MW in 2045.

Note: Table 3A summarizes distinct physical resources and modeled incremental capacity. The RDT also includes CAM allocations, short-term and generic resource-adequacy products, REC- or attribute-only products, bridge arrangements, and separate compliance-reporting entries.

Together, these contracted, identified, and modeled resources form the portfolio described in greater detail below.

Table 4 compares the composition of CleanPowerSF's prospective new resources with the composition of new-resource additions identified in the adopted 2025–2026 Transmission Planning Process (TPP) base case portfolio. The table also provides a short explanation of the variances between the PCP and the TPP portfolio and their significance.

Table 4: Comparison of PCP's New Resource Mix with the Adopted 2025–2026 TPP Base Case Portfolio

Resource Type	CleanPowerSF PCP (Percentage of PCP Capacity)	TPP Portfolio Comparison Value (Percentage of TPP Portfolio Capacity)	CleanPowerSF Pro-rata Share of TPP Portfolio	Variance and Significance
Utility-scale solar	1,700 MW (41.1%)	61,800 MW (47.2%)	1,064 MW	CleanPowerSF is 6.1 percentage points lower than the TPP share, but both portfolios rely heavily on utility-scale solar. The difference is primarily offset by CleanPowerSF's greater use of four-hour storage, firm clean resources, and wind resources.

Four-hour battery storage	1,460 MW (35.3%)	15,700 MW (12.0%)	270 MW	CleanPowerSF is 23.3 percentage points higher than the TPP share. The PCP relies more heavily on four-hour batteries to integrate solar production and support evening and hourly portfolio needs.
Long-duration storage	0 MW (0.0%)	22,400 MW (17.1%)	386 MW	CleanPowerSF selects no additional long-duration storage, while the TPP assigns 17.1% of gross positive additions to eight-hour batteries, pumped hydro, and other LDES.
Out-of-state wind	200 MW (4.8%)	15,700 MW (12.0%)	270 MW	CleanPowerSF is 7.2 percentage points lower than the TPP share. The PCP includes 200 MW of New Mexico wind for geographic and production-profile diversity but Ascend limited out-of-state wind availability relative to statewide RESOLVE potential. In addition, the PCP selected more in-state wind than the pro rata share of the TPP additions, and its combined Planned New wind capacity exceeds its pro rata share of the TPP's combined wind additions.
Geothermal	240 MW (5.8%)	1,600 MW (1.2%)	28 MW	CleanPowerSF is 4.6 percentage points higher than the TPP share. The PCP uses geothermal as a firm,

				clean, and diversifying resource, including generic and CC Power geothermal additions.
Offshore wind	0 MW (0.0%)	4,500 MW (3.4%)	77 MW	CleanPowerSF selects no offshore wind, compared with 3.4% of gross TPP additions. Offshore wind was available as a candidate, but no centralized-procurement minimum was imposed as a modeling constraint, and it was not selected under current cost and portfolio assumptions.
In-state Wind resources	540 MW (13.0%)	9,000 MW (6.9%)	155 MW	CleanPowerSF is 5.9 percentage points higher than its pro-rata share of TPP additions.
Biomass resources	0 MW	200 MW (0.2%)	3 MW	The PCP did not select any biomass resources.

Differences in the relative shares of individual resource types reflect the results of CleanPowerSF's LSE-specific portfolio analysis rather than a departure from the Commission's broader system-planning direction. The comparison above demonstrates that CleanPowerSF's PCP is broadly consistent with the resource types identified in the adopted 2025–2026 TPP base case portfolio, while reflecting CleanPowerSF-specific load characteristics, existing contractual commitments, candidate-resource assumptions, procurement opportunities, and planning constraints.

The following subsection describes the PCP in greater detail, including the selected resource mix, timing of planned additions, principal portfolio drivers, and the basis for CleanPowerSF's selection of the portfolio.

b. Preferred Conforming Portfolio

CleanPowerSF selected the 100% Renewable portfolio as its 8 MMT by 2045 PCP. CleanPowerSF developed the portfolio using CleanPowerSF's CPUC-assigned annual energy and peak-demand forecast,

the Data Center Adjusted hourly load profile, existing and contracted resources, candidate-resource availability and cost assumptions, and constraints described in Section II.

The PCP includes 4,140 MW of prospective new resources through 2045, consisting of [redacted] classified as Review and [redacted] classified as Planned New. By technology, these resources consist of 1,700 MW of utility-scale solar, 1,460 MW of four-hour battery storage, 740 MW of onshore wind, and 240 MW of geothermal generation.

The solar additions include 640 MW of standalone solar and 1,060 MW of solar paired with four-hour storage. The storage additions also include 400 MW of standalone four-hour storage. The wind additions consist of 540 MW of in-state wind and 200 MW of New Mexico wind. The geothermal additions consist of 140 MW of generic geothermal capacity and 100 MW of identified geothermal development opportunities.

The buildout begins with 20 MW of geothermal in 2028, followed by 380 MW of wind additions during 2029 and 2030 and another 20 MW of geothermal in 2031. Cumulative prospective new resources reach 1,300 MW by 2035 and 1,980 MW by 2040. The remaining additions are substantially back-loaded, including 940 MW in 2044 and 1,160 MW in 2045. Approximately 51 percent of the prospective new capacity identified over the planning horizon occurs in those final two years.

The selected technologies serve complementary portfolio functions. Solar and four-hour storage represent the largest shares of Planned New capacity because they were the most cost-effective resources available to serve substantial load growth, meet renewable-energy and GHG requirements, and shift renewable production into evening and other high-net-load periods. In-state and New Mexico wind provide geographic, hourly, and seasonal production diversity, while geothermal provides renewable, high-capacity-factor generation that is less dependent on weather conditions.

CleanPowerSF also evaluated long-duration storage and offshore wind as candidate resources. The model did not select additional capacity from either category under the modeling assumptions. CleanPowerSF nevertheless has long-duration storage under contract and will continue to evaluate both technologies as costs, commercial availability, transmission conditions, procurement opportunities, and regulatory requirements evolve. Additional resource-specific considerations are discussed in the applicable planning subsections below.

CleanPowerSF evaluated sensitivities that imposed more restrictive time-coincident clean-energy requirements and different implementation schedules. Those sensitivities improved hourly clean-energy matching but generally required additional or earlier resource development, increased portfolio costs, increased excess generation and market sales, and created greater procurement-feasibility and over-procurement risk. CleanPowerSF selected the PCP because it satisfies the applicable load, GHG, renewable-energy (including consistency with the RPS requirements), and reliability planning requirements while providing a more reasonable balance among affordability, resource diversity, procurement feasibility, market exposure, and flexibility to respond to future changes. The PCP also does not require the addition of new natural gas resources, or contracting with existing natural gas resources.

The PCP meets CleanPowerSF's assigned GHG emissions benchmarks in every applicable benchmark year. Its emissions fall below the 2045 benchmark because the portfolio relies on renewable generation, energy storage, and clean firm resources rather than Planned New fossil-fueled generation. The

portfolio's emissions falling below the assigned benchmark did not materially affect reliability[6]. The RDT shows a positive net capacity position in every study year. Sections III.c and III.f provide the detailed emissions and reliability results.

The PCP is also consistent with the requirement to procure at least 60 percent of retail sales from RPS-eligible renewable resources by December 31, 2030, and with the requirement that at least 65 percent of RPS procurement counted toward each compliance period come from contracts with terms of 10 years or more, ownership, or ownership agreements. CleanPowerSF's projected RPS position, procurement strategy, and compliance measures are described in its 2026 RPS Procurement Plan.

As shown in Table 5, CleanPowerSF's existing long-term contracted RPS volume exceeds its long-term RPS procurement requirement throughout 2026–2036. The PCP also reflects CleanPowerSF's annual planning targets of at least 73 percent RPS-eligible and a 100 percent RPS-eligible and/or GHG-free procurement. Existing contracted RPS resources are identified individually in the RDT as Online or Development resources and are incorporated into the PCP. CleanPowerSF has not identified specific additional existing RPS facilities for future contracting at this time. Planned New RPS resources in the PCP consist of utility-scale solar, in-state and New Mexico wind, and geothermal generation. New and existing resources supporting D.21-06-035, D.23-02-040, and D.26-02-057 are identified in Section IV.a and the RDT.

Table 5 - CleanPowerSF Long-Term Contracted RPS Volume Relative to Requirement

Year	Long-Term RPS Procurement Requirement (GWh)	Long-Term Contracted RPS Volume (GWh)	Contracted Volume as % of Requirement	RPS-Eligible Procurement Target (% of Retail Sales)	Renewable and/or GHG-Free Portfolio Target (% of Retail Sales)
2026	[redacted]	[redacted]	[redacted]	73%	100%
2027	[redacted]	[redacted]	[redacted]	73%	100%
2028	[redacted]	[redacted]	[redacted]	73%	100%
2029	1,199	2,849	238%	73%	100%
2030	1,284	2,403	187%	73%	100%
2031	1,315	2,411	183%	73%	100%
2032	1,346	2,411	179%	73%	100%
2033	1,377	2,411	175%	73%	100%
2034	1,410	2,411	171%	73%	100%
2035	1,454	2,411	166%	73%	100%
2036	1,496	2,237	150%	73%	100%

As a community choice aggregator, CleanPowerSF plans and procures resources to serve its own assigned load and does not assume that an investor-owned utility will procure on its behalf. This approach supports just and reasonable rates and reduces the potential for inappropriate cost shifting to bundled-service customers or other load-serving entities. The PCP also supports system and community resilience through a geographically and operationally diverse resource mix. It retains the CPUC-assigned

6 The PCP was not developed as a separate, more stringent GHG case. .

BTM PV forecast and applicable demand-side load modifiers, while CleanPowerSF's customer programs separately support distributed energy resources, transportation and building electrification, and demand management.

For purposes of this analysis, CleanPowerSF assumed that other load-serving entities procure in a manner generally in alignment with the Commission's adopted 2025–2026 Transmission Planning Process base case portfolio.

In contrast, CleanPowerSF's 2022 PCP required a substantially smaller buildout than the current PCP. CleanPowerSF's 2022 25 MMT PCP was the Time-Coincident Case, which applied a 90 percent time-coincident renewable and/or GHG-free energy requirement for all non-peak hours beginning in 2030, and a 100 percent time-coincident constraint during peak hours (from 5:00 p.m. – 9:00 p.m.). That portfolio identified 260 MW of new renewable resources and 350 MW of additional battery storage not already under contract by 2035, for a total of 610 MW of planned additional capacity. The 2026 PCP includes 1,300 MW of prospective new resources by 2035—more than twice the quantity identified for the same year in the 2022 portfolio—and 4,140 MW through the extended 2045 planning horizon.

The larger buildout is driven principally by CleanPowerSF's materially higher CPUC-assigned load forecast, the extension of the planning horizon from 2035 to 2045, the more stringent 8 MMT by 2045 statewide GHG planning target, expiration of existing contracts, changes in CleanPowerSF's contracted portfolio, and updated resource-cost, market-price, generation-profile, and resource-availability assumptions.

The portfolio design also differs. The 2022 portfolio's time-coincident requirement placed greater emphasis on battery storage and additional capacity needed to align renewable production with hourly demand. The 2026 PCP does not impose the same portfolio-wide time-coincident requirement and instead reflects a more geographically and operationally diverse mix of four-hour storage, wind, geothermal, and solar resources. It selects no additional long-duration storage. CleanPowerSF has added contracted long-duration storage to its portfolio since the 2022 IRP which is included in the modeled base resources.

Taken together, these changes produce a larger but differently configured portfolio. Although the PCP includes substantially more prospective new capacity, it preserves the prior plan's emphasis on renewable generation, storage, reliability, and CleanPowerSF's clean-energy objectives while responding to significant changes in load, policy, market, technology, and portfolio conditions.

CleanPowerSF's Preferred Conforming Portfolio is consistent with the applicable statutory requirements of Public Utilities Code section 454.52(a)(1). The discussion in this section, together with the analyses incorporated by reference below, demonstrates how the PCP satisfies those requirements:

(A) Greenhouse gas emissions reductions. Section III.c demonstrates that the PCP remains below CleanPowerSF's assigned GHG emissions benchmark in each applicable benchmark year, consistent with section 454.52(a)(1)(A).

(B) Renewables Portfolio Standard. As described above in this section, the PCP is consistent with the requirement to procure at least 60 percent eligible renewable energy resources by December 31, 2030, consistent with section 454.52(a)(1)(B).

(C) Just and reasonable rates. Section 454.52(a)(1)(C) is framed in terms of enabling electrical corporations to fulfill their obligation to serve customers at just and reasonable rates and therefore does not impose a direct rate-setting obligation on CleanPowerSF as a community choice aggregator. Section

III.e nevertheless addresses the affordability considerations reflected in this requirement.

(D) Ratepayer bill impacts. Section III.e describes the PCP's modeled costs, compares those costs with CleanPowerSF's approved 10-Year Financial Plan, and explains how affordability and long-term rate stability were considered in portfolio selection, consistent with section 454.52(a)(1)(D).

(E) System and local reliability. Section III.f demonstrates that the PCP maintains a positive net capacity position throughout the planning horizon. Section II.b.iii also describes CleanPowerSF's treatment of weather, building electrification, transportation electrification, and data-center demand in developing its hourly load profile, consistent with the reliability-planning considerations identified in section 454.52(a)(1)(E).

(F) Long-term renewable contracting. As described above in this section, CleanPowerSF's existing long-term contracted RPS volume exceeds its applicable long-term contracting requirement over the period evaluated, consistent with section 454.52(a)(1)(F).

(G) Diversity, sustainability, and resilience. This section describes the PCP's diverse portfolio of solar, energy storage, onshore wind, and geothermal resources. Sections III.d and III.m further describe local-community considerations and transmission planning associated with the portfolio, consistent with section 454.52(a)(1)(G).

(H) Distribution systems and demand-side energy management. CleanPowerSF does not own or operate the electric distribution system, but Sections III.d and IV.a.viii–ix describe CleanPowerSF's customer programs and transportation- and building-electrification activities that support demand-side energy management, consistent with CleanPowerSF's role under section 454.52(a)(1)(H).

(I) Localized air pollutants and disadvantaged communities. Sections III.d.i and III.d.ii quantify the PCP's criteria-air-pollutant emissions and describe CleanPowerSF's efforts to minimize impacts on disadvantaged communities, consistent with section 454.52(a)(1)(I).

(J) Diverse portfolio of energy resources. As described above, the PCP maintains a diverse portfolio of renewable generation, energy storage, clean firm generation, and other portfolio resources. Section IV.a.x addresses potential centralized procurement by the Department of Water Resources and explains how CleanPowerSF would incorporate any future eligible allocations into its planning, consistent with section 454.52(a)(1)(J).

c. GHG Emissions Results

Table 6 below shows that the PCP's calculated emissions are lower than the assigned benchmarks. The table compares CleanPowerSF's assigned GHG emission benchmark for selected years with the PCP's emissions calculated by the CSP Calculator. The benchmarks represent CleanPowerSF's pro rata share of the electric sector GHG planning target. In 2030 and 2035, GHG emissions from the electricity sector are assumed to be 30 MMT and 25 MMT, respectively. From 2035 to 2045, the emissions target declines to 8 MMT. CleanPowerSF's pro rata share is calculated as the portion of its load relative to the load in the state's electric sector.

Even though the PCP identifies new prospective resources from only clean energy sources and storage, the CSP Calculator assigns some GHG emissions to CleanPowerSF. The most significant source is

from purchases of system power. System power is generated by different sources, including GHG-emitting natural gas plants.

In addition, the CSP Calculator assigns CleanPowerSF a proportional share of emissions from CAISO in-front-of-the-meter combined heat and power ("IFM CHP") generation. CleanPowerSF does not contract with these facilities, but the CSP methodology allocates a portion of their emissions to each LSE. The CSP Calculator assigns CleanPowerSF IFM CHP emissions in 2028, 2030, and 2035, but assigns no IFM CHP emissions in 2040 or 2045.

Table 6: CleanPowerSF GHG Emissions Benchmark versus PCP's GHG emissions

	Unit	2028	2030	2035	2040	2045
GHG Benchmark	MMt/year	NA	0.343	0.278	0.270	0.149
Portfolio's Calculated GHG emissions	MMt/year	0.379	0.302	0.263	0.256	0.104
Average emissions intensity	tCO2/MWh	0.099	0.072	0.049	0.041	0.016

d. Local Air Pollutant Minimization and Disadvantaged Communities

i. Local Air Pollutants

CleanPowerSF's PCP supports minimization of localized air pollutants by relying on renewable generation, energy storage, and other non-emitting resources rather than adding new fossil-fueled generation. Table 7 presents the $PM_{2.5}$, SO_2, and NO_x emissions calculated for the portfolio using the CSP Calculator.

The CSP Calculator assigns system power emissions to LSEs on an hourly basis. A portion of these system power emissions are assigned to CleanPowerSF regardless of its available energy supply, which means system power emissions are assigned during certain hours even if CleanPowerSF's supply portfolio meets its demand with renewable resources in those hours. This occurs because in certain hours of the day emitting facilities must run even if there is excess generation of non-emitting resources on the system. To account for all system emissions across LSE portfolios during such hours, the CSP Calculator allocates emissions from system power to LSEs on a pro rata basis. These emissions cannot be displaced by the addition of renewable resources on the system.

Combined Heat and Power (CHP) resources also contribute to CleanPowerSF's portfolio criteria pollutant emissions. Even though CleanPowerSF does not contract with any CHP facilities the CSP

Calculator automatically allocates to each LSE its proportional emissions based on load share. More detail on this process can be found in the Documentation.[7]

Table 7: PCP Criteria Pollutant Results

$PM_{2.5}$	***Unit***	**2028**	**2030**	**2035**	**2040**	**2045**
Coal	*tonnes/yr*	-	-	-	-	-
IFM CHP	*tonnes/yr*	4	4	4	-	-
Biogas	*tonnes/yr*	-	-	-	-	-
Biomass	*tonnes/yr*	-	-	-	-	-
System Power	*tonnes/yr*	19	14	13	17	8
Total	***tonnes/yr***	**23**	**19**	**18**	**17**	**8**
Avg emissions intensity	*kg/MWh*	**0.0062**	**0.0045**	**0.0034**	**0.0029**	**0.0013**

SO_2	***Unit***	**2028**	**2030**	**2035**	**2040**	**2045**
Coal	*tonnes/yr*	-	-	-	-	-
IFM CHP	*tonnes/yr*	0	0	0	-	-
Biogas	*tonnes/yr*	-	-	-	-	-
Biomass	*tonnes/yr*	-	-	-	-	-
System Power	*tonnes/yr*	2	1	1	2	1
Total	***tonnes/yr***	**2**	**2**	**2**	**2**	**1**
Avg emissions intensity	*kg/MWh*	**0.0061**	**0.0044**	**0.0033**	**0.0028**	**0.0012**

NO_x	***Unit***	**2028**	**2030**	**2035**	**2040**	**2045**
Coal	*tonnes/yr*	-	-	-	-	-
IFM CHP	*tonnes/yr*	13	12	13	-	-
Biogas	*tonnes/yr*	-	-	-	-	-
Biomass	*tonnes/yr*	-	-	-	-	-
System Power	*tonnes/yr*	21	15	45	17	9
Total	***tonnes/yr***	**34**	**28**	**27**	**17**	**9**
Avg emissions intensity	*kg/MWh*	**0.0089**	**0.0065**	**0.0050**	**0.0027**	**0.0014**

ii. Focus on Disadvantaged Communities

CleanPowerSF aims to address the disproportionate environmental burdens historically faced by low-income communities predominated by people of color by maximizing the renewable content of its portfolio and minimizing procurement from polluting facilities located in these communities. In fact, CleanPowerSF only procures renewable energy or zero GHG-emitting projects which have minimal air

[7] The Clean System Power Calculator Documentation is available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/csp-tool-documentationupdated-03192026ver2.pdf [accessed 6/21/2026]

pollutants emissions. In addition, the PCP minimizes the amount of system power use as much of this energy comes from fossil-fuel generators that are located within disadvantaged communities. The PCP minimizes system power purchases between 5 – 9 PM, peak hours where typically gas power plants provide energy to the grid.

CleanPowerSF identified 18 census tracts within San Francisco that are Disadvantaged Communities pursuant to the CPUC's definition. CleanPowerSF serves 31,178 customers within 17 of these census tracts which is 8.00 percent of the total CleanPowerSF customers. Nine of these tracts are in the Hunters Point neighborhood of San Francisco, two are around the Portola/Sunnydale/Visitation neighborhoods, three are in the Moscone Center/South of Market (SoMA) neighborhoods, and the remaining two are in the Civic Center area. The 18th census tract is on Treasure Island, which is entirely served by Hetch Hetchy Power, San Francisco's public power utility. Figure 4 below identifies the locations of San Francisco's Disadvantaged Communities (DACs). Census tracts identified in the top 25 percent of CalEnviroScreen 4.0 scores are in red and census tracts identified in 2017 DAC designation regardless of the CalEnviroScreen 4.0 scores are in blue. Table 8 provides additional information on CleanPowerSF customers in each of these census tracts.

Figure 4: San Francisco's Disadvantaged Communities

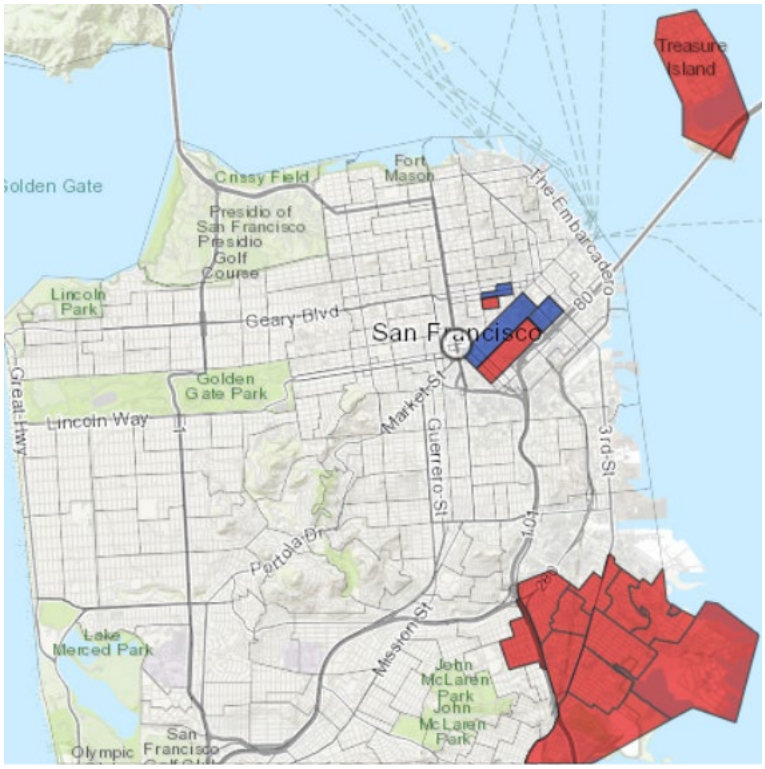


Table 8: CleanPowerSF Disadvantaged Communities Identified

CleanPowerSF TOTAL Census Tract	Qualification	Residential Customer total	Commercial customer total	CleanPower SF customer total
6075012301	Designated DAC in 2017	675	161	836
6075012501	Designated DAC in 2017	1,891	191	2,082
6075012502	Top 25% of CalEnviro Screen 4	927	114	1,041
6075017601	Designated DAC in 2017	6,481	743	7,224
6075017802	Top 25% of CalEnviro Screen 4	4,284	663	4,947

6075017801	Designated DAC in 2017	1,584	172	1,756
6075023001	Top 25% of CalEnviro Screen 4	1,147	105	1,252
6075023003	Top 25% of CalEnviro Screen 4	1,056	39	1,095
6075023102	Top 25% of CalEnviro Screen 4	1,253	40	1,293
6075023103	Top 25% of CalEnviro Screen 4	1,428	71	1,499
6075023200	Top 25% of CalEnviro Screen 4	1,218	360	1,578
6075023300	Top 25% of CalEnviro Screen 4	1,231	109	1,340
6075023400	Top 25% of CalEnviro Screen 4	668	245	913
6075025702	Top 25% of CalEnviro Screen 4	1,112	189	1,301
6075061000	Top 25% of CalEnviro Screen 4	1,540	60	1,600
6075061200	Top 25% of CalEnviro Screen 4	1,118	118	1,236
6075980600	Top 25% of CalEnviro Screen 4	185[8]		

[8] Due to the small number of customers in this census tract, CleanPowerSF can't provide a further breakdown by customer type.

Procurement of Generation Resources in DAC

CleanPowerSF only procures energy supply resources that are RPS-eligible or GHG-free at the source. In addition, no polluting or GHG-emitting power resources are located within Disadvantaged Communities located in San Francisco.

CleanPowerSF recognizes the economic and environmental benefits of investing in renewable energy projects in communities that are disproportionately impacted by pollution, poverty, unemployment and other sociodemographic factors. Investing in these communities provides economic benefits, creates jobs, and potentially reduces reliance on fossil gas.

CleanPowerSF does not use a separate numerical scoring metric specifically for criteria air-pollutant reductions in DACs. The RPS-eligible or GHG-free eligibility screen described above has been applied in prior procurement efforts by limiting eligible supply to those resource categories rather than fossil-fueled generation.

Figure 5 below details CleanPowerSF's projects located within 10 miles of a DAC. Table 9 provides a brief description of these communities.

Figure 5: CleanPowerSF's Procurement near Disadvantaged Communities

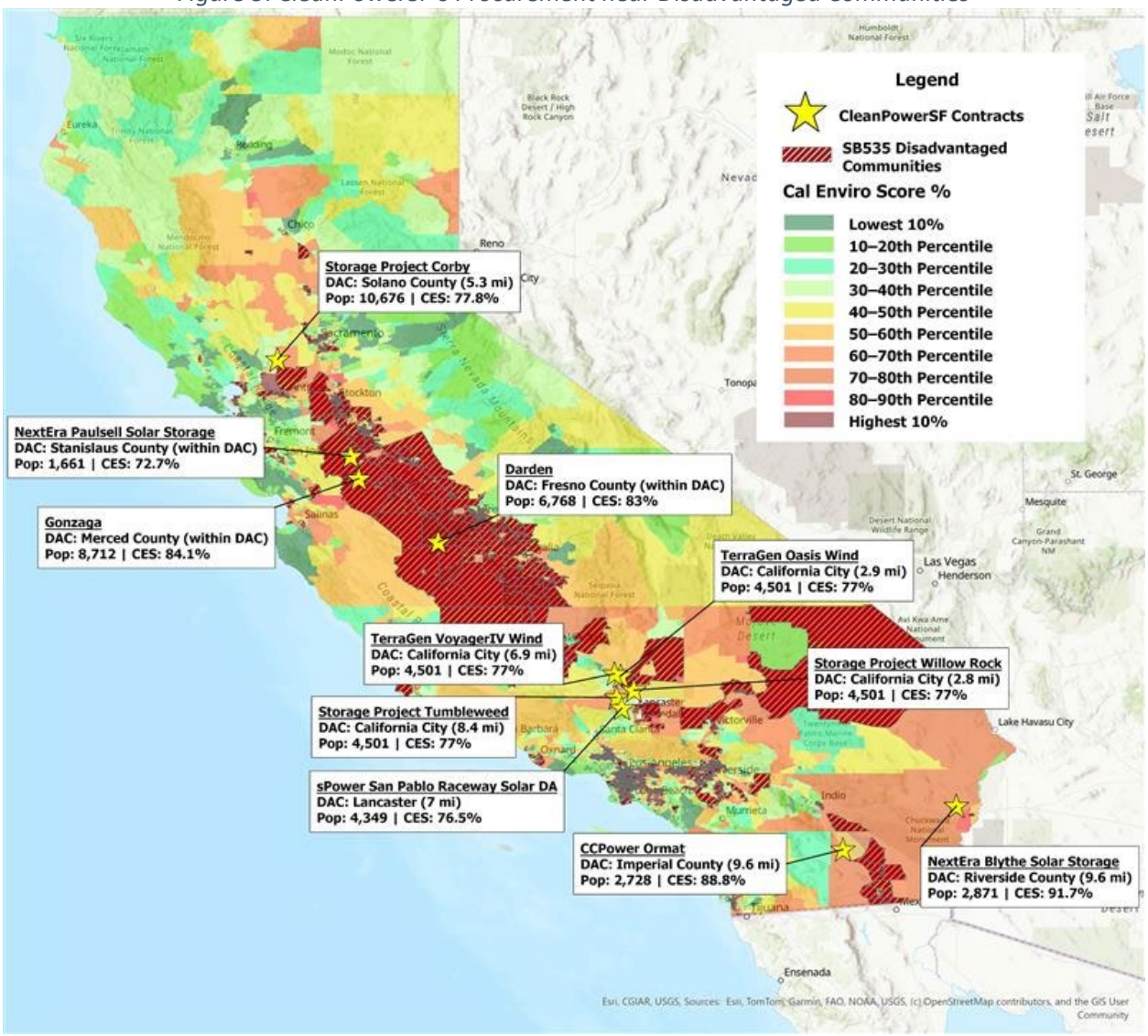


Table 9: Description of Communities with nearby CleanPowerSF Energy Supply Resources

Project	Community	Census Tract	Distance (Miles)	Population	CalEnviroScreen 4.0 Percentile
Corby (BESS)	Solano County (Around and including Rio Vista)	6095253500	5.3	10,676	78
Gonzaga Ridge (Wind + BESS)	Merced County (Pacheco State Park)	6047002000	0.0	8,712	84
Darden (Solar + BESS)	Fresno County (West of City of Fresno)	6019008200	0.0	6,768	83
Blythe (Solar + BESS)	Blythe	6065046200	9.6	2,871	92
Paulsell (Solar + BESS)	Stanislaus County (South of Oakdale)	6099003400	0.0	1,661	73
Tumbleweed (BESS)	Kern County (Fremont Valley on the outskirts of Mojave, Boron and California City)	6029006500	10.3	4,501	77
CC Power Ormat (Geothermal)	Imperial County (Around Westmorland)	6025010200	9.5	2,728	89
TerraGen Oasis and Voyager (Wind)	Kern County (Fremont Valley on the outskirts of Mojave, Boron and California City)	6029006500	0.0	4,501	77
Willow Rock (CAES)	Kern County (Fremont Valley on the outskirts of Mojave, Boron and California City)	6029006500	3.5	4,501	77
sPower San Pablo Raceway (Solar)	Los Angeles County (Lancaster)	6037900703	7.0	4,349	76

Programs that focus on serving DACs or low-income customers

While CleanPowerSF does not currently make specified purchases of energy from emitting facilities in Disadvantaged Communities, it is committed to minimizing its system power emissions and providing the following benefits to Disadvantaged Communities in and outside of its service area:

- Reduction in Use of Polluting Power Plants in Disadvantaged Communities: Through procurement of California and Bay Area renewable energy at levels above the state RPS requirements, CleanPowerSF plays a part in moving away from reliance on natural gas power plants and their emissions, which disproportionately affect Disadvantaged Communities. The City and County of San Francisco successfully collaborated with state energy planning agencies in the past to close down large in-city pollution-emitting power plants (in the Hunters Point and Potrero areas of San Francisco).
- Prioritization on Program Affordability and Stability: As previously discussed, CleanPowerSF program goals include affordability and long-term rate stability. CleanPowerSF's net revenues go back to ratepayers, either in the form of lower rates or customer-sided programming and incentives. CleanPowerSF's financial reserves provide rate stabilization protection for its most economically vulnerable ratepayers.
- Programs Accessible to All: As CleanPowerSF continues to develop new customer-sided programming, programs for Disadvantaged Communities and hard-to-reach populations – including financing and offerings for multi-family residential – are a top priority. CleanPowerSF currently offers and is in the process of planning programs with the aim of providing benefits to low-income customers and customers located in Disadvantaged Communities.
- GoSolarSF[9], the SFPUC's solar incentive program provided more than $1 million in financial incentives to support low-income access to on-site renewable generation at more than 120 customer sites since CleanPowerSF began service in 2016. While the GoSolarSF Program retired most all its solar incentive rebate categories, it's one remaining solar rebate category supports exclusively Disadvantaged Communities – Single-Family Solar Homes (DAC-SASH) eligible customers receiving solar system through Grid Alternatives.
- In 2022, CleanPowerSF began offering a Solar Inverter Replacement Program.[10] The Solar Inverter Replacement Program provides up to $3,000 in rebates to CleanPowerSF CARE or FERA customers who previously installed solar through the GoSolarSF program. The program helps assure these systems can continue to operate by offering the bill reduction and environmental benefits intended for these low-income customers who likely need support for inverter repairs.

[9] For more information, visit "GoSolarSF" at https://www.sfpuc.gov/accounts-services/sign-up-for-savings/gosolarsf [accessed July 30, 2026].

[10] For more information, visit "Solar Inverter Replacement Program" at https://cleanpowersf.org/solarinverter. [accessed June 26, 2026].

- CleanPowerSF's Budget Billing program, [11] available to all customers, helps low-income customers avoid big swings in their monthly payments by averaging their energy costs and providing a predictable and stable monthly bill.
- Go Electric Bill Credits[12]: In 2025, CleanPowerSF transitioned its water heater incentives from a contractor incentive program to a new novel bill credits incentive model. The new bill credits program provides direct support to our residential customers in the form of ongoing discounts on electric bills. The new program includes monthly bill credits that include additional incentives for income-qualified customers (who receive up to $1,800 over three years).
- CleanPowerSF launched its Disadvantaged Communities Green Tariff (DAC-GT)[13] program, enrolling eligible customers beginning June 2022. This program is administered by the CPUC and reduces barriers to renewable energy adoption by residents in Disadvantaged Communities. Branded as SuperGreen Saver, participating customers receive 100% RPS-renewable energy at a total 20% bill discount on both their generation charges and their electricity transportation charges through PG&E.
- CleanPowerSF is developing energy efficiency programming to support food services, including restaurants, grocery stores, refrigerated warehouses and community food services. The program would support energy efficiency measures for refrigeration, food preparation equipment, ventilation controls and other technologies. New equipment and energy savings will improve the financial viability and long-term operational efficiency of participating organizations, which we hope will include child & senior care centers, free dining rooms, grocery/food pantries, and other community support centers.
- Through the Electrify Your Home program, CleanPowerSF offers bill credits to residential customers electrifying their gas-burning appliances, by installing equipment such as heat pump water heaters (HPWHs), heat pump air-conditioning units, electric dryers, and induction stoves. Income-qualified customers receive 50% more bill credits for their electrification projects. In addition, CleanPowerSF seeks to expand the use of HPWHs and similar technologies for low-income households and multifamily buildings through targeted outreach and education.
- For affordable housing buildings, CleanPowerSF offers the All-Electric Multifamily Program, [14] which provides free electrification roadmaps to building owners and operators. These roadmaps include deep analysis of building energy systems and a customized multi-year plan to tackling full building electrification at these challenging sites.

[11] For more information, visit "Budget Billing Program" at https://cleanpowersf.org/budgetbilling [accessed on June 26, 2026].

[12] For more information, visit "Electrify Your Home" at https://cleanpowersf.org/electrify-your-home [accessed on June 26, 2026].

[13] For more information, visit "SuperGreen Saver" at https://cleanpowersf.org/supergreensaver [accessed on July 2, 2026].

14 For more information, visit "All Electric Multifamily Program" at https://www.sfpuc.gov/programs/clean-energy/all-electric-multifamily-program [accessed on July 30, 2026].

- EV Charge SF[15] is an EV charging incentive program aimed at parking garages and lots. This program prioritizes affordable housing through an additional 20% incentive kicker, in addition to also providing technical assistance to support the design of charging infrastructure and ensure compliance with state and local ordinances.
- CleanPowerSF also supports transportation electrification through the Electrify My Ride[16] program, which provides $1000 coupons to income-qualified customers when they purchase an electric bike at a local participating bike retailer. This program has helped hundreds of low-income residents access a healthier, more environmentally friendly mode of transportation. Later this year, CleanPowerSF will be launching a new program to provide incentives that will help low-income customers purchase electric vehicles.
- CleanPowerSF is committed to continuing to address issues of equity when it comes to accessing renewable energy and distributed energy resources (DERs). CleanPowerSF established a working group tasked with developing an equity framework to guide the development of additional customer programs, policies, and business practices that are inclusive and directly address the community's needs. This equity framework is now being used by the Power Enterprise to inform customer program development initiatives undertaken at the SFPUC.

e. Cost and Rate Analysis

CleanPowerSF's Rate-Setting Process

CleanPowerSF rates are subject to public oversight. Rate changes must be approved by the San Francisco Public Utilities Commission at a noticed public meeting. CleanPowerSF's rates are developed with input and review from the Rate Fairness Board, an advisory body of ratepayers and City financial officers established under voter-approved Proposition E, to support rate stability, fairness, and affordability.[17] Proposed rates must conform to the SFPUC Ratepayer Assurance Policy, which is guided by revenue sufficiency, customer equity, environmental sustainability, affordability, predictability, and simplicity. As required by San Francisco Charter section 16.112, [18] a Notice of Public Hearing on the Establishment of Rates approved by the SFPUC are subject to rejection by the San Francisco Board of Supervisors within 30 days of notification.

IRP Cost and Rate Analysis

Affordability and long-term rate stability are core CleanPowerSF program objectives. In developing its PCP, CleanPowerSF used capacity-expansion modeling to identify a cost-effective portfolio that

[15] For more information, visit "EV Charge SF" at https://www.sfpuc.gov/programs/clean-energy/ev-charge-sf [accessed on June 26, 2026].

[16] For more information, visit "Electrify My Ride" at https://www.sfpuc.gov/programs/clean-energy/electrify-my-ride. [accessed on June 26, 2026]

[17] San Francisco Public Utilities Commission, Ratepayer Assurance Policy (September 2017), available at: https://www.sfpuc.gov/sites/default/files/about-us/policies-reports/RatepayerAssurancePolicy_SEPT2017.pdf. See also San Francisco Public Utilities Commission, Rate Fairness Board, available at: https://www.sfpuc.gov/about-us/boards-commissions-committees/rate-fairness-board [accessed July 30, 2026].

[18] San Francisco Charter Section 16.112 requires timely publication of notice prior to a public hearing.

satisfies applicable reliability, renewable energy, and GHG requirements. Consistent with the Commission's direction, the analysis assumes that other load-serving entities procure resources in a manner consistent with the 2025–2026 TPP portfolio.

CleanPowerSF estimates that the PCP will have a net portfolio cost of approximately $4.90 billion on a net-present-value basis over the 2026–2045 planning horizon. This is equivalent to an average net portfolio cost of approximately $91.66/MWh on a discounted basis.

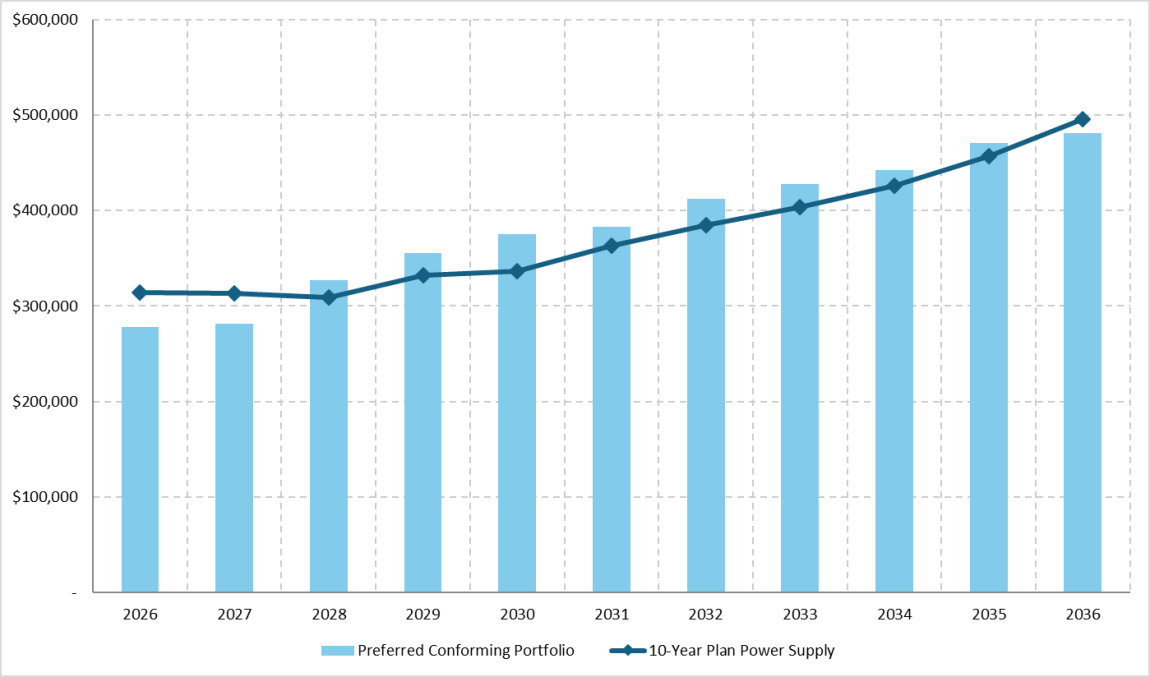
Figure 6 compares the annualized modeled power-supply costs of the PCP with the power-supply cost assumptions included in CleanPowerSF's approved 10-Year Financial Plan.[19] The 10-Year Financial Plan is the SFPUC's annually updated forecast of CleanPowerSF revenues, expenditures, and financial metrics, as approved by the San Francisco Public Utilities Commission. It therefore provides a relevant financial baseline for comparing the PCP's modeled power-supply costs with the costs currently incorporated into CleanPowerSF program and rate planning. The 10-Year Financial Plan also includes contingency amounts that serve as a budgeted adjustment for cost variability; those contingency amounts are excluded from the comparison shown in Figure 6. The modeled costs broadly track the Financial Plan but exceed the approved plan in eight of the eleven overlapping years from 2026 through 2036. The largest difference occurs in 2030, when modeled costs exceed the Financial Plan by approximately $40.8 million, or 12.1 percent. Average annualized modeled costs over this period are approximately $387.1 million per year.

Key cost and rate drivers include rapid growth in CleanPowerSF's CPUC-assigned load forecast, the increasingly stringent GHG emissions benchmarks over the planning horizon, the timing and quantity of new resource additions, the expiration and replacement of existing contracts, forecast energy and capacity market prices, and the cost of contracted resources. Market purchases increase costs when portfolio resources are insufficient to serve load, while revenue from market sales offsets a portion of portfolio costs during periods of excess generation. The value of those purchases and sales depends on future wholesale-market conditions.

The analysis uses nominal-dollar cash flows and an 8 percent discount rate for net-present-value calculations. The Financial Plan comparison illustrates how modeled power-supply costs compare with CleanPowerSF's current financial planning assumptions; it is not a forecast of future retail rates. Actual customer rates will depend on realized load, procurement and market outcomes, non-power-supply costs, reserve and financial requirements, and future actions taken through the SFPUC's public rate-setting process.

[19] SFPUC, *10-Year Financial Plan, FY 2026-27 to FY 2035-36* (February 2026), available at https://www.sfpuc.gov/sites/default/files/about-us/policies-reports/FY27-10-Year-Plan-Report.pdf [accessed July 30, 2026].

Figure 6: Preferred Conforming Portfolio Annualized Power-Supply Costs Compared with 10-Year Financial Plan Power-Supply Costs Before Contingency



f. System Reliability Analysis

CleanPowerSF evaluated the PCP's contribution to system reliability using the reliability need and effective capacity values calculated in the RDT. The analysis compares CleanPowerSF's total reliability need with the effective capacity supplied by resources in each RDT contract-status category over the full study period.

Table 10 presents the PCP's Load and Resource Table by Contract Status for all study years, including total reliability need, total supply, and net capacity position in effective MW. Figure 7 presents these results graphically.

Figure 7: CleanPowerSF Preferred Conforming Portfolio Contribution to System Reliability



Table 10: Preferred Conforming Portfolio Reliability Need, Effective Supply by Resource Status, and Net Capacity Position

The RDT results show that the PCP has a positive net capacity position in every study year.

CleanPowerSF's total reliability need increases from approximately [redacted] in 2026 to [redacted] in 2045. [redacted]. The larger Planned New resources modeled in 2044 and 2045 [redacted]. These later-year additions represent long-term planning needs identified through the IRP analysis and do not constitute a present commitment to procure the precise modeled quantities on that schedule.

The PCP's reliability contribution is supported by a diverse combination of resources. Four-hour storage contributes effective capacity during high-net-load periods, geothermal provides high-capacity-factor renewable generation, and geographically diverse wind and solar resources contribute capacity in accordance with the applicable RDT assumptions. The RDT calculation also includes BTM PV and applicable capacity allocations. These allocations contribute to CleanPowerSF's reliability accounting but are not physical Planned New resources procured by CleanPowerSF.

The RDT results are a long-term planning assessment and do not replace CleanPowerSF's annual and monthly resource-adequacy compliance activities. CleanPowerSF will continue to manage near-term resource adequacy through contracted capacity, solicitations, bilateral procurement, and other available compliance mechanisms. CleanPowerSF will also reassess its longer-term needs as load forecasts, resource accreditation values, project-development schedules, transmission conditions, capacity allocations, market conditions, and regulatory requirements evolve.

g. Existing Resource Planning

The 2026 PCP includes approximately 855.4 MW of existing resources, all of which are classified as Online; contracted resources still in Development are reported separately. By comparison, CleanPowerSF's 2022 25 MMT Preferred Conforming Portfolio included 240 MW of Planned Existing resources in 2035, consisting of 60 MW of in-state hydroelectric generation and 180 MW of blended renewable and GHG-free supply. The increase of approximately 615.4 MW primarily reflects resources reaching commercial operation, changes in CleanPowerSF's contracted portfolio, and updated RDT classifications, rather than a like-for-like increase in anticipated procurement from existing facilities.

CleanPowerSF considers the current level of existing resources appropriate because it reflects identified, operating resources represented in CleanPowerSF's portfolio rather than assumed procurement from an unspecified pool of existing facilities. Each resource was modeled based on its expected availability during its applicable contract period, and CleanPowerSF did not assume that a resource would remain available after contract expiration unless a renewal or replacement is subsequently secured.

Because all resources counted as existing in the current PCP are Online and the portfolio includes no Planned Existing resources, implementation of the portfolio does not depend on procuring an additional quantity of existing-resource capacity from the market. Potential challenges nevertheless include

resource outages or underperformance, degradation, retirement, contract expiration, and changes in renewal terms. If CleanPowerSF seeks to renew an expiring agreement or procure replacement supply from another existing facility, it may also face competition from other load-serving entities and limited availability of resources with the desired energy, environmental, or reliability attributes.

CleanPowerSF submits one PCP for the 2026 IRP cycle and therefore does not provide a comparison of existing-resource amounts across alternative portfolios.

h. Hydro Generation Risk Management

CleanPowerSF's reliance on physical hydroelectric supply has declined substantially since its 2022 IRP. The 2022 Preferred Conforming Portfolio modeled 100 MW of physical hydro supply through 2035, consisting of 60 MW of in-state hydroelectric generation and 40 MW of Pacific Northwest hydroelectric imports. The 2022 Resource Data Template represented approximately 386.6 GWh of combined annual hydroelectric energy in the principal study years. In contrast, the 2026 PCP includes no physical hydroelectric energy or capacity and includes only the limited, attributes-only forecast allocation in 2026 and 2027. The change reflects the removal of modeled future hydro purchases, changes in CleanPowerSF's contracted portfolio, and the increased role of solar, wind, geothermal, and energy-storage resources in meeting long-term portfolio needs. As a result, the current portfolio is materially less exposed than the 2022 portfolio to drought-related cost, emissions, and reliability effects.

The PCP includes no physical hydroelectric energy deliveries, hydroelectric capacity, or Planned New conventional hydroelectric generation. It includes a forecast allocation of 275,000 MWh of hydro-related GHG-free attributes in each of 2026 and 2027 through PG&E's Energy Resource Recovery Account (ERRA) forecast. The allocation is neither a contract with PG&E nor a Voluntary Allocation and Market Offer allocation and includes no associated energy delivery or capacity. For clean-energy accounting purposes, the forecast allocation is equivalent to approximately 8.1 percent of CleanPowerSF's assigned load in 2026 and 7.8 percent in 2027.

CleanPowerSF conservatively assumes no hydro-related attribute allocation after 2027 in the PCP because PG&E evaluates these allocations on a three-year cycle corresponding to RPS compliance periods. PG&E's May 2027 ERRA forecast is expected to indicate whether similar allocations will be available for 2028 through 2030. Because the amount and continued availability of any future allocation are uncertain. Because the forecast allocation provides attributes only, reduced hydroelectric generation or a change in a future ERRA forecast would not create a physical energy shortfall or reduce the PCP's effective capacity. The PCP's modeled long-term physical energy supply and reliability position is therefore not dependent on hydroelectric availability. A reduction in the forecast allocation could increase portfolio costs if CleanPowerSF procures replacement renewable or GHG-free attributes and could affect CleanPowerSF's clean-energy or GHG-free accounting until replacement attributes are secured. It would not directly alter the emissions associated with the portfolio's physical energy supply.

Given the limited duration, uncertainty, and attributes-only nature of the forecast allocation, any associated risk is managed through CleanPowerSF's normal portfolio-monitoring and procurement processes. CleanPowerSF monitors its renewable and GHG-free positions and may procure replacement renewable or GHG-free attributes when necessary and available. Energy and reliability needs are managed separately through contracted and planned generating resources, energy storage, market transactions, and applicable capacity allocations.

The published new-resource portfolio for the adopted 2025–2026 TPP base case identifies no new conventional hydroelectric generation. On the comparable measure of proposed new conventional hydro resources, the PCP and the TPP base case therefore both include zero MW. The TPP base case separately includes 500 MW of pumped-hydro storage in 2030 and 800 MW beginning in 2035, while CleanPowerSF's PCP includes no Planned New pumped-hydro storage. Pumped-hydro storage is treated as a long-duration energy-storage resource and is not directly comparable to conventional hydroelectric generation for purposes of evaluating drought-related energy-supply risk. CleanPowerSF's portfolio therefore does not incur greater drought exposure than the TPP base case through proposed new conventional hydro generation.

Although the SFPUC owns and operates hydroelectric facilities through Hetch Hetchy Power, CleanPowerSF and Hetch Hetchy Power are operated as separate power-supply businesses. CleanPowerSF may purchase capacity from Hetch Hetchy Power through short-term spot transactions, but the PCP does not assume the continued availability of that capacity as a long-term hydroelectric resource. CleanPowerSF also does not direct the operation of Hetch Hetchy Power's hydroelectric facilities.

i. Long-Duration Storage Planning

CleanPowerSF evaluated long-duration energy storage (LDES), defined for this IRP as storage capable of discharging at maximum capacity for at least eight hours, as a candidate resource through 2045. LDES has the potential to shift renewable generation across longer periods, support reliability during extended periods of high net load or low renewable production, reduce renewable curtailment, and provide technological diversity within CleanPowerSF's storage portfolio.

CleanPowerSF has already procured approximately 23.5 MW of eight-hour LDES through California Community Power (CC Power) to support its Commission-ordered mid-term reliability requirements. This includes CleanPowerSF's 12 MW share of the lithium-ion Tumbleweed project and 11.5 MW share of the Willow Rock compressed-air energy storage project. Tumbleweed is classified as Online in the RDT, while Willow Rock is classified as Development because it is under contract but not yet online. Both projects are included among the base resources modeled in the 2026 analysis and are not counted among the PCP's Planned New additions.

For the 2026 IRP, CleanPowerSF included 12-hour and 100-hour storage as candidate resources in the PowerSIMM analysis. No additional LDES was selected for the PCP under the modeled portfolio assumptions. The model instead selected four-hour storage and other resources to meet CleanPowerSF's load, reliability, renewable energy, and GHG planning requirements. This result does not indicate that LDES lacks potential portfolio value, but that incremental LDES was not the most cost-effective resource under the assumptions and requirements evaluated.

LDES may provide greater flexibility than shorter-duration storage during prolonged system stress, extended periods of low renewable production, or periods when renewable energy must be shifted across multiple hours or days. Potential risks include higher costs, limited commercial maturity for certain technologies, development and construction risk, uncertain operating performance, interconnection and deliverability constraints, and uncertainty regarding future capacity accreditation. CleanPowerSF considers these factors together with reliability value, technology diversity, project viability, and portfolio fit when evaluating LDES opportunities. CleanPowerSF therefore considers LDES resources as potential projects, and will continue to do so in future solicitations.

CleanPowerSF's current LDES planning differs materially from its 2022 IRP. The 2022 Preferred Conforming Portfolio selected 350 MW of additional 8- to 12-hour storage by 2035, driven in significant part by its 90 percent time-coincident renewable and/or GHG-free energy requirement. The 2026 PCP does not impose the same portfolio-wide time-coincident requirement and selects no additional LDES. The change also reflects updated resource costs and availability, changes in CleanPowerSF's existing and contracted portfolio, updated load and market assumptions, and CleanPowerSF's procurement of the Tumbleweed and Willow Rock projects since the prior planning cycle.

CleanPowerSF is evaluating whether LDES may contribute toward its procurement obligation under Decision 26-02-057, which may be satisfied through LDES, firm clean renewable resources, or an eligible combination of those resources. CleanPowerSF may also consider increasing its share of existing LDES projects or procuring additional LDES when proposals provide sufficient reliability, compliance, cost, and portfolio-diversity value. The PCP does not, however, identify a separate quantity of additional LDES beyond CleanPowerSF's existing contractual commitments and applicable Commission-ordered procurement needs. CleanPowerSF will continue to evaluate LDES offers through its competitive procurement processes based on cost-effectiveness, commercial readiness, reliability value, interconnection and deliverability, operating performance, and consistency with CleanPowerSF's affordability and clean-energy objectives.

j. Clean Firm Power Planning

CleanPowerSF evaluated clean firm generation as part of its resource planning through 2045. Clean firm resources can provide high-capacity-factor, non-weather-dependent generation that complements variable renewable resources such as solar and wind. These resources may support reliability, reduce dependence on market purchases during periods of low renewable production, and provide renewable or GHG-free energy across a broad range of operating conditions.

Geothermal generation is the principal clean firm resource represented in CleanPowerSF's current portfolio and long-term planning. The PCP includes 240 MW of new geothermal capacity through 2045, consisting of [redacted] of generic geothermal capacity classified as Planned New and [redacted] of identified geothermal development opportunities classified as Review. The generic additions include [redacted], and 100 MW in 2045. PowerSIMM selected geothermal based on its modeled cost, generation profile, contribution to renewable-energy and GHG requirements, and ability to generate without dependence on weather conditions. The identified geothermal development opportunities are included in the Resource Data Template so that the CPUC and CAISO can consider their potential locations and transmission needs in long-term system planning. They are planning assumptions only: CleanPowerSF has not executed contracts or otherwise committed to procure these resources.

CleanPowerSF has pursued geothermal procurement both directly and through CC Power. Through CC Power, CleanPowerSF has contracted for shares of the Fish Lake Geothermal project and the Ormat Geothermal Portfolio to support its Commission-ordered clean firm procurement obligation and broader portfolio objectives. CleanPowerSF's current Resource Data Template represents approximately 2.4 MW from Fish Lake and approximately [redacted] associated with the Ormat portfolio as Development resources. These contracted resources are separate from the 240 MW of new geothermal identified in the PCP.

Clean firm generation offers several potential portfolio benefits, including renewable or GHG-free energy production, high annual capacity factors, geographic and technological diversification, and

generation during periods of low wind and solar output. These characteristics may reduce reliance on short-term market purchases and lessen the amount of renewable overbuild or energy storage otherwise needed to serve load across all hours.

Geothermal development also presents technology-specific risks. Exploration and drilling are costly and may determine that a resource is smaller or less economic than initially projected. Some projects depend on emerging geothermal technologies that have not yet been deployed commercially at scale. The limited number of mature projects can constrain competition and contribute to higher prices. Project schedules and costs may also be affected by financing conditions, permitting, interconnection, and transmission availability.

Geothermal resources are geographically constrained and cannot always be developed near available CAISO transmission. Out-of-CAISO projects may require firm transmission service, wheeling arrangements, and sufficient Maximum Import Capability (MIC) to deliver energy and capacity into CAISO. Limited MIC and regional transmission constraints, particularly for resources in Nevada and other western states, may affect project cost, timing, and deliverability. In-CAISO projects may also depend on significant network upgrades with long development timelines.

Since the 2022 IRP, CleanPowerSF has advanced from evaluating clean firm resources to contracting for and supporting development of new geothermal resources. The 2022 PCP included 60 MW of Planned New geothermal capacity by 2035, compared with 240 MW of prospective new geothermal capacity through 2045 in the current portfolio. CleanPowerSF's direct and joint procurement experience has also provided greater visibility into risks from geothermal exploration, technology, commercial, and transmission. These risks, together with relatively high costs and limited near-term project availability, continue to constrain the pace and scale of geothermal procurement.

CleanPowerSF is evaluating whether firm clean renewable resources may contribute toward its procurement obligation under Decision 26-02-057. CleanPowerSF may also procure geothermal beyond its existing contractual commitments when opportunities provide sufficient compliance, reliability, cost, and portfolio-diversity value. CleanPowerSF will continue to evaluate conventional and next-generation geothermal opportunities based on cost, commercial readiness, transmission access, reliability value, project viability, and consistency with CleanPowerSF's renewable-energy and GHG reduction objectives.

California Community Power Geothermal Coordination

The following discussion describes CC Power-wide development activities and project opportunities; CleanPowerSF's PCP represents 100 MW of these opportunities as Review resources. CleanPowerSF is a member of CC Power, a joint procurement agency comprised of nine CCAs. CC Power has played a pivotal role in driving procurement of geothermal capacity to meet the state's future clean firm energy needs, demonstrated by its leadership in contracting the first new geothermal resources following release of the MTR clean firm requirement. CC Power recognizes that the long-term need for clean firm power for its members goes well beyond the needs of MTR, and recently announced Geothermal Exploration, Offtake and Development Engagement (GEODE) agreements with three geothermal developers with innovative approaches to development targeted at unlocking scale-up of in-state geothermal capacity[20]. CC Power sees these proactive relationships between offtakers and industry as pivotal in overcoming the commercial and infrastructure challenges geothermal opportunities face.

[20] See "CC Power Signs 3 GEODE Agreements to Incentivize California Geothermal Development" (April 13, 2026) at https://cacommunitypower.org/cc-power-signs-3-geode-agreements-to-incentivize-california-geothermal-development/ [accessed July 30, 2026].

Additionally, as a joint procurement entity representing 30,000 GWh of collective annual load, CC Power is able to engage with a larger diversity of developers and opportunities with different risk profiles than what could be pursued by an individual load serving entity.

CC Power GEODE Agreement Capacity

CleanPowerSF's IRP includes its participation in CC Power's GEODE agreements, which are expected to deliver [redacted] of total capacity in the early 2030s. The GEODE agreements are principally focused on development opportunities in Northern California that both avoid import constraints and directly offset power costs for CC Power's members. CC Power has coordinated with its GEODE partners in representing expected development opportunities in the IRP. [redacted] Atlantica and XGS are planning to deploy advanced closed-loop technology, which both enables development beyond the geologic constraints of conventional hydrothermal development and minimizes water requirements. Closed-loop technology has been demonstrated in the field and recently through commercial development in Germany[21]. Through its GEODE agreement, Zanskar is applying its unique capabilities leveraging artificial intelligence and modeling to discover new hydrothermal systems. [redacted] The GEODE projects are represented with online dates in the early 2030s but could be accelerated if transmission is readily available. GEODE projects are reported as "Review" status in the RDT to reflect the active commercial discussions between CC Power and developers on specific project opportunities.

CC Power Enhanced Geothermal System (EGS) Capacity

CleanPowerSF's IRP also includes its participation in CC Power's engagement with [redacted], a developer of a near-field [redacted] enhanced geothermal system (EGS) project [redacted]. CC Power is currently under exclusivity for this project, which has site control and is planning to build upon [redacted] success in applying EGS technology to development in Nevada and Utah. This project is represented with an online date in [redacted] but could be accelerated if transmission is made readily available. This project is also reported as "Review" status in the RDT given the advanced nature of commercial discussions.

CleanPowerSF's IRP includes its early-stage participation in CC Power's engagement with [redacted] regarding their [redacted] project. CC Power and [redacted] have nearly reached terms on an exclusivity agreement and have exchanged contract redlines for the project. The project will be developed in [redacted]

CC Power Strategic Geothermal Capacity Coordination

CleanPowerSF has coordinated with CC Power on representing geothermal capacity needs beyond the opportunities described above. Collectively, CC Power entities are anticipating nearly 500 MW of additional geothermal development need to meet 2045 needs. A key challenge with geothermal development is that even with next-generation technologies, the best opportunities are locationally

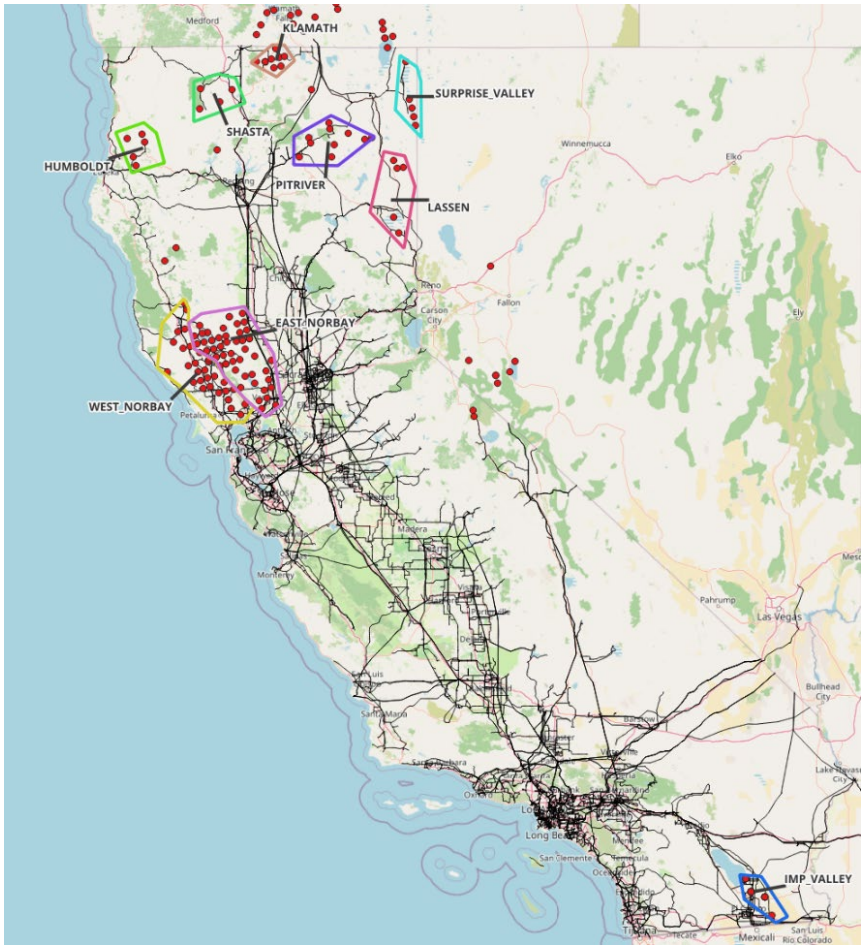
[21] See "Eavor's First-of-Its-Kind Closed-Loop Geothermal Project Produces Grid Power in Germany" (January 8, 2026) at https://www.powermag.com/eavors-first-of-its-kind-closed-loop-geothermal-project-produces-grid-power-in-germany/ [accessed July 30, 2026].

constrained. Accordingly, it is critical that transmission is proactively planned to areas that are commercially viable for both developers and offtakers.

In the interest of providing a consistent indication of development areas with both high-quality resources and commercial offtake interest, CC Power members have taken a methodical approach to mapping and representing long-term geothermal needs. First, CC Power has leveraged one of the best available datasets on next-generation geothermal potential: supply curves from Wilson Ricks and Jesse Jenkins' May 2025 study on national-scale adoption of EGS.[22] The Ricks & Jenkins study leverages the recent Stanford thermal modeling already used by the Commission, but also specifically characterizes near-field EGS resources—which are likely to be the first and most economical projects to be developed. CC Power applied both technological and economic filters to the supply curve data (depth <= 4.5 km, temperature <= 275C, inferred LCOE <= $100/MWh, project capacity > 50 MW). Data points that met CC Power's filter criteria are represented as the red dots in Figure 8.

[22] Wilson Ricks and Jesse D. Jenkins, "Pathways to National-Scale Adoption of Enhanced Geothermal Power Through Experience-Driven Cost Reductions," Joule (2025), available at: https://zero.lab.princeton.edu/wp-content/uploads/2025/06/Ricks-Jenkins-2025-Pathways-to-national-scale-adoption-of-enhanced-geothermal-Joule.pdf. Supplementary data are available at: https://zenodo.org/records/15485307 [accessed July 30, 2026].

Figure 8: CC Power Strategic Geothermal Mapping



Using the filtered data, CC Power identified clusters of opportunities with distinct transmission needs: West North Bay, East North Bay, Humboldt, Shasta, Klamath, Pit River, Surprise Valley, Lassen, and Imperial Valley (see colored polygons in Figure 8). CC Power members strongly prefer resources in CAISO due to import capacity constraints, and accordingly did not carry Imperial Valley, Klamath, and Shasta further in the analysis. Although Surprise Valley and Lassen are currently outside the CAISO, CC Power is encouraged by the 2026-27 focus on adding import capacity to the Hilltop substation in Northeastern California and sees a lot of synergies with creating better access to Northern Nevada resources and in-state wind.

Based on the supply curve filtering, the six remaining areas of interest individually represent 0.8 to 13.5 GW each of theoretical capacity. CC Power has represented its interest using two tiers: the East North Bay and West North Bay with 150 MW of total interest (out of 10+ GW theoretical capacity each) and the other four areas with 50 MW of interest (out of 0.8 to 1.6 GW of theoretical capacity each). CleanPowerSF's IRP includes its share of these opportunities with a substation designated that is indicative of the resource area's transmission needs. These opportunities are listed as "Review" to reflect CC Power's active commercial review of specific geothermal development opportunities and are flagged for retention priority given the need to proactively plan transmission. CC Power will continue developing relationships with industry to further commercialize this capacity.

k. Non-CAISO, including Out-of-State, Wind Planning

CleanPowerSF evaluated non-CAISO, including out-of-state, wind as a candidate resource through 2045. The PCP includes 200 MW of Planned New New Mexico wind, consisting of 100 MW in 2029 and an additional 100 MW in 2030.

New Mexico wind can provide access to high-quality wind resources, geographic diversification, and production during evening, overnight, and seasonal periods when California solar output is lower. These characteristics can complement CleanPowerSF's solar and in-state wind resources and reduce dependence on a single renewable technology, location, or production profile.

Since the 2022 IRP, CleanPowerSF has entered into an agreement for energy from the SunZia Wind project in New Mexico. SunZia Wind and its dedicated high-voltage direct-current transmission line that became operational in 2026, providing an established transmission pathway from central New Mexico to Arizona and western electricity markets.[23] This development demonstrates the commercial viability of delivering large-scale New Mexico wind to California customers and reduces some of the transmission-development uncertainty identified in CleanPowerSF's 2022 IRP. The SunZia agreement is separate from the 200 MW of Planned New New Mexico wind identified by the 2026 capacity-expansion analysis. Those modeled additions represent generic New Mexico wind resources and are not assigned to SunZia or any other specific project.

In PowerSIMM, the Planned New New Mexico wind candidates were represented as delivering electricity west through WECC Paths 47 and 48 to Arizona and the Four Corners area and then through WECC Path 46 into Southern California. The additions were modeled as generic New Mexico wind resources and were not associated with a specific project, transmission line, contractual delivery arrangement, or procurement commitment.

SunZia provides one operational pathway that may support delivery of additional New Mexico wind, subject to the availability and cost of transmission capacity and associated commercial arrangements. Other New Mexico or Mountain West wind opportunities could require new transmission facilities or upgrades that are not yet online. Actual procurement would require confirmation of firm transmission service, wheeling and scheduling arrangements, congestion exposure, import capability, and any upgrades necessary to deliver energy into CAISO. If a resource is intended to provide resource adequacy, sufficient Maximum Import Capability would also be required. These considerations could affect the timing, cost, deliverability, and commercial feasibility of the modeled additions.

Potential risks of additional out-of-state wind include limited transmission availability, congestion and wheeling costs, project and interconnection delays, contracting and scheduling complexity, curtailment, counterparty risk, and uncertainty regarding the timing and cost of transmission development. CleanPowerSF will weigh these risks against the resource's generation value, geographic and production-profile diversity, reliability contribution, and potential to reduce reliance on market purchases during periods of lower California renewable production.

The PCP represents a material change from CleanPowerSF's 2022 IRP, which did not include out-of-state wind in its modeled portfolios. The change reflects the commercial advancement of New Mexico wind and associated transmission, CleanPowerSF's experience with the SunZia project, the modeled

[23] Pattern Energy, "SunZia Comes Online, Transforming Power Delivery in the United States," June 18, 2026, https://patternenergy.com/sunzia-comes-online/ [accessed July 30, 2026].

portfolio value of geographically diverse wind generation, higher assigned load, more stringent GHG requirements, and updated resource-cost, generation-profile, and market assumptions.

CleanPowerSF will continue, individually and through California Community Power, to evaluate New Mexico and other out-of-state wind opportunities. Future procurement decisions will depend on resource pricing, generation value, transmission and delivery certainty, import capability, project viability, procurement feasibility, and consistency with CleanPowerSF's reliability, affordability, renewable-energy, and GHG objectives.

l. Offshore Wind Planning

CleanPowerSF evaluated offshore wind as a candidate resource through 2045. Offshore wind could provide large-scale renewable generation, geographic and technological diversity, and a production profile that complements California's solar-heavy resource mix.

CleanPowerSF has not procured offshore wind. Central Coast and North Coast offshore wind were available for selection in the PowerSIMM capacity-expansion analysis, but neither was selected for the PCP. The portfolio therefore includes zero MW of offshore wind. Under the modeled cost, availability, and operating assumptions, other candidate resources were more cost-effective for meeting CleanPowerSF's load, reliability, renewable-energy, and GHG planning requirements.

Central Coast and North Coast offshore wind present different development and transmission considerations. Central Coast resources are closer to major California load centers and existing or planned transmission infrastructure but may face military-use, environmental-review, transmission, port, and floating-technology constraints. North Coast resources offer substantial wind potential but are expected to require significant new transmission and port infrastructure to deliver generation to the CAISO system. Federal policy has also become an additional source of uncertainty for both regions. The federal government has paused new or renewed offshore-wind leasing and approvals pending review, and in 2026 entered agreements providing for the cancellation of two existing Morro Bay offshore-wind leases. [24]

Potential benefits of offshore wind include renewable generation at scale, production during hours and seasons that may complement solar generation, and greater geographic and technological diversity. Principal risks include high and uncertain costs, dependence on floating offshore wind technology, long development timelines, transmission and interconnection requirements, port and supply-chain constraints, permitting and environmental impacts, hostile federal policy, financing uncertainty, and the potential for project delay or cost escalation.

CleanPowerSF's 2022 IRP did not include offshore wind in its submitted portfolios. The 2026 analysis more directly evaluated offshore wind as a potential portfolio resource, reflecting progress in state and federal leasing, transmission planning, port and supply-chain planning, and development of a centralized

[24] The White House, "Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects," January 20, 2025; U.S. Bureau of Ocean Energy Management, "California Activities," https://www.boem.gov/renewable-energy/state-activities/california-activities [accessed July 30, 2026] (noting 2026 settlement agreements concerning Lease Nos. OCS-P 0564 and OCS-P 0565).

procurement framework. Despite that progress, significant uncertainty remains regarding commercial timing, cost, transmission availability, permitting, financing, and project execution.

Although offshore wind was not selected in the PCP, both time-coincident clean-energy sensitivities selected offshore wind later in the planning horizon. Under the more restrictive time-coincident hourly clean-energy matching requirements, offshore wind was able to provide a complementary production profile in addition to allowing additional capacity since the modeled build limits were reached. CleanPowerSF did not select either sensitivity, however, because the broader sensitivity portfolios resulted in materially higher costs, greater excess generation and market sales, and greater procurement and implementation risk.

CleanPowerSF is not currently pursuing direct offshore wind procurement. CleanPowerSF will continue to monitor offshore wind development, centralized procurement activities, transmission and port planning, project costs, and commercial readiness. CleanPowerSF will also account for any eligible offshore wind resources or associated obligations allocated through a future centralized procurement process when updating its portfolio and procurement plans.

m. Transmission Planning

CleanPowerSF considered transmission availability, interconnection status, deliverability, and development timing when preparing its PCP and RDT. CleanPowerSF's approach generally prioritizes use of existing or approved transmission capability and considers the cost, timing, and development risk associated with resources that may require additional network upgrades, firm transmission service, wheeling arrangements, or MIC.

CleanPowerSF reviewed available CAISO transmission-planning and interconnection information together with project-specific information supplied by developers and counterparties. Relevant information included interconnection-queue status, identified network upgrades, expected upgrade timing, deliverability, transmission capability, and the most recent available busbar-mapping and transmission-planning information.

Contracted and In-Development Resources

CleanPowerSF is not proposing or seeking approval of a transmission project through this IRP. Certain contracted resources nevertheless depend on project-specific interconnection facilities, network upgrades, or deliverability milestones. Known dependencies include the Vaca-Dixon and Contra Costa line-terminal reconfiguration work associated with the Corby energy-storage project, [redacted] and SCE interconnection upgrades associated with Willow Rock. These resources are represented as Development resources in the RDT. Table 11 summarizes the points of interconnection and CAISO queue positions for selected contracted or Development resources represented in the RDT. CleanPowerSF will continue to monitor the applicable upgrades and coordinate with project counterparties regarding potential effects on commercial-operation dates, deliverability, replacement-resource obligations, and cost.

Table 11: CleanPowerSF New Resource CAISO Interconnection Queue Positions

Resource	Capacity (MW)	Location or point of interconnection	Interconnection status
Aramis Solar	75 MW Solar/75 MW Storage	Cayetano Substation	Cluster 10 - #1349
Gonzaga Ridge Wind Farm	129.8 MW Wind/ 50 MW Storage	Los Banos substation	Cluster 10 - #1378
Gonzaga Ridge Wind Farm – Dinosaur Point	17.7 MW Wind	Dinosaur Point Tap on the Los Banos-Pacheco 70 kV line	Interconnection position 0052CONV
Darden Solar Project	[redacted]	Harlan Switching Station	Cluster 14 - #1949
Willow Rock	11.5 MW storage	Whirlwind substation	Cluster 13 - #1782

Planned Resources and Busbar Mapping

For Planned New resources that do not have a project-specific interconnection-queue position, CleanPowerSF used the candidate-resource areas or other geographic representations reported in the RDT. These locations reflect plausible areas for the modeled technologies based on available resource, commercial, and transmission-planning information. They do not establish project-level deliverability or demonstrate that any particular interconnection or transmission upgrade has been secured.

The locations assigned to generic Planned New resources are not intended to represent location information for which CAISO should plan or approve transmission projects 10 or 15 years in advance. CleanPowerSF does not object to relocation of a generic uncontracted resource during CPUC busbar mapping where another location represents the same technology and provides comparable commercial potential, transmission availability, cost, and portfolio value. Contracted projects and specifically identified development opportunities are more location-sensitive and should not be relocated without considering the underlying project information reported in the RDT.

Imports, MIC, and Regional Transmission

The PCP includes contracted, identified, or generic resources that may be located outside the CAISO balancing authority area. Delivery of these resources may require firm transmission service, wheeling and scheduling arrangements, sufficient intertie capability, and, in some cases, additional network upgrades. If an imported resource is intended to provide resource adequacy, sufficient MIC must also be available and allocated at the applicable intertie.

As discussed in Section III.k, the Planned New New Mexico wind additions were modeled as generic resources rather than as a specific project or transmission arrangement. Procurement would require confirmation of available transmission rights, delivery and scheduling arrangements, congestion and curtailment exposure, wheeling costs, and any MIC needed to support resource-adequacy treatment. The PCP does not assume that these commercial arrangements have already been secured.

The portfolio also includes geothermal resources with different CAISO and non-CAISO configurations. Imported geothermal resources may require project-specific transmission-service rights, delivery arrangements, network upgrades, and MIC before delivery into CAISO is feasible. The timing and cost of these requirements could affect project deliverability and commercial-operation dates.

Consistency With Prior Planning

CleanPowerSF's 2026 transmission-planning assumptions differ from its 2022 IRP because the current portfolio includes additional contracted and Development resources, a larger geothermal buildout, and 200 MW of generic New Mexico wind that was not included in the 2022 submitted portfolio. The RDT also reflects updated project locations, interconnection information, and current CPUC and CAISO transmission-planning and busbar-mapping information.

Where possible, generic Planned New resources were represented using resource areas consistent with current transmission-planning and busbar-mapping information. Differences from the 2022 portfolio reflect the updated resource mix, contractual portfolio, and candidate-resource assumptions rather than a request to treat all Planned New locations as fixed commitments. Generic resources may be relocated through busbar mapping where the alternative location preserves the relevant technology, regional characteristics, commercial potential, and portfolio value.

IV. Action Plan

a. Proposed Procurement Activities and Potential Barriers

CleanPowerSF developed the PCP using resource-availability assumptions intended to represent quantities that could reasonably be developed or procured in each study year. The resulting portfolio includes a mix of renewable generation, energy storage, existing and contracted resources, and shorter-term portfolio products that can be implemented through competitive solicitations, bilateral procurement, joint procurement, project-specific development activities, and market transactions.

The PCP identifies 4,140 MW of prospective new capacity through 2045, consisting of [redacted] of Review resources and [redacted] of Planned New resources. Cumulative additions reach [redacted] by 2030, 1,300 MW by 2035, and 1,980 MW by 2040. Approximately 51 percent of the modeled additions occur in 2044 and 2045. CleanPowerSF therefore distinguishes between near- and medium-term procurement activities needed to address identified portfolio requirements and later-year planning results that will be reassessed before specific procurement commitments are made.

CleanPowerSF expects to issue one or more competitive solicitations beginning by the end of 2026 for renewable generation, energy storage, and other eligible portfolio products. Subsequent solicitations will be timed to CleanPowerSF's evolving load, contract expirations, regulatory obligations, market conditions, project availability, and results from future IRP analyses rather than conducted automatically on an annual schedule. CleanPowerSF may also pursue bilateral transactions, joint procurement through California Community Power or other CCA partnerships, and project-specific solicitations when those approaches provide greater portfolio or ratepayer value.

The principal procurement activities anticipated to implement the PCP and address applicable procurement obligations are summarized in Table 12.

Table 12: CleanPowerSF Procurement Strategy and Timing

PROCUREMENT HORIZON	TARGET RESOURCES & PRODUCTS	PROCUREMENT APPROACH	SOLICITATION TIMING
Long-Term	Utility-scale solar; paired and standalone storage; in-state and generic New Mexico wind; geothermal; long-duration storage	Competitive solicitations, bilateral transactions, and joint procurement	Initial solicitation activity by the end of 2026; first modeled deliveries beginning in 2028; later needs reassessed periodically
Local Long-Term	In-City and Bay Area renewable generation and storage	Site development and project-specific or broader competitive procurement	Ongoing development; solicitation and delivery based on site readiness and project feasibility
Short-Term	Renewable energy and RECs; VAMO products; ERRA forecast hydro attributes; GHG-free attributes; resource adequacy; wholesale energy	Competitive solicitations, bilateral transactions, market purchases	Ongoing or as needed

CleanPowerSF is committed to developing local resources within the nine Bay Area counties. Following its 2020 Local Renewable Energy Report and subsequent site analysis, CleanPowerSF has continued to evaluate renewable-energy opportunities on City-owned property. The PCP modeling includes the SFPUC-owned University Mound North Basin and the San Francisco Police Department's Crime Laboratory solar project. CleanPowerSF is also evaluating additional local opportunities, including Sutro Reservoir and other City-owned sites, as technical, commercial, permitting, and interconnection feasibility is established. These projects may contribute toward the PCP's modeled solar additions, but the PCP does not establish a predetermined solicitation or delivery schedule for any individual site.

In addition to long-term procurement, CleanPowerSF uses shorter-term procurement to manage renewable-energy, greenhouse gas-free attribute, resource-adequacy, and other portfolio needs. These transactions may include competitive solicitations, bilateral purchases, and participation in applicable investor-owned utility allocation or market-offer processes.

CleanPowerSF participated in the 2023–2024 Voluntary Allocation process and will continue to evaluate future Voluntary Allocation and Market Offer (VAMO) opportunities based on product eligibility, pricing, delivery term, portfolio need, and consistency with CleanPowerSF's compliance and clean-energy objectives. VAMO resources are distinct from the forecast allocation of 275,000 MWh of hydro-related greenhouse gas-free attributes included in the PCP for each of 2026 and 2027 through PG&E's ERRA forecast. That forecast allocation is neither a contract with PG&E nor a VAMO allocation and includes no associated energy delivery or capacity. Because future allocations remain uncertain, the PCP assumes no comparable ERRA hydro-related attribute allocation after 2027.

To avoid excessive reliance on short-term attribute purchases, PowerSIMM limited annual candidate purchases beginning in 2027 to 400,000 MWh of PCC1 renewable energy attributes and 400,000 MWh of non-RPS greenhouse gas-free attributes. Physical large-hydroelectric resources were not included as selectable candidate resources. CleanPowerSF will monitor its renewable-energy, greenhouse gas-free,

resource-adequacy, and energy positions and undertake short-term procurement as needed while maintaining a balanced mix of contract terms and avoiding reliance on short-term products as a substitute for the long-term resource development identified in the PCP.

i. Resources to meet IRP mandated procurement requirements, including D.21-06-035 and D.23-02-040:

CleanPowerSF is implementing the procurement requirements established by D.21-06-035, D.23-02-040 and D.26-02-057 through a combination of resources summarized in Table 13 below. Table 14 summarizes the applicable procurement requirements by year and resource category. These resources include new renewable generation paired with storage, standalone storage, long-duration storage, and clean firm renewable generation. The contracted resources identified below contribute to one or more applicable procurement requirements, although the quantity credited for compliance may differ from the resource's nameplate capacity because compliance is determined using applicable net qualifying capacity, effective-load-carrying-capability, eligibility, online-date, and counting rules. For detailed explanation of what resources are used to meet each tranche, please refer to CleanPowerSF's June 1, 2026 MTR Compliance filing.[25]

[25] CleanPowerSF, June 1, 2026 Procurement Compliance Filing And Response to Data Request. Available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M608/K067/608067162.PDF [accessed August 4, 2026].

Table 13: CleanPowerSF MTR-eligible Project Status

Resource		Contract Status
Existing Resources Under Contract	Blythe Solar (62.5 MW Solar, 47 MW Storage)	Online
	Maverick Solar+Storage (100 MW Solar, 50 MW Storage)	Online
	Paulsell Solar+Storage (20 MW Solar, 15 MW Storage)	Online
	SunZia (100 MW Wind)	Online
	Tumbleweed (12 MW Storage)	Online
New Resources CleanPowerSF under contract	Aramis Solar (75 MW Solar, 75 MW Storage)	In Development (12/2026 COD)
	Corby (75 MW Storage)	In Development [redacted] COD)
	Fish Lake (2.4 MW Geothermal)	In Development [redacted] COD)
	Ormat Geothermal Portfolio [redacted] Geothermal)	In Development (multiple COD)[26]
	Gonzaga (129.8 MW Wind, 50 MW Storage)	In Development [redacted] COD)
	Darden ([redacted] Storage, [redacted] solar)	In Development ([redacted] COD)
	Willow Rock (11.5 MW Storage)	In Development (12/2030 COD)

[26] CC Power contracted with Ormat Technologies for multiple projects with different CODs.

Table 14: Summary of CleanPowerSF MTR Obligation (D.21-06-035, D.23-02-040, and D.26-02-057)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Generic NQC Capacity	31 MW	93 MW	23 MW	31 MW*	31 MW*			36 MW	36 MW	36 MW
Minimum Zero-Emitting Capacity	39 MW**									
Long-Duration Storage	15 – 16 MW***							27 MW****		
Clean Firm Capacity	15 – 16 MW***									

** Note that CleanPowerSF's total responsibility in 2026 and 2027 total 63 MW even though the listed obligation for 2026 and 2027 totals 62 MW.*[44]
***Zero-emitting capacity is a subset of the Generic NQC Capacity.*[45]
****Long-Duration Storage and Clean Firm Capacity must sum up to 31 MW.*
***** Long-Duration Storage and Clean Firm Capacity are a subset of the Generic NQC Capacity.*

CleanPowerSF will continue implementing applicable Commission-mandated procurement requirements through contract administration and future procurement activities. CleanPowerSF issued eligible-resource solicitations in 2022[27] and 2024[28] and plans to issue another solicitation by the end of 2026, informed by the results of this IRP.

CleanPowerSF, similar to other LSEs, continues to face challenging market conditions that may pose risks to the implementation of its PCP. These potential barriers include:

- Project Development and Schedule Risk**:** Projects may experience delays associated with permitting, site control, equipment procurement, construction, interconnection, transmission upgrades, financing, or achievement of contractual milestones. These risks may affect commercial-operation dates and require bridge, replacement, or supplemental procurement.
- Cost and Financing Risk**:** Inflation, interest rates, equipment and labor costs, supply-chain conditions, tax and trade policy, and changing financing requirements may increase project costs or affect developers' ability to perform under existing contract terms. New solicitations may also produce prices above historical procurement levels.
- CAISO Interconnection and Deliverability Timelines: CAISO interconnection studies, network-upgrade development, transmission construction, and deliverability awards may have long or uncertain timelines. These dependencies can affect project viability, cost, and online dates.
- Maximum Import Capability Uncertainty: Out-of-state resources may require firm transmission service, wheeling and scheduling arrangements, sufficient intertie capability, and Maximum

[27] CleanPowerSF 2022 Renewable Energy Supplies (PUC.PRO.0263), available at: https://sfbid.sfwater.org/opportunity/details/?cid=263 [accessed July 30, 2026].

[28] 2024 CleanPowerSF Renewable Energy Supplies (PUC.PRO.0280), available at: https://sfbid.sfwater.org/opportunity-details/280/2024-cleanpowersf-renewable-energy-supplies [accessed July 30, 2026].

Import Capability to provide resource adequacy. Uncertainty regarding these arrangements may affect whether and when imported resources can deliver energy and capacity to CAISO.

CleanPowerSF will continue to administer its existing contracts, monitor project milestones and eligibility, and undertake replacement, or supplemental procurement as needed to maintain compliance. Additional detail regarding CleanPowerSF's current MTR compliance position is provided in its June 1, 2026 MTR Compliance Filing.

ii. Plans for resources that are currently non-candidate in CPUC's IRPs not described above

CleanPowerSF does not plan to procure resource types that are not included as candidate resources in the CPUC's IRP. CleanPowerSF will continue to monitor emerging technologies and may consider such resources in future planning cycles or solicitations if they become commercially viable and support CleanPowerSF's program goals.

iii. Other renewable and/or zero carbon resources not described above

Not applicable. All renewable and zero-carbon resources included in the PCP and associated procurement activities are described above.

iv. Other energy storage not described above

Not applicable. All energy-storage resources included in the PCP and associated procurement activities are described above.

v. Other demand response not described above

Not applicable. The PCP does not identify any additional demand-response procurement activities under this category.

vi. Other energy efficiency not described above

Not applicable. The PCP does not identify any additional energy-efficiency procurement activities under this category.

vii. Other distributed generation not described above

Not applicable. The PCP does not identify any additional distributed-generation procurement activities under this category.

viii. Transportation electrification, including any investments that correspond to different levels than what is included in Integrated Energy Policy Report (IEPR)

The PCP uses the CPUC-assigned annual energy and peak-demand forecast and does not assume a separate level of transportation-electrification load that differs from the assigned forecast. CleanPowerSF's custom hourly load profile nevertheless reflects the expected timing and operating characteristics of transportation-electrification demand, including charging by light-duty vehicles used by San Francisco residents and commuters and medium- and heavy-duty vehicles. This treatment

changes the hourly distribution of assigned demand but does not increase or decrease the annual energy or peak-demand values used in the PCP.

CleanPowerSF separately supports transportation electrification through customer programs, including EV Charge SF[29] and Electrify My Ride[30]. These programs encourage adoption of electric transportation and charging infrastructure but were not modeled as separate load modifiers or investments beyond the CPUC-assigned load forecast.

ix. Building electrification, including any investments that correspond to different levels than what is included in Integrated Energy Policy Report (IEPR)

The PCP uses the CPUC-assigned annual energy and peak-demand forecast and does not assume a separate level of building-electrification load that differs from the assigned forecast. CleanPowerSF's custom hourly load profile reflects anticipated fuel switching in existing buildings and electric demand from new construction based on CleanPowerSF's internal electrification analysis. This treatment changes only the hourly distribution of assigned demand and does not alter the annual energy or peak-demand values used in the PCP.

CleanPowerSF separately supports building electrification through customer programs such as the All-Electric Multifamily Program[31], which provides building owners and operators with technical analysis and support as they transition appliances from natural gas to electric. These activities support San Francisco's electrification and climate objectives but were not modeled as separate load modifiers or investments beyond the CPUC-assigned forecast.

x. Potential Centralized Procurement, pursuant to AB-1373

CleanPowerSF represented potential AB 1373 centralized-procurement allocations as candidate resource sets, but none were selected for the PCP under the modeled assumptions. The PCP therefore does not include hypothetical allocations of centrally procured resources and does not rely on centralized procurement to satisfy CleanPowerSF's contractual commitments or Commission-mandated procurement requirements.

If DWR procures long-lead-time resources and the CPUC allocates associated costs and benefits to CleanPowerSF, CleanPowerSF will incorporate the allocation into subsequent resource planning and contract-planning decisions. Existing contractual commitments would not automatically be reduced or terminated; rather, CleanPowerSF would evaluate the resource's technology, delivery schedule, reliability value, environmental attributes, allocated cost, and relationship to its portfolio needs.

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[29] SFPUC, "EV Charge SF," https://www.sfpuc.gov/programs/clean-energy/ev-charge-sf [accessed July 30, 2026].

[30] SFPUC, "Electrify My Ride," https://www.sfpuc.gov/programs/clean-energy/electrify-my-ride [accessed July 30, 2026].

[31] SFPUC, "All-Electric Multifamily Program," https://www.sfpuc.gov/programs/clean-energy/all-electric-multifamily-program [accessed July 30, 2026].

Comparable later-year Planned New additions would be reassessed through future IRPs to avoid duplicative procurement.

xi. Other

Not applicable. CleanPowerSF has not identified any additional procurement activities outside the categories addressed above.

b. Disadvantaged Communities (DACs)

Since the 2022 IRP, CleanPowerSF has expanded its DAC- and equity-related activities through additional customer affordability and electrification programs, continued implementation of its DAC tariff programs, use of the Power Enterprise equity framework, and procurement activity intended to satisfy its DAC-GT obligations.

In accordance with the SFPUC's Community Benefits policy[32], CleanPowerSF has sought to include Social Impact Partnerships as part of its long-term renewable energy contracts. CleanPowerSF, as a program of the SFPUC, encourages responses to competitive solicitations for renewable energy supply valued at $5 million or more to include social impact commitments to benefit communities directly affected by the construction and operation of projects.[33] The SFPUC was the first public utility in the nation to adopt community benefits and environmental justice policies, and through new long-term renewable commitments, CleanPowerSF aims to continue contributing to investments in workforce development, education, environmental justice, neighborhood revitalization, and the arts in communities impacted by its activities.[34]

CleanPowerSF conducts public and customer engagement through SFPUC meetings, workshops, community partnerships, customer communications, and program outreach. Where a proposed procurement could affect a DAC within CleanPowerSF's service territory, CleanPowerSF plans to seek community input directly or coordinate outreach through its procurement partners or project developers, as appropriate.

Section III.d.ii describes CleanPowerSF's current programs and activities serving DACs, as well as the potential impacts of its resource portfolio on DACs within and outside San Francisco. In implementing the procurement activities described in Section IV.a, CleanPowerSF will continue to prioritize renewable and non-emitting resources and consider potential GHG, criteria air pollutant, and community impacts associated with specific projects.

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[32] See *SFPUC Commission Resolution No. 11-0008 affirming the Community Benefits Policy,* SFPUC (Jan. 11, 2011) at https://sfpuc.org/sites/default/files/about-us/policies-reports/CommunityBenefits%20Policy_JAN2011.pdf [accessed July 30, 2026].

[33] See San Francisco Public Utilities Commission, Social Impact Partnerships in Contracts Process Overview, available at: https://sfpuc.org/sites/default/files/construction-and-contracts/Social%20Impact%20Program%20Information_2021.pdf [accessed July 30, 2026].

[34] More information on the SFPUC's Community Benefits program is available at https://sfpuc.org/about-us/policies-plans/community-benefits-policy [accessed July 30, 2026].

c. LSEs' Tribal Customers

CleanPowerSF does not currently have customers that are tribal governments, tribal organizations, or otherwise identified as tribal customers.

CleanPowerSF did not conduct tribal engagement specifically for development of this IRP. CleanPowerSF recognizes that its resource planning and procurement activities may affect tribes outside its service territory, including through the siting and development of generation, storage, and transmission resources.

As specific procurement projects and locations are identified, CleanPowerSF will consider whether potentially affected tribes should be engaged directly, through project developers, or through joint-procurement partners. Engagement would be informed by the location and potential impacts of the proposed project and the respective roles of CleanPowerSF, its partners, and the developer.

d. Procurement Products

CleanPowerSF expects to use a combination of long-term physical contracts, shorter-term bilateral products, capacity products, environmental attributes, and wholesale-market transactions to implement the PCP and manage changes in load, resource performance, contract timing, and regulatory requirements. The specific product, term, pricing structure, and quantity used in any transaction will depend on CleanPowerSF's portfolio position, market conditions, counterparty credit, compliance requirements, and applicable approval processes. CleanPowerSF may use standard collateral and credit-support provisions in its contracts.

Table 15 summarizes the physical and financial products CleanPowerSF may use to implement the PCP.

Table 15 – CleanPowerSF Physical and Financial Procurement Products

Product	Description of Product
Renewable energy contracts	Long- or short-term purchases of renewable energy and associated renewable energy credits.
Energy storage agreements	Contracts for standalone or paired storage capacity and related operational rights.
Renewable energy credits	Purchases or sales used to manage RPS compliance and renewable product content.
Greenhouse gas-free attributes	Purchases, allocations, or sales of non-RPS greenhouse gas-free attributes, with or without associated energy.
Resource adequacy capacity	System, local, flexible, or import capacity used to meet applicable compliance requirements.
Wholesale energy	Bilateral and CAISO market purchases and sales used to balance portfolio supply and customer demand.
Excess portfolio products	Sales or exchanges of surplus energy, capacity, renewable energy credits, or greenhouse gas-free attributes.

e. Commission Direction of Actions

The CPUC does not authorize CleanPowerSF's spending, programmatic goals, budgets, or individual procurement decisions. However, Commission procurement orders, centralized-procurement activities, and IRP planning requirements materially affect CleanPowerSF's procurement needs, timing, and costs. CleanPowerSF respectfully requests greater predictability and coordination in the following areas.

CleanPowerSF supports Commission work on increasing the certainty around long-term procurement to facilitate LSEs procuring in a manner that achieves state and local goals, while maintaining affordability to ratepayers. Long term planning inherently contains a lot of uncertainty due to changing economic, technological and legislative/regulatory factors, but the Commission can take steps to decrease this uncertainty.

First, the CPUC should adopt a Reliable and Clean Power Procurement Program (RCPPP) as soon as possible. Discussion on establishing a programmatic approach to procurement in the IRP track started in 2020, but a program has yet to be adopted. Since then, the CPUC has issued three ad-hoc procurement orders, each with significantly different parameters.

Second, it is difficult to plan procurement over the long run when an LSE is faced with multiple layers of uncertain centralized procurement efforts. LSEs cannot control the parameters by which

centralized procurement is successful or not. The DWR Central Procurement Entity presents a significant challenge for planners, because neither the capacity, timing, nor technology type is known. While centralized procurement might be beneficial for technologies that are highly risky, and require substantial and unique infrastructure needs, it is not needed for technologies such as enhanced geothermal, with which certain LSEs and companies have successfully contracted. Restricting the CPE to more limited technologies and creating clearer procurement schedules will allow LSEs to better plan in their individual IRPs.

Third, the CPUC should implement a more streamlined representation for the GHG emission benchmarks in the CSP. For modelling purposes, having an annual GHG emission benchmark, rather than every five years, will allow the capacity optimization to build resources rather than rely on short term contracts to meet the requirements in the CSP years.

Fourth, we recommend the CPUC create a single document with all the information and assumptions needed to do capacity expansion and production cost modeling. For this IRP iteration, there were several documents relied on by staff that were at times inconsistent or contained incomplete information. While the I&A slides were useful and contained a lot of necessary information, it was not easy to discern whether some of this information is explanation of methodologies, or are assumptions that LSEs should rely on for their modeling. In addition, some of the assumptions related to the 2025 – 2026 TPP assumptions while others related to the 2026 – 2027 TPP assumptions. Creating a one document or spreadsheet with all the required assumptions will ensure consistency between LSEs, and ensure accuracy.

Finally, the Commission should work more closely with the CEC to ensure that LSE forecasts are representative of the actual data that LSE's observe. CleanPowerSF has noted in multiple instances that its observed load is significantly different than the assignment by the CEC IEPR. In fact, the IEPR 2024 forecast for 2024 load was 7% higher forecast than actual (3,185 GWh, while actual load was 2,975 GWh). Similarly, for IEPR 2025, the forecast for 2025 was 9% higher than actual (3,268 GWh, while actual load was 2,991 GWh). These significant discrepancies contribute to higher planned procurement obligations to CleanPowerSF. As a result, the results of planning processes are less accurate, any over-procurement will leave the portfolio exposed to market volatility, and the resulting increased costs will shift to CleanPowerSF ratepayers.

V. Lessons Learned

IRP Schedule

CleanPowerSF appreciates the improvements made to the 2026 IRP process. In particular, providing LSEs approximately six months after issuance of the final Inputs and Assumptions and having no late changes to the CSP Calculator and RDT gave LSE staff greater certainty and time to complete the required analysis.

CleanPowerSF recommends that the CPUC also coordinate the timing of IRP-related requests, workshops, and compliance filings across related proceedings. During preparation of this IRP, CleanPowerSF staff were also required to submit an RPS Procurement Plan, respond to an IRP survey, review preliminary busbar-mapping information, and respond to procurement-compliance workshop questions. Greater advance notice and more deliberate staggering of related deadlines would allow LSEs to provide more complete and useful input, while accommodating governing-body review and normal staff availability.

IRP Forecast

CleanPowerSF recognizes that a Conforming Portfolio must use the annual load forecast assigned through the IRP process and that LSEs may submit an Alternative Portfolio based on different assumptions. However, significant differences between the assigned forecast and an LSE's recent observed demand or locally developed forecast can result in a Conforming Portfolio that does not align with the LSE's actual or most likely near-term procurement needs.

CleanPowerSF is concerned with the limited flexibility LSEs have in influencing the load assumptions to be used in their Conforming Portfolio. Statewide forecasting methods necessarily rely on common assumptions and may not fully capture local conditions. San Francisco's compact geography, aging building stock, high public transit use, customer composition, and pace of electrification may produce load growth that differs from broader statewide trends. CleanPowerSF recommends a more structured process for LSEs to submit current load-profile information, understand and reconcile significant differences before load assignments are finalized, and ensure that final assignments better reflect local conditions and forecasts specific to each LSE's service territory.

This approach would preserve a consistent statewide planning framework while giving the CPUC, LSE governing bodies, and customers a clearer understanding of forecast uncertainty, procurement risk, and the range of resources that may ultimately be needed. It would also help LSEs balance reliability and state policy objectives with affordability and the risk of over-procurement.

Glossary of Terms

Alternative Portfolio: *LSEs are permitted to submit "Alternative Portfolios" developed from scenarios using different assumptions from those used in the Preferred System Plan with updates. Any deviations from the "Conforming Portfolio" must be explained and justified.*

Approve (Plan)*: the CPUC's obligation to approve an LSE's integrated resource plan derives from Public Utilities Code Section 454.52(b)(2) and the procurement planning process described in Public Utilities Code Section 454.5, in addition to the CPUC obligation to ensure safe and reliable service at just and reasonable rates under Public Utilities Code Section 451.*

Balancing Authority Area (CAISO): *the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.*

Baseline resources: *Those resources assumed to be fixed as a capacity expansion model input, as opposed to Candidate resources, which are selected by the model and are incremental to the Baseline. Baseline resources are existing (already online) or owned or contracted to come online within the planning horizon. Existing resources with announced retirements are excluded from the Baseline for the applicable years. Being "contracted" refers to a resource holding signed contract/s with an LSE/s for much of its energy and capacity, as applicable, for a significant portion of its useful life. The contracts refer to those approved by the CPUC and/or the LSE's governing board, as applicable. These criteria indicate the resource is relatively certain to come online. Baseline resources that are not online at the time of modeling may have a failure rate applied to their nameplate capacity to allow for the risk of them failing to come online.*

Candidate resource: *those resources, such as renewables, energy storage, natural gas generation, and demand response, available for selection in IRP capacity expansion modeling, incremental to the Baseline resources.*

Capacity Expansion Model: *a capacity expansion model is a computer model that simulates generation and transmission investment to meet forecasted electric load over many years, usually with the objective of minimizing the total cost of owning and operating the electrical system. Capacity expansion models can also be configured to only allow solutions that meet specific requirements, such as providing a minimum amount of capacity to ensure the reliability of the system or maintaining greenhouse gas emissions below an established level.*

Certify (a Community Choice Aggregator Plan)*: Public Utilities Code 454.52(b)(3) requires the CPUC to certify the integrated resource plans of CCAs. "Certify" requires a formal act of the Commission to determine that the CCA's Plan complies with the requirements of the statute and the process established via Public Utilities Code 454.51(a). In addition, the Commission must review the CCA Plans to determine any potential impacts on public utility bundled customers under Public Utilities Code Sections 451 and 454, among others.*

Clean System Power (CSP) methodology*: the methodology used to estimate GHG and criteria pollutant emissions associated with an LSE's Portfolio based on how the LSE will expect to rely on system power on an hourly basis.*

Community Choice Aggregator*: a governmental entity formed by a city or county to procure electricity for its residents, businesses, and municipal facilities.*

Conforming Portfolio*: the LSE portfolio that conforms to IRP Planning Standards, the 2045 LSE-specific GHG Emissions Benchmark, use of the LSE's assigned load forecast, use of inputs and assumptions matching those used in developing the Reference System Portfolio, as well as other IRP requirements including the filing of a complete Narrative Template, a Resource Data Template and Clean System Power Calculator.*

Effective Load Carrying Capacity*: a percentage that expresses how well a resource is able avoid loss-of-load events (considering availability and use limitations). The percentage is relative to a reference resource, for example a resource that is always available with no use limitations. It is calculated via probabilistic reliability modeling, and yields a single percentage value for a given resource or grouping of resources.*

Effective Megawatts (MW): *perfect capacity equivalent MW, such as the MW calculated by applying an ELCC % multiplier to nameplate MW.*

Electric Service Provider*: an entity that offers electric service to a retail or end-use customer, but which does not fall within the definition of an electrical corporation under Public Utilities Code Section 218.*

Filing Entity*: an entity required by statute to file an integrated resource plan with CPUC.*

Future*: a set of assumptions about future conditions, such as load or gas prices.*

GHG Benchmark (or LSE-specific 2045 GHG Benchmark)*: the mass-based GHG emission planning targets calculated by staff for each LSE based on the methodology established by the California Air Resources Board and required for use in LSE Portfolio development in IRP.*

GHG Planning Price: *the systemwide marginal GHG abatement cost associated with achieving a specific electric sector GHG planning target.*

Integrated Resources Planning Standards (Planning Standards)*: the set of CPUC IRP rules, guidelines, formulas and metrics that LSEs must include in their LSE Plans.*

Integrated Resource Planning (IRP) process*: integrated resource planning process; the repeating cycle through which integrated resource plans are prepared, submitted, and reviewed by the CPUC*

Long term*: more than 5 years unless otherwise specified.*

Load Serving Entity*: an electrical corporation, electric service provider, community choice aggregator, or electric cooperative.*

Load Serving Entity (LSE) Plan*: an LSE's integrated resource plan; the full set of documents and information submitted by an LSE to the CPUC as part of the IRP process.*

Load Serving Entity (LSE) Portfolio*: a set of supply- and/or demand-side resources with certain attributes that together serve the LSE's assigned load over the IRP planning horizon.*

Loss of Load Expectation (LOLE): *a metric that quantifies the expected frequency of loss-of-load events per year. Loss-of-load is any instance where available generating capacity is insufficient to serve electric demand. If one or more instances of loss-of-load occurring within the same day regardless of duration are counted as one loss-of-load event, then the LOLE metric can be compared to a reference point such as the industry probabilistic reliability standard of "one expected day in 10 years," i.e. an LOLE of 0.1.*

Maximum Import Capability*: a California ISO metric that represents a quantity in MW of imports determined by the CAISO to be simultaneously deliverable to the aggregate of load in the ISO's Balancing Authority (BAA) Area and thus eligible for use in the Resource Adequacy process. The California ISO assess a MIC MW value for each intertie into the ISO's BAA and allocated yearly to the LSEs. A LSE's RA import showings are limited to its share of the MIC at each intertie.*

Net Qualifying Capacity (NQC): *Qualifying Capacity reduced, as applicable, based on: (1) testing and verification; (2) application of performance criteria; and (3) deliverability restrictions. The Net Qualifying Capacity determination shall be made by the California ISO pursuant to the provisions of this California ISO Tariff and the applicable Business Practice Manual.*

Non-modeled costs*: embedded fixed costs in today's energy system (e.g., existing distribution revenue requirement, existing transmission revenue requirement, and energy efficiency program cost).*

Nonstandard LSE Plan*: type of integrated resource plan that an LSE may be eligible to file if it serves load outside the CAISO balancing authority area.*

Optimization*: an exercise undertaken in the CPUC's Integrated Resource Planning (IRP) process using a capacity expansion model to identify a least-cost portfolio of electricity resources for meeting specific policy constraints, such as GHG reduction or RPS targets, while maintaining reliability given a set of assumptions about the future. Optimization in IRP considers resources assumed to be online over the planning horizon (baseline resources), some of which the model may choose not to retain, and additional resources (candidate resources) that the model is able to select to meet future grid needs.*

Planned resource: *any resource included in an LSE portfolio, whether already online or not, that is yet to be procured. Relating this to capacity expansion modeling terms, planned resources can be baseline resources (needing contract renewal, or currently owned/contracted by another LSE), candidate resources, or possibly resources that were not considered by the modeling, e.g., due to the passage of time between the modeling taking place and LSEs developing their plans. Planned resources can be specific (e.g., with a CAISO ID) or generic, with only the type, size and some geographic information identified.*

Qualifying capacity*: the maximum amount of Resource Adequacy Benefits a generating facility could provide before an assessment of its net qualifying capacity.*

Preferred Conforming Portfolio*: the conforming portfolio preferred by an LSE as the most suitable to its own needs; submitted to CPUC for review as one element of the LSE's overall IRP plan.*

Preferred System Plan: *the Commission's integrated resource plan composed of both the aggregation of LSE portfolios (i.e., Preferred System Portfolio) and the set of actions necessary to implement that portfolio (i.e., Preferred System Action Plan).*

Preferred System Portfolio: the combined portfolios of individual LSEs within the CAISO, aggregated, reviewed and possibly modified by Commission staff as a proposal to the Commission, and adopted by the Commission as most responsive to statutory requirements per Pub. Util. Code 454.51; part of the Preferred System Plan.

Short term: 1 to 3 years (unless otherwise specified).

Staff: CPUC Energy Division staff (unless otherwise specified).

Standard LSE Plan: type of integrated resource plan that an LSE is required to file if it serves load within the CAISO balancing authority area (unless the LSE demonstrates exemption from the IRP process).

Transmission Planning Process (TPP): process conducted by the California Independent System Operator (CAISO) to identify potential transmission system limitations and areas that need reinforcements over 10-year and 15-year horizons.

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

CleanPowerSF

Appendix A
CleanPowerSF Resource Data Template

(Public Version, Redacted)

RDT Certification Form – Verification Declaration

Load Serving Entity Full Name:	CleanPowerSF
Load Serving Entity Abbreviation:	CPSF
Submission Type:	IRP Biennial Filing
Date of Filing:	8/10/2026

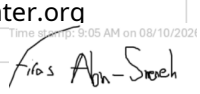
Note: Consistent with Rules 1.1 & 1.11 of the CPUC's Rules of Practice and Procedure, this Procurement Showing has been verified by an officer of the corporation or organization, who expressly certifies, under penalty of perjury, the following:

1. I have responsibility for the activities reflected in this showing;
2. I have reviewed, or have caused to be reviewed, this showing;
3. Based on my knowledge, information, or belief, this filing does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made;
4. Based on my knowledge, information, or belief, this filing contains all of the information required to be provided by CPUC orders, rules, and regulations.

LSE Officer

Title:	Operations Manager
Name:	Cheryl Taylor
Email:	ctaylor@sfwater.org
Phone:	415-934-3982
Signature:	

Backup Contact Information

Title:	Acting Manager, Resource Planning
Name:	Firas Abu-Sneneh
Email:	fabusneneh@sfwater.org
Phone:	415-554-2436
Signature:	

Load Serving Entity Information

LSE Address Line 1:	525 Golden Gate Avenue
LSE Address Line 2:	7th Floor
LSE City:	San Francisco
LSE State:	CA
LSE Zip:	94102

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	[redacted]	[redacted]	alternative_resource_name	contract_status	project_interconnection_position	interconnection_substation	marginal_addition	marginal_addition_to	total_nameplate_capacity	contracted_nameplate_capacity	sep_contracted_new_sep	contract_gwh_annual	is_hybrid_paired	can_charge_from_grid	total_generator_mw	contracted_generator_mw
2	CPSF30005	ADLIN_1_UNIT5	Calpine Geysers	Online	FCDS	TH_NP15_GEN-APND_DA	NA		50	50		438	NotHybrid			
3	CPSF50002	BGSKYN_2_ASPSR2	ANTELOPE SOLAR 2 SAN PABLO	Online	1208	Big Sky Substation	NA		100	100		291	NotHybrid			
4	CPSF50003	DRACKR_2_DS4SR4	DRACKER SOLAR UNIT 4	Online	294	Colorado River 230kV Substation	NA		62.5	62.5		193	ExistingSolarExistingStorage	NO	62.5	62.5
5	CPSF50004	ALMASL_2_GS6SR6	ALMASOL_GENERATING_STATION_6	Online	1428	Red Bluff 220 kV Substation	NA		100	100		319	ExistingSolarExistingStorage	NO	100	100
6	CPSF70006	TEHAPI_2_PW1WD1	POINT WIND 1	Online	119	Vincent 230 kV Substation	NA		50.1	47.49		176	NotHybrid			
7	CPSF70009	ESTWND_2_OPPWD1	OASIS POWER PLANT EASTWIND	Online	119	Vincent 230 kV Substation	NA		60.3	57.14		211	NotHybrid			
8	CPSF50004-BAT		ALMASL_2_AL6BT6	MAVERICKSSTORAGE	Online	1428	Red Bluff 220 kV Substation	Yes		50	50		-	ExistingSolarExistingStorage	NO	100	0
9	[redacted]		ALMASL_2_AL6BT6	MAVERICKSSTORAGE	Online	1428	Red Bluff 220 kV Substation	Yes	ALMASL_2_GS6SR6	50	50		-	ExistingSolarExistingStorage	NO	100	0
10	CPSF50003-BAT		DRACKR_2_DSUBT4	DRACKER SOLAR UNIT 4 BESS	Online	294	Colorado River 230kV Substation	Yes	DRACKR_2_DS4SR4	47	47		-	ExistingSolarExistingStorage	NO	62.5	0
11	CPSF50005		PALSEL_6_PLSSR1	PAULSELL SOLAR ENERGY CENTER PV	Online	1350	Crow Creek 60 kV Substation	NA		20	20		77	ExistingSolarExistingStorage	NO	20	20
12	CPSF50005-BAT		PALSEL_6_PLSBT1	PAULSELL SOLAR ENERGY CENTER BESS	Online	1350	Crow Creek 60 kV Substation	NA		15	15		-	ExistingSolarExistingStorage	NO	20	0
13	[redacted]		PALSEL_6_PLSBT1	PAULSELL SOLAR ENERGY CENTER BESS	Online	1350	Crow Creek 60 kV Substation	NA		15	15		-	ExistingSolarExistingStorage	NO	20	0
14	ESSA_3221		TUMBWD_2_WISBT4	Tumbleweed Energy Storage	Online	1217	Whirlwind Substation 230 kV	NA		75	12.045		-	NotHybrid			
15	ESSA_3221_IR		TUMBWD_2_WISBT4	Tumbleweed Energy Storage	Online	1217	Whirlwind Substation 230 kV	NA		75	12.045		-	NotHybrid			
16	CPSF70011	_NEW_GENERIC_WIND_OOS_AZNM	SunZia Wind North LLC	Online	wind_import_existing	Pete Heinrich Switchyard	NA		1089	29.8		97	NotHybrid			
17	CPSF70012	_NEW_GENERIC_WIND_OOS_AZNM	SunZia Wind South LLC	Online	wind_import_existing	Pete Heinrich Switchyard	NA		2562	70.2		223	NotHybrid			
18	4223_CPSF_MSCG	_BRANCH_GENERIC_NOB_ITC	MSCG Import RA	Online	hydro_import_existing	CAISO Delivery at NOB	NA		20	20		-				
19	[redacted]															
20																
21																
22																
23																
24																
25	CPSF_REC_EXISTING_SOLAR_PGE	_NEW_GENERIC_SOLAR_1AXIS	Existing PCC1 REC-Backed Solar Delivery - Baseline CA Profile	Online		NA	NA						NotHybrid	0		
26	CPSF_REC_EXISTING_WIND_PGE	_NEW_GENERIC_WIND_CA	Existing PCC1 REC-Backed Wind Delivery - Baseline CA Profile	Online		NA	NA						NotHybrid	0		
27	CPSF_CAM_DCPP_2026_2029	_EXISTING_GENERIC_NUCLEAR	DCPP CAM Allocation - 2026-2029	Online	NA	NA	NA		[redacted]				NotHybrid			
28	CPSF_CAM_DR_2026_2045	_EXISTING_GENERIC_DR	CAM Demand Response Allocation - 2026-2045	Online	NA	NA	NA						NotHybrid			
29	CPSF_CAM_STORAGE4H_2026_2045	_EXISTING_GENERIC_BATTERY_STORAGE	CAM Storage 4h Allocation - 2026-2045	Online	NA	NA	NA						NotHybrid			
30	CPSF_CAM_SYSTEM_2026	_EXISTING_GENERIC_COMBINED_CYCLE	CAM System Allocation - 2026	Online	NA	NA	NA						NotHybrid			
31	CPSF_CAM_SYSTEM_2027_2045	_EXISTING_GENERIC_COMBINED_CYCLE	CAM System Allocation - 2027-2045	Online	NA	NA	NA						NotHybrid			
32	CPSF30004	_NEW_GENERIC_GEOTHERMAL	Fish Lake Geothermal	Development	geothermal_import_planned	Silver Peak 55 kV Substation	NA		16.8	2.436		21	NotHybrid			
33	CPSF30004_IR	_NEW_GENERIC_GEOTHERMAL	Fish Lake Geothermal	Development	geothermal_import_planned	Silver Peak 55 kV Substation	NA		16.8	2.436		21	NotHybrid			
34	CPSF30003_Portfolio	_NEW_GENERIC_GEOTHERMAL	Ormat Portfolio	Development	geothermal_import_planned	TBD	NA		[redacted]				NotHybrid			
35	CPSF30003_Portfolio_IR	_NEW_GENERIC_GEOTHERMAL	Ormat Portfolio	Development	geothermal_import_planned	TBD	NA						NotHybrid			
36	CPSF30003_Part1	_NEW_GENERIC_GEOTHERMAL	[redacted]	Development	geothermal_import_planned	[redacted]	NA						NotHybrid			
37	CPSF30003_Part1_IR	_NEW_GENERIC_GEOTHERMAL		Development	geothermal_import_planned		NA						NotHybrid			
38	CPSF30003_Part2	_NEW_GENERIC_GEOTHERMAL		Development	geothermal_import_planned		NA						NotHybrid			
39	CPSF30003_Part2_IR	_NEW_GENERIC_GEOTHERMAL		Development	geothermal_import_planned		NA						NotHybrid			
40	CPSF70010	_NEW_GENERIC_WIND_CA	Gonzaga Ridge Wind Farm	Development	1378, 1718	Los Banos Substation 70kV	NA		129.8	129.8		312	NewWindNewStorage	NO	147.5	129.8
41	CPSF70010-DP	_NEW_GENERIC_WIND_CA	Gonzaga Ridge Wind Farm - Dinosaur Point	Development	0052CONV	Point Tap on the Los Banos - Pacheco	NA		17.7	17.7		36	NotHybrid	NO	147.5	17.7
42	CPSF70010-BAT	_NEW_GENERIC_BATTERY_STORAGE	Gonzaga Ridge Wind Farm - BESS	Development	1378, 1718	Los Banos Substation 70kV	NA		50	50		-	NewWindNewStorage	NO	147.5	0
43	[redacted]	_NEW_GENERIC_BATTERY_STORAGE	Gonzaga Ridge Wind Farm - BESS	Development	1378, 1718	Los Banos Substation 70kV	NA		50	50		-	NewWindNewStorage	NO	147.5	0
44	CPSF50013	_NEW_GENERIC_SOLAR_1AXIS	IP Darden III	Development	1949	Harlan Switching Station 500kV	NA		25.74	12.68		37	NewSolarNewStorage	YES	25.74	12.68
45	CPSF50013-BAT	_NEW_GENERIC_BATTERY_STORAGE	IP Darden III - BESS	Development	1949	Harlan Switching Station 500kV	Yes	NEW_GENERIC_SOLAR_1AXI	13.06	13.06		-	NewSolarNewStorage	YES	25.74	0
46	CPSF50014	_NEW_GENERIC_SOLAR_1AXIS	IP Darden IV	Development	1949	Harlan Switching Station 500kV	NA		117.6	58.8		171	NewSolarNewStorage	YES	117.6	58.8
47	CPSF50014-BAT	_NEW_GENERIC_BATTERY_STORAGE	IP Darden IV - BESS	Development	1949	Harlan Switching Station 500kV	Yes	NEW_GENERIC_SOLAR_1AXI	58.8	58.8		-	NewSolarNewStorage	YES	117.6	0
48	CPSF50006	_NEW_GENERIC_SOLAR_1AXIS	Aramis - Solar	Development	1349	230 kV Cayetano Substation	NA		75	75		180	NewSolarNewStorage	NO	75	75
49	CPSF50006-BAT	_NEW_GENERIC_SOLAR_1AXIS	Aramis - BESS	Development	1349	230 kV Cayetano Substation	NA		75	75			NewSolarNewStorage	NO	75	0
50	ESSA_3942	_NEW_GENERIC_BATTERY_STORAGE	Corby Energy Storage	Development	1270	Vaca-Dixon Substation 230 kV	NA		300	75		-	NotHybrid			
51	CPSF50012	_NEW_GENERIC_SOLAR_1AXIS	IP EASLEY II SOLAR PROJECT	Development	Q-2042	RedBluff 500 kV			400	50		125	nothybrid			
52	ESSA_7442_IR	_NEW_GENERIC_BATTERY_STORAGE	WILLOWROCK	Development	1782	Whirlwind Substation 230 kV	NA		50	11.5		-	NotHybrid			
53	[redacted]															
54																
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58																
59	CPSF_PCP_GEO_GENERIC_2045_100MW	_NEW_GENERIC_GEOTHERMAL	PCP - Geothermal - 2045 - 100 MW	Plannednew		NA	NA		100	100		741	NotHybrid	0	100	100
60	CPSF_PCP_SOLAR_NP15_2035_40MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 - 2035 - 40 MW	Plannednew		NA	NA		40	40		114	NotHybrid	0	40	40
61	CPSF_PCP_SOLAR_NP15_2037_40MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 - 2037 - 40 MW	Plannednew		NA	NA		40	40		114	NotHybrid	0	40	40
62	CPSF_PCP_SOLAR_NP15_2038_40MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 - 2038 - 40 MW	Plannednew		NA	NA		40	40		114	NotHybrid	0	40	40
63	CPSF_PCP_SOLAR_NP15_2039_40MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 - 2039 - 40 MW	Plannednew		NA	NA		40	40		114	NotHybrid	0	40	40
64	CPSF_PCP_SOLAR_NP15_2040_40MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 - 2040 - 40 MW	Plannednew		NA	NA		40	40		114	NotHybrid	0	40	40
65	CPSF_PCP_SOLAR_SP15_2036_20MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2036 - 20 MW	Plannednew		NA	NA		20	20		60	NotHybrid	0	20	20
66	CPSF_PCP_SOLAR_SP15_2037_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2037 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
67	CPSF_PCP_SOLAR_SP15_2038_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2038 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
68	CPSF_PCP_SOLAR_SP15_2039_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2039 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
69	CPSF_PCP_SOLAR_SP15_2040_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2040 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
70	CPSF_PCP_SOLAR_SP15_2043_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2043 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
71	CPSF_PCP_SOLAR_SP15_2044_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2044 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
72	CPSF_PCP_SOLAR_SP15_2045_60MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 - 2045 - 60 MW	Plannednew		NA	NA		60	60		180	NotHybrid	0	60	60
73	[redacted]															
74																
75	CPSF_PCP_WIND_NP15_2044_40MW	_NEW_GENERIC_WIND_CA	PCP - Wind NP15 - 2044 - 40 MW	Plannednew		NA	NA		40	40		95	NotHybrid	0	40	40
76	CPSF_PCP_WIND_NP15_2045_100MW	_NEW_GENERIC_WIND_CA	PCP - Wind NP15 - 2045 - 100 MW	Plannednew		NA	NA		100	100		237	NotHybrid	0	100	100
77	[redacted]															
78																
79	CPSF_PCP_WIND_SP15_2039_100MW	_NEW_GENERIC_WIND_CA	PCP - Wind SP15 - 2039 - 100 MW	Plannednew		NA	NA		100	100		252	NotHybrid	0	100	100
80	CPSF_PCP_WIND_SP15_2040_100MW	_NEW_GENERIC_WIND_CA	PCP - Wind SP15 - 2040 - 100 MW	Plannednew		NA	NA		100	100		252	NotHybrid	0	100	100
81	CPSF_PCP_WIND_SP15_2045_20MW	_NEW_GENERIC_WIND_CA	PCP - Wind SP15 - 2045 - 20 MW	Plannednew		NA	NA		20	20		50	NotHybrid	0	20	20
82	CPSF_PCP_STORAGE4H_GENERIC_2044_200MW	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2044 - 200 MW	Plannednew		NA	NA		200	200		-	NotHybrid	0		
83	CPSF_PCP_STORAGE4H_GENERIC_2045_200MW	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2045 - 200 MW	Plannednew		NA	NA		200	200		-	NotHybrid	0		
84	CPSF_PCP_SOLAR_STORAGE4H_NP15HYB_2044_120MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 Hybrid - 2044 - 120 MW	Plannednew		NA	NA		120	120		341	NewSolarNewStorage	YES	120	120
85	CPSF_PCP_SOLAR_STORAGE4H_NP15HYB_2044_120MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2044 - 120 MW	Plannednew		NA	NA		120	120			NewSolarNewStorage	YES	120	0
86	CPSF_PCP_SOLAR_STORAGE4H_NP15HYB_2045_140MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar NP15 Hybrid - 2045 - 140 MW	Plannednew		NA	NA		140	140		398	NewSolarNewStorage	YES	140	140
87	CPSF_PCP_SOLAR_STORAGE4H_NP15HYB_2045_140MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2045 - 140 MW	Plannednew		NA	NA		140	140			NewSolarNewStorage	YES	140	0
88	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2034_200MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 Hybrid - 2034 - 200 MW	Plannednew		NA	NA		200	200		599	NewSolarNewStorage	YES	200	200
89	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2034_200MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2034 - 200 MW	Plannednew		NA	NA		200	200			NewSolarNewStorage	YES	200	0
90	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2035_200MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 Hybrid - 2035 - 200 MW	Plannednew		NA	NA		200	200		599	NewSolarNewStorage	YES	200	200
91	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2035_200MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2035 - 200 MW	Plannednew		NA	NA		200	200		-	NewSolarNewStorage	YES	200	0
92	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2044_200MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 Hybrid - 2044 - 200 MW	Plannednew		NA	NA		200	200		599	NewSolarNewStorage	YES	200	200
93	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2044_200MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2044 - 200 MW	Plannednew		NA	NA		200	200		-	NewSolarNewStorage	YES	200	0
94	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2045_200MW	_NEW_GENERIC_SOLAR_1AXIS	PCP - Solar SP15 Hybrid - 2045 - 200 MW	Plannednew		NA	NA		200	200		599	NewSolarNewStorage	YES	200	200
95	CPSF_PCP_SOLAR_STORAGE4H_SP15HYB_2045_200MW-BAT	_NEW_GENERIC_BATTERY_STORAGE	PCP - Storage 4h - 2045 - 200 MW	Plannednew		NA	NA		200	200		-	NewSolarNewStorage	YES	200	0
96	[redacted]															
97																
98	CPSF_CSP_TRUEUP_REC_WIND_PGE_2035	_NEW_GENERIC_WIND_CA	CSP Compliance True-Up PCC1 REC-Backed Wind Delivery - 2035	Plannednew		NA	NA						NotHybrid	0		
99	CPSF_CSP_TRUEUP_REC_WIND_PGE_2040	_NEW_GENERIC_WIND_CA	CSP Compliance True-Up PCC1 REC-Backed Wind Delivery - 2040	Plannednew		NA	NA						NotHybrid	0		
100	[redacted]	SCE_NOL_Geothermal	[redacted]	Review		[redacted]	NA		[redacted]				NotHybrid	0	[redacted]	
101		PGE_NGBA_EGS_NF		Review			NA						NotHybrid	0		
102		PGE_NGBA_Geothermal		Review	[redacted]		NA						NotHybrid	0		
103		PGE_NGBA_Geothermal		Review			NA						NotHybrid	0		
104		PGE_NGBA_Geothermal		Review			NA						NotHybrid	0		
105		PGE_NGBA_Geothermal		Review			NA						NotHybrid	0		
106		PGE_Northeast_CA_Geothermal		Review			NA						NotHybrid	0		
107		SCE_Eastern_Geothermal		Review			NA						NotHybrid	0		
108		PGE_NGBA_Geothermal		Review			NA						NotHybrid	0		
109	CPSF_PCP_CCPGEO_STRAT_HUMBOLDT_2037	PGE_NGBA_Geothermal	Strategic Geothermal - Humboldt	Review		Maple Creek 115 kV	NA		50	6		46	NotHybrid	0	6	6
110	CPSF_PCP_CCPGEO_STRAT_LASSEN_2037	PGE_Northeast_CA_Geothermal	Strategic Geothermal - Lassen	Review		Shaffer 345 kV (LMUD/NVE)	NA		50	6		46	NotHybrid	0	6	6
111	CPSF_PCP_CCPGEO_STRAT_NGBA_E_2037	PGE_NGBA_Geothermal	Strategic Geothermal - NGBA East	Review		Redbud 115 kV	NA		150	18		139	NotHybrid	0	18	18
112	CPSF_PCP_CCPGEO_STRAT_NGBA_W_2037	PGE_NGBA_Geothermal	Strategic Geothermal - NGBA West	Review		Cloverdale 115 kV	NA		150	18		139	NotHybrid	0	18	18
113	CPSF_PCP_CCPGEO_STRAT_PITRIVER_2037	PGE_Northeast_CA_Geothermal	Strategic Geothermal - Pit River	Review		Hat Creek 2 230 kV	NA		50	6		46	NotHybrid	0	6	6
114	CPSF_PCP_CCPGEO_STRAT_SURPRISE_2037	PGE_Northeast_CA_Geothermal	Strategic Geothermal - Surprise Valley	Review		Hilltop 345 kV	NA		50	6		46	NotHybrid	0	6	6
115																
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1	total_storage_mw	contracted_storage_mw	solar_technology_sub_type	storage_technology_sub_type	total_storage_depth_mwh	contracted_storage_depth_mwh	viability_cod_reasonableness	viability_technical_feasibility	viability_financing_uncontrol	resource_mix	i_d1931016_vamo_gbgfree	buy_sell_own	counterparty	generator_supplier	developer_name	capacity_area	capacity_sub_area	cpuc_approval_ref	county	COD_year	COD_month
2												Buy	non-LSE supplier	Calpine	Calpine	NP15			SonomaCounty	2018	5
3			1Axis									Buy	non-LSE supplier	sPower	sPower	BigCreekVentura	No_sub_area		LosAngelesCounty	2019	8
4	47	0	1Axis	Li	188	0						Buy	non-LSE supplier	NextERA	NextERA	SCE	No_sub_area		RiversideCounty	2020	9
5	50	0	1Axis	Li	200	0						Buy	non-LSE supplier	EDF_Trading_North_America_LLC	EDF_Trading_North_America_LLC	SCE	No_sub_area		RiversideCounty	2021	12
6												Buy	non-LSE supplier	TGP_Energy_Management_LLC	TGP_Energy_Management_LLC	SCE	No_sub_area		KernCounty	2021	3
7												Buy	non-LSE supplier	TGP_Energy_Management_LLC	TGP_Energy_Management_LLC	SCE	No_sub_area		KernCounty	2021	10
8	50	50	1Axis	Li	200	200						Buy	non-LSE supplier	EDF_Trading_North_America_LLC	EDF_Trading_North_America_LLC	SCE	No_sub_area		RiversideCounty	2021	12
9	50	50	1Axis	Li	200	200						Buy	non-LSE supplier	EDF_Trading_North_America_LLC	EDF_Trading_North_America_LLC	SCE	No_sub_area		RiversideCounty	2021	12
10	47	47	1Axis	Li	188	188						Buy	non-LSE supplier	NextERA	NextERA	SCE	No_sub_area		RiversideCounty	2022	10
11	15	0	1Axis	Li	60	0						Buy	non-LSE supplier	NextERA	NextERA	Stockton	No_sub_area		StanislausCounty	2024	6
12	15	15	1Axis	Li	60	60						Buy	non-LSE supplier	NextERA	NextERA	Stockton	No_sub_area		StanislausCounty	2024	6
13	15	15	1Axis	Li	60	60						Buy	non-LSE supplier	NextERA	NextERA	Stockton	No_sub_area		StanislausCounty	2024	6
14				Li	600	96.36	4	3	5			Buy	non-LSE supplier	LS Power/REV Renewables	REV RENEWABLES	BigCreekVentura	No_sub_area		KernCounty	2026	6
15				Li	600	96.36	4	3	5			Buy	non-LSE supplier	LS Power/REV Renewables	REV RENEWABLES	BigCreekVentura	No_sub_area		KernCounty	2026	6
16							4	3	5			Buy	non-LSE supplier	Pattern Energy	Pattern Energy	PNM	No_sub_area		San Miguel County		
17							4	3	5			Buy	non-LSE supplier	Pattern Energy	Pattern Energy	PNM	No_sub_area		Lincoln and Torrance C		
18										[hydro, 20]		Buy	non-LSE supplier	Morgan Stanley	Morgan Stanley		No_sub_area			1970	1
19																					
20																					
21																					
22																					
23																					
24																					
25			1Axis									Buy	non-LSE supplier	Multiple/Portfolio	Multiple/Portfolio	PGE	No_sub_area				
26												Buy	non-LSE supplier	Multiple/Portfolio	Multiple/Portfolio	PGE	No_sub_area				
27											CAM	Buy	PGE		NA	PacGE	No_sub_area				
28											CAM	Buy	PGE		NA	PacGE	No_sub_area				
29											CAM	Buy	PGE		NA	PacGE	No_sub_area				
30											CAM	Buy	PGE		NA	PacGE	No_sub_area				
31											CAM	Buy	PGE		NA	PacGE	No_sub_area				
32							4	2	4			Buy	non-LSE supplier	Open_Mountain_Energy	OPEN MOUNTAIN ENERGY	NEVP	No_sub_area		Nevada	2027	7
33							4	2	4			Buy	non-LSE supplier	Open_Mountain_Energy	OPEN MOUNTAIN ENERGY	NEVP	No_sub_area		Nevada	2027	7
34							1	2	2			Buy	non-LSE supplier	Ormat	ORMAT					2028	6
35							1	2	2			Buy	non-LSE supplier	Ormat	ORMAT					2028	6
36							2	2	4			Buy	non-LSE supplier	Ormat	ORMAT						
37							2	2	4			Buy	non-LSE supplier	Ormat	ORMAT						
38							3	2	4			Buy	non-LSE supplier	Ormat	ORMAT						
39							3	2	4			Buy	non-LSE supplier	Ormat	ORMAT						
40	50	0		Li	200	0	4	2	3			Buy	non-LSE supplier	SCOUT_CLEAN_Energy	Scout Clean Energy	PacGE	No_sub_area		MercedCounty		
41							4	2	3			Buy	non-LSE supplier	SCOUT_CLEAN_Energy	Scout Clean Energy	PacGE	No_sub_area		MercedCounty		
42	50	50		Li	200	200	4	2	3			Buy	non-LSE supplier	SCOUT_CLEAN_Energy	Scout Clean Energy	PacGE	No_sub_area		MercedCounty		
43	50	50		Li	200	200	4	2	3			Buy	non-LSE supplier	SCOUT_CLEAN_Energy	Scout Clean Energy	PacGE	No_sub_area		MercedCounty		
44	13.06	0	1Axis	Li	300	0				[solar, 12.68]		Buy	non-LSE supplier	Intersect USA	Intersect USA	GreaterFresno	No_sub_area		FresnoCounty		
45	13.06	13.06	1Axis	Li	52.24	52.24	4	3	5	[battery, 13.06]		Buy	non-LSE supplier	Intersect USA	Intersect USA	GreaterFresno	No_sub_area		FresnoCounty		
46	58.8	0	1Axis	Li	300	0				[solar, 58.8]		Buy	non-LSE supplier	Intersect USA	Intersect USA	GreaterFresno	No_sub_area		FresnoCounty		
47	58.8	58.8	1Axis	Li	235.2	235.2	4	3	5	[battery, 58.8]		Buy	non-LSE supplier	Intersect USA	Intersect USA	GreaterFresno	No_sub_area		FresnoCounty		
48	75	0	1Axis	Li	300	0	4	3	2			Buy	non-LSE supplier	Intersect USA	Intersect USA	PacGE	No_sub_area		AlamedaCounty		
49	75	75		Li	300	300	4	3	2			Buy	non-LSE supplier	Intersect USA	Intersect USA	PacGE	No_sub_area		AlamedaCounty		
50				Li	1200	300	4	3	5			Buy	non-LSE supplier	NextERA	NextERA	PacGE	No_sub_area		SolanoCounty		
51							3	2	3						Intersect USA	SCE	No_sub_area		RiversideCounty	2027	1
52	50	11.5		Other	400	92	3	2	4				non-LSE supplier		Hydrostor	SCE	No_sub_area		KernCounty	2030	12
53																					
54																					
55																					
56																					
57																					
58																					
59							3	2	3	[geothermal, 100]					NA					2045	6
60			1Axis				3	2	3	[solar, 40]					NA					2035	6
61			1Axis				3	2	3	[solar, 40]					NA					2037	6
62			1Axis				3	2	3	[solar, 40]					NA					2038	6
63			1Axis				3	2	3	[solar, 40]					NA					2039	6
64			1Axis				3	2	3	[solar, 40]					NA					2040	6
65			1Axis				3	2	3	[solar, 20]					NA					2036	6
66			1Axis				3	2	3	[solar, 60]					NA					2037	6
67			1Axis				3	2	3	[solar, 60]					NA					2038	6
68			1Axis				3	2	3	[solar, 60]					NA					2039	6
69			1Axis				3	2	3	[solar, 60]					NA					2040	6
70			1Axis				3	2	3	[solar, 60]					NA					2043	6
71			1Axis				3	2	3	[solar, 60]					NA					2044	6
72			1Axis				3	2	3	[solar, 60]					NA					2045	6
73																					
74																					
75							3	2	3	[wind, 40]					NA					2044	6
76							3	2	3	[wind, 100]					NA					2045	6
77																					
78																					
79							3	2	3	[wind, 100]					NA					2039	6
80							3	2	3	[wind, 100]					NA					2040	6
81							3	2	3	[wind, 20]					NA					2045	6
82	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2044	6
83	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2045	6
84	120	0	1Axis		480	0	3	2	3	[solar, 120]					NA					2044	6
85	120	120		Li	480	480	3	2	3	[battery, 120]					NA					2044	6
86	140	0	1Axis		560	0	3	2	3	[solar, 140]					NA					2045	6
87	140	140		Li	560	560	3	2	3	[battery, 140]					NA					2045	6
88	200	0	1Axis		800	0	3	2	3	[solar, 200]					NA					2034	6
89	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2034	6
90	200	0	1Axis		800	0	3	2	3	[solar, 200]					NA					2035	6
91	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2035	6
92	200	0	1Axis		800	0	3	2	3	[solar, 200]					NA					2044	6
93	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2044	6
94	200	0	1Axis		800	0	3	2	3	[solar, 200]					NA					2045	6
95	200	200		Li	800	800	3	2	3	[battery, 200]					NA					2045	6
96																					
97																					
98							3	2	3			Buy	non-LSE supplier	Multiple/Portfolio	Multiple/Portfolio	PGE	No_sub_area			2035	1
99							3	2	3			Buy	non-LSE supplier	Multiple/Portfolio	Multiple/Portfolio	PGE	No_sub_area			2040	1
100							1	1	3			Buy	non-LSE supplier			SCE	NO_SUB_AREA		InyoCounty	2034	6
101							1	1	3			Buy	non-LSE supplier				NO_SUB_AREA		LakeCounty	2034	6
102							3	3	4			Buy	non-LSE supplier				NO_SUB_AREA		SonomaCounty	2034	6
103							1	1	3			Buy	non-LSE supplier				NO_SUB_AREA		LakeCounty	2034	6
104							1	1	1			Buy	non-LSE supplier				NO_SUB_AREA		LakeCounty	2034	6
105							1	2	1			Buy	non-LSE supplier				NO_SUB_AREA		LakeCounty	2034	6
106							1	2	1			Buy	non-LSE supplier				NO_SUB_AREA		LassenCounty	2034	6
107							1	2	1			Buy	non-LSE supplier				NO_SUB_AREA		NewMexico	2034	6
108							1	2	1			Buy	non-LSE supplier				NO_SUB_AREA		SonomaCounty	2034	6
109							1	1	1			Buy	non-LSE supplier				NO_SUB_AREA		HumboldtCounty	2037	6
110							1	1	1			Buy	non-LSE supplier				NO_SUB_AREA		LassenCounty	2037	6
111							1	1	1			Buy	non-LSE supplier			NorthCoastNorthBay	NO_SUB_AREA		LakeCounty	2037	6
112							1	1	1			Buy	non-LSE supplier			NorthCoastNorthBay	NO_SUB_AREA		SonomaCounty	2037	6
113							1	1	1			Buy	non-LSE supplier				NO_SUB_AREA		ShastaCounty	2037	6
114							1	1	1			Buy	non-LSE supplier				NO_SUB_AREA		ModocCounty	2037	6
115																					
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	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF
1	COD_day	contract_start_date_year	contract_start_date_month	contract_start_date_day	contract_end_date_year	contract_end_date_month	contract_end_date_day	contract_execution_date_year	contract_execution_date_month	contract_execution_date_day	contract_type	contract_price	contract_price_unit	tx_upgrades	tx_upgrade_date_year	tx_upgrade_date_month	tx_upgrade_date_day	tx_upgrade_description	d2106035_procurement_cat	mtr_tranche1_NQC	mtr_tranche2_NQC
2	1	2018	5	1	2029	12	31														
3	2	2019	7	1	2041	8	1	2018	5	7											
4	11	2020	7	1	2040	9	10	2019	7	9											
5	1	2021	11	1	2041	11	30	2020	7	22											
6	30	2021	3	8	2036	3	29	2018	5	7											
7	12	2021	9	1	2036	10	11	2020	4	16											
8	1	2021	11	1	2041	11	30	2020	7	22											
9	1	2021	11	1	2041	11	30	2020	7	22											
10	1	2022	10	1	2040	9	10	2019	7	9											
11	20	2024	6	20	2044	6	21	2020	7	22											
12	20	2024	6	20	2044	6	21	2020	7	22											
13	20	2024	6	20	2044	6	21	2020	7	22											
14	1	2026	6	1	2041	5	31	2022	1	24				NO							
15	1	2026	6	1	2041	5	31	2022	1	24				NO							
16								2025	5	15											
17								2025	5	15											
18	1	2024	5	1	2024	10	31	2023	9	8											
19																					
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24																					
25														NA				NA			
26														NA				NA			
27																					
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29																					
30																					
31																					
32	1	2027	7	1	2047	6	30	2022	5	31				NO							
33	1	2027	7	1	2047	6	30	2022	5	31				NO							
34	1	2028	6	1	2047	6	30	2022	5	31				NO							
35	1	2028	6	1	2047	6	30	2022	5	31				NO							
36								2022	5	31											
37								2022	5	31											
38								2022	5	31											
39								2022	5	31											
40								2024	2	9											
41								2024	2	9				YES	2028	12	1				
42								2024	2	9											
43								2024	2	9											
44								2025	11	12											
45								2025	11	12											
46								2025	11	12											
47								2025	11	12											
48								2020	11	20											
49								2020	11	20											
50								2023	4	17				YES	2027	2	1	Vaca Dixon 230 kv; Contra Costa PP 230 kV Line Terminals Reconfiguration Project			
51	1	2027	1	1	2047	1	1							NO							
52	31	2030	12	31	2050	12	30	2026	2	4				NO				SCE is expected to complete upgrades to the interconnection by H2 2029.			
53																					
54																					
55																					
56																					
57																					
58																					
59	1	2045	6	1	2065	6	1							NA				NA			
60	1	2035	6	1	2055	6	1							NA				NA			
61	1	2037	6	1	2057	6	1							NA				NA			
62	1	2038	6	1	2058	6	1							NA				NA			
63	1	2039	6	1	2059	6	1							NA				NA			
64	1	2040	6	1	2060	6	1							NA				NA			
65	1	2036	6	1	2056	6	1							NA				NA			
66	1	2037	6	1	2057	6	1							NA				NA			
67	1	2038	6	1	2058	6	1							NA				NA			
68	1	2039	6	1	2059	6	1							NA				NA			
69	1	2040	6	1	2060	6	1							NA				NA			
70	1	2043	6	1	2063	6	1							NA				NA			
71	1	2044	6	1	2064	6	1							NA				NA			
72	1	2045	6	1	2065	6	1							NA				NA			
73																					
74																					
75	1	2044	6	1	2064	6	1							NA				NA			
76	1	2045	6	1	2065	6	1							NA				NA			
77																					
78																					
79	1	2039	6	1	2059	6	1							NA				NA			
80	1	2040	6	1	2060	6	1							NA				NA			
81	1	2045	6	1	2065	6	1							NA				NA			
82	1	2044	6	1	2064	6	1							NA				NA			
83	1	2045	6	1	2065	6	1							NA				NA			
84	1	2044	6	1	2064	6	1							NA				NA			
85	1	2044	6	1	2064	6	1							NA				NA			
86	1	2045	6	1	2065	6	1							NA				NA			
87	1	2045	6	1	2065	6	1							NA				NA			
88	1	2034	6	1	2054	6	1							NA				NA			
89	1	2034	6	1	2054	6	1							NA				NA			
90	1	2035	6	1	2055	6	1							NA				NA			
91	1	2035	6	1	2055	6	1							NA				NA			
92	1	2044	6	1	2064	6	1							NA				NA			
93	1	2044	6	1	2064	6	1							NA				NA			
94	1	2045	6	1	2065	6	1							NA				NA			
95	1	2045	6	1	2065	6	1							NA				NA			
96																					
97																					
98	1	2035	1	1	2035	12	31							NA				NA			
99	1	2040	1	1	2040	12	31							NA				NA			
100	1	2034	6	1	2054	6	1							NA							
101	1	2034	6	1	2054	6	1							NA							
102	1	2034	6	1	2054	6	1							YES							
103	1	2034	6	1	2054	6	1							NA							
104	1	2034	6	1	2054	6	1							NA							
105	1	2034	6	1	2054	6	1							NA							
106	1	2034	6	1	2054	6	1							NA							
107	1	2034	6	1	2054	6	1							NA							
108	1	2034	6	1	2054	6	1							NA							
109	1	2037	6	1	2057	6	1							NA							
110	1	2037	6	1	2057	6	1							NA							
111	1	2037	6	1	2057	6	1							NA							
112	1	2037	6	1	2057	6	1							NA							
113	1	2037	6	1	2057	6	1							NA							
114	1	2037	6	1	2057	6	1							NA							
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	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA
1	mtr_tranche3_NQC	mtr_tranche4_NQC	mtr_tranche5_NQC	mtr_tranche6_NQC	mtr_NQC_IX_gen_gained_dr	mtr_tranche7_NQC	mtr_tranche8_NQC	mtr_tranche9_NQC	mtr_bridge_to	contract_RA_compliant	engineering_assessment_included	capacity_factor	contract_changed	previous_COD_year	previous_COD_month	previous_COD_day	remediation_plan	signed_contract	notice_to_proceed	public_contract	buying_energy_capacity
2													NO					YES	YES	YES	EnergyCapacity
3																		YES	YES	YES	EnergyCapacity
4																		YES	YES	YES	EnergyCapacity
5																		YES	YES	YES	EnergyCapacity
6																		YES	YES	YES	EnergyCapacity
7																		YES	YES	YES	EnergyCapacity
8																		YES	YES	YES	EnergyCapacity
9																		YES	YES	YES	EnergyCapacity
10																		YES	YES	YES	EnergyCapacity
11														2023	12	1		YES	YES	YES	EnergyCapacity
12														2023	12	1		YES	YES	YES	EnergyCapacity
13														2023	12	1		YES	YES	YES	EnergyCapacity
14														2025	4	15		NO	YES	NO	EnergyCapacity
15														2025	4	15		NO	YES	NO	EnergyCapacity
16																		YES	YES	YES	EnergyCapacity
17																		YES	YES	YES	EnergyCapacity
18																		YES	YES	YES	EnergyCapacity
19																					
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22																					
23																					
24																					
25									NA				NO					YES	YES	NO	EnergyCapacity
26									NA				NO					YES	YES	NO	EnergyCapacity
27													NO					YES	YES	NO	CapacityOnly
28													NO					YES	YES	NO	CapacityOnly
29													NO					YES	YES	NO	CapacityOnly
30													NO					YES	YES	NO	CapacityOnly
31													NO					YES	YES	NO	CapacityOnly
32																		YES		YES	EnergyCapacity
33																		YES		YES	EnergyCapacity
34																		YES		YES	EnergyCapacity
35																		YES		YES	EnergyCapacity
36																		YES		YES	EnergyCapacity
37																		YES		YES	EnergyCapacity
38																		YES		YES	EnergyCapacity
39																		YES		YES	EnergyCapacity
40																		YES	YES	YES	EnergyCapacity
41													YES					YES	YES	YES	EnergyCapacity
42																		YES	YES	YES	EnergyCapacity
43																		YES	YES	YES	EnergyCapacity
44																		YES		NO	
45																		YES		NO	
46																		YES		NO	
47																		YES		NO	
48																		YES	YES	YES	EnergyCapacity
49																		YES	YES	YES	EnergyCapacity
50																		YES		YES	EnergyCapacity
51																					
52																		YES		YES	
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90													NA					NA	No		EnergyCapacity
91													NA					NA	No		
92													NA					NA	No		EnergyCapacity
93													NA					NA	No		
94													NA					NA	No		EnergyCapacity
95													NA					NA	No		
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97																					
98									NA				NO					NO	NO	NO	EnergyCapacity
99									NA				NO					NO	NO	NO	EnergyCapacity
100													NA					NO	NO	NO	EnergyCapacity
101													NA					NO	NO	NO	EnergyCapacity
102																		NO	NO	NO	EnergyCapacity
103													NA					NO	NO	NO	EnergyCapacity
104													NA					NO	NO	NO	EnergyCapacity
105													NA					NO	NO	NO	EnergyCapacity
106													NA					NO	NO	NO	EnergyCapacity
107													NA					NO	NO	NO	EnergyCapacity
108													NA					NO	NO	NO	EnergyCapacity
109													NA					NO	NO	NO	EnergyCapacity
110													NA					NO	NO	NO	EnergyCapacity
111													NA					NO	NO	NO	EnergyCapacity
112													NA					NO	NO	NO	EnergyCapacity
113													NA					NO	NO	NO	EnergyCapacity
114													NA					NO	NO	NO	EnergyCapacity
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	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL
1	NQC_reporting_source	procurement_origin	planned_project_retention_priority	cap_resource_category	cap_annual_2028	cap_annual_2030	cap_annual_2035	cap_annual_2040	cap_annual_2045	macro_supertype	notes
2	Calculated	Renewable Energy		Geothermal (GWh)	439.15			-	-	physical	
3	Calculated	Renewable Energy		Solar Baseline California (GWh)	252.39	249.90	242.29	237.37	-	physical	
4	Calculated	Renewable Energy		Hybrid_or_Paired_Solar_and_Battery (GWh)	151.48	150.12	149.17	100.72	-	physical	
5	Calculated	Renewable Energy		Hybrid_or_Paired_Solar_and_Battery (GWh)	257.49	253.55	246.84	241.07	-	physical	
6	Calculated	Renewable Energy		Wind Baseline California (GWh)	181.65	179.26	178.86	-	-	physical	contracted_nameplate_capacity' value updated to reflect MAXGEN in 'resources' tab; however, CPSF has contracted 50.1 MW
7	Calculated	Renewable Energy		Wind Baseline California (GWh)	217.54	218.29	215.85	-	-	physical	contracted_nameplate_capacity' value updated to reflect MAXGEN in 'resources' tab; however, CPSF has contracted 60.3 MW
8	Calculated	Renewable Energy		NA						physical	
9	Calculated	Renewable Energy		NA						physical	
10	Calculated	Renewable Energy		NA						physical	
11	Calculated	Local Renewable Energy		Hybrid_or_Paired_Solar_and_Battery (GWh)	46.34	45.42	43.77	42.40	-	physical	
12	Calculated	Local Renewable Energy		NA						physical	
13	Calculated	Local Renewable Energy		NA						physical	
14	Calculated	D2106035		Battery Storage (MWh Energy Capacity)	96.36	96.36	96.36	96.36	-	physical	
15	Calculated	D2106035		NA						physical	
16	Calculated	D2106035		Wind New Mexico (GWh)	86.29	85.73	85.62	86.33	-	newgeneric	
17	Calculated	D2106035		Wind New Mexico (GWh)	199.56	198.26	198.00	199.66	-	newgeneric	
18	Calculated	D2106035		NA						unspecifiedimport	
19				NA						physical	
20				NA						physical	
21				NA						physical	
22				NA						physical	
23				NA						physical	
24				NA						physical	
25		Renewable Energy		Solar Baseline California (GWh)			436.48	10.40	-	newgeneric	
26		Renewable Energy		Wind Baseline California (GWh)			187.06	4.46	-	newgeneric	
27	Calculated	CAM		NA						existinggeneric	
28	Calculated	CAM		NA						existinggeneric	
29	Calculated	CAM		NA						existinggeneric	
30	Calculated	CAM		NA						existinggeneric	
31	Calculated	CAM		NA						existinggeneric	
32	Calculated	D2106035		Geothermal (GWh)	11.98	12.69	12.85	12.62	12.27	newgeneric	
33	Calculated	D2106035		NA						newgeneric	
34	Calculated	D2106035		Geothermal (GWh)	21.54	79.77	79.53	80.60	78.95	newgeneric	
35	Calculated	D2106035		NA						newgeneric	
36	Calculated	D2106035		NA						newgeneric	
37	Calculated	D2106035		NA						newgeneric	
38	Calculated	D2106035		NA						newgeneric	
39	Calculated	D2106035		NA						newgeneric	
40	Calculated	D2106035		Wind New PG&E (GWh)	320.93	317.73	319.59	319.31	318.75	newgeneric	
41	Calculated	D2106035		Wind New PG&E (GWh)	39.00	38.82	38.91	38.93	38.93	newgeneric	
42	Calculated	D2106035		Battery Storage (MWh Energy Capacity)	200.00	200.00	200.00	200.00	200.00	newgeneric	
43	Calculated	D2106035		NA						newgeneric	
44	Calculated			Hybrid_or_Paired_Solar_and_Battery (GWh)	20.67	33.53	32.47	31.45	-	newgeneric	
45	Calculated			NA						newgeneric	
46	Calculated			Hybrid_or_Paired_Solar_and_Battery (GWh)	96.67	156.86	151.89	147.09	-	newgeneric	
47	Calculated			NA						newgeneric	
48	Calculated	D2106035		Hybrid_or_Paired_Solar_and_Battery (GWh)	133.35	134.66	130.89	122.12	141.12	newgeneric	The agreement was amended to reflect a change in COD from 12/31/2023 to 12/31/2025 and amended a second time to reflect a change in COD from 12/31/2025 to 12/31/2026. FCDS or replacement RA is a contractual requirement but has not been obtained to date.
49	Calculated	D2106035		NA						newgeneric	
50	Calculated	D2106035		Battery Storage (MWh Energy Capacity)	300.00	300.00	300.00	300.00	-	newgeneric	
51				Solar Baseline California (GWh)	135.70	133.57	130.65	-	-	newgeneric	
52	Calculated			Battery Storage (MWh Energy Capacity)	-	-	92.00	92.00	92.00	newgeneric	
53											
54											
55											
56											
57											
58											
59		IRP PCP	TRUE	Geothermal (GWh)	-	-	-	-	740.67	newgeneric	
60		IRP PCP	TRUE	Solar New PG&E (GWh)	-	-	113.60	113.60	113.60	newgeneric	
61		IRP PCP	TRUE	Solar New PG&E (GWh)	-	-	-	113.60	113.60	newgeneric	
62		IRP PCP	TRUE	Solar New PG&E (GWh)	-	-	-	113.60	113.60	newgeneric	
63		IRP PCP	TRUE	Solar New PG&E (GWh)	-	-	-	113.60	113.60	newgeneric	
64		IRP PCP	TRUE	Solar New PG&E (GWh)	-	-	-	113.60	113.60	newgeneric	
65		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	59.95	59.95	newgeneric	
66		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	179.84	179.84	newgeneric	
67		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	179.84	179.84	newgeneric	
68		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	179.84	179.84	newgeneric	
69		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	179.84	179.84	newgeneric	
70		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	-	179.84	newgeneric	
71		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	-	179.84	newgeneric	
72		IRP PCP	TRUE	Solar New SCE SDG&E (GWh)	-	-	-	-	179.84	newgeneric	
73											
74											
75		IRP PCP	TRUE	Wind New PG&E (GWh)	-	-	-	-	94.97	newgeneric	
76		IRP PCP	TRUE	Wind New PG&E (GWh)	-	-	-	-	227.43	newgeneric	
77											
78											
79		IRP PCP	TRUE	Wind New SCE SDG&E (GWh)	-	-	-	252.32	252.32	newgeneric	
80		IRP PCP	TRUE	Wind New SCE SDG&E (GWh)	-	-	-	252.32	252.32	newgeneric	
81		IRP PCP	TRUE	Wind New SCE SDG&E (GWh)	-	-	-	-	50.46	newgeneric	
82		IRP PCP	TRUE	Battery Storage (MWh Energy Capacity)	-	-	-	-	800.00	newgeneric	
83		IRP PCP	TRUE	Battery Storage (MWh Energy Capacity)	-	-	-	-	800.00	newgeneric	
84		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	-	-	340.79	newgeneric	
85		IRP PCP	TRUE	NA						newgeneric	
86		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	-	-	397.59	newgeneric	
87		IRP PCP	TRUE	NA						newgeneric	
88		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	599.47	599.47	599.47	newgeneric	
89		IRP PCP	TRUE	NA						newgeneric	
90		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	599.47	599.47	599.47	newgeneric	
91		IRP PCP	TRUE	NA						newgeneric	
92		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	-	-	599.47	newgeneric	
93		IRP PCP	TRUE	NA						newgeneric	
94		IRP PCP	TRUE	Hybrid_or_Paired_Solar_and_Battery (GWh)	-	-	-	-	599.47	newgeneric	
95		IRP PCP	TRUE	NA						newgeneric	
96											
97											
98		IRP PCP	TRUE	Wind Baseline California (GWh)	-	-	315.00	-	-	newgeneric	
99		IRP PCP	TRUE	Wind Baseline California (GWh)	-	-	-	590.00	-	newgeneric	
100	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
101	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
102	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
103	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
104	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
105	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
106	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
107	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
108	Calculated	IRP PCP	TRUE	Geothermal (GWh)						newresolve	
109	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	45.24	44.44	newresolve	CC Power coordinated strategic mapping described in narrative.
110	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	45.24	44.44	newresolve	CC Power coordinated strategic mapping described in narrative.
111	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	135.71	133.32	newresolve	CC Power coordinated strategic mapping described in narrative.
112	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	135.71	133.32	newresolve	CC Power coordinated strategic mapping described in narrative.
113	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	45.24	44.44	newresolve	CC Power coordinated strategic mapping described in narrative.
114	Calculated	IRP PCP	TRUE	Geothermal (GWh)	-	-	-	45.24	44.44	newresolve	CC Power coordinated strategic mapping described in narrative.
115											
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[redacted] Highlighted cells in yellow require input from LSEs

Reliability Need - updated with 2025 Filing Requirements release

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
CAISO gross peak (MW)	55,445	56,568	58,624	60,556	62,505	64,292	66,076	68,093	69,939	71,976	73,218	74,668	76,057	77,338	78,968	79,726	80,523	81,423	82,089	82,936
PRM (%)	16%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	14%	14%	14%	14%	14%	14%	14%	14%
CAISO Total Reliability Need (TRN) (MW)	64,088	65,238	67,457	69,522	71,597	73,685	75,771	78,127	80,290	82,674	83,983	85,527	86,996	88,337	90,073	90,937	91,846	92,873	93,633	94,599
CAISO Reliability Procurement Need (RPN) (MW)	53,361	54,394	55,427	50,516	45,606	47,269	48,932	50,595	52,259	53,922	55,180	56,437	57,695	58,953	60,210	60,949	61,688	62,427	63,167	63,906
LSE share of load during critical hours (%)	[redacted]																			
LSE reliability procurement requirement (RPR) (MW)	506	519	531	490	448	466	483	502	520	538	561	585	609	634	659	680	702	723	745	767

BTM PV Forecast - updated with 2025 Filing Requirements release

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Capacity (MW)	353	364	380	387	400	412	430	445	454	462	470	478	486	494	502	510	519	527	535	543

ELCC (%) - updated with 2025 Filing Requirements release

Resource Type	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
in_state_wind_south	20%	18%	15%	15%	15%	16%	17%	18%	19%	19%	18%	16%	14%	12%	11%	11%	11%	11%	12%	12%
in_state_wind_north	30%	28%	26%	31%	35%	35%	35%	35%	35%	35%	33%	31%	28%	26%	24%	24%	24%	25%	25%	26%
out_of_state_wind_WY	44%	44%	44%	41%	37%	38%	39%	40%	41%	41%	39%	37%	35%	33%	30%	32%	33%	35%	36%	38%
out_of_state_wind_IDWAOR	27%	22%	17%	21%	25%	26%	27%	27%	28%	29%	27%	25%	23%	22%	20%	20%	20%	19%	19%	19%
out_of_state_wind_AZNM	43%	43%	43%	39%	36%	37%	38%	40%	41%	42%	39%	37%	34%	32%	29%	30%	31%	32%	33%	34%
offshore_wind_north	62%	65%	69%	63%	57%	55%	53%	51%	48%	46%	44%	42%	40%	38%	36%	36%	36%	36%	36%	36%
offshore_wind_south	42%	45%	47%	39%	30%	29%	28%	26%	25%	23%	22%	20%	19%	18%	16%	17%	19%	20%	21%	22%
utility_pv	8%	9%	10%	10%	10%	11%	11%	11%	11%	11%	11%	12%	12%	13%	13%	13%	12%	12%	11%	11%
btm_pv	7%	8%	8%	8%	7%	8%	8%	8%	9%	9%	10%	10%	10%	11%	11%	11%	10%	10%	9%	9%
4hr_batteries	92%	84%	75%	49%	22%	21%	20%	19%	18%	17%	17%	17%	17%	17%	17%	17%	17%	16%	16%	16%
8hr_batteries	97%	92%	87%	63%	39%	36%	32%	29%	25%	22%	24%	25%	27%	28%	30%	30%	31%	31%	32%	32%
12hr_batteries	94%	92%	91%	69%	47%	42%	37%	32%	27%	22%	24%	25%	27%	28%	30%	30%	31%	31%	32%	32%
24hr_batteries	96%	94%	92%	74%	56%	50%	44%	37%	31%	25%	27%	29%	30%	32%	34%	34%	34%	34%	34%	35%
100hr_batteries	99%	99%	98%	86%	74%	69%	64%	58%	53%	48%	49%	50%	51%	52%	53%	53%	52%	52%	51%	51%
pumped_storage	90%	87%	85%	66%	48%	43%	37%	32%	27%	22%	24%	25%	27%	28%	30%	30%	31%	31%	32%	32%
demand_response	94%	85%	76%	59%	42%	36%	30%	24%	18%	12%	12%	11%	11%	11%	11%	10%	10%	10%	9%	9%
hydro	69%	66%	63%	57%	50%	48%	46%	44%	43%	41%	40%	39%	39%	38%	37%	36%	36%	35%	35%	34%
small_hydro	42%	39%	36%	33%	30%	28%	26%	24%	22%	21%	21%	21%	21%	21%	21%	20%	20%	20%	19%	19%
geothermal	91%	91%	92%	89%	87%	87%	87%	87%	87%	87%	87%	88%	88%	88%	88%	89%	89%	89%	89%	90%
biomass_wood	100%	99%	99%	99%	99%	99%	99%	98%	98%	98%	98%	98%	99%	99%	99%	99%	98%	98%	98%	98%
biogas	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
nuclear	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
gas_cc	86%	85%	85%	83%	82%	82%	82%	83%	83%	83%	84%	85%	86%	87%	88%	87%	87%	86%	85%	84%
gas_ct	69%	69%	69%	65%	62%	62%	62%	62%	61%	61%	64%	66%	69%	71%	74%	72%	71%	70%	68%	67%
cogen	92%	91%	91%	91%	90%	90%	90%	90%	90%	90%	91%	92%	92%	93%	N/A	N/A	N/A	N/A	N/A	N/A
ice	94%	94%	94%	94%	93%	93%	93%	93%	93%	93%	94%	94%	95%	95%	96%	95%	95%	95%	94%	94%

Contract ELCC (effective MW)

Resource Type	Conrtact Status	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
hybrid	Online	[redacted]																			
in_state_wind_south	Online																				
in_state_wind_north	Online																				
out_of_state_wind_WY	Online																				
out_of_state_wind_IDWAOR	Online																				
out_of_state_wind_AZNM	Online																				
offshore_wind_north	Online																				
offshore_wind_south	Online																				
utility_pv	Online																				
btm_pv	Online																				
4hr_batteries	Online																				
8hr_batteries	Online																				
12hr_batteries	Online																				
24hr_batteries	Online																				
100hr_batteries	Online																				
pumped_storage	Online																				
demand_response	Online																				
hydro	Online																				
small_hydro	Online																				
geothermal	Online																				
biomass_wood	Online																				
biogas	Online																				
nuclear	Online																				
gas_cc	Online																				
gas_ct	Online																				
cogen	Online																				
ice	Online																				
hybrid	Development																				

	A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
81		in_state_wind_south	Development																				
82		in_state_wind_north	Development																				
83		out_of_state_wind_WY	Development																				
84		out_of_state_wind_IDWAOR	Development																				
85		out_of_state_wind_AZNM	Development																				
86		offshore_wind_north	Development																				
87		offshore_wind_south	Development																				
88		utility_pv	Development																				
89		btm_pv	Development																				
90		4hr_batteries	Development																				
91		8hr_batteries	Development																				
92		12hr_batteries	Development																				
93		24hr_batteries	Development																				
94		100hr_batteries	Development																				
95		pumped_storage	Development																				
96		demand_response	Development																				
97		hydro	Development																				
98		small_hydro	Development																				
99		geothermal	Development																				
100		biomass_wood	Development																				
101		biogas	Development																				
102		nuclear	Development																				
103		gas_cc	Development																				
104		gas_ct	Development																				
105		cogen	Development																				
106		ice	Development																				
107		hybrid	Review																				
108		in_state_wind_south	Review																				
109		in_state_wind_north	Review																				
110		out_of_state_wind_WY	Review																				
111		out_of_state_wind_IDWAOR	Review																				
112		out_of_state_wind_AZNM	Review																				
113		offshore_wind_north	Review																				
114		offshore_wind_south	Review																				
115		utility_pv	Review																				
116		btm_pv	Review																				
117		4hr_batteries	Review																				
118		8hr_batteries	Review																				
119		12hr_batteries	Review																				
120		24hr_batteries	Review																				
121		100hr_batteries	Review																				
122		pumped_storage	Review																				
123		demand_response	Review																				
124		hydro	Review																				
125		small_hydro	Review																				
126		geothermal	Review																				
127		biomass_wood	Review																				
128		biogas	Review																				
129		nuclear	Review																				
130		gas_cc	Review																				
131		gas_ct	Review																				
132		cogen	Review																				
133		ice	Review																				
134		hybrid	PlannedExisting																				
135		in_state_wind_south	PlannedExisting																				
136		in_state_wind_north	PlannedExisting																				
137		out_of_state_wind_WY	PlannedExisting																				
138		out_of_state_wind_IDWAOR	PlannedExisting																				
139		out_of_state_wind_AZNM	PlannedExisting																				
140		offshore_wind_north	PlannedExisting																				
141		offshore_wind_south	PlannedExisting																				
142		utility_pv	PlannedExisting																				
143		btm_pv	PlannedExisting																				
144		4hr_batteries	PlannedExisting																				
145		8hr_batteries	PlannedExisting																				
146		12hr_batteries	PlannedExisting																				
147		24hr_batteries	PlannedExisting																				
148		100hr_batteries	PlannedExisting																				
149		pumped_storage	PlannedExisting																				
150		demand_response	PlannedExisting																				
151		hydro	PlannedExisting																				
152		small_hydro	PlannedExisting																				
153		geothermal	PlannedExisting																				
154		biomass_wood	PlannedExisting																				
155		biogas	PlannedExisting																				
156		nuclear	PlannedExisting																				
157		gas_cc	PlannedExisting																				
158		gas_ct	PlannedExisting																				
159		cogen	PlannedExisting																				
160		ice	PlannedExisting																				
161		hybrid	PlannedNew																				

	C	D
162	in_state_wind_south	PlannedNew
163	in_state_wind_north	PlannedNew
164	out_of_state_wind_WY	PlannedNew
165	out_of_state_wind_IDWAOR	PlannedNew
166	out_of_state_wind_AZNM	PlannedNew
167	offshore_wind_north	PlannedNew
168	offshore_wind_south	PlannedNew
169	utility_pv	PlannedNew
170	btm_pv	PlannedNew
171	4hr_batteries	PlannedNew
172	8hr_batteries	PlannedNew
173	12hr_batteries	PlannedNew
174	24hr_batteries	PlannedNew
175	100hr_batteries	PlannedNew
176	pumped_storage	PlannedNew
177	demand_response	PlannedNew
178	hydro	PlannedNew
179	small_hydro	PlannedNew
180	geothermal	PlannedNew
181	biomass_wood	PlannedNew
182	biogas	PlannedNew
183	nuclear	PlannedNew
184	gas_cc	PlannedNew
185	gas_ct	PlannedNew
186	cogen	PlannedNew
187	ice	PlannedNew
188	**LSE total supply (effective MW)**	
189		
190		
191		
192	***Load and Resource Table by Resource Type***	

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
193																				
194	**LSE reliability need (MW)**	506	519	531	490	448	466	483	502	520	538	561	585	609	634	659	680	702	723	745	767
195	**ELCC by resource type (effective MW)**																				
196	hybrid																				
197	in_state_wind_south																				
198	in_state_wind_north																				
199	out_of_state_wind_WY																				
200	out_of_state_wind_IDWAOR																				
201	out_of_state_wind_AZNM																				
202	offshore_wind_north																				
203	offshore_wind_south																				
204	utility_pv																				
205	btm_pv																				
206	4hr_batteries																				
207	8hr_batteries																				
208	12hr_batteries																				
209	24hr_batteries																				
210	100hr_batteries																				
211	pumped_storage																				
212	demand_response																				
213	hydro																				
214	small_hydro																				
215	geothermal																				
216	biomass_wood																				
217	biogas																				
218	nuclear																				
219	gas_cc																				
220	gas_ct																				
221	cogen																				
222	ice																				
223	**LSE total supply (effective MW)**																				
224	**Net capacity position (+ve = excess, -ve = shortfall) (effective MW)**																				
225																					
226																					
227																					
228																					
229																					
230																					
231	***Load and Resource Table by Contract Status***																				

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
232																				
233	**LSE reliability need (MW)**																				
234	**ELCC by contract status (effective MW)**																				
235	Online																				
236	Development																				
237	Review																				
238	PlannedExisting																				
239	PlannedNew																				
240	BTM PV																				
241	**LSE total supply (effective MW)**																				
242	**Net capacity position (+ve = excess, -ve = shortfall) (effective MW)**																				

	tranche_1	tranche_2	tranche_3	tranche_4	tranche_5	tranche_6	MTR Total
	2023	2024	2025	2026	2027	2028	All
LSE [redacted] Obligation	31	93	23	31	31	31	241
CCA							-

	Total NQC reported (non-LLT and non-DCR)	[redacted]
Summary of unique_contracts	Total NQC reported (LLT)	
	Total NQC Entered	
	Total NQC vs Obligation	
Summary of mtr_NQC_validation_tool	Calculated NQC (general including DCR)	
	Calculated vs Total Reported NQC	
	Calculated NQC vs Obligation	
Summary with Pending D.23-02-040 Compliance trades	Enter values on this row:	
	Total NQC vs Proposed Obligation	[redacted]
	Calculated NQC vs Proposed Obligation	
Summary of LLT	Calculated LLT NQC	
	Total Reported LLT NQC	
	Calculated DCR NQC	
Summary of DCR NQC	Total Reported DCR NQC	
	DCR portfolio net energy	[redacted]

lse_unique_contract_id	lse_selected_mtr_tranche	vic_d2106035_procurement_cat	hybrid	is_non_grid_charging	engineering_assessment_confirmation	% nameplate/tranche non hybrid	% nameplate/tranche hybrid pen	% nameplate/tranche hybrid storage	Contract total calculated MTR general NQC MW	Total reported MTR general NQC MW	Contract total calculated MTR LLT NQC MW	Total reported MTR LLT NQC MW (unique contracts)	Total reported MTR DCR nqc MW	Sum of Cal_vs_reported_Diff
[redacted]														

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

CleanPowerSF

Appendix B
CleanPowerSF Clean Power System Calculator

	A	B	C	D	E	F	G	H	I
1		**Emissions Summary**							
2									
3		**Emissions Total**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
4		CO2	MMt/yr	0.379	0.302	0.263	0.256	0.104	Includes both in-CAISO and import emissions
5		PM2.5	tonnes/yr	23.264	18.582	17.760	17.350	8.161	Only In-CAISO emissions
6		SO2	tonnes/yr	2.226	1.793	1.712	1.626	0.762	Only In-CAISO emissions
7		NOx	tonnes/yr	34.136	27.531	27.012	16.909	8.996	Only In-CAISO emissions
8									
9		**Emissions by resource type**							
10									
11		**CO2**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
12		Coal	MMt/yr	0.000	0.000	0.000	0.000	0.000	Included in GHG emissions total
13		IFM CHP	MMt/yr	0.079	0.074	0.078	0.000	0.000	
14		Biogas	MMt/yr	0.000	0.000	0.000	0.000	0.000	
15		Biomass	MMt/yr	0.000	0.000	0.000	0.000	0.000	
16		System Power Unadjusted	MMt/yr	0.335	0.259	0.239	0.309	0.154	Includes emissions from in-CAISO dispatchable gas and unspecified imports
17		System Power	MMt/yr	0.300	0.227	0.185	0.256	0.104	Includes emissions from in-CAISO dispatchable gas and unspecified imports. After CSP - RESOLVE adjustment.
18		Asset Controlling Supplier	MMt/yr	0.000	0.000	0.000	0.000	0.000	
19		**Total**	**MMt/yr**	**0.379**	**0.302**	**0.263**	**0.256**	**0.104**	**Includes both in-CAISO and import emissions**
20		Average emissions intensity	tCO2/MWh	0.099	0.071	0.049	0.041	0.016	Emissions per MWh of sales
21		Oversupply Emissions Credits	MMt/yr	0.042	0.068	0.088	0.083	0.080	When hourly supply exceeds hourly load and system power is on the margin, LSE recieves credit at the system power emissions rate. Impact included in Total.
22									
23		**PM2.5**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
24		Coal	tonnes/yr	0.000	0.000	0.000	0.000	0.000	Information only, not included in total
25		IFM CHP	tonnes/yr	4.448	4.195	4.390	0.000	0.000	
26		Biogas	tonnes/yr	0.000	0.000	0.000	0.000	0.000	
27		Biomass	tonnes/yr	0.000	0.000	0.000	0.000	0.000	
28		System Power	tonnes/yr	18.816	14.387	13.369	17.350	8.161	In-CAISO emissions only - unspecified import emissions excluded
29		**Total**	**tonnes/yr**	**23.264**	**18.582**	**17.760**	**17.350**	**8.161**	**Only In-CAISO emissions**
30		Average emissions intensity	kg/MWh	0.006	0.004	0.003	0.003	0.001	Emissions per MWh of sales
31									
32		**SO2**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
33		Coal	tonnes/yr	0.000	0.000	0.000	0.000	0.000	Information only, not included in total
34		IFM CHP	tonnes/yr	0.469	0.443	0.464	0.000	0.000	
35		Biogas	tonnes/yr	0.000	0.000	0.000	0.000	0.000	
36		Biomass	tonnes/yr	0.000	0.000	0.000	0.000	0.000	

	A	B	C	D	E	F	G	H	I
37		System Power	tonnes/yr	1.757	1.350	1.249	1.626	0.762	In-CAISO emissions only - unspecified import emissions excluded
38		**Total**	**tonnes/yr**	**2.226**	**1.793**	**1.712**	**1.626**	**0.762**	**Only In-CAISO emissions**
39		Average emissions intensity	kg/MWh	0.001	0.000	0.000	0.000	0.000	Emissions per MWh of sales
40									
41		**NOx**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
42		Coal	tonnes/yr	0.000	0.000	0.000	0.000	0.000	Information only, not included in total
43		IFM CHP	tonnes/yr	13.247	12.218	12.813	0.000	0.000	
44		Biogas	tonnes/yr	0.000	0.000	0.000	0.000	0.000	
45		Biomass	tonnes/yr	0.000	0.000	0.000	0.000	0.000	
46		System Power	tonnes/yr	20.890	15.313	14.199	16.909	8.996	In-CAISO emissions only - unspecified import emissions excluded
47		**Total**	**tonnes/yr**	**34.136**	**27.531**	**27.012**	**16.909**	**8.996**	**Only In-CAISO emissions**
48		Average emissions intensity	kg/MWh	0.009	0.006	0.005	0.003	0.001	Emissions per MWh of sales
49									
50		**Supply and Demand Balance**							
51									
52		**Demand Summary**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	
53		Managed Retail Sales Forecast (assigned to LSE)	GWh	3838.5	4249.1	5381.9	6174.7	6624.8	Sales forecast (before T&D losses increase demand at generator bus-bar)
54		Baseline Demand, non-C&I	GWh	2012.6	1982.0	2050.2	2171.3	2224.9	Summary of active inputs from Demand Inputs tab
55		Baseline Demand, C&I	GWh	2090.6	2185.6	2461.6	2625.4	2690.2	
56		Electric Vehicle Load	GWh	260.6	450.4	1016.0	1465.6	1773.3	
57		Building Electrification	GWh	120.4	227.0	503.8	623.2	710.8	
58		Energy Efficiency	GWh	-108.5	-133.8	-180.5	-181.5	-189.7	
59		Data Center Load	GWh	196.8	323.0	469.6	508.9	523.5	
60		Climate Change Impact	GWh	11.4	17.6	30.0	45.5	61.7	
61		BTM PV	GWh	-410.3	-431.9	-498.8	-542.0	-586.3	
62		**Demand (at generator bus-bar)**	**GWh**	**4176.3**	**4623.2**	**5855.9**	**6718.6**	**7208.8**	
63									
64		**Supply Summary**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
65		Large Hydro	GWh	0.0	0.0	0.0	0.0	0.0	
66		Imported Hydro	GWh	0.0	0.0	0.0	0.0	0.0	
67		Asset Controlling Supplier	GWh	0.0	0.0	0.0	0.0	0.0	
68		Nuclear	GWh	0.0	0.0	0.0	0.0	0.0	
69		Biogas	GWh	0.0	0.0	0.0	0.0	0.0	
70		Biomass	GWh	0.0	0.0	0.0	0.0	0.0	
71		Geothermal	GWh	624.4	246.8	698.6	1148.7	1868.8	
72		Small Hydro	GWh	0.0	0.0	0.0	0.0	0.0	
73		Wind CAISO	GWh	1014.7	1515.2	1828.3	2031.3	1818.1	Wind and solar values represent production potential (pre-curtailment). Curtailment is calculated at the portfolio level (as opposed to the resource level), and is included as a line item below

	A	B	C	D	E	F	G	H	I
74		Wind Out Of State	GWh	285.9	942.9	942.5	944.9	658.9	
75		Wind Offshore	GWh	0.0	0.0	0.0	0.0	0.0	
76		Solar Utility Scale	GWh	984.5	1099.6	1200.3	1874.5	2163.9	
77		Solar Distributed	GWh	0.0	0.0	0.0	0.0	0.0	Distributed solar generation that is in front of the meter
78		Hybrid or Paired Solar and Battery	GWh	706.0	774.1	1954.0	1883.8	3277.4	
79		Shed DR	GWh	0.0	0.0	0.0	0.0	0.0	
80		Pumped Storage	GWh	0.0	0.0	0.0	0.0	0.0	Negative because storage losses represent net negative energy production
81		Battery Storage	GWh	-29.7	-30.5	-35.7	-35.7	-95.7	Negative because storage losses represent net negative energy production
82		Storage Resource Custom Profile	GWh	0.0	0.0	0.0	0.0	0.0	Negative because storage losses represent net negative energy production
83		RPS Resource Custom Profile	GWh	0.0	0.0	0.0	0.0	0.0	
84		GHG-free non-RPS Resource Custom Profile	GWh	0.0	0.0	0.0	0.0	0.0	
85		Coal	GWh	0.0	0.0	0.0	0.0	0.0	
86		IFM CHP	GWh	141.7	129.8	135.9	0.0	0.0	
87									
88		**Supply Demand Balance Summary**	**Unit**	**2028.0**	**2030.0**	**2035.0**	**2040.0**	**2045.0**	**Notes**
89		LSE Supply, before curtailment and exports	GWh	3727.5	4677.9	6724.0	7847.4	9691.4	Represents LSE's net power production, before curtailment and exports reduce the power available to dispace CAISO dispatchable gas/unspecified imports
90		Net Purchases, before curtailment and exports	GWh	448.8	-54.7	-868.1	-1128.7	-2482.6	The net system power that the LSE would consume (positive = consume from system, negative = supply to system) if dispatchable gas/unspecified imports were on the margin at the
91		Curtailment	GWh	-289.8	-603.0	-1307.9	-1707.1	-2606.0	Power that, if supplied to the system, would not displace CAISO dispatchable gas and/or unspecified import emissions and would instead be curtailed
92		Exports	GWh	-87.8	-88.4	-115.7	-133.5	-162.3	Power that, if supplied to the system, would not displace CAISO dispatchable gas and/or unspecified import emissions and would instead be exported
93		Zero Emissions Power From System	GWh	0.1	4.6	0.4	0.2	0.0	Power supplied to meet LSE demand that does not incur emissions. Oversupply conditions at the system level result in surplus zero emissions power in some hours.
94		Net System Power (incurs emissions)	GWh	826.2	632.1	555.1	711.6	285.8	Power supplied by the system (or sent back to the system from if negative) in hours when CAISO dispatchable gas and/or unspecified imports are on the margin. The net system power produced or consumed is multiplied by the system power emissions rate in each hour.
95		**Check: Supply equals demand**		**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	
96									
97		**Renewable and GHG-Free %**	**Unit**	**2028**	**2030**	**2035**	**2040**	**2045**	**Notes**
98		Retail Sales	GWh	3838.5	4249.1	5381.9	6174.7	6624.8	
99		RPS-Eligible Delivered Renewable	GWh	3325.7	3975.6	5315.8	6176.0	7181.1	Represents delivered renewable energy. Not directly comparable to production from an LSE's RPS-eligible resources.

	A	B	C	D	E	F	G	H	I
100		GHG free	GWh	3325.8	3980.2	5316.3	6176.3	7181.1	A small fraction of Asset Controlling Supplier imports are not counted as GHG-free
101		RPS-Eligible Delivered Renewable Percentage	% of retail sales	86.6%	93.6%	98.8%	100.0%	108.4%	Represents delivered renewable energy. Not directly comparable to production from an LSE's RPS-eligible resources.
102		**GHG-free Percentage**	**% of retail sales**	**86.6%**	**93.7%**	**98.8%**	**100.0%**	**108.4%**	