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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop An Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements	Rulemaking 20-05-003 (Filed May 7, 2020)

Commercial Energy of Montana d/b/a Commercial Energy of California 2022 Integrated Resource Plan

Public Version

Template posted by Commission on June 15, 2022

Standard LSE Plan

COMMERCIAL ENERGY OF MONTANA DBA COMMERCIAL ENERGY OF CALIFORNIA

2022 INTEGRATED RESOURCE PLAN

NOVEMBER 1, 2022

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I. Executive Summary

Commercial Energy of Montana dba Commercial Energy of California (Commercial Energy) presents its 2022 Integrated Resource Plan (IRP) as an Electric Service Provider (ESP) licensed by the CPUC with ESP #1378. Commercial Energy serves energy to commercial, institutional, and industrial customers throughout California and is the leading natural gas CTA in California and Montana. Commercial Energy helps its clients achieve their sustainability and cost management goals by providing customized energy management solutions to manage their supply requirements across various utilities while lowering their overall energy and/or carbon footprint through a robust portfolio of onsite and offsite solutions. Commercial Energy appreciates the opportunity to highlight our progress and fulfill the statewide IRP exercise.

Commercial Energy has grown these services since our inception in 1997 and growth to California in 2004. We remain privately held by the firm's founders and employees working from our Oakland, California headquarters. Commercial Energy feels that its product mix of both natural gas and electricity position it well to help reliably meet California's Greenhouse Gas (GHG) reduction goals in a cost competitive manner by educating and implementing decarbonizing solutions at its diverse client locations. With its established and growing customer base in California, Commercial Energy now has the ability, capacity, discipline and foresight to engage in long-term contracting while balancing our competitive position with GHG reductions and reliability requirements.

Commercial Energy produced both a Preferred Conforming Portfolio for the 30MMT and 25MMT targets. Commercial Energy worked diligently to build our portfolios based on current and planned procurements that align with the Reference System Portfolio (RSP) and assigned GHG Targets, as well as Commercial Energy's Resource Adequacy (RA) and Renewable Portfolio Standard (RPS) requirements. With its intimate knowledge of our clients' natural gas usage and patterns, Commercial Energy is also evaluating decarbonizing their buildings while expanding access to customer-sited electric vehicle charging and fleet retrofits.

II. Study Design

Commercial Energy is a California ESP; therefore, the load assignment for this IRP was calculated by taking our 2023 Year-Ahead Forecast as filed with the California Public Utilities Commission (CPUC) and utilizing the confidentially assigned load forecast. This forecast was used in conjunction with the GHG Calculator, CSP 30MMT and CSP 25MMT templates to build our demand scenario. The Resource Data Templates, CSP 30MMT and CSP 25MMT, were then populated to design our supply scenarios.

a. Objectives

Commercial Energy's objective is to assist both the State of California and our clients in exceeding their RA, RPS and GHG reductions in a cost-effective manner. Through this exercise, we also sought to highlight areas where we may be able to achieve synergies across our gas and electricity

commodity desks and integration with our Energy Services division's business development strategies over the next decade. While we respect and appreciate that each individual customer ultimately dictates how much they are willing to pursue towards a carbon-free or carbon-neutral energy footprint, as a company we provide options to help them create a greener future. The process of integrating their desires with our own desire to lower our aggregate GHG footprint below the State mandates while remaining market competitive requires continuous iteration and calibration. This report represents a snapshot of where we stand today towards clarifying that vision and bringing it to fruition over the next decade.

At this time, our objective from 2021-24 is to provide [redacted] than the statewide 40% mandate. With the growth of Direct Access and Commercial Energy's own client base, Commercial Energy expects to exceed [redacted] against the state mandate of 60% by 2030. We believe we can meet these goals while growing our market position and still provide superior customer service.

b. Methodology

i. Modeling Tool(s)

- Resource Data Template
- 2023 Year-Ahead Load Forecast
- Assigned Load Forecast
- ESP GHG Benchmark Calculator
- Clean System Power 30MMT Template
- Clean System Power 25MMT Template

ii. Modeling Approach

On the demand side, Commercial Energy's load assignment for this IRP was calculated by taking our 2023 Year-Ahead Forecast as filed with the CPUC and utilizing the confidentially assigned load forecast. This forecast was used in conjunction with the GHG Calculator, CSP 30MMT and CSP 25MMT Templates to build our demand scenario. Commercial Energy made one adjustment to the demand baseline. Commercial Energy only serves C&I customers so the custom baseline of 100% C&I makes sense, even though that derived hourly load profile still materially over-estimates Commercial Energy's client load during peak hours. The Resource Data Template, CSP 30MMT and CSP 25MMT were populated to design our supply scenarios. Commercial Energy built the supply scenarios based on current and planned procurements that align with the RSP and assigned GHG Targets, as well as Commercial Energy's RA and RPS requirements.

Commercial Energy also evolved its proprietary forward price model of electricity in the California market over the next ten years. Historical practice has been adjusted as the prior practice of taking the last ten years of energy price evolution and developing price curves is no longer prudent in a rapidly evolving renewables market. Today we see far greater price

volatility driven by the vagaries of weather, renewable generation, and net load. Applying those inputs to current forward market prices in a variety of Monte Carlo simulations is providing a more prudent management tool. Such a price forecast then informs procurement decisions for both the short and long term given mandated changes to the California procurement mix over the decade. It does not, and cannot, account for unanticipated changes to the regulatory or legislative climate.

Load Shape

Commercial Energy uses the ESP average C&I load shape in this planning process even though our shape is significantly less in peak hours. Coming out of the COVID-19 pandemic, Commercial Energy believes C&I load is almost fully recovered to 2019 levels. The unique modelling challenges include the rapid rise in inflation, the threat of recession caused by monetary tightening and inflation, and the migration of residents from the cities to lower priced locales in an evolving work-from-anywhere state and world. This combination of factors makes relying on energy usage in prior recessions in inflationary environments difficult to calibrate.

Additional Resources

The recent decision to extend nuclear generation for an unspecified period also introduces new pricing uncertainties, as do the delays in both the CPE and third-party deployment of grid-level renewable and storage assets. When these existing facilities are commissioned, together with the potential glut of new energy projects facilitated by the Inflation Reduction Act, they could create a significant diminution in the long term and hourly value of these investments. In this environment, the prudent procurement and risk manager can find it difficult to justify many new investments. Therefore, the Commission decision to defer the mandatory filing of long-term RA asset contracts is fully justified and provides some breathing room while this market finds a more stable pricing and load environment.

The passage of Senate Bill 905 to establish the Carbon Capture, Removal, Utilization and Storage (CCUS) program could affect the predicted demise of natural gas generation in the state. Combined with the tax benefits of the Inflation Reduction Act of 2022, Commercial Energy sees a very plausible opportunity to develop our own sequestration facilities using our Montana natural gas production fields that will eventually reach the end of their economically useful life.

Commercial Energy is using this IRP to build a portfolio that will ultimately mirror our hourly load while Commercial Energy carries hourly price and load imbalance. That portfolio will [redacted] our Executive team sees prudency and conformance with our internal Earnings-at-Risk guidelines.

III. Study Results

a. Conforming and Alternative Portfolios

- *ces_csp_30mmt_preferred_conforming_na_v1.xlsx (Attachment B)*
- *ces_csp_25mmt_preferred_conforming_na_v1.xlsx (Attachment C)*

b. Preferred Conforming Portfolios

Commercial Energy produced both a Preferred Conforming Portfolio for the 30MMT and 25MMT targets. Commercial Energy created our portfolios based on current and planned procurements that align with the RSP and assigned GHG Targets, as well as Commercial Energy's RA and RPS requirements and prudent business policies and risk positions. Given the uncertainties cited above, we are not providing an alternative portfolio of our goal of [redacted]

c. GHG Emissions Results

Please reference Commercial Energy's 30MMT preferred portfolio and Commercial Energy's 25MMT preferred portfolio.

d. Local Air Pollutant Minimization and Disadvantaged Communities

i. Local Air Pollutants

a. See Attachment D for 30MMT
b. See Attachment E for 25MMT

ii. Focus on Disadvantaged Communities

Commercial Energy agrees with the need to lower pollution in disadvantaged communities and all communities in general. In this portfolio, over [redacted] of our customer electricity volume is delivered within Disadvantaged Communities (DAC). While we currently do not have any DAC specific programs, like all ESPs our customers pay for IOU programs for DACs through rate surcharges for Public Purpose Programs. In past RFPs, Commercial Energy has purposefully upgraded projects located in DACs from conforming bidders and will continue to do so. Commercial Energy also includes a premium for locally hired labor where available. Commercial Energy continues to develop and install carbon footprint reduction measures in many of our customers. Our client locations currently have [redacted] in operation with [redacted]

This commitment to DACs fulfills two of the stated goals of improving economic opportunity and reducing pollution that causes climate change. Commercial Energy's direct access offering provides its clients pricing options designed to meet their economic or renewable energy goals. Renewable goals can be met via our 100% renewable electricity price options, Electric Vehicle (EV) charging programs, carbon reduction retrofits or all the above. Economic goals can be met by our standard price options that should provide cost reductions compared to Investor-Owned Utility (IOU) bundled rates while meeting the state's standard for RPS compliance. In turn, each customer can then choose how to support their area's DAC community improvement programs with the capital that our programs free up for them.

Through its Energy Services team, Commercial Energy expects to continue to deploy dispatchable and Distributed Energy Resources (DERs) at our clients in DACs. As has been our practice, we bring in the industry leaders to execute these opportunities, whether they are behind-the-meter energy storage and/or solar, natural gas retrofits, demand reductions, or fuel cells with lower emissions footprint than the grid.

The table below quantifies the number of meters in each of the DAC zip codes that Commercial Energy serves. All these meters are actual users of electricity supplied by Commercial Energy.

County	Zip Code	Meter Count
Los Angeles	90040	[redacted]
Los Angeles	90221	
Los Angeles	90245	
Los Angeles	90401	
Los Angeles	90640	
Los Angeles	90701	
Los Angeles	90805	
Los Angeles	90806	
Los Angeles	91010	
Los Angeles	91745	
Los Angeles	91767	
San Bernardino	91786	
San Diego	91910	
San Diego	91945	
San Diego	92020	
San Diego	92021	
San Diego	92101	
Riverside	92543	
Orange	92831	
Orange	92832	
Orange	92867	
Santa Barbara	93111	

Kern	93203		[redacted]
Kern	93301		
Kern	93306		
Madera	93637		
Fresno	93662		
Fresno	93706		
Fresno	93725		
Fresno	93727		
Monterey	93901		
Monterey	93905		
Monterey	93933		
San Mateo	94063		
San Mateo	94080		
San Francisco	94102		
San Francisco	94103		
San Francisco	94107		
San Francisco	94124		
San Mateo	94401		
Contra Costa	94509		
Contra Costa	94520		
Solano	94533		
Solano	94534		
Alameda	94544		
Alameda	94545		
Alameda	94560		
Contra Costa	94565		
Solano	94571		
Alameda	94577		
Alameda	94578		
Alameda	94587		[redacted]
Solano	94590		
Alameda	94601		
Alameda	94603		
Alameda	94606		
Alameda	94607		
Alameda	94608		
Alameda	94612		
Alameda	94621		
Alameda	94710		
Contra Costa	94804		
Contra Costa	94806		

Santa Clara	95020		[redacted]	
Santa Cruz	95076			
Santa Clara	95116			
Santa Clara	95131			
San Joaquin	95203			
San Joaquin	95204			
San Joaquin	95206			
San Joaquin	95207			
San Joaquin	95215			
San Joaquin	95240			
San Joaquin	95320			
San Joaquin	95330			
San Joaquin	95336			
San Joaquin	95337			
Merced	95369			
San Joaquin	95376			
Sonoma	95407			
Yolo	95691			
Yuba	95901			
Butte	95928			
Butte	95965			
Glenn	95988			
Sutter	95991			

e. Cost and Rate Analysis

As an ESP, Commercial Energy must procure to provide reliable and cost-effective Supply, RA and RPS on behalf of our customers while meeting or exceeding their sustainability and GHG reduction goals and aspirations. As LSEs must procure resources to meet State RPS goals, we evaluate future procurements based on both cost and hourly and annual risk against our portfolio. We intend to continue to make the best investments possible to meet both our regulatory obligations as well as our customers' needs. Some of those investments will be behind the meter, built in partnership with our clients, especially solar and storage assets. Others will be at the wholesale level, almost certainly in the State of California.

Our risk management positions are quantified through our Risk Management Committee, a decade-long monthly assessment practice across our business platform. Commercial Energy has specific Earnings-At-Risk guidelines that cannot be exceeded without Commercial Energy's Board approval. Our portfolio risk approach spanning multiple states across multiple industries, supplying both natural gas and electricity provides the Company with unique tools to mitigate gross margin volatility and insure long-term stability and capital for continued growth in energy solutions.

f. System Reliability Analysis

Commercial Energy works diligently to build our portfolios based on current and planned procurements that align with the RSP and assigned GHG Targets while contributing our fair share to system reliability and renewable integration. The interplay between decarbonization goals and system reliability may force us to consider certain non-renewable RA assets for long term RA. Our experience using natural gas storage as a reliability backstop certainly informs us of the value of electricity RA. That same gas storage serves as a tool to meet electricity peaking needs if so enabled. The beauty of natural gas is that it is fully dispatchable on a peak hour, but it is not exhausted in four hours, as battery storage still is. The value of natural gas peak generators once again was demonstrated over this past Labor Day weekend when over 50% of statewide load was served by gas peak generators. We should not sacrifice reliability as we move forward in our energy transition to decarbonization. ESPs in alignment may do far more to help realize decarbonization opportunities than energy storage can do alone. This IRP process does not allow us to bring those resources to bear but Commercial Energy has attached what we can do in the electricity sector:

- See Attachment F for 30MMT System Reliability Tracking Table.
- See Attachment G for 25MMT System Reliability Tracking Table.

g. High Electrification Planning

Building electrification is not seen as a significant driver of changes in electricity consumption by our clients at this time. Our clients are constantly striving to lower their total energy costs, so any effort to replace natural gas consumption with electricity consumption is balanced by the net difference in cost and potential reliability. Our team actively educates our clients of these opportunities. Depending on the client and their location, having two sources of energy during extreme events is preferred to relying on electricity alone.

Commercial Energy is currently building a proprietary EV database to quantify the number of electric vehicles at each of its clients, their capacity to deploy EV charging, our ability to monitor and control that charging and discharging regime to maintain and enhance system RA and reliability. Commercial Energy believes it is essential to incent through hourly pricing to quickly charge vehicles during the sunlight hours and discharge in the evening when needed. Because Commercial Energy has the pricing tools to apply this principle to its clients' EV chargers, there is little need for regulatory manipulations of wholesale pricing tools.

Once Commercial Energy completes its analysis by the end of 2022, it will adopt a capacity plan to provide the extra energy and capacity as this load grows over the next two decades to displace over 80% of all passenger vehicle fueling. But such a long runway makes proposing specific resources difficult at this time.

h. Existing Resource Planning

Commercial Energy's 2022 IRP relies on planned or online resources not including CAM or VAMO allocations as displayed. The vast majority is already online, although half began initial operation in 2021. Depending on client growth or migration, Commercial Energy will engage with primarily new renewable generation to meet any additional long-term needs. We do not see any obstructions in our ability to find such resources on a long-term basis. Commercial Energy did not quantify the effect of implementation of its own CCUS resources as it has only begun evaluating the project.

i. Hydro Generation Risk Management

Both of our Preferred Conforming Portfolios rely on large, in-state hydro due to the relative high availability, low cost, and clean power. Hydro systems with large reservoirs can store water for multiple years and smooth out generation over time. Because of the timing of hydro generation, it is generally only an energy-related risk, and not a reliability risk, and we are not procuring RA from hydro generation sources . If an extensive drought significantly reduces available hydro generation during the scope of this IRP cycle, Commercial Energy will likely face increased procurement costs. Commercial Energy understands the risks of drought and will continue to explore potential, cost-effective, alternate GHG-free power options, including CCUS. This will allow us to help ensure system reliability and remain within our target GHG goals.

j. Long-Duration Storage Planning

Commercial Energy has evaluated long duration storage for the past decade, and co-invested [redacted] The goal was commercialization of an iron-chromium flow battery technology to create long duration storage either on the grid or behind the meter. Unfortunately, that company declared bankruptcy three years later and the technology has yet to be proven commercially viable.

Our executive team meets regularly with other developers to evaluate advancements in energy storage and generation technologies. To date we have seen models work conceptually at 2-10 kW size, but they do not scale well and may face difficulties proving commercial viability. Issues revealed are usually around roundtrip efficiency of less than 75%, parasitic loads of 10+% to flow the fluids and cool the generators, and fouling of the membranes where the energy is re-created. Because of our deep knowledge of natural gas production and storage, we have looked at compressed air storage (and CO2 capture from power plants in those same depleted gas fields). Roundtrip efficiency fails miserably, and control is difficult to assure in the long term. As part of the CleanTech Open that we have co-sponsored for many years, our team judged a variety of other early-stage storage concepts, from freight trains on a hill (think pumped storage), to concrete blocks dropped from many stories (think gravity). Again, Commercial Energy has not seen commercially competitive solutions in the market.

Both of our Preferred Conforming Portfolios rely on 4-hour battery storage. Commercial Energy sees long-duration storage, created today by simply adding more battery capacity at each interconnect, as an important opportunity to increase renewable integration and reduce curtailment of renewable facilities. This will allow GHG-free energy to replace significant system power from fossil fuel plants. Commercial Energy supports the further development of both battery storage and long duration pumped storage and will continue to look for opportunities to increase procurements and/or prudently invest.

In our current portfolio, Commercial Energy has added significant new battery storage to meet our RA needs and co-located at solar sites in California. Commercial Energy has also executed long-term solar contracts for the same reason. However, Commercial Energy will procure the minimum long-term needed to meet the obligations imposed by 21-06-055.

k. Clean Firm Power Planning

Commercial Energy's existing procurement of renewables is premised on clean, firm attributes and we pay the premium for such energy. However, this is a contractual and not a physical product, with the delivery obligation borne by a portfolio of renewable sites all based in California.

Commercial Energy evaluated geothermal generation projects in the prior two years as a source of high load factor, clean firm generation. The resources are limited and extremely competitive with only a couple of proven developers. Commercial Energy placed development risk too high to place a bet on a large ramp up of their capacity in the next ten years with significant environmental risk due to the high need for water. Commercial Energy will not look at resources outside of California, consistent with our past practices.

Commercial Energy continues to deploy fuel cell generators that run on our natural gas at its client sites. These reduce our baseload at each meter but are only reflected a year after deployment in our forward forecasts. Employed where we site them, these fuel cells also diminish the net carbon footprint versus the grid portfolio. When hydrogen is readily available, our technology partners assure us they can replace their prime movers with hydrogen enabled fuel cells and we look forward to that day. Over the next two years, Commercial Energy expects to reduce its current Direct Access load by at least 20% annually through onsite fuel cell displacement.

l. Out-of-State Wind Planning

Commercial Energy's Preferred Conforming Portfolios do not rely on out-of-state wind. Commercial Energy does understand the importance of out-of-state wind and supports further development, especially projects that could delivery energy into a CBA consistent with PCC 1 REC characteristics.

m. Offshore Wind Planning

Due to the sheer size and transmission requirements of offshore wind, Commercial Energy strongly believes this asset class should only be developed through the CPE framework and should be allocated to all LSEs proportionately once deployed. At this time, we recognize the planning calls for only 5 GW by 2030, if it is determined that Humboldt or Morro Bay can provide the infrastructure to support them. Transmission interconnections to offshore units would be problematic as Commercial is not an IOU that can plan and build sufficient capacity. Any plan for offshore wind must factor the interconnection costs into the initial investment's prudency review. Therefore, Commercial's plan does not interact with the planning goals required by AB 525 at this time.

n. Transmission Planning

Commercial Energy does not own any electricity transmission resources. Therefore, Commercial Energy has nothing to report on transmission development. Commercial Energy will reevaluate this at a time when or if it becomes necessary.

IV. Action Plan

a. Proposed Procurement Activities and Potential Barriers

Commercial Energy's Board listens to its clients, employees and its regulators to design its policies, set its GHG strategies and develop its go-to-market directives. Commercial Energy attempts to purchase RA and RPS to meet and ideally exceed both its current customer contracts and regulatory requirements. The RPS requirements that began in 2021 require 65% of procurement to come from long-term contracts of 10 years or more. Commercial Energy accomplished that objective based on its client load in the prior planning period. If and when Commercial Energy's client load grows, we will work to procure resources consistent with the portfolios developed for this IRP cycle. Commercial Energy does not believe any changes in these practices are required to continue to remain below our GHG Benchmark despite the additional requirements and significant load increase that we will see over the next few years.

Commercial Energy has a multi-faceted approach to meeting its electricity needs. Our trading desk makes the near-term buys for energy, RPS, and RA by working with a variety of suppliers across the west through bilateral negotiations. Because we are a private company, we cannot aggregate our buying power with our competitors, nor do we want to. Frequently our relatively small load, combined with the scarcity of RA available in the market, makes it difficult to procure at a favorable price, shape, or attribute we may desire.

The changing rules and asset mix of the legacy contracts allocated by the IOUs to ESPs continues to create uncertainties in our planning process. Commercial Energy is only this year getting experience with the Voluntary Allocation and Market Offer (VAMO) process and how it will supplement our renewable procurement objectives. Commercial Energy is only now seeing developers and IOUs clear their backlog of projects in progress for a variety of reasons created by the pandemic.

Commercial Energy has recently seen how the Enforcement Division has taken a pessimistic view of our prior procurement practices and we believe they have also mischaracterized our efforts. Despite these headwinds, we continue to privately pursue prudent long-term purchases of renewable energy coupled with local RA to exceed the compliance requirements.

b. Disadvantaged Communities

Commercial Energy currently provides over [redacted] of its electricity to businesses located in disadvantaged communities. These businesses provide the jobs for the community and working with our company allows them to control costs. Helping these businesses stay in business in a tough economy serves those communities as does our commitment to EV charging sited at the same businesses, as documented above. We believe our commitment to seek out and serve businesses in the disadvantaged areas is part of our social license to operate. The fact that our corporate office was relocated to Oakland 15 years ago should only affirm that social license and commitment.

Commercial Energy is trying to scale its long-term procurement in a cost-effective manner from sites in disparate areas of California. However, because Commercial Energy does not have the customer scale to engage and contract dozens of such sites, and because we are not a site developer of grid-connected assets, our ability to directly take action in DACs is limited to our behind-the-meter activities at each of our hundreds of clients. Those activities are explained above. We expect any long-term contracts will also be written with developers in DAC areas, and will give preference to them.

c. Commission Direction of Actions

The greatest barrier to Commercial Energy helping its clients decarbonize is the decision of the Energy Division to decline to present a recommendation to open Direct Access to all businesses in California. Absent taking customers from other DA providers, we cannot grow our business and as a group, we cannot grow at all. We cannot help frustrated business customers who are under pressure from their local CCA to not opt-out and to just go-along for the good of the community. This political power is compelling and used quite well. But for businesses to be denied any real choice, especially when they can do so much more working with an ESP, is contradictory to the entire notion of resilience and innovation. Resilience is based on a market with lots of participants with disparate agendas, not just two. Innovations in technology and procurement practices that can advance goals towards addressing climate change can be further enabled through the expansion of competitive forces and Direct Access. Once again, Commercial Energy urges the Commission to make a recommendation to the legislature to fully open Direct Access for all business customers and let ESPs and their customers compete to solve emission reduction solutions in the state.

V. Lessons Learned

Commercial Energy's procurement practices will continue to improve, and we will make prudent purchasing decisions to best meet our regulatory requirements.

Commercial Energy did anticipate the failure of many renewable and storage developers to deploy their new generating assets timely in the past two years. Commercial Energy learned that our view

of the market was correct and our decisions to defer longer term engagements at the time were well made. The heat wave this past September should have reminded all of us of the true intermittency of all renewable resources and the hesitancy to rely on a completely GHG-free portfolio. On the other hand, the extension of the Diablo Canyon contract affirmed the vacillations of governmental mandates, however well-intentioned. That only magnifies the inherent difficulty of writing a ten year and longer energy plan in California.

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 forecast 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 2030 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 2030 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 2030 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 MWs 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)**: annual process conducted by the California Independent System Operator (CAISO) to identify potential transmission system limitations and areas that need reinforcements over a 10-year horizon.*

Attachment B

30 MMT in 2035

Supply Inputs: Values should be pasted directly from the Resource Data Template using Excel's "Paste Values" option

Resource	2024	2026	2030	2035	Units	Type
Large Hydro					GWh	GHG-Free
Imported Hydro					GWh	GHG-Free
Asset Controlling Supplier					GWh	GHG-Free (Partial)
Nuclear					GWh	GHG-Free
Biogas					GWh	RPS Eligible
Biomass					GWh	RPS Eligible
Geothermal					GWh	RPS Eligible
Small Hydro					GWh	RPS Eligible
Wind Resources						
Wind Baseline California					GWh	RPS Eligible
Wind New PG&E					GWh	RPS Eligible
Wind New SCE SDG&E					GWh	RPS Eligible
Wind Pacific Northwest					GWh	RPS Eligible
Wind Wyoming					GWh	RPS Eligible
Wind New Mexico					GWh	RPS Eligible
Wind Offshore Morro Bay					GWh	RPS Eligible
Wind Offshore Humboldt					GWh	RPS Eligible
Solar Resources						
Solar Baseline California					GWh	RPS Eligible
Solar New PG&E					GWh	RPS Eligible
Solar New SCE SDG&E					GWh	RPS Eligible
Solar Distributed					GWh	RPS Eligible
Hybrid						
Hybrid_or_Paired_Solar_and_Battery					GWh	RPS Eligible
Storage & DR						
Shed DR					MW	GHG-Free
Pumped Storage					MW	n/a
Battery Storage					MWh Energy Capacity	n/a
User-Specified Profies						
Storage Resource Custom Profile					MW	n/a
RPS Resource Custom Profile					GWh	RPS Eligible
GHG-free non-RPS Resource					GWh	GHG-Free
Coal						
Coal					GWh	n/a
Calculated Share of IFM CHP - do not edit						
IFM CHP					GWh	n/a

Checks	2024	2026	2030	2035
No negative supply inputs	TRUE	TRUE	TRUE	TRUE
Storage Resource Custom Profile does not produce power on a net basis	TRUE	TRUE	TRUE	TRUE
Storage Resource Custom Profile has values between -1 and 1	TRUE	TRUE	TRUE	TRUE
Sum of hourly RPS Resource Custom Profile equals annual input	TRUE	TRUE	TRUE	TRUE
Sum of hourly GHG-free non-RPS Resource Custom Profile equals annual input	TRUE	TRUE	TRUE	TRUE

30 MMT in 2035

Demand Inputs

		Units	2024	2026	2030
Managed Retail Sales Forecast (assigned to LSE)		GWh			
Behind-The-Meter Photovoltaics (BTM PV) Forecast (assigned to LSE)		GWh			
Retail Sales without BTM PV reduction		GWh			
Behind-The-Meter Photovoltaics (BTM PV) grossed up for T&D losses		GWh			
Calculated share of CAISO system demand (% of Retail Sales)		%			
Commercial & Industrial Fraction of Baseline Demand	***Use Custom?***	***Units***			
Default C&I Percentage of Total	*No*	%			
Custom C&I Percentage of Total (OPTIONAL)		%			
Calculated Demand, based on sales-weighted share of total from IEPR		***Units***			
Baseline net energy for load		GWh			
Electric Vehicle Load		GWh			
Building Electrification		GWh			
Energy Efficiency		GWh			
Behind-The-Meter Photovoltaics (BTM PV)		GWh			
Behind-The-Meter Storage Losses (BTM Storage)		GWh			
Behind-The-Meter Storage Capacity (BTM Storage)		Nameplate MW			
Custom Demand Inputs (OPTIONAL; overwrites sales-weighted IEPR values from Calculated Demand section)	***Use Custom?***	***Units***			
Baseline net energy for load	*No*	GWh			
Electric Vehicle Load	*No*	GWh			
Building Electrification	*No*	GWh			
Energy Efficiency	*No*	GWh			
Behind-The-Meter Photovoltaics (BTM PV)	*No*	GWh			
Behind-The-Meter Storage Capacity (BTM Storage)	*No*	Nameplate MW			
Behind-The-Meter Storage Losses (BTM Storage)		GWh			
Active Demand Inputs	***Source***	***Units***			
Baseline net energy for load	*IEPR*	GWh			
Non-commercial/industrial portion of baseline (included in baseline total)	*IEPR*	GWh			
Commercial/industrial portion of baseline (included in baseline total)	*IEPR*	GWh			
Electric Vehicle Load	*IEPR*	GWh			
Building Electrification	*IEPR*	GWh			
Energy Efficiency	*IEPR*	GWh			
Behind-The-Meter Photovoltaics (BTM PV)	*IEPR*	GWh			
Behind-The-Meter Storage Losses (BTM Storage)	*IEPR*	GWh			
Calculated demand at utility-scale generator bus-bar		GWh			
IFM CHP Calculation					
CASIO-wide in front of the meter (IFM) Combined Heat and Power (CHP) generation		GWh			
LSE share of IFM CHP		GWh			

Checks	2024	2026	2030
Correct sign (positive/negative) on demand inputs	TRUE	TRUE	TRUE
If custom C&I percentage is used, positive percentage is used	TRUE	TRUE	TRUE

30 MMT in 2035

Emissions Summary

Emissions Total	Unit		2024	2026	2030	2035
CO_2	*MMt/yr*					
PM2.5	*tonnes/yr*					
SO_2	*tonnes/yr*					
NOx	*tonnes/yr*	#N/				

Emissions by resource type

CO_2	Unit
Coal	*MMt/yr*
CHP	*MMt/yr*
Biogas	*MMt/yr*
Biomass	*MMt/yr*
System Power	*MMt/yr*
Asset Controlling Supplier	*MMt/yr*
Total	***MMt/yr***
Average emissions intensity	*tCO2/MWh*
Oversupply Emissions Credits	*MMt/yr*

PM2.5	Unit
Coal	*tonnes/yr*
CHP	*tonnes/yr*
Biogas	*tonnes/yr*
Biomass	*tonnes/yr*
System Power	*tonnes/yr*
Total	***tonnes/yr***
Average emissions intensity	*kg/MWh*

SO_2	Unit
Coal	*tonnes/yr*
CHP	*tonnes/yr*
Biogas	*tonnes/yr*
Biomass	*tonnes/yr*
System Power	*tonnes/yr*
Total	***tonnes/yr***
Average emissions intensity	*kg/MWh*

NOx	Unit
Coal	*tonnes/yr*
CHP	*tonnes/yr*
Biogas	*tonnes/yr*
Biomass	*tonnes/yr*
System Power	*tonnes/yr*
Total	***tonnes/yr***
Average emissions intensity	*kg/MWh*

Supply and Demand Balance

Demand Summary	Unit
Managed Retail Sales Forecast (assigned to LSE)	*GWh*
Baseline Demand, non-C&I	*GWh*
Baseline Demand, C&I	*GWh*
Electric Vehicle Load	*GWh*
Building Electrification	*GWh*
Energy Efficiency	*GWh*
BTM PV	*GWh*
Demand (at generator bus-bar)	*GWh*

Supply Summary	Unit
Large Hydro	*GWh*
Imported Hydro	*GWh*
Asset Controlling Supplier	*GWh*
Nuclear	*GWh*
Biogas	*GWh*
Biomass	*GWh*
Geothermal	*GWh*
Small Hydro	*GWh*
Wind CAISO	*GWh*
Wind Out Of State	*GWh*
Wind Offshore	*GWh*
Solar Utility Scale	*GWh*
Solar Distributed	*GWh*
Hybrid_or_Paired_Solar_and_Battery	*GWh*
Shed DR	*GWh*
Pumped Storage	*GWh*
Battery Storage	*GWh*
Storage Resource Custom Profile	*GWh*
RPS Resource Custom Profile	*GWh*
GHG-free non-RPS Resource	*GWh*
Coal	*GWh*
IFM CHP	*GWh*

Supply Demand Balance Summary	Unit
LSE Supply, before curtailment and exports	*GWh*
Net Purchases, before curtailment and exports	*GWh*
Curtailment	*GWh*
Exports	*GWh*
Zero Emissions Power From System	*GWh*
Net System Power (incurs emissions)	***GWh***
Check Supply equals demand	

		2024	2026	2030	2035
		TRUE	TRUE	TRUE	TRUE

Renewable and GHG-Free %	Unit
Retail Sales	GWh
RPS-Eligible Delivered Renewable	GWh
GHG free	GWh
RPS-Eligible Delivered Renewable Percentage	*% of retail sales*
GHG-free Percentage	*% of retail sales*

Attachment C

25 MMT in 2035

Supply Inputs: Values should be pasted directly from the Resource Data Template using Excel's "Paste Values" option

Resource	2024	2026	2030	2035	Units	Type
Large Hydro	[redacted]				GWh	GHG-Free
Imported Hydro					GWh	GHG-Free
Asset Controlling Supplier					GWh	GHG-Free (Partial)
Nuclear					GWh	GHG-Free
Biogas					GWh	RPS Eligible
Biomass					GWh	RPS Eligible
Geothermal					GWh	RPS Eligible
Small Hydro					GWh	RPS Eligible
Wind Resources						
Wind Baseline California					GWh	RPS Eligible
Wind New PG&E					GWh	RPS Eligible
Wind New SCE SDG&E					GWh	RPS Eligible
Wind Pacific Northwest					GWh	RPS Eligible
Wind Wyoming					GWh	RPS Eligible
Wind New Mexico					GWh	RPS Eligible
Wind Offshore Morro Bay					GWh	RPS Eligible
Wind Offshore Humboldt					GWh	RPS Eligible
Solar Resources						
Solar Baseline California					GWh	RPS Eligible
Solar New PG&E					GWh	RPS Eligible
Solar New SCE SDG&E					GWh	RPS Eligible
Solar Distributed					GWh	RPS Eligible
Hybrid						
Hybrid_or_Paired_Solar_and_Battery					GWh	RPS Eligible
Storage & DR						
Shed DR					MW	GHG-Free
Pumped Storage					MW	n/a
Battery Storage					MWh Energy Capacity	n/a
User-Specified Profies						
Storage Resource Custom Profile					MW	n/a
RPS Resource Custom Profile					GWh	RPS Eligible
GHG-free non-RPS Resource					GWh	GHG-Free
Coal						
Coal					GWh	n/a
Calculated Share of IFM CHP - do not edit						
IFM CHP					GWh	n/a

Checks	2024	2026	2030	2035
No negative supply inputs	TRUE	TRUE	TRUE	TRUE
Storage Resource Custom Profile does not produce power on a net basis	TRUE	TRUE	TRUE	TRUE
Storage Resource Custom Profile has values between -1 and 1	TRUE	TRUE	TRUE	TRUE
Sum of hourly RPS Resource Custom Profile equals annual input	TRUE	TRUE	TRUE	TRUE
Sum of hourly GHG-free non-RPS Resource Custom Profile equals annual input	TRUE	TRUE	TRUE	TRUE

25 MMT n 2035

Demand Inputs

		Un te	2024	2026	2030	2035	Notes
Managed Reta l Sales Forecast (assigned to LSE)		GWh					Must be ente ed ega dless of demand mod fe s selected Includes mpact
Behind-The Meter Photovoltaics (BTM PV) Forecast (assigned to LSE)		GWh					Measu ed at custome nots g cased up fo T&D losses
Reta l Sales w thout BTM PV educt on		GWh					Used to c lcula te demand mod fe s
Beh nd-The-Mete Photovo ta cs (BTM PV) g cased up fo T&D losses		GWh					t gene ato bus-ba
Calculated sha e of CA SO system demand (% of Reta l Sales)		%					Do not ed t

Commercial & Industr al Fraction of Basel ne Demand	Use Custom?	Un te					Notes
Defau t C&I Pe centage of Total		%					Defau t do not change Does not nclude demand f om Light Duty EVs
Custom C&I Pe centage of Total (OPTIONAL)	No	%					W l be used nstead of defau t f "Use Custom?" = Yes

Calculated Demand, based on sales-weighted share of total from EPR		Un te					Notes
Basel ne net ene gy fo load		GWh					g cased up fo T&D losses demand met by BTM CHP excluded
Elect c Veh cle Load		GWh					g cased up fo T&D losses
Bu ld ng Elect f cat on		GWh					g cased up fo T&D losses
Ene gy Eff c ency		GWh					g cased up fo T&D losses
Beh nd-The-Mete Photovo ta cs (BTM PV)		GWh					g cased up fo T&D losses
Beh nd-The-Mete Sto age Losses (BTM Sto age)		GWh					g cased up fo T&D losses
Beh nd-The-Mete Sto age Capacity (BTM Sto age)		Nameplate MW					o nfo mat on only

Custom Demand Inputs (OPTIONAL overwrites sales-weighted IEPR values from Calculated Demand section)	Use Custom?	Un te					Notes
Basel ne net ene gy fo load	No	GWh					o ove w te set "Use Custom" to "Yes" and nput fo ecast Fo use n Alte n
Elect c Veh cle Load	No	GWh					ustom demand values should be g cased up fo T&D losses
Bu ld ng Elect f cat on	No	GWh					Use -spec fied demand p of les should be nput n the "Custom P of les" tab
Ene gy Eff c ency	No	GWh					ne gy eff c ency and BTM PV subt act f om demand and the nfo e should b
Beh nd-The-Mete Photovo ta cs (BTM PV)	No	GWh					
Beh nd-The-Mete Sto age Capacity (BTM Sto age)	No	Nameplate MW					ustom BTM sto age should be ente ed n te ms of Nameplate MW
Beh nd-The-Mete Sto age Losses (BTM Sto age)		GWh					

Active Demand Inputs	Source	Un te					Notes
Basel ne net ene gy fo load	IEPR	GWh					g cased up fo T&D losses demand met by BTM CHP excluded
Non-comme c al/ ndust al po t on of basel ne (ncluded n basel ne tota)	IEPR	GWh					g cased up fo T&D losses demand met by BTM CHP excluded
Comme c al/ ndust al po t on of basel ne (ncluded n basel ne tota)	IEPR	GWh					g cased up fo T&D losses demand met by BTM CHP excluded
Elect c Veh cle Load	IEPR	GWh					g cased up fo T&D losses
Bu ld ng Elect f cat on	IEPR	GWh					g cased up fo T&D losses
Ene gy Eff c ency	IEPR	GWh					g cased up fo T&D losses
Beh nd-The-Mete Photovo ta cs (BTM PV)	IEPR	GWh					g cased up fo T&D losses
Beh nd-The-Mete Sto age Losses (BTM Sto age)	IEPR	GWh					g cased up fo T&D losses

Calculated demand at ut l ty-scale gene ato bus-ba		GWh					ota of "Act ve Demand Inputs"

IEM CHP Calculation							
CAISO-w de In f ont of the mete (IFM) Comb ned Heat and Powe (CHP) gene at on		GWh					nput data - do not change Values v a f om SERVM d spa ch
LSE sha e of IFM CHP		GWh					alcula on – do not change

Checks	2024	2026	2030	2035
Co ect s gn (pos t ve/negat ve) on demand nputs	TRUE	TRUE	TRUE	TRUE
If custom C&I pe centage s used, pos t ve pe centage s used	TRUE	TRUE	TRUE	TRUE

Custom Demand Shapes (OPTIONAL overwrites default demand shapes)		Custom Hourly Demand Profiles						
	Use Custom Shape?	No	No	No	No	No	No	No
	Notes	[illegible] Shape should be no mal zed - the sum of the hou ly values ove the ent e yea should equal 1 w th the excep on of BTM Sto age Fo all p of les except BTM Sto age no mal ze by d vd ng eve y hou of the c g nal non-no mal zed shape (n MW) by the annual total (n MWh/y)						
	Check Sums to 1 If custom shape is define d	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Total		-	-	-	-	-	-	-

25 MMT in 2035

Emissions Summary

Emissions Total	Unit	2024	2026	2030	2035
CO_2	MMt/yr				
PM2.5	tonnes/yr				
SO_2	tonnes/yr				
NOx	tonnes/yr				

Emissions by resource type

CO_2	Unit	2024	2026	2030	2035
Coal	MMt/yr				
CHP	MMt/yr				
Biogas	MMt/yr				
Biomass	MMt/yr				
System Power	MMt/yr				
Asset Controlling Supplier	MMt/yr				
Total	**MMt/yr**				
Average emissions intensity	tCO2/MWh				
Oversupply Emissions Credits	MMt/yr				

PM2.5	Unit
Coal	tonnes/yr
CHP	tonnes/yr
Biogas	tonnes/yr
Biomass	tonnes/yr
System Power	tonnes/yr
Total	**tonnes/yr**
Average emissions intensity	kg/MWh

SO_2	Unit
Coal	tonnes/yr
CHP	tonnes/yr
Biogas	tonnes/yr
Biomass	tonnes/yr
System Power	tonnes/yr
Total	**tonnes/yr**
Average emissions intensity	kg/MWh

NOx	Unit
Coal	tonnes/yr
CHP	tonnes/yr
Biogas	tonnes/yr
Biomass	tonnes/yr
System Power	tonnes/yr
Total	**tonnes/yr**
Average emissions intensity	kg/MWh

Supply and Demand Balance

Demand Summary	Unit
Managed Retail Sales Forecast (assigned to LSE)	GWh
Baseline Demand, non-C&I	GWh
Baseline Demand, C&I	GWh
Electric Vehicle Load	GWh
Building Electrification	GWh
Energy Efficiency	GWh
BTM PV	GWh
Demand (at generator bus-bar)	GWh

Supply Summary	Unit
Large Hydro	GWh
Imported Hydro	GWh
Asset Controlling Supplier	GWh
Nuclear	GWh
Biogas	GWh
Biomass	GWh
Geothermal	GWh
Small Hydro	GWh
Wind CAISO	GWh
Wind Out Of State	GWh
Wind Offshore	GWh
Solar Utility Scale	GWh
Solar Distributed	GWh
Hybrid_or_Paired_Solar_and_Battery	GWh
Shed DR	GWh
Pumped Storage	GWh
Battery Storage	GWh
Storage Resource Custom Profile	GWh
RPS Resource Custom Profile	GWh
GHG-free non-RPS Resource	GWh
Coal	GWh
IFM CHP	GWh

Supply Demand Balance Summary	Unit				
LSE Supply, before curtailment and exports	GWh				
Net Purchases, before curtailment and exports	GWh				
Curtailment	GWh				
Exports	GWh				
Zero Emissions Power From System	GWh				
Net System Power (incurs emissions)	**GWh**				
Check Supply equals demand		TRUE	TRUE	TRUE	TRUE

Renewable and GHG-Free %	Unit	2024	2026	2030	2035
Retail Sales	GWh				
RPS-Eligible Delivered Renewable	GWh				
GHG free	GWh				
RPS-Eligible Delivered Renewable Percentage	% of retail sales				
GHG-free Percentage	% of retail sales				

Attachment D

30 MMT in 2035

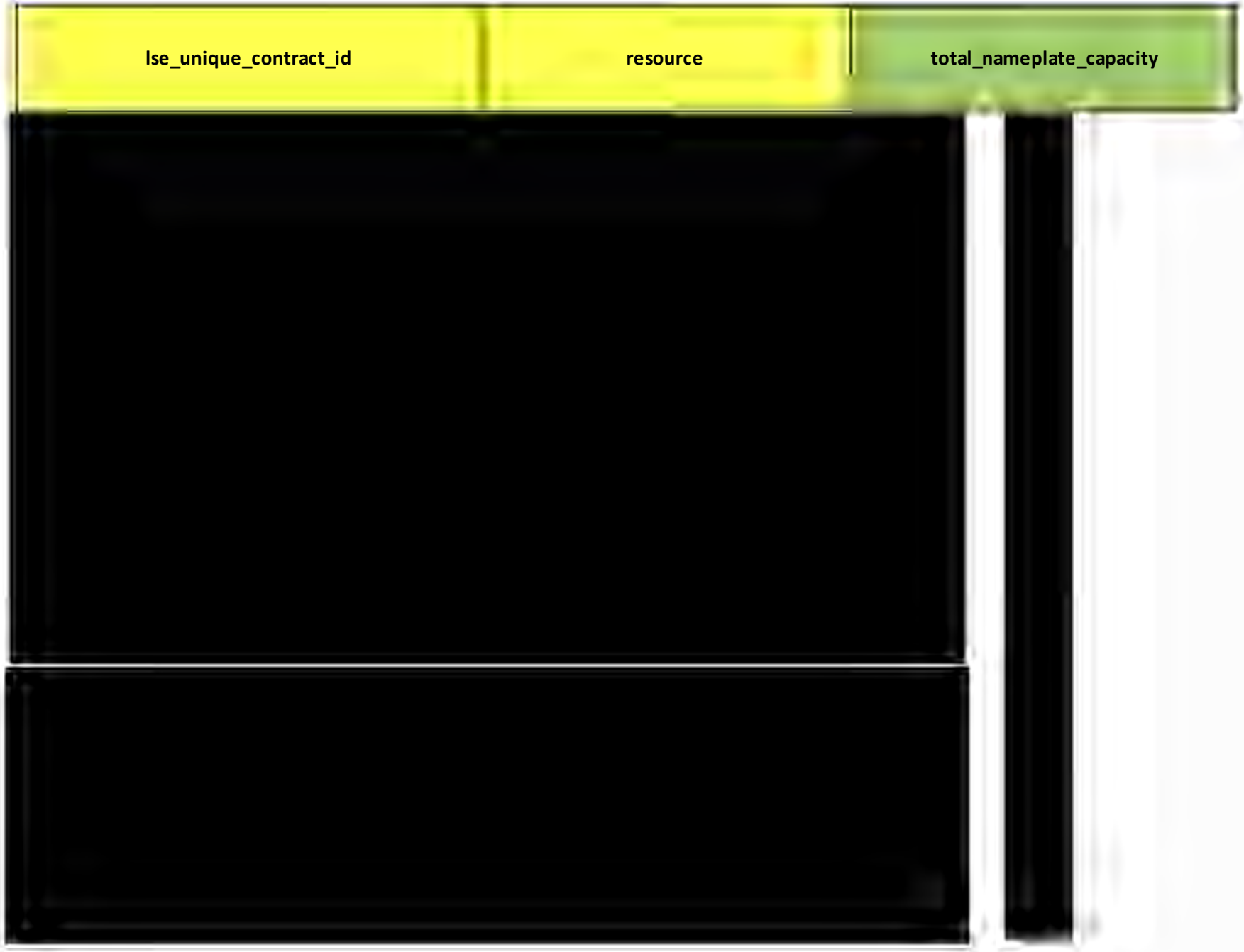
LSEs within Utility Territory	2030 GHG Emissions Benchmark (MMT)	2035 GHG Emissions Benchmark (MMT)	2030 DA Load (GWh)	2035 DA Load (GWh)	ESP 2030 load within each IOU territory (GWh)	ESP 2035 load within each IOU territory (GWh)	ESP 2030 benchmark for each IOU territory (MMT)	ESP 2035 benchmark for each IOU territory (MMT)
Paci ic Gas and Electric Company (Direct Access)	1 6214	1 1776	11 393	11 393			0 074	0 054
Southern Cali omia Edison Company (Direct Access)	1 6376	1 2201	13 421	13 421			0 013	0 010
San Diego Gas and Electric Company (Direct Access)	0 6637	0 4982	3 940	3 940			0 014	0 011
TOTAL			**28,754**	**28,754**			**0.102**	**0.075**

Attachment E

25 MMT in 2035

LSEs within Utility Territory	2030 GHG Emissions Benchmark (MMT)	2035 GHG Emissions Benchmark (MMT)	2030 DA Load (GWh)	2035 DA Load (GWh)	ESP 2030 load within each IOU territory (GWh)	ESP 2035 load within each IOU territory (GWh)	ESP 2030 benchmark for each IOU territory (MMT)	ESP 2035 benchmark for each IOU territory (MMT)
Paci ic Gas and Electric Company (Direct Access)	1 2250	0 9412	11 393	11 393			0 056	0 043
Southern Cali omia Edison Company (Direct Access)	1 2280	0 9695	13 421	13 421			0 010	0 008
San Diego Gas and Electric Company (Direct Access)	0 5049	0 4013	3 940	3 940			0 011	0 009
TOTAL			**28,754**	**28,754**			**0.077**	**0.060**

Attachment F


lse_unique_contract_id
resource
total_nameplate_capacity

[redacted]

[redacted]

contracted_nameplate_capacity	sep_contracted_mw_nqc
[redacted]	

Attachment G

resource	total_nameplate_capacity	contracted_nameplate_capacity
[redacted]		


sep_contracted_mw_nqc

OFFICER VERIFICATION

I am an officer of Commercial Energy of Montana, Inc dba Commercial energy of California and am authorized to make this verification of its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information and belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the forgoing is true and correct, and that this verification is executed on this 1st day of November, 2022 at Oakland, California.

Curry Stypula
President
Commercial Energy of Montana, Inc. dba
Commercial Energy of California

Integrated Resource Planning (R.20-05-003)
2022 IRP Filing Requirements
LSE Contact Information Form

Please provide the following information. CPUC staff will contact the person(s) listed here for questions about LSE's filing.

Name of Load Servin Entity (LSE)	Commercial Energy of Montana
The LSE's abbreviation, provided in the Resource Data Template's workbook in the "lse_names" tab	CES

Contact Person for Questions about this Filing	
Name	Samantha Folsom
Title	Director of Renewable Energy Services
Email	sfolsom@ces-ltd.com
Telephone	267-238-4787

Back-Up Contact Person for Questions about this Filing (Optional)	
Name	Alex Hersch
Title	Operations Manager
Email	Alex.hersch@commercialenergy.net
Telephone	510-567-2702

Back-Up Contact Person for Questions about this Filing (Optional)	
Name	
Title	
Email	
Telephone	