BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

FILED
11/01/22
11:57 AM
R2005003

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC (U-933-E) 2022 INTEGRATED RESOURCE PLAN

PUBLIC VERSION

Sharon Yang
Director of Legal Services
Liberty Utilities (CalPeco Electric) LLC
9750 Washburn Road
Downey, CA 90241
(562) 299-5120
Sharon.Yang@libertyutilities.com
On behalf of Liberty

Andrew B. Brown
Ellison Schneider Harris & Donlan, LLP
2600 Capitol Avenue, Suite 400
Sacramento, CA 95819
(916) 447-2166
Email: ABB@ESLawfirm.com
Attorneys for Liberty

November 1, 2022

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC (U-933-E)
2022 INTEGRATED RESOURCE PLAN

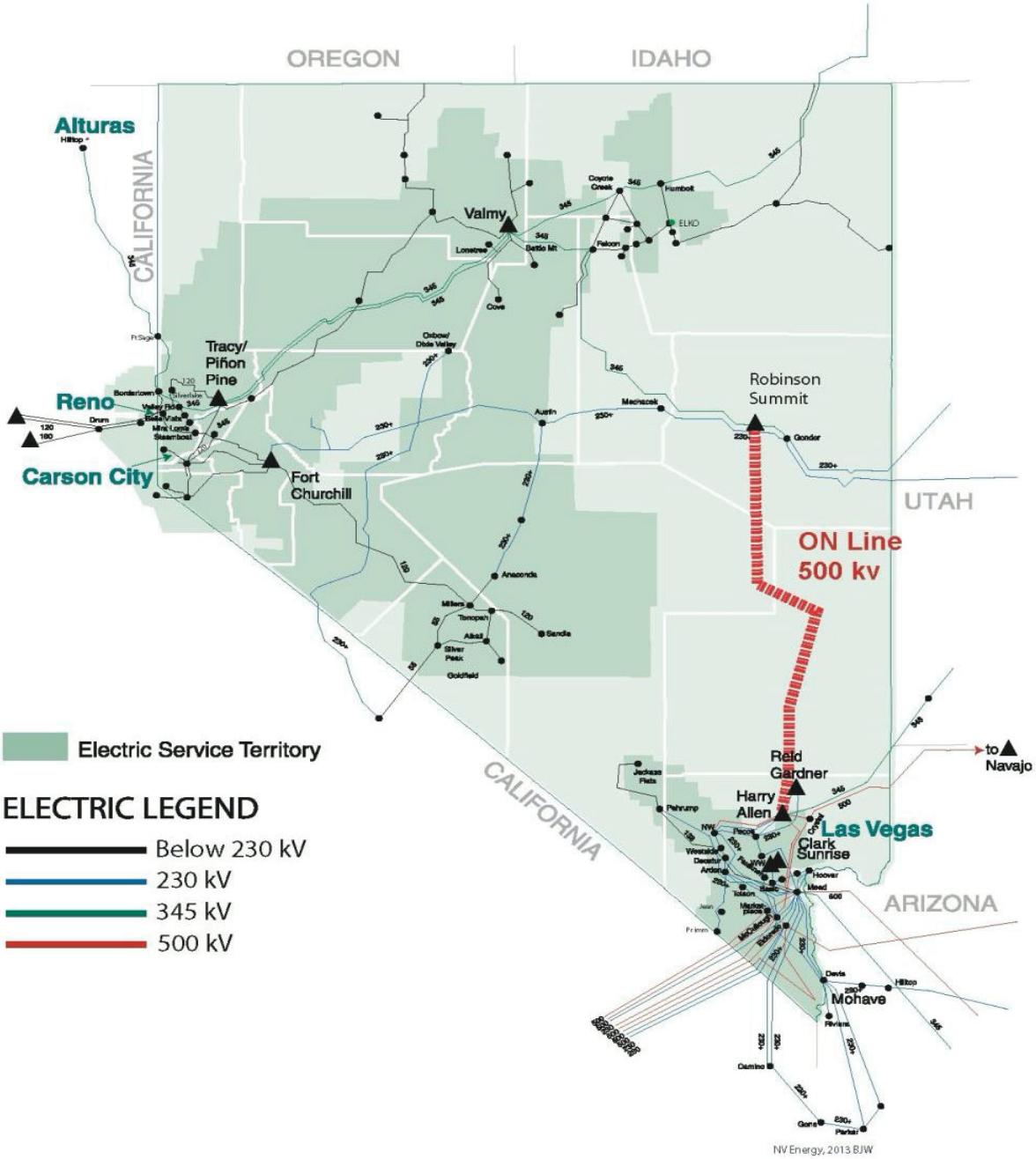
PUBLIC VERSION

Pursuant to California Public Utilities Commission ("CPUC") Decision 22-02-004 "Decision Adopting 2021 Preferred System Plan" issued February 15, 2022, and the "Administrative Law Judge's Ruling Finalizing Load Forecasts and Greenhouse Gas Emissions Benchmarks for 2022 Integrated Resource Plan Filings" issued on June 15, 2022, Liberty Utilities (CalPeco Electric) LLC (U 933-E) ("Liberty") submits its Nonstandard LSE Integrated Resource Plan ("IRP") filing. Accordingly, Liberty is filing this Narrative Template as required for Nonstandard LSE IRP filings and is not filing the Resource Data Template. The exhibits to this narrative are omitted from the public version as they contain confidential data, but the narrative has been structured to avoid disclosure of confidential data.

Liberty serves approximately 49,000 electric customers in California, in and around the Lake Tahoe Basin. Its service territory is geographically compact and generally encompasses the western portions of the Lake Tahoe Basin (almost 80% of Liberty's customers are in the Lake Tahoe Basin). Liberty is filing a Nonstandard LSE IRP plan given that it does not operate within the California Independent System Operator ("CAISO") balancing authority area and instead is located within the NV Energy Balancing Authority Area ("BAA") "North System," which has very limited connections to the CAISO.1 Liberty's load is served entirely from NV Energy's transmission system and is a full requirements wholesale customer of NV Energy. Liberty owns and operates two solar plants in Nevada that use NV Energy's transmission system to help deliver the energy to Liberty's customers. Unlike most California load-serving entities ("LSE"),

[1] The North System is the portion of NV Energy's transmission system in Northern Nevada connected by the ON Line to the South System in Southern Nevada (see the map on p. 11) here: http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/TaskForces/2017/11-07-2017_Generation-Transmission-Delivery_Agenda4_NV%20Energy%20Presentation.pdf.

Liberty is winter-peaking with peak loads occurring at night, typically during the holiday season. Further, given Liberty's location, it has few industrial customers, but larger seasonal loads associated with ski resorts and hotels. Liberty's customers are particularly concerned with climate change and related environmental issues and, as described in greater detail below, Liberty is working to exceed minimum renewable and greenhouse gas ("GHG")-free supply requirements to help address these concerns.



Dated: November 1, 2022

Respectfully submitted,

Sharon Yang
Director of Legal Services
Liberty Utilities (CalPeco Electric) LLC
9750 Washburn Road
Downey, CA 90241
(562) 299-5120
Sharon.Yang@libertyutilities.com
On behalf of Liberty

Andrew B. Brown
Ellison Schneider Harris & Donlan, LLP
2600 Capitol Avenue, Suite 400
Sacramento, CA 95819
(916) 447-2166
Email: ABB@ESLawfirm.com
Attorneys for Liberty

VERIFICATION

I am the attorney for Liberty Utilities (CalPeco Electric) LLC ("Liberty") and am authorized to make this verification on its behalf. Liberty is absent from the County of Sacramento, California, where I have my office, and I make this verification for that reason. The statements in this 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.

Executed on November 1, 2022 at Sacramento, California.

/s/

Andrew B. Brown
Ellison Schneider Harris & Donlan LLP
2600 Capitol Avenue, Suite 400
Sacramento, CA 95816
Telephone: (916) 447-2166
Facsimile: (916) 447-3512
Email: abb@eslawfirm.com

Attorney for Liberty Utilities (CalPeco Electric) LLC

Non-Standard LSE Plan

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC (U 933-E)

2022 INTEGRATED RESOURCE PLAN

NOVEMBER 1, 2022

Table of Contents

Liberty has been authorized to file a Non-Standard Plan and has elected to use the Commission's Narrative Template posted on June 15, 2022, but as a Non-Standard LSE Plan filer, is not submitting the Clean System Power calculator tool or the Resource Data Template.

I. Executive Summary

Liberty is located within the NV Energy balancing authority area and currently serves its approximately 49,000 customers from a combination of owned resources and an energy services agreement with NV Energy. Liberty entered into a multi-year services agreement ("2021 NV Energy Services Agreement"),[2] which became effective on December 30, 2020 and has a term through December 29, 2025. The California Public Utilities Commission ("Commission" or "CPUC") approved Liberty's entering the 2021 NV Energy Services Agreement in D.19-04-040. On September 4, 2020, Liberty submitted Advice Letter ("AL") 153-E presenting its 2021 Energy Services Agreement with NV Energy in accordance with D.19-04-040. AL 153 was approved on November 19, 2020.

The 2021 NV Energy Services Agreement ("ESA") is a full requirements contract that includes energy, capacity, scheduling, and the treatment of Liberty's renewable assets. The ESA provides Liberty with the majority of its capacity, system power and RPS energy but adds the flexibility to displace the purchase of RPS energy from NV Energy to up to a maximum of 60 MW from Liberty's own renewable solar projects and 60 MW from Liberty's own proposed solar plus battery storage project. In D.16-01-021 ("Luning Approval Decision"), the Commission authorized Liberty to acquire, operate, and maintain the 50 MW Luning Solar

[2] See Advice Letter 153-E, Exhibit 4, Service Agreement Between Sierra Pacific Power Company and Liberty Utilities (CalPeco Electric) LLC (August 21, 2020).

Project. The Luning Solar Project is located in Luning, Nevada and commenced commercial operation in February 2017, displacing 50 MW of RPS energy from the 2016 NV Energy Service Agreement.

Additionally, in Application 16-12-009, Liberty requested Commission approval to acquire, finance, own, operate, and maintain the 10 MW Turquoise Solar Project ("Turquoise"). In D.17-12-008 (Turquoise Approval Decision"), the Commission authorized Liberty to acquire, own, and operate Turquoise. Liberty has provided notice to NV Energy that it would displace certain amounts of RPS energy, which NV Energy would otherwise supply, with generation from Turquoise. Turquoise commenced commercial operation in November 2019.

In 2021, in Application ("A.") 21-04-006 Liberty requested Commission approval to develop, finance, operate and maintain the Luning Expansion Project, comprising of 60MW of solar and 259MWh of battery storage. The facility will offset energy and capacity that meets Liberty's load that would otherwise be purchased from NV Energy. The output from the hybrid Luning Expansion Project will be used to serve Liberty's customers during the evening peak load hours. This expansion opportunity will leverage the 30% Federal Investment Tax Credit ("ITC") to provide the greatest benefits to Liberty's customers, similar to the financial approaches used for Luning and Turquoise. The project is currently under review by the CPUC and targeting a commercial operation date of December 31, 2023.

In previous IRPs, Liberty expressed its intention to terminate the 2016 NV Energy Services Agreement early (prior to the expiration of the agreement's original term through December 2020). However, various events prevented Liberty from achieving that goal. In its effort to exit both the 2016 NV Energy Services Agreement and any future supply services from NV Energy, Liberty applied for Network Integrated Transmission Service ("NITS") under NV

Energy's Open Access Transmission Tariff ("OATT") to serve its load as of the second quarter of 2019 and initiated solicitations for potential third-party providers. Unknown to Liberty at the time, this request was premised on erroneous information published on NV Energy's Open Access Same-Time Information System ("OASIS") portal that overstated the available transmission capacity reflecting a quantity sufficient to support imports into the NV Energy system. The System Impact Study report from NV Energy corrected this error in available transmission capacity resulting in a very limited amount of import capacity for 2021 and no available capacity after 2022. Although Liberty explored a number of supply options with potential third-party suppliers, ultimately this lack of available transmission capacity or import capacity and energy into the NV Energy balancing area left Liberty with no commercially reasonable option to move forward with its plans to serve its load. Liberty has retained its queue position within NV Energy's NITS queue, but that request will not be granted until NV Energy's import capacity expands sufficiently to allow for it.

On July 20, 2020, NV Energy filed a joint Northern and Southern Service Territory IRP 4th Amendment with the Public Utilities Commission of Nevada that announced plans to increase northern system import capacity titled the Greenlink Initiative. The initiative is comprised of two new 525 kV and three new 345 kV transmission lines. The first phase, "Greenlink West," includes a new 525 kV transmission line from Las Vegas, NV to Yerington, NV. The project is expected to increase NV Energy's northern system import capacity by approximately 725 MW and is targeting a December 2026 In-Service Date. The second phase, "Greenlink North," includes the addition of a 525 kV line from Ely, NV to Yerington, NV. This project is expected to increase NV Energy's northern system transfer capability by approximately 500 MW and is targeting a December 2028 In-Service Date. Three additional 345

kV lines between Reno, NV and Yerington, NV are also planned for development over the next 10 years. If all five transmission lines are pursued, it is estimated that the total northern system import capacity may increase to approximately 2,800 MW from the current 1,275 MW limit. [3]

Adding further complexity to the future of Nevada transmission, in 2021 the Nevada legislature passed the New Energy Economy Act (NV Senate Bill 448). The law requires Nevada electric utilities including NV Energy to join a Western RTO by 2030. Currently, NV Energy participates in the California Energy Imbalance Market, but is not a member of the CAISO. Various larger transmission-owning utilities are exploring the development of a western market structure.[4] As an entity operating within the NV Energy BAA, these future developments have the potential to significantly open up opportunities for Liberty to access higher capacity factor renewable and low-carbon resources not otherwise available now.

In 2021, NV Energy exceeded its Renewable Portfolio Standard requirement by 6.1% or approximately 1.27 million Renewable Energy Credits.[5] In addition to this overperformance, the PUCN recently approved an additional 600 MW of solar with storage to be used by NV Energy to serve its customers and in Q2, 2022 NV Energy announced two new geothermal power purchase agreements for 25 MW and 105-135 MW respectively.[6] These announcements demonstrate that NV Energy's renewable energy portfolio appears robust and there is

---

[3] See Nevada Public Utilities Commission Docket: 20-07023 Joint Application Technical Appendix volume 7, TRAN-1 "Greenlink Nevada" filed July 20, 2020 (pgs. 15 and 23).

[4] CAISO is in the process of undertaking a study on regional market structures pursuant to ACR 182. See http://www.caiso.com/informed/Pages/RegionalSolutions.aspx.

[5] See Nevada PUC Docket 22-04016 filed April 4, 2022 (pg. 16).

[6] See press release announcing new geothermal PPAs signed between NV Energy and Ormat Technologies, Inc. https://www.globenewswire.com/en/news-release/2022/05/19/2446980/26372/en/Ormat-Technologies-Signs-Two-PPAs-With-NV-Energy-for-Up-to-160-MW-of-Geothermal-Capacity.html.

commitment to further expand NV Energy's development of renewable energy well into the next decade.

Liberty continues to investigate how these developments impact the options available to secure additional renewable and low-cost energy for its customers. Given the radical changes expected to Liberty's transmission provider over the next 15 years, it has been determined that the clearest path to provide the most certainty and least risk to customers is to stay with NV Energy throughout the IRP planning horizon. This determination is based on three findings: (i) NV Energy's plan for development on the Greenlink Initiative is aggressive and by no means certain, (ii) the impacts of Nevada's participation in a Western RTO including which RTO it ultimately joins are not yet well defined, and (iii) NV Energy's recently announced renewable development provides increased opportunity to rely on NV Energy's renewable pool until Liberty can secure the transmission and portfolio of generation capacity needed to meet its long term zero-carbon goal.

Given Liberty's understanding of NV Energy's transmission planning activities, the earliest time at which Liberty could potentially leave its current energy supply arrangement with NV Energy would be after Phase I of the Greenlink Initiative goes into service which is not planned until the end of 2026. The project was preliminarily approved by the PUCN in 2021 and legislatively mandated to be built no later than 2028, However, despite this momentum the project remains only in the Environmental Impact Statement ("EIS") design phase with the Bureau of Land Management and a draft EIS is not expected until early 2023.[7] Moreover, the final Available Transmission Capacity of the project has not begun to be incorporated by NV

[7]See Bureau of Land Management's ePlanning page for Greenlink West and Greenlink North: https://www.blm.gov/greenlink-west-and-greenlink-north.

Energy for Network Integrated Transmission Service studies. NV Energy posted publicly on January 11, 2022, "Until the NV Energy system's updated Available Transfer Capability is posted to include the Greenlink projects in accordance with the OATT, any applications for interconnection or transmission service will be processed in the normal course based on the configuration and capabilities of the existing system – i.e., they will not assume the existence of Greenlink."[8] As a result, Liberty cannot determine with reasonable confidence when the transmission capacity needed to leave the current full-requirements relationship with NV Energy will become available and whether the cost of securing energy supplies beyond NV Energy will be the best solution for customers. Liberty supports NV Energy in its endeavor to expand transmission access in the North System and the Greenlink Initiative as proposed will provide potential of greater access to renewable resources to Liberty customers. However, it is too early in the project cycle to establish a firm plan based on the limited information available today.

NV Energy's participation in a Western RTO will have large ramifications on the future of Liberty's energy and transmission access. Electrically, Liberty's northern territory is served by NV Energy from a transmission path that runs between NV Energy and the CAISO BAAs. If NV Energy ultimately joins a CAISO-led RTO, it is likely that Liberty would be obligated to follow in some fashion lacking significant access to any other transmission systems. However, there is no obligation for NV Energy to join the CAISO or a CAISO-led RTO. Lacking clear direction on the future participation of NV Energy in a Western RTO, Liberty cannot comfortably invest in resource solutions that would perform well under certain market conditions but be suboptimal in others. As a result, the only clear path forward for customers is to remain a full-service NV

[8] See NV Energy's public OASIS Current Event notices: https://www.oasis.oati.com/NEVP/.

Energy customer until many of the Western RTO design and transmission availability questions are answered.

The current energy service agreement with NV Energy contractually limits Liberty from entering power purchase agreements and only allows for self-developed projects as explicitly outlined in the agreement (i.e., Luning, Turquoise, and Luning Expansion) when they benefit customers. Renewable development opportunities within Liberty's service territory are limited due to poor solar and wind resource availability, high property and development costs, and challenging terrain. For these reasons, Liberty has relied on NV Energy to provide the remaining energy and capacity – including renewables - needed to meet the company's goals and state mandates. This strategy has worked historically to help Liberty provide stable and low risk renewable energy to customers and is the most secure means to continue this effort through the IRP planning horizon.

Once the Luning Expansion is energized, Liberty forecasts that it will not require additional renewable assets to meet Renewable Portfolio Standard requirements until at least 2028.[9] Given the proposed renewable energy development being undertaken by NV Energy and the relatively small shortfall in renewable energy needs forecasted by Liberty throughout the IRP planning horizon, relying on NV Energy's renewable pool to support Liberty's additional renewable energy needs provides a low-risk means to secure the energy Liberty's customers need.[10]

---

[9] This assumes unbundled PCC3 RECs will continue to be a compliant instrument for Liberty to meet small shortfalls in solar fleet performance due to curtailment if needed.

[10] For California RPS compliance purposes, Liberty may use a small number of unbundled RECs to satisfy remaining gaps between the performance of its solar fleet and the RPS standard. Liberty will purchase unbundled RECs in some cases for cost efficiency. However, Liberty believes a strategy focused on building and purchasing bundled renewable energy inside the North System is more in line with its customer's goals and the intentions of California regulation.

Accordingly, Liberty anticipates that another follow-on supply agreement with NV Energy will be necessary when the existing agreement expires in 2025. Currently the market within the NV Energy BAA is dynamic due to recent changes in Nevada law which will expand NV Energy's renewables portfolio under that utility's IRP. It is not possible to reasonably anticipate what changes will occur within the BAA while the 2021 NV Energy ESA is operating or what new resource opportunities may arise over the course of the next 4-5 years.[11] Accordingly, Liberty expects that for the portion of its capacity and energy needs not met by its own resource portfolio, it will remain a wholesale customer of NV Energy.

To further enhance local reliability within its system, Liberty proposed a Customer Resiliency Program ("CRP") which includes distributed storage.[12] These Liberty-owned and operated projects would address resiliency concerns related to the Wildfire Mitigation Plan during summer periods as well as helping with system challenges during extreme winter weather events. This program will be offered to Liberty's most vulnerable customers while providing customer-wide benefits in terms of demand reduction under the NV Energy agreement. Additionally, inclusion of other in-system storage can help the company integrate the larger solar projects and manage demand charge costs for all customers under the 2021 NV Energy ESA.

Liberty is committed to achieving 100% of the electricity supplied to its customers with low-GHG and renewable energy as soon as practicable, pending renewable procurement and development opportunities and CPUC approval. Liberty's ambitious goal will not only ensure that RPS targets are satisfied, including the higher RPS targets mandated by SB 100, but that all its load is served with renewable and/or low-GHG energy. Liberty aspires to become the first

[11] The Nevada PUC permits NV Energy to maintain confidentiality of the IRP for a period of five years, so Liberty has limited insight to know NV Energy's precise development intentions.

[12] See Liberty's Customer Resiliency Program, CPUC Application 22-02-008 ("CRP Application").

California IOU to deliver 100% low-GHG and renewable electricity from local and regional sources to 100% of its customers. In addition to the 60 MW of solar resources in operation and approved by the CPUC,[13] the Commission has also authorized Liberty's transportation electrification programs. Liberty continues to investigate installation of in-territory distributed storage and microgrid projects to assist in the management of supply from intermittent power production facilities[14] while continuing to provide its customers with reliable service throughout its service territory. Moreover, Liberty has programs to support customer behind-the-meter ("BTM") solar installations[15] and its low-income energy efficiency program to mitigate some load growth over the planning horizon. These programs contemplated for in-territory deployment will provide additional resiliency to the system, not only during PSPS events, but also during the winter storm season when weather-related events can challenge localized reliability. During ordinary operating conditions, when they are not being needed for anticipated resiliency events, these microgrid and storage systems will be operated by Liberty to manage demand charges imposed by the 2021 NV Energy ESA resulting in system-wide benefits and reducing supply cost for all customers.[16]

As previously mentioned, one of the central impediments to the planning path presented in the prior IRP submission has been the significant transmission limitations on the NV Energy North System that has essentially precluded import supply options such as higher capacity factor wind from outside Nevada. Liberty does have the opportunity under the 2021 NV Energy ESA to develop additional load-matching renewables and in-territory resiliency assets. Liberty is

[13] See D.16-01-021 and D.17-12-008.

[14] See D.18-09-034 and D.19-11-017.

[15] See, e.g., D.16-12-024. Liberty CalPeco also has a program for multi-family solar, but no customers have utilized that program to date.

[16] See Liberty's CRP Application.

actively seeking opportunities to leverage this capability. However, after energization of the Luning Expansion Project, Liberty's remaining load not served by renewables will be primarily during non-sunlight hours and winter months which limits the ability to add cost-effective renewable energy resources with current technology. Liberty will continue to monitor the progress of the multi-stage Greenlink Initiative and Western RTO negotiations with an eye toward adjusting its long-term procurement plans as developments merit. Liberty will update the Commission on those developments as warranted, such as in the next IRP cycle.

Meanwhile, Liberty will continue to investigate opportunities to develop assets that can provide additional renewable energy, resiliency, and lower costs to customers. The company is currently investigating many new technologies to find proven solutions that can be implemented towards these goals. Some of the solutions currently under investigation include long-duration flow battery storage, hydrogen (generation, storage, and distribution), biomass, transmission development, microgrids, microturbines with carbon sequestration, electric transportation, and geothermal energy. As these investigations yield concrete opportunities for Liberty to increase renewable energy, resiliency, and/or lower costs without significant risk, they will be presented to regulators.

Liberty remains optimistic that pursuing a plan to utilize its existing relationship with NV Energy under the 2021 NV Energy ESA followed by the development of additional renewable and storage facilities will move Liberty toward its desired portfolio of 100% renewable energy and low greenhouse gas ("GHG") emitting supplies.

II. Study Design

a. Objectives

Liberty's IRP seeks to develop and implement resource strategies that provide customers with the best balance of our primary resource planning objectives: reliability, environmental stewardship, and reasonable cost:

- **Reliability.** The resource strategy must comply with all appliable reliability, resource adequacy and operational requirements placed on Liberty under the NV Energy 2021 NV Energy ESA and/or NV Energy OATT;
- **Environmental Stewardship.** At a minimum, the resource strategy must conform to the CPUC-assigned 2030 and 2035 GHG Emissions targets for Liberty under the 30 MMT and 25 MMT GHG Benchmarks, but are permitted to outperform those targets to align with the environmental preferences of Liberty's customers. In addition, Liberty is working to position itself towards a long term goal of serving its customers with a 100% renewable energy and non-GHG emitting resource portfolio.;
- **Reasonable Cost.** The resource strategy must satisfy all of the foregoing objectives at a reasonable cost commensurate with the benefits derived from the strategy.

Because of the recent developments in the northern Nevada transmission system, namely the Greenlink Initiative and Western RTO developments, Liberty is pivoting its strategy towards developing a portfolio that leverages the existing full-requirements relationship with NV Energy instead of aiming to terminate the service as soon as possible in favor of a bilateral energy procurement strategy. As a result, the objective of the resource planning process for this IRP cycle focused on optimizing a resourcing path for Liberty while remaining largely inside the existing 2021 NV Energy ESA framework.

Consistent with these overarching objectives, in this IRP Liberty has pursued significant carbon reductions that can be realized while advancing an RPS strategy with bundled renewables (as opposed to utilizing only unbundled RECs as permitted under the RPS laws).

b. Methodology

i. Modeling Tool(s)

Charles River Associates, International ("CRA") was engaged to provide quantitative simulation modeling analysis and results to Liberty that is comparable to the modeling performed by RESOLVE. These simulation modeling results were then post-processed to develop the data and results underlying this IRP filing.

CRA modeled the natural gas for electric power generation market using GPCM® modeling software package licensed by RBAC Inc. This tool is the industry-standard modeling software for the North American natural gas market. The outputs of this simulation were then used as a primary input for the electricity market and portfolio modeling conducted in Aurora, a chronological production cost model licensed by Energy Exemplar, Inc. Aurora is an industry-standard tool that is widely used by utilities, system operators, and other market participants. CRA used the Aurora model to analyze the entire WECC region, producing forecasts of power price, carbon emissions, and capacity and generation by fuel type over time for the NV Energy system. CRA then used the Aurora model to perform an hourly, chronological dispatch of Liberty's portfolio, accounting for all variable costs of operation and economic purchases and sales with the NV Energy system to produce projections of asset level dispatch and the total variable costs associated with serving load. The model also limited Liberty's generation facilities as required under the 2021 NV Energy ESA and interconnection agreements to respect transmission limitations.

ii. Modeling Approach

System Retail Sales and Wholesale Energy for Load

- Liberty used the CPUC-assigned retail sales for development of the IRP plans, which is the demand forecast case from the CEC's 2021 IEPR Form 1.1c adopted in the June 15, 2022 ALJ Ruling;

- These retail sales quantities were loss-adjusted upward by 6.75% to derive Liberty's wholesale supply requirements for 2023-2035;

- The loss factor of 6.75% is derived from the transmission loss assumptions that Liberty is required to use to adjust metered retail sales to wholesale requirements in its CY 2021 GHG report to CARB (4.75% Annual Loss Factor and 2.00% Transmission Loss Factor);

- The annual supply requirements reflect bundled customer requirements only—any projected wholesale sales volumes have been excluded;

- These annual supply requirements were then allocated to an hourly shape using the Liberty's recorded 2021 hourly system loads to derive the 8760 hourly shape.

Liberty IRP Filing Annual Loads

	CPUC-Assigned Retail Sales (GWh) *	Wholesale Energy for Load (MWh)
		6.75%
2023	557.7	595,316
2024	557.7	595,316
2025	561.2	599,077
2026	564.8	602,922
2027	568.8	607,189
2028	571.9	610,512
2029	575.6	614,487
2030	579.5	618,585
2031	583.9	623,350
2032	587.6	627,213
2033	591.5	631,423
2034	595.2	635,414
2035	599.2	639,608

*CEC 2021 IEPR Form 1.1c mid case;

GHG Emissions Benchmark

For reasons described later in this IRP, the lowest risk, long-term resourcing strategy for Liberty is to pivot towards increasing renewable energy and non-GHG emitting resources while remaining within the existing NV Energy ESA paradigm. For this reason, Liberty's GHG emissions forecast was calculated following the current formula required under the California Air Resources Board ("CARB") Mandatory Greenhouse Gas Reporting Regulation ("MRR"). This is different than the process of prior IRPs because it aligns the methodology of calculating Liberty's GHG emissions obligation with the technique of projecting future GHG emissions. More specifically, since Liberty is now proposing to stay within the NV Energy ESA framework throughout the remainder of the IRP planning horizon, this approach should project future emissions consistent with the existing CARB regulatory framework.

Since Liberty is located within NV Energy's BAA, conventional energy (i.e., energy produced from carbon emitting resources like natural gas-fired power plants)[17] supplied to Liberty is not scheduled on any transmission paths. Instead, the energy is generated and used within the same balancing area, similar to NV Energy's native load. As a result, conventional energy purchased from NV Energy and delivered into Liberty's service territory is considered "un-specified energy" by CARB. Un-specified energy has a California regulatorily-established, imputed CARB GHG emissions rate of 0.428 MT-CO_2/MWh.

As a result, when modeling the energy supply portfolios all conventional energy purchased from NV Energy was assumed to have a 0.428 MT-CO_2/MWh emissions rate. Liberty believes this change will better reflect the actual emission obligation it will be responsible for

[17] The 2021 NV Energy ESA excludes coal as a generating resource whose output can be sold to Liberty.

under a long-term NV Energy ESA future and will therefore provide clearer direction for Liberty to evaluate the true costs and ensure compliance of its proposed energy portfolios.

All of Liberty's Conforming Plans presented here achieve the following GHG Benchmarks emissions assigned to Liberty on the "Benchmarks _30 MMT" and "Benchmarks_25 MMT" tabs of the Final GHG Emissions Benchmarks for LSEs posted on June 28, 2022:

- "30 MMT Benchmark" - 0.084 MMT Liberty 2030/0.064 MMT Liberty 2035 GHG Benchmark for the 30 MMT statewide target;
- "25 MMT Benchmark" - 0.063 MMT Liberty 2030/0.51 MMT 2035 GHG Benchmark for the 25 MMT statewide target.

The hourly dispatch simulation modeling results provided by CRA were then post-processed using Microsoft Excel to develop the specific Preferred Conforming Portfolios submitted by Liberty in this IRP filing, using the following approach:

- The dispatch of Liberty's resources was adjusted to reflect the provisions of the 2021 NV Energy ESA that were not reflected in CRA's dispatch simulation modeling results (e.g., hourly generation from new solar resources was modeled as curtailed in order to ensure that there were no hours when Liberty's total generation output exceeded its hourly system load to reflect transmission constraints);
- The hourly GHG Emissions were calculated and aggregated up to annual values based on the 0.428 MT-CO_2/MWh unspecified energy GHG emissions rate; and
- The amount of energy purchases from NV Energy's renewable energy pool, needed to reduce Liberty's GHG emissions to meet the 30 MMT and 25 MMT benchmarks was calculated and added to the portfolio cost simulations; and
- The proposed storage was deployed as a means of capturing additional curtailed solar to evaluate the use of this asset towards reducing the revenue requirement and increasing solar energy use.

III. Study Results

a. Conforming and Alternative Portfolios

Liberty is submitting a total of four (4) Conforming Portfolios in this 2022 IRP submission, differentiated as follows (in all cases, shortfalls between the output of these resources and Liberty's system load requirements are assumed to be fulfilled by the 2021 NV Energy ESA during its term or from future ESAs with NV Energy that will operate under similar terms):

Table 1: 30 MMT Scenario Baseline, Portfolio A, and Portfolio B

	2023-2035 Resource Additions					Conformance with 2030 and 2035 Standards					Costs of GHG Reductions					
Portfolio Selection	Luning Expansion Solar (MW)	Luning BESS Storage (MWh)	NVE Renewable Pool Addition (MWh) by 2030	NVE Renewable Pool Addition (MWh) by 2035	BTM Storage (MWh)	**2030 Emissions (MMT)**	2030 38 MMT Liberty Benchmark	**2035 Emissions (MMT)**	2035 30 MMT Liberty Benchmark	2035 RPS Performance (60% Obligation)	2030 Generation Costs (2021 $ Millions)	2030 GHG Emission Reduction vs Current Baseline (MMT)	Cost per Tonne GHG reduction	2035 Generation Costs (2021 $Millions)	2035 GHG Emission Reduction vs Current Baseline (MMT)	Cost per Tonne GHG reduction
Baseline	60	259	0	0	0	**0.149**	0.084	**0.157**	0.064	48%	60.1	-	-	67.0	-	-
Portfolio A	60	259	153,467	218,985	0	**0.084**	0.084	**0.064**	0.064	84%	64.3	0.066	$ 63.12	64.9	0.094	$ (22.90)
Portfolio B	60	259	156,720	221,652	55	**0.084**	0.084	**0.064**	0.064	84%	65.5	0.066	$ 81.49	64.3	0.094	$ (29.20)

Table 2: 25 MMT Scenario Baseline, Portfolio C, and Portfolio D

	2023-2035 Resource Additions					Conformance with 2030 and 2035 Standards					Costs of GHG Reductions					
Portfolio Selection	Luning Expansion Solar (MW)	Luning BESS Storage (MWh)	NVE Renewable Pool Addition (MWh) 2030	NVE Renewable Pool Addition (MWh) 2035	BTM Storage (MWh)	**2030 Emissions (MMT)**	2030 30 MMT Liberty Benchmark	**2035 Emissions (MMT)**	2035 25 MMT Liberty Benchmark	2035 RPS Performance (60% Obligation)	2030 Generation Costs (2021 $ Millions)	2030 GHG Emission Reduction vs Current Baseline (MMT)	Cost per Tonne GHG reduction	2035 Generation Costs (2021 $Millions)	2035 GHG Emission Reduction vs Current Baseline (MMT)	Cost per Tonne GHG reduction
Baseline	60	259	0	0	0	**0.149**	0.063	**0.157**	0.051	48%	60.1	-	-	67.0	-	-
Portfolio C	60	259	201,089	248,749	0	**0.063**	0.063	**0.051**	0.051	89%	66.6	0.086	$ 74.8	65.2	0.106	$ (17.25)
Portfolio D	60	259	204,343	251,416	55	**0.063**	0.063	**0.051**	0.051	89%	67.8	0.086	$ 88.9	64.6	0.106	$ (22.70)

i. 30 MMT Required Conforming Portfolio A. ("NVE Only")

Portfolio A reflects Liberty's anticipated plan of continuing to rely on NV Energy as a full-requirements wholesale customer for energy and capacity (including renewables) for the post-2025 period under a follow-on supply agreement. This portfolio is a Conforming Portfolio for the 30 MMT Benchmark case and it represents Liberty's Base Plan and also meets both the 38 MMT and the 30 MMT statewide targets by producing a Liberty 2030 GHG Benchmark of 0.084 MMT and 2035 GHG Benchmark of 0.064 MMT:

- 60 MW of existing solar (Turquoise and Luning);

- Luning Expansion Project with paired 60 MW solar / 259MWh storage components to be added January 1, 2024;
- Purchase all remaining renewable energy needs to meet Liberty load from the NV Energy renewable pool.

ii. 30 MMT Required Conforming Portfolio B. ("NVE and CRP Program")

Portfolio B is an alternate Conforming Portfolio whose 2030 GHG Benchmark satisfies Liberty's assigned share of the both the 38 MMT and the 30 MMT statewide targets by producing a Liberty 2030 GHG Benchmark of 0.084 MMT and 2035 GHG Benchmark of 0.064 MMT**:**

- 60 MW of existing solar (Turquoise and Luning);
- Luning Expansion Project with paired 60 MW solar / 259MWh storage components to be added January 1, 2024;
- 55 MWh in-territory storage to be added progressively after January 1, 2023 under Liberty's CRP;
- Purchase all remaining renewable energy needs to meet Liberty Load from the NV Energy renewable pool.

iii. 25 MMT Required Conforming Portfolio C. ("NVE Only")

Portfolio C reflects Liberty's anticipated plan of continuing to rely on NV Energy as a full-requirements wholesale customer for energy and capacity (including renewables) for the post-2025 period under a follow-on supply agreement. This portfolio is a Conforming Portfolio for the 25 MMT Benchmark case and outperforms both the 30 MMT and the 25 MMT statewide targets by producing a Liberty 2030 GHG Benchmark of 0.063 MMT and 2035 GHG Benchmark of 0.051 MMT:

- 60 MW of existing solar (Turquoise and Luning);
- Luning Expansion Project with paired 60 MW solar /259MWh storage components to be added January 1, 2024;

- Purchase all remaining renewable energy needs from the NV Energy renewable pool.

iv. 25 MMT Required Conforming Portfolio D. ("NVE and CRP Program")

Portfolio D is the preferred Conforming Portfolio whose GHG Benchmarks satisfy Liberty's assigned share of the both the 30 MMT and the 25 MMT statewide targets by producing a Liberty 2030 GHG Benchmark of 0.063 MMT and 2035 GHG Benchmark of 0.051 MMT

- 60 MW of existing solar (Turquoise and Luning);
- Luning Expansion Project with paired 60 MW solar / 259 MWh storage components to be added January 1, 2024;
- 55 MWh in-territory storage to be added progressively after January 1, 2023 under Liberty's CRP;
- Purchase all remaining renewable energy needs from the NV Energy renewable pool.

As demonstrated in Tables 1 and 2, implementing the Conforming Portfolios results in a net increase to generation costs by 2030 due to the need to pay a premium for nighttime renewable energy to meet the RPS and GHG benchmark. This was the expected result. However, surprisingly by 2035 the Conforming Portfolios are forecasted to result in a lower generation cost than the baseline, suggesting that increasing the renewable energy used by Liberty to meet the proposed 2035 GHG benchmarks may result in lower costs to customers. This is due to the escalating GHG allowance costs under the California Cap and Trade program which are forecasted to exceed $80/ton by 2035.[18]

[18] See California 2021 IEPR GHG Allowance Price Forecast.

b. Preferred Conforming Portfolios

i. Preferred 30 MMT Conforming Portfolio

Portfolio B "NVE plus CRP program" is Liberty's Preferred Conforming Portfolio for the 30 MMT case given that it represents Liberty's Base Plan and also conforms to both the 38 MMT 2030 and the 30 MMT 2035 statewide targets by producing a Liberty 2030 GHG Benchmark of 0.084 MMT and 2035 GHG Benchmark of 0.064 MMT:

- 60 MW of existing solar (Turquoise and Luning);
- Luning Expansion Project with paired 60 MW solar / 259MWh storage components to be added January 1, 2024;
- 55 MWh in-territory storage to be added progressively after January 1, 2023 under Liberty's CRP;
- Purchase all remaining renewable energy needs from the NV Energy renewable pool.

ii. Preferred 25 MMT Conforming Portfolio D.

Portfolio D "NVE plus CRP program" is Liberty's Preferred Conforming Portfolio for the 25 MMT case given that it represents Liberty's Base Plan and also outperforms both the 30 MMT 2030 and the 25 MMT 2035 statewide targets by producing a Liberty 2030 GHG Benchmark of 0.063 MMT and 2035 GHG Benchmark of 0.051 MMT:

- 60 MW of existing solar (Turquoise and Luning);
- Luning Expansion Project with paired 60 MW solar / 259MWh storage components to be added January 1, 2024;
- 55 MWh in-territory storage to be added progressively after January 1, 2023 under Liberty's CRP;
- Purchase all remaining renewable energy needs from the NV Energy renewable pool.

All of Liberty's Conforming Portfolios rely on the addition of Luning Expansion during the 2023-2035 planning horizon for a variety of reasons, including the following:

- The Luning Expansion Project provides the least-cost, best-fit new resource options currently available to serve Liberty's customers;

- Solar and storage resources like Luning Expansion are the best resources to integrate quickly and easily into the NV Energy North System under the 2021 NV Energy ESA and/or the OATT;
- Resource availability and/or transmission capacity to delivery other forms of renewable or low-GHG resources to Liberty's service territory (e.g., wind, geothermal and hydro) are limited or non-existent at this time and therefore are not feasible for including in the IRP plans;
- Solar and storage resource additions like Luning Expansion are the easiest resource to add incrementally and have the shortest lead times. Thus, these projects are the easiest to scale upward and downward providing flexibility to respond to future uncertainties in customer load requirements, policy changes and technological advances;
- The Luning Expansion Project leverages Liberty's existing interconnection and transmission capacity from the Luning Solar, which eliminates costs that would be encountered on any other renewable project interconnecting into NV Energy's congested North System.

The Preferred Portfolios also include using the in-territory energy storage provided by the CRP proposal to optimize demand and transmission charges. These charges are derived from Liberty's peak demand coincident with NV Energy's peak. When the CRP is deployed, it is expected that much of the storage capacity can be used for both resiliency benefit and peak demand reduction benefit. As a result, both Portfolios B and D reduce costs for customers compared to their respective alternatives by reducing demand and transmission costs as presented in Tables 4 and 5.

Liberty's preferred portfolios rely on the continuation of the energy supply framework currently provided in the 2021 NV Energy ESA. This is a pivot away from previous IRP filings where Liberty proposed a long-term goal of reducing and ultimately eliminating NV Energy from its energy supply plans. This pivot was caused by a variety of factors including the following:

- Currently, there is no power import transmission capacity available to Liberty in NV Energy's North System and this will remain to be the case until at least 2026 when the Greenlink West transmission project is targeting in-service. The import transmission capacity addition that this project will allow for has not been finalized and NV Energy is not currently issuing transmission studies with the capacity available. Relying on this capacity for Liberty's future energy needs would be speculative at this time;
- The Greenlink Initiative has received preliminary state regulatory approvals but is still in the early phases of environmental permitting. Large transmission projects in the Western US do not have firm in-service deadlines and NV Energy is not required to complete the first phase of the project until 2028 at the earliest. Liberty does not want to commit to leaving NV Energy and purchasing power on the bilateral market until the Greenlink Initiative timeline has more certainty because planning around an estimated completion date introduces serious risk to Liberty's customers. In addition, the Greenlink Initiative is forecasted to increase transmission costs to all NV Energy transmission customers appreciably including Liberty. The size of the cost increase has not been determined nor approved. Ultimately, Liberty cannot commit to leaving NV Energy with such a large unknown cost potential;
- NV Energy is obligated to enter a Western RTO by 2030. This development will have a significant impact on the transmission capacity cost and availability in NV Energy's North System. The structure of this future market must be much more developed before Liberty can comfortably commit to a changed resourcing strategy;
- NV Energy has outperformed its RPS goals and has a deep portfolio of geothermal resources that can be accessed by Liberty in the same way it currently does under the existing 2021 NV Energy ESA.

Liberty's Preferred Conforming Portfolio is Portfolio D, which includes the full Luning Expansion Project utilizing 60 MW of incremental solar paired with 259 MWh of new battery storage and increasing purchases of additional renewable energy from NV Energy's renewable

pool up to 274,251 MWhs in 2035. Liberty prefers this portfolio over the alternative conforming portfolio for numerous reasons, including the facts that it:

- Best positions Liberty to meet or exceed future, potentially more stringent, GHG reduction requirements because it outperforms the GHG Benchmarks associated with both the 30 MMT and 25 MMT statewide targets;
- Provides superior GHG reductions through 2035 because it produces the greatest displacement of energy and carbon emissions from system power purchased either under the 2021 NV Energy ESA;
- Produces superior cost and rate benefits to Liberty's bundled customers by maximizing Liberty's ability to leverage available benefits of the Federal 30% ITC provisions in order to reduce the costs of building and operating new solar and storage resources for the benefit of customers;
- Provides the lowest risk strategy to meet GHG goals and secure stable renewable energy that can be delivered to Liberty customers.

c. GHG Emissions Results

Liberty calculated GHG emissions associated with its IRP portfolios using the CARB established un-specified GHG emissions rate of 0.428 MT-CO_2/MWh for all conventional energy purchases. Liberty's Conforming Plans presented here achieve the following GHG Benchmarks emissions assigned to Liberty on the "Benchmarks_30 MMT" and "Benchmarks_25 MMT" tabs of the "Final GHG Emission Benchmarks for LSEs" posted on June 28, 2022, which are the levels specified in the June 15, 2022 ALJ Ruling:

- 0.084 MMT 2030/0.064 MMT 2035 GHG Benchmark for the 30 MMT statewide target;
- 0.063 MMT 2030/0.051 MMT 2035 GHG Benchmark for the 25 MMT statewide target.

Thus, the preferred Conforming Plan provides superior carbon-reductions given that it outperforms both required GHG Benchmarks for the 30 MMT and 25 MMT statewide targets.

Table 3: Cost Baseline Portfolio

Year	Portfolio Demand (MWh)	Luning Existing Solar (MWh)	Turquoise Existing Solar (MWh)	Luning Expansion Solar+BESS (MWh)	Final CalPeco RPS %	California RPS Requirement	NV Energy Renewable Pool Purchases (MWh)	Total Renewable Generation (MWh)	Remaining Unspecified Energy Purchases	NV Energy Energy Purchase Cost ($ Million)	REC Purchase Costs ($ Million)	Capacity Costs ($ Million)	Transmission Costs ($ Million)	Realized Emissions (MMT)	IRP Emissions (MMT)
2023	595,316	129,459	29,881	-	35%	41%	34,883	194,224	401,092	22.40	$ 0.193	$ 6.65	$ 2.09	0.187	
2024	595,316	130,526	29,979	124,804	51%	44%	-	285,309	310,007	13.15	$ -	$ 4.23	$ 2.04	0.140	
2025	599,077	130,247	29,881	124,478	51%	47%	-	284,606	314,471	12.42	$ -	$ 4.34	$ 2.00	0.141	
2026	602,922	130,258	29,881	124,492	50%	49%	-	284,632	318,291	11.82	$ -	$ 4.78	$ 1.95	0.143	
2027	607,189	130,258	29,881	124,492	50%	52%	-	284,632	322,557	12.47	$ 0.080	$ 4.81	$ 3.29	0.145	
2028	610,512	130,537	29,979	124,858	50%	55%	-	285,373	325,139	13.77	$ 0.224	$ 4.89	$ 3.23	0.146	
2029	614,487	130,256	29,881	124,487	49%	57%	-	284,624	329,863	14.94	$ 0.451	$ 4.89	$ 4.48	0.148	
2030	**618,585**	**130,244**	**29,881**	**124,485**	**49%**	**60%**	**-**	**284,611**	**333,974**	**16.02**	$ 0.384	**$ 4.81**	**$ 4.39**	**0.149**	**0.084**
2031	623,350	130,251	29,881	124,477	49%	60%	-	284,609	338,741	17.16	$ 0.388	$ 4.95	$ 4.30	0.151	
2032	627,213	130,537	29,979	124,858	49%	60%	-	285,373	341,840	18.10	$ 0.335	$ 5.26	$ 4.21	0.152	
2033	631,423	130,258	29,881	124,487	48%	60%	-	284,627	346,796	19.18	$ 0.264	$ 5.67	$ 4.13	0.154	
2034	635,414	130,258	29,881	124,492	48%	60%	-	284,632	350,781	20.19	$ 0.266	$ 5.44	$ 4.04	0.156	
2035	**639,608**	**130,258**	**29,881**	**124,492**	**48%**	**60%**	**-**	**284,632**	**354,976**	**21.27**	$ 0.177	**$ 5.50**	**$ 3.96**	**0.157**	**0.064**

Table 4: 30 MMT Scenario, Emissions Performance of Portfolios A and B

Portfolio A: Luning Expansion (60 MW Solar/259 MWh BESS) and NV Energy Renewable Pool Purchases

Year	Portfolio Demand (MWh)	Luning Existing Solar (MWh)	Turquoise Existing Solar (MWh)	Luning Expansion Solar+BESS (MWh)	Final CalPeco RPS %	California RPS Requirement	NV Energy Renewable Pool Purchases (MWh)	Total Renewable Generation (MWh)	Remaining Unspecified Energy Purchases	NV Energy Energy Purchase Cost ($ Million)	REC Purchase Costs	Capacity Costs ($ Million)	Transmission Costs ($ Million)	Realized Emissions (MMT)	IRP Emissions (MMT)
2023	595,316	129,459	29,881	-	35%	41%	34,883	194,224	401,092	22.88	$ 0.193	$ 6.65	$ 2.09	0.172	
2024	595,316	130,526	29,979	124,804	51%	44%	-	285,309	310,007	13.15	$ -	$ 4.23	$ 2.04	0.140	
2025	599,077	130,247	29,881	124,478	51%	47%	-	284,606	314,471	12.42	$ -	$ 4.34	$ 2.00	0.141	
2026	602,922	130,258	29,881	124,492	51%	49%	5,630	290,261	312,661	12.00	$ -	$ 4.78	$ 1.95	0.140	
2027	607,189	130,258	29,881	124,492	54%	52%	24,065	308,697	298,492	13.44	$ -	$ 4.81	$ 3.29	0.134	
2028	610,512	130,537	29,979	124,858	57%	55%	41,413	326,786	283,726	15.49	$ -	$ 4.89	$ 3.23	0.128	
2029	614,487	130,256	29,881	124,487	60%	57%	60,332	344,956	269,531	17.27	$ -	$ 4.89	$ 4.48	0.084	
2030	**618,585**	**130,244**	**29,881**	**124,485**	**76%**	**60%**	**153,467**	**438,077**	**180,508**	**24.18**	**$ -**	**$ 4.81**	**$ 4.39**	**0.084**	**0.084**
2031	623,350	130,251	29,881	124,477	76%	60%	157,754	442,364	180,987	24.35	$ -	$ 4.95	$ 4.30	0.084	
2032	627,213	130,537	29,979	124,858	76%	60%	160,460	445,833	181,380	24.40	$ -	$ 5.26	$ 4.21	0.084	
2033	631,423	130,258	29,881	124,487	76%	60%	165,247	449,874	181,549	24.70	$ -	$ 5.67	$ 4.13	0.084	
2034	635,414	130,258	29,881	124,492	76%	60%	169,357	453,989	181,425	24.99	$ -	$ 5.44	$ 4.04	0.084	
2035	**639,608**	**130,258**	**29,881**	**124,492**	**84%**	**60%**	**218,985**	**503,617**	**135,991**	**27.54**	**$ -**	**$ 5.50**	**$ 3.96**	**0.064**	**0.064**

Portfolio B: Luning Expansion (60 MW Solar/259 MWh BESS) and 55 MWh of BTM storage

Year	Portfolio Demand (MWh)	Luning Existing Solar (MWh)	Turquoise Existing Solar (MWh)	Luning Expansion Solar+BESS (MWh)	Final CalPeco RPS %	California RPS Requirement	NV Energy Renewable Pool Purchases (MWh)	Total Renewable Generation (MWh)	Remaining Unspecified Energy Purchases	NV Energy Energy Purchase Cost ($ Million)	REC Purchase Costs	Capacity Costs ($ Million)	Transmission Costs ($ Million)	Realized Emissions (MMT)	IRP Emissions (MMT)
2023	595,316	129,459	29,881	-	35%	41%	34,883	194,224	401,092	22.88	$ 0.193	$ 6.65	$ 2.09	0.172	
2024	595,316	130,526	29,979	124,804	51%	44%	-	285,309	310,007	13.15	$ -	$ 4.23	$ 2.04	0.140	
2025	599,077	130,247	29,881	124,478	51%	47%	-	284,606	314,471	12.42	$ -	$ 4.34	$ 1.65	0.141	
2026	602,922	130,258	29,881	124,492	51%	49%	5,630	290,261	312,661	12.00	$ -	$ 4.72	$ 1.62	0.140	
2027	607,189	130,258	29,881	124,492	54%	52%	24,065	308,697	298,492	13.44	$ -	$ 4.75	$ 2.72	0.134	
2028	610,512	130,537	29,979	124,858	57%	55%	41,413	326,786	283,726	15.60	$ -	$ 4.83	$ 2.67	0.129	
2029	614,487	130,258	29,881	124,492	60%	57%	60,324	344,956	269,531	17.39	$ -	$ 4.82	$ 3.71	0.123	
2030	**618,585**	**130,258**	**29,881**	**124,492**	**76%**	**60%**	**156,720**	**441,352**	**177,233**	**24.55**	**$ -**	**$ 4.74**	**$ 3.63**	**0.084**	**0.084**
2031	623,350	130,258	29,881	124,492	76%	60%	160,907	445,539	177,811	24.70	$ -	$ 4.89	$ 3.56	0.084	
2032	627,213	130,537	29,979	124,858	76%	60%	163,501	448,874	178,338	24.73	$ -	$ 5.19	$ 3.48	0.084	
2033	631,423	130,258	29,881	124,492	76%	60%	168,231	452,863	178,560	25.00	$ -	$ 5.60	$ 3.41	0.084	
2034	635,414	130,258	29,881	124,492	76%	60%	172,408	457,040	178,374	25.29	$ -	$ 5.37	$ 3.34	0.084	
2035	**639,608**	**130,258**	**29,881**	**124,492**	**84%**	**60%**	**221,652**	**506,284**	**133,324**	**27.80**	**$ -**	**$ 5.43**	**$ 3.27**	**0.064**	**0.064**

Table 5: 25 MMT Scenario, Emissions Performance of Portfolios A and B

Portfolio C: Luning Expansion (60 MW Solar/259 MWh BESS) and NV Energy Renewable Pool Purchases															
Year	Portfolio Demand (MWh)	Luning Existing Solar (MWh)	Turquoise Existing Solar (MWh)	Luning Expansion Solar+BESS (MWh)	Final CalPeco RPS %	California RPS Requirement	NV Energy Renewable Pool Purchases (MWh)	Total Renewable Generation (MWh)	Remaining Unspecified Energy Purchases	NV Energy Purchase Cost ($ Million)	REC Purchase Costs	Capacity Costs ($ Million)	Transmission Costs ($ Million)	Realized Emissions (MMT)	IRP Emissions (MMT)
2023	595,316	129,459	29,881	-	35%	41%	34,883	194,224	401,092	22.88	$ 0.193	$ 6.65	$ 2.09	0.172	
2024	595,316	130,526	29,979	124,804	51%	44%	-	285,309	310,007	13.15	$ -	$ 4.23	$ 2.04	0.140	
2025	599,077	130,247	29,881	124,478	51%	47%	-	284,606	314,471	12.42	$ -	$ 4.34	$ 2.00	0.141	
2026	602,922	130,258	29,881	124,492	51%	49%	5,630	290,261	312,661	12.00	$ -	$ 4.78	$ 1.95	0.140	
2027	607,189	130,258	29,881	124,492	54%	52%	24,065	308,697	298,492	13.44	$ -	$ 4.81	$ 3.29	0.134	
2028	610,512	130,537	29,979	124,858	57%	55%	41,413	326,786	283,726	15.49	$ -	$ 4.89	$ 3.23	0.128	
2029	614,487	130,256	29,881	124,487	60%	57%	60,332	344,956	269,531	17.27	$ -	$ 4.89	$ 4.48	0.122	
2030	**618,585**	**130,244**	**29,881**	**124,485**	**84%**	**60%**	**201,089**	**485,700**	**132,885**	**27.59**	**$ -**	**$ 4.81**	**$ 4.39**	**0.063**	**0.063**
2031	623,350	130,251	29,881	124,477	84%	60%	205,377	489,986	133,364	27.51	$ -	$ 4.95	$ 4.30	0.063	
2032	627,213	130,537	29,979	124,858	84%	60%	208,083	493,455	133,757	27.35	$ -	$ 5.26	$ 4.21	0.063	
2033	631,423	130,258	29,881	124,487	84%	60%	212,869	497,496	133,927	27.42	$ -	$ 5.67	$ 4.13	0.063	
2034	635,414	130,258	29,881	124,492	84%	60%	216,979	501,611	133,802	27.51	$ -	$ 5.44	$ 4.04	0.063	
2035	**639,608**	**130,258**	**29,881**	**124,492**	**89%**	**60%**	**248,749**	**533,381**	**106,227**	**28.97**	**$ -**	**$ 5.50**	**$ 3.96**	**0.051**	**0.051**

Portfolio D: Luning Expansion (60 MW Solar/259 MWh BESS) and 55 MWh of BTM storage															
Year	Portfolio Demand (MWh)	Luning Existing Solar (MWh)	Turquoise Existing Solar (MWh)	Luning Expansion Solar+BESS (MWh)	Final CalPeco RPS %	California RPS Requirement	NV Energy Renewable Pool Purchases (MWh)	Total Renewable Generation (MWh)	Remaining Unspecified Energy Purchases	NV Energy Purchase Cost ($ Million)	REC Purchase Costs	Capacity Costs ($ Million)	Transmission Costs ($ Million)	Realized Emissions (MMT)	IRP Emissions (MMT)
2023	595,316	129,459	29,881	-	35%	41%	34,883	194,224	401,092	22.88	$ 0.193	$ 6.65	$ 2.09	0.172	
2024	595,316	130,526	29,979	124,804	51%	44%	-	285,309	310,007	13.15	$ -	$ 4.23	$ 2.04	0.140	
2025	599,077	130,247	29,881	124,478	51%	47%	-	284,606	314,471	12.42	$ -	$ 4.34	$ 1.65	0.141	
2026	602,922	130,258	29,881	124,492	51%	49%	5,630	290,261	312,661	12.00	$ -	$ 4.72	$ 1.62	0.140	
2027	607,189	130,258	29,881	124,492	54%	52%	24,065	308,697	298,492	13.44	$ -	$ 4.75	$ 2.72	0.134	
2028	610,512	130,537	29,979	124,858	57%	55%	41,413	326,786	283,726	15.60	$ -	$ 4.83	$ 2.67	0.129	
2029	614,487	130,258	29,881	124,492	60%	57%	60,324	344,956	269,531	17.39	$ -	$ 4.82	$ 3.71	0.123	
2030	**618,585**	**130,258**	**29,881**	**124,492**	**84%**	**60%**	**204,343**	**488,975**	**129,610**	**27.98**	**$ -**	**$ 4.74**	**$ 3.63**	**0.063**	**0.063**
2031	623,350	130,258	29,881	124,492	84%	60%	208,529	493,162	130,189	27.87	$ -	$ 4.89	$ 3.56	0.063	
2032	627,213	130,537	29,979	124,858	84%	60%	211,124	496,497	130,716	27.68	$ -	$ 5.19	$ 3.48	0.063	
2033	631,423	130,258	29,881	124,492	84%	60%	215,854	500,486	130,938	27.74	$ -	$ 5.60	$ 3.41	0.063	
2034	635,414	130,258	29,881	124,492	84%	60%	220,030	504,662	130,751	27.82	$ -	$ 5.37	$ 3.34	0.063	
2035	**639,608**	**130,258**	**29,881**	**124,492**	**89%**	**60%**	**251,416**	**536,048**	**103,559**	**29.24**	**$ -**	**$ 5.43**	**$ 3.27**	**0.051**	**0.051**

d. Local Air Pollutant Minimization and Disadvantaged Communities

i. Local Air Pollutants

With respect to local generation emissions, Liberty's only contribution to air pollutants results from reliance on NV Energy system power where the majority of generating resources currently providing power are located inside Nevada. As noted above, given the significant levels of uncertainty regarding future opportunities in the northern NV Energy system, at this time it is speculative what options may become available to Liberty to minimize the reliance on conventional power sources under an NV Energy ESA approach. Liberty's customers are particularly concerned with climate change and related environmental issues and, as described in greater detail below, Liberty is working to exceed minimum renewable and GHG-free supply requirements to help address these concerns, which also will reduce reliance on conventional system power sourced from NV Energy.

Liberty's King Beach diesel-fueled generating plant provides emergency reliability services only and thus on a forecast basis provides zero net generation and zero criteria air pollution. While this asset is not consistent with Liberty's goal of a supply portfolio with no GHG emissions, Liberty is exploring technology options that may permit its replacement in the future, so long as any replacement technologies can provide similar or superior reliability benefits. Kings Beach, as an emergency use resource, provides important reliability benefits for specific contingency and operational risks tied to potential severe winter weather conditions when supply lines (both transmission and distribution) experience temporary deratings or service interruptions.

ii. Focus on Disadvantaged Communities

Liberty's service territory is located on the eastern edge of California around the Lake Tahoe area.[19] Liberty's service territory contains one cluster of Disadvantaged Communities ("DACs"), as defined in SB 535 and the Disadvantaged Communities Map. The area includes approximately 65 customers or approximately 0.13% of Liberty's customer base. The majority of generating resources currently providing power to Liberty are owned and controlled by other parties and are located inside Nevada, and thus do not have directly measurable local air pollution impacts on Liberty's customers. Liberty's only fossil-fueled supply resource—the Kings Beach diesel generator—is operated on an emergency-only basis and has zero projected generation output and zero projected GHG or local pollution emissions. Consequently, Liberty has no further programs to minimize local air pollution associated with energy production, whether within or outside of DACs.

[19] See service territory at https://california.libertyutilities.com/uploads/ServiceArea-1.pdf and also CEC map at https://data.cnra.ca.gov/dataset/energy-and-utility-service-areas/resource/97777704-80e9-4d78-aacf-5fa402c9b884.

With respect to supporting DACs, Liberty does have existing programs that seek to provide services and rate relief to its eligible customers.[20]

a) Energy Savings Assistance Program ("ESAP")[21]

ESAP provides energy efficiency ("EE") upgrades to homes at no cost to Liberty customers who are income qualified or meet the eligibility requirements of certain other low-income state and federal assistance programs. Income eligibility for the ESAP program is households at or below 250 percent of the Federal Poverty Level. Homes that receive these EE measures are described as either "weatherized" or "treated." A weatherized home receives only upgrades to insulation, weather stripping, caulking, low-flow showerheads, water heater blankets, and building envelope repairs. A treated home receives weatherization, energy audits, energy education, appliance replacement, and energy efficient lighting, such as LEDs. The ESAP measures provide energy cost savings to low-income customers, as well as improve quality of life with health, comfort, and safety benefits.

b) California Alternate Rates for Energy ("CARE")

The CARE program offers a 20 percent discount to low-income and categorically eligible primary residents in Liberty's service territory. The goal of the program is to reduce the cost of electric service to benefit the maximum number of eligible customers. Income eligibility for CARE customers require a gross annual household income at or below 200 percent of the Federal Poverty Level. Qualifying customers complete a self-certifying application every two years. Customers on a fixed income are required to re-certify every four years. Applications are

[20] These programs are distinct from the COVID-19 programs adopted by the CPUC that are applicable to all IOUs.

[21] For clarity, the Energy Savings Assistance Program is abbreviated as "ESAP" in this document but is abbreviated as "ESA" in other Liberty filings.

available online as well as distributed through Liberty's North Lake Tahoe and South Lake Tahoe offices and through mailings and other outreach efforts.

c) Medical Baseline Allowance

This program benefits customers who use life support equipment and/or have illnesses that require additional heating and/or cooling needs. This program provides an increase in the allowance of electricity charged at the baseline (lowest) rate. The customer and the customer's qualified medical professional must both complete an application to qualify.

e. Cost and Rate Analysis

Liberty's IRP plans carefully consider the cost and rate impacts on its customers and the company seeks to develop and implement resource strategies that provide customers with the best balance of our primary resource planning objectives: reliability, environmental stewardship and reasonable cost. An important tool for Liberty is the utilization of the solar plus storage resource in the Luning Expansion Project. Liberty will review opportunities to reduce costs to customers that may arise in light of newer federal legislation, namely the Inflation Reduction Act, including the ability to apply ITC to stand-alone storage facilities.

Liberty has provided the Cost and Rate Analysis tables as Exhibit 1.[22]

f. System Reliability Analysis

As discussed elsewhere in this IRP filing, Liberty has constructed its IRP plans assuming it operates under the 2021 NV Energy ESA at least through its initial 5-year (less one day) term through the end of 2025, and then under similar provisions for 2026-2030, under a follow-on NV

[22] All costs adjusted to 2021 dollars using the IEPR Dollar Deflator Series found here: https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/irp-lse-plan-templates.

Energy ESA. As a California IOU operating within the NV Energy BAA, Liberty is not subject to the CPUC's resource adequacy program. However, the IRP plans outlined here explicitly ensure that Liberty contributes its fair share to system reliability and renewable integration on NV Energy's North System because they reflect compliance with the resource adequacy and transmission operations requirements imposed by the 2021 NV Energy ESA and NV Energy OATT.

Consistent with the provisions of the 2021 NV Energy ESA, Liberty's IRP plans use the assumptions for the Nameplate Capacity MW and the Electric Load Carrying Capability ("ELCC") percentages of existing and proposed new resources as shown in the following tables. These ELCC values are specific to the NV Energy system and are not directly comparable to the CPUC's ELCC values provided in the "Reliability" tab of this cycle's Resource Data Template applicable to entities filing those materials. However, the stated values substantiate that Liberty's IRP plans contribute its fair share to system reliability and renewable integration as determined by NV Energy carrying out its balancing area responsibilities under its OATT.

There are no capacity shortages in Liberty's IRP plans relative to its share of CAISO managed coincident peak demand, given that all of Liberty's loads, existing resources and currently planned resources are located in the NV Energy's North System and not within the CAISO-controlled grid. Moreover, as described above, Liberty's IRP portfolios explicitly model monthly capacity purchases required to satisfy fully its resource adequacy obligations within the NV Energy BAA under the 2021 NV Energy ESA and the NV Energy OATT.

g. High Electrification Planning

Liberty will continue to investigate high load scenarios including high electrification cases as requested by state agencies. For this IRP, only the standard IEPR demand forecast was modeled.

Liberty's territory includes three of the five coldest weather stations in California, including Boca Reservoir, the location of the lowest recorded temperature in California history.[23] Average temperatures throughout Liberty's territory can stay below freezing for several days in winter months. As a result, Liberty anticipates that customers and municipal building code implementers will exercise strong caution while working to convert building heating from natural gas to electric. Liberty will continue to support efforts to balance the safety of its customers with the goal of eliminating emissions from heating.

h. Existing Resource Planning

As addressed in other sections of this IRP, Liberty is in a unique position where it receives its energy supply entirely from the NV Energy BAA, not CAISO. Under the 2021 NV Energy ESA, NV Energy is obligated to procure and maintain adequate energy supplies to serve Liberty. In the 2021 NV Energy IRP[24] several new renewable generation additions have been proposed to increase reliable supply of energy to Nevada's BAA including service to Liberty. These additions include 600 MW solar and 480 MW storage and/or up to 500 MW of new geothermal generation in NV Energy's North System. These projects, combined with upgrades to

[23] Temperature Extremes in California. King, Guy. The California Geographer (2009) (pg. 77) https://scholarworks.csun.edu/bitstream/handle/10211.2/2791/CAgeographer2009_p71-84.pdf?sequence=1#:~:text=Boca%20has%20the%20distinction%20of,Oceanic%20and%20Atmospheric%20Administration%202009).

[24] See NV Energy 2021 IRP PUCN Docket #21-06001: https://pucweb1.state.nv.us/puc2/Dktinfo.aspx?Util=Electric.

NV Energy's conventional fleet to increase peak generation capacity, is forecasted to push NV Energy's generation fleet beyond the 16% planning reserve margin throughout the planning horizon.

In addition, the Luning Expansion Project will provide Liberty customers with a storage-backed solar asset that can serve approximately 40% of Liberty's peak load. This is in addition to the existing 60 MW of solar resources that are already dedicated solely to Liberty's use. Since both NV Energy and Liberty are on a path to secure new major storage-backed resources in the next 3-5 years and Liberty does not compete with other California LSEs for this energy, there is little risk that the resources Liberty is planning to use will be unavailable in the market.

i. Hydro Generation Risk Management

All of Liberty's loads, existing resources and currently planned resources are located in the NV Energy BAA's North System; consequently, the risks of shortfalls in California hydroelectric generation due to drought conditions in California do not present meaningful risks to the adequacy and/or security of Liberty's existing or planned power supply sources. Similarly, there is relatively limited existing or planned hydroelectric generation located within the NV Energy North System, none of which is dedicated to service Liberty's loads, so the ongoing drought risks of Nevada hydroelectric generation to Liberty's supply adequacy and security are limited as well. Consequently, Liberty does not have any specific controls or strategies in place to manage such risks and its IRP portfolios do not differ based on any consideration or quantitative analysis of such risks.

j. Long-Duration Storage Planning

All of Liberty's loads, existing resources and currently planned resources are located in the NV Energy BAA's North System, where potential sites for pumped hydroelectric or other

long duration storage are extremely limited. Moreover, under the 2021 NV Energy ESA, Liberty is to limit its generation to the level of its loads. Given the current transmission limitations on imports, there is no clear path for delivering the output from long-duration storage. Consequently, Liberty is not currently pursuing or intending to pursue activities to support development of bulk long-duration storage, but will continue to evaluate such opportunities when and if they arise. Long-duration storage is being investigated for microgrid projects and customer resiliency inside Liberty's service territory. These projects will be pursued as they are identified in their respective programs.

k. Clean Firm Power Planning

Liberty currently meets 100% of its midday load during the spring and fall with solar energy from Luning and Turquoise solar projects. Once Luning Expansion is developed and the associated storage is brought online, it is projected that Liberty will serve approximately 50% of its annual retail load through solar power. However, the remaining 50% of energy use will occur during non-daylight hours, limiting the tools Liberty can use to add new renewable capacity.

Additional solar plus storage beyond Luning Expansion starts to become problematic for Liberty because Liberty's loads are opposite of solar production periods. Liberty's peak loads occur during winter and primarily after sunset and Liberty's loads are the lowest during summer months. In addition, Liberty is prohibited from selling excess solar during periods of over production. As a result, each additional MW of solar generation must be paired with significant storage to adjust the generation to match load. Preliminary investigations have found that the additional storage required to capture the necessary solar energy is appreciably larger than what can be commercially justified at this time. Also, the resource will still be weather dependent and

not qualify as clean-firm generation. The same is true for new wind resources except with the added downside of poor wind resource in Liberty and NV Energy's service territories.

As a result, the preferred portfolio proposes continuing to use NV Energy's renewable pool which is undergirded by geothermal energy. Under the current ESA, NV Energy provides additional renewable energy to Liberty via five existing geothermal projects. This arrangement is a function of the fact that Liberty already meets most of its daytime load via its own solar, and thus NV Energy provides geothermal energy as complimentary resource to serve some of Liberty's nighttime load. In order to meet the most aggressive GHG reduction and RPS goals, the preferred portfolio anticipates the need to acquire 274,251 MWhs of additional renewable energy per year by 2035. This is approximately the annual energy output of a 35 MW geothermal plant operating at a 90% capacity factor.[25]

Currently, NV Energy is contracted with 14 geothermal projects in northern Nevada with a combined nameplate output of 428.6 MW.[26] In addition, NV Energy has recently announced power purchase agreements for between 130 – 160 MW of additional geothermal capacity, which supports the assumption that ample geothermal energy will be available in the North System throughout the IRP planning horizon for Liberty to negotiate for with NV Energy in future iterations of the Energy Services Agreement.

---

[25] "Modern geothermal power plants deliver a capacity factor upwards of 90-95%" https://www.energy.gov/eere/articles/chapter-2-geothermal-takes-stage#:~:text=Modern%20geothermal%20power%20plants%20deliver,upwards%20of%2090%2D95%25.

[26] See NV Energy Renewable Resources Map updated April 21, 2022 https://www.nvenergy.com/publish/content/dam/nvenergy/brochures_arch/cleanenergy/renewable-energy-projects-map.pdf.

l. Out-of-State Wind Planning

As stated elsewhere in this IRP filing, because of the transmission limitations that currently foreclose importation of energy, Liberty will not explore higher capacity factor out-of-state wind resources at this time. Should the Greenlink Initiative development materialize, Liberty will reassess such resources, most likely in the next IRP cycle. Since the transmission capacity gains promised by the Greenlink Initiative have not been finalized or offered to NV Energy's transmission customers, and because there may be additional structural changes to the operation of NV Energy's transmission system operations should it join a Western RTO, Liberty cannot confidently speculate on the extent of any new transmission capacity or its timing for accessing higher capacity wind resources in the larger regional market.

m. Offshore Wind Planning

As an LSE served entirely outside of CAISO and along the eastern border of California, Liberty does not have an opportunity to secure offshore wind resources. It is possible that once a Western RTO is established and/or NV Energy's transmission upgrades increase Liberty's access to a broader set of assets this fact may change. However, until either or both of those propositions materialize Liberty cannot consider offshore wind resources as they will not be deliverable to Liberty's loads.

n. Transmission Planning

All of Liberty's loads, existing resources and currently planned resources are located in the NV Energy BAA's North System, and thus are not anticipated to be impacted by, nor have any impacts on, the availability or cost of transmission transfer capability anywhere on the CAISO system. On that basis, Liberty would conclude that there is no meaningful information

from Liberty's IRP plans that need to be incorporated into materials that would inform the CAISO transmission planning processes. Moreover, Liberty's planning currently focuses on renewable resource and storage opportunities within or near its service territories that provide significant decarbonization benefits and value to customers, rather than any transmission development efforts outside the territory that may take a long period to develop and aid in serving loads.

As previously noted, NV Energy has proposed a significant expansion of transmission capabilities as part of their July 20, 2020 updated IRP. The Greenlink Initiative is a multi-year, multi-phase, project that may yield significant improvements in Liberty's ability to import higher capacity renewables or low-carbon resources. NV Energy describes some of the goals of the project as follows:

> Resource diversity and transmission infrastructure each play a key role in allowing NV Energy to achieve these state policy goals. While Nevada has abundant solar and geothermal resource potential, high quality wind and hydro resources are nearly absent within the state. Further, while battery technology continues to evolve, the zero-carbon analysis by E3 this filing demonstrates that solar and PV energy storage alone cannot accomplish the aggressive renewable goals established for the state. A balance must be created between resource types and the availability of those resources as the sun rises and sets through each day.
>
> The only way to gain access to diverse renewable resources is through an interconnected western grid. Nevada's geographic location provides the opportunity to be a key player in the development of that grid and a key renewable energy provider in the west. At this point, the missing piece is the lack of transmission infrastructure in Nevada. The transmission infrastructure proposed

> in the Greenlink Nevada [Initiative] plan builds a foundation for the state to access diverse resources and increase the transfer of energy between Nevada and the developing western grid. Several regional projects in the western grid are already under development and propose connections to or though the state of Nevada."[27]

While Liberty is not a participant in this long-term transmission development, the company will continue to closely monitor its development and adjust its long-term planning to the extent the capability of future imports becomes more foreseeable. Absent a material expansion of the NV Energy North System import and transmission capabilities, Liberty anticipates remaining a captive wholesale customer of NV Energy for a portion of its energy and capacity needs not met through the projects that Liberty proposes to construct. At this time the company anticipates updating the Commission regarding the status of the Greenlink Initiative in subsequent IRP cycles.

IV. Action Plan

a. Proposed Procurement Activities and Potential Barriers

i. Resources to meet D.19-11-016 procurement requirements

The D.19-11-016 decision does not obligate Liberty or other members of the California Association of Small and Multi-Jurisdictional Utilities ("CASMU") to undertake additional procurement. Nevertheless, Liberty continues to develop the proposed Luning Expansion project which will add additional solar and storage by early 2024.[28] In addition, Liberty is pursuing in-

[27] NV Energy, *Northern and Southern Service Territory IRP 4th Amendment*, July 20, 2020, in PUCN Docket #20-07023, Volume 7, (pgss 4-5). Available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2020_THRU_PRESENT/2020-7/3427.pdf.

[28] The September 26, 2022 settlement of the Luning Expansion is currently pending before the Commission in A.21-04-006.

system storage under the proposed Customer Resiliency Program which includes BTM storage and is continually investigating opportunities for additional microgrids and self-build renewable projects inside NV Energy's North System.

ii. Resources to meet D.21-06-035 procurement requirements, including:

a. 1,000 MW of firm zero-emitting resource requirements

Because it is outside of the CAISO BAA, Liberty's operations and resource procurement do not directly impact the CAISO resource adequacy situation, and accordingly Liberty's IRP plans do not explicitly address nor offer any explicit assistance in replacing Diablo Canyon capacity. However, the resources that are proposed to be added in Liberty's IRP plans (paired solar plus storage and behind-the-meter storage) themselves contribute firm, flexible and GHG-free resources to its utility territory within the NV Energy BAA that is located within California. In the case of the in-territory storage projects, the intent behind that effort is to advance the type of resiliency benefits associated with its Wildfire Mitigation Plans along with enhancing reliability during extreme winter weather events. An additional co-benefit from the storage aspects of these proposals will be the enhanced management of the demand charges under the 2021 NV Energy ESA and the larger renewable projects' intermittent output during times when Liberty can control the dispatch of those resources.

b. 1,000 MW of long-duration storage resource requirements

All of Liberty's loads, existing resources and currently planned resources are located in the NV Energy BAA's North System, where potential sites for pumped hydroelectric or other long duration storage are extremely limited. Moreover, under the 2021 NV Energy ESA, Liberty is to limit its generation to the level of its loads, therefore given the current transmission limitations on imports, there is no clear path for delivering the output from long-duration storage.

Consequently, Liberty is not currently pursuing or intending to pursue activities to support development of long-duration storage but will continue to evaluate such opportunities when and if they arise.

c. 2,500 MW of zero-emissions generation, generation paired with storage, or demand response resource requirements

Although Liberty continually investigates opportunities to issue competitive solicitations in the future to secure utility owned facilities, at this time Liberty's only specific development is the Luning Expansion Project which has a proposed settlement pending before the Commission. As described above, the proposed Luning Expansion project would add solar and storage in a hybrid configuration that optimizes an existing interconnection on the constrained NV energy system. The key barriers to this project are standard greenfield renewable project risks including permitting risks, development risks, and operational risks. Liberty is confident that under the terms of the settlement now pending before the Commission, it has adequately addressed these risks. The Luning Expansion is sited adjacent to the existing Luning Solar project minimizing permitting risk by working within an environmental and land use framework well understood by the company. The location minimizes the disturbance to the Nevada ecosystem by using land between the existing disturbed area for Luning Solar and highway 95 near Luning, NV. It also uses existing transmission capacity and does not trigger additional transmission line upgrades beyond the Luning Solar substation. Liberty is addressing development risks by engaging with top tier engineering firms, equipment suppliers, and construction companies for the project. Significant due diligence has been undertaken for the project since it was originally proposed in 2020, and Liberty is confident that the project can be delivered as proposed in the settlement. Operational risks for the project will also be minimized by being co-located with the existing

Luning Solar site. Operational teams will be able to optimize efforts between the two plants limiting risks to performance.

d. All other procurement requirements

The preferred portfolio includes securing additional geothermal generation from NV Energy in the second-half of the IRP planning horizon. This procurement would not follow a standard solicitation process and instead be undertaken as part of the negotiation of a future follow-on ESA with NV Energy. This future ESA would require approval by the CPUC and the renewable energy procurement terms will require further investigation when the future ESA negotiations are initiated as the expiration of the existing ESA draws closer in 2025.

Liberty has historically relied on provision of both conventional and renewable energy from the NV Energy generation portfolio. While Liberty has made progress in increasing its commitment of non-emitting GHG renewable energy for its customers, the majority of the generation portfolio in Nevada remains primarily conventional GHG emitting resources. However, through the IRP planning horizon Liberty asserts that continuing to rely on NV Energy for its remaining requirements offers the simplest and lowest risk means to serve Liberty customers. The company aims to continue efforts to work inside the existing framework to reduce GHG emissions while further clarity in the future of the Nevada transmission system develops. For example, prior and current NV Energy ESAs exclude coal resources reducing Liberty's overall real GHG emissions that would otherwise have been caused by Liberty's use of NV Energy's conventional portfolio. Further, Liberty's reliance on NV Energy's conventional resources will decline appreciably following the Luning Expansion project and proposed additional procurement of geothermal energy by NV Energy itself. Regardless of which strategy is ultimately implemented, due to the transmission topology and geography of its territory,

Liberty expects to remain a NV Energy transmission customer and full-requirements wholesale customer for residual energy and capacity requirements for the foreseeable future.

The main risk of this strategy is NV Energy refusing to offer nighttime energy from its renewable pool at a competitive rate. This could occur either due to NV Energy's geothermal costs being un-competitive with other options available to Liberty, or NV Energy lacking sufficient geothermal capacity to satisfy Liberty's needs.

Current estimates of NV Energy renewable pool assets based on payments to existing geothermal projects indicate that renewable pool prices could exceed $80/MWh.[29] However, Liberty's energy demands primarily occur during winter and nighttime hours and after Luning Expansion begins, operation there will be minimal use for additional energy during the day. This fact could result in NV Energy requiring Liberty to pay a premium above the base cost of geothermal power because NV Energy will have to provide Liberty with the more valuable nighttime energy while absorbing the less valuable daytime geothermal energy. For the purposes of the proposed plan, the average geothermal rate was used as a base estimate without a premium, but generally the price of setting up a nighttime only geothermal energy supply could be significantly higher than the base price currently available.

Though geothermal energy on a pure $/MWh cost basis exceeds the cost of solar plus storage in the North System, the added benefits of a firm, high capacity factor renewable energy source is worth the additional premium. This is exceptionally the case post-Luning Expansion when almost all additional energy needs will be during nighttime hours. In addition, NV Energy has consistently exceeded its RPS mandates and has shown a willingness to partner with large

[29] See PUCN Docket 22-03002 Sierra Pacific Power Corporation Annual Deferred Energy Adjustment Application Exhibit E-2, which outlines 2021 energy costs for existing geothermal plants Stillwater, Tuscarora, and McGinnis Hills (filed March 1, 2022) (pgs. 102-116).

energy use customers to support their aggressive renewable energy goals.[30] For these reasons, Liberty believes that NV Energy will have excess geothermal energy available that can be requested by Liberty to meet GHG benchmarks throughout the IRP planning horizon.

iii. Offshore wind

As described earlier in this IRP, Liberty's load is served entirely outside of CAISO and along the eastern border of California. As a result, Liberty does not have plans to solicit offshore wind.

iv. Out-of-state wind

As described earlier in this IRP, because of the transmission limitations that current foreclose importation of energy, Liberty does not have plans to solicit higher capacity factor out-of-state wind resources at this time.

v. Other renewable energy not described above

Liberty continues to look for any opportunity to bring more renewable energy to its customers in a way that is cost-effective. The proposed and alternative portfolios do not include any additional renewable energy not already described above.

vi. Other energy storage not described above

Liberty is proposing the Customer Resiliency Program which will provide up to 55 MWh of distributed storage inside Liberty's service territory. The primary focus of the program is to provide resiliency for critical customers and green cross customers under service outages whether it be caused by wildfire prevention or typical system outages.[31] However, a secondary

[30] See PUCN Docket 17-11002 requesting approval of a 50 MW solar project as part of an agreement between Apple and NV Energy and Docket 19-12017 requesting approval of a 350 MW solar plus 280 MW storage project between NV Energy and Google Inc. (filed December 19, 2019).

[31] See Liberty's CRP Application.

benefit of the program is that as conditions allow it will provide Liberty with the opportunity to charge the system during periods of overgeneration. Currently, when Liberty's solar fleet over-generates the energy is curtailed. Adding this storage asset will allow Liberty to frequently capture this over-generation thereby increasing the renewable energy that reaches customers.

vii. Other demand response not described above

Liberty's customer base does not include a large amount of cooling load that can be addressed with traditional demand response tools. It is investigating the use of managed charging for electric vehicles as a demand response asset. However, this program is in its infancy and no spending on the program is being requested in this IRP.

The proposed distributed storage asset will also increase Liberty's ability to adjust load during peak transmission hours. As conditions permit, Liberty will be able to reduce its coincident peak transmission demand and therefore its transmission fee that it pays to NV Energy. This project is not being pursued as a demand response asset, but it does offer a demand response value stream that will provide savings to customers.

viii. Other energy efficiency not described above

Liberty's service territory is primarily high altitude with moderate summer temperatures high second-home ownership, a recreational-based economy, and low industrial load which limits the opportunities for energy efficiency savings and demand response. Liberty's 2022 Energy Efficiency Program Reporting demonstrated that for compliance year 2021, only 517.4 MWhs of energy savings (or 0.09% of Liberty's retail load) were able to be captured across Liberty's Energy Efficiency programs.[32] As a result, Liberty is not proposing additional energy

[32] See 2022 Energy Efficiency Reporting in Compliance with SEC. 28 Section 454.55 of the PUC, Energy Savings Table 2018 - 2021 (pg. 2).

efficiency programs in this IRP. However, improvements in building electrification and electric heating technologies may introduce additional opportunities for Liberty to offer a reduction in local GHG emissions contributed by natural gas heating. These opportunities require significantly more investigation and market maturity before Liberty will start proposing programs in this arena.

ix. Other distributed generation not described above

Liberty is no longer proposing a 4 MW microgrid project as outlined in the 2020 IRP. The opportunity to develop microgrids is always being considered as a tool to reduce wildfire risk, increase renewable penetration, provide resiliency benefits, and defer or replace traditional grid investments. This was best exemplified by the Sagehen microgrid project which was energized in 2020 and has provided all four of these benefits. These opportunities are expected to remain less than 50 kW in size, and do not have an appreciable impact on load forecasts or resource planning. Liberty anticipates similar investments will be identified throughout its territory in the next several years. However, no investments are currently being proposed under this IRP.

x. Transportation electrification, including any investments above and beyond what is included in Integrated Energy Policy Report (IEPR)

Liberty has several transportation electrification (TE) programs to meet the requirements of Senate Bill (SB) 350, Assembly Bill (AB) 1082 and AB 1083, and accelerate the widespread adoption of TE. The Direct Current Fast Charger (DCFC) program installs DCFC equipment and infrastructure in strategic locations to help eradicate range anxiety for customers and visitors driving electric vehicles (EVs) in Liberty's service territory. Residential customers can take advantage of Liberty's home charging rebate (up to $1,500) to install EV home charging equipment. A rebate of up to $2,500 is available to small businesses that install charging stations

at their locations which are also available to the public. The EV Bus Infrastructure Program is to install charging equipment at a Tahoe Transportation District site to enable overnight charging of EV buses.

Liberty is installing charging for school buses, staff, students, and visitors at schools and parks throughout Liberty's service territory. Liberty also hosts a customer online resource that provides customers with information on EVs, charging infrastructure, rebate programs, EV incentives, and other EV-related information, including an online calculator to estimate potential energy savings and carbon footprint reduction based on comparisons of various EV models. In addition to the programs described above, Liberty has implemented its EV Infrastructure Rule 24. This rule supports all Electric Distribution Infrastructure on the utility side of the Customer's meter (EV Service Extension) for Commercial and Multi-family Unit Dwelling Customers (Applicant) installing separately metered infrastructure to support EV Supply Equipment.

xi. Building electrification, including any investments above and beyond what is included in Integrated Energy Policy Report (IEPR)

Liberty continues to investigate building electrification technologies and its impact to load and resource planning. At this time Liberty does not have any proposed building electrification projects. However, Liberty will align future programs with the anticipated phasing out of natural gas. These programs will be developed in future iterations as the unique trajectory of natural gas decommissioning among Liberty's customer base is defined.

xii. Other

The NVE BAA controlled exclusively by the vertically integrated utility, NV Energy. As such, generation and load in this market are managed through bilateral contracts between market participants, delivered under point-to-point transmission service or network integration service. Key to the success of Liberty's forward-looking plan is the ability to have greater control over its

generation and storage consistent with the 2021 NV Energy ESA to meet the Liberty load shape. Rather than simply focusing on maximizing renewable MWh production, the company is looking at leveraging renewables and storage together to better match loads consistent with the terms of the NV Energy ESA, and to meet GHG goals and enhance in-territory benefits for all customers.

b. Disadvantaged Communities

As described in prior sections and earlier IRPs, while there are low-income customers within the Liberty territory, there are no areas that would be considered DACs under the CalEnviro screens, primarily because of the sizing of the districts and the rural nature the service territory. Moreover, Liberty does not have combustion resources that operate during ordinary operating conditions.

However, Liberty has made significant progress under the auspices of the Wildfire Mitigation Plans and related community organizing in terms of recognizing communities relying on languages other than English, as well as improving community outreach including with local tribes.

The proposed CRP program will also include outreach to Disadvantaged Communities including Green Cross customers and CARE customers.

In addition, in Liberty's 2022 General Rate Case ("GRC") Chapter 5: Public Purpose Programs recommended a refocusing of the Solar Incentive Program towards Disadvantaged Communities. The filing provided the following discussion regarding its Solar Incentive Program:

> The success with residential customers is almost exclusively limited to single family homes. Liberty recognizes that an important segment of its customer base (income qualified customers and renters), may not have been able to capitalize on these benefits…

> Liberty proposes to maintain the SIP budget at the 2019-2021 level of $420,000 per year, but refocus the incentive funding entirely on this customer segment for the GRC period 2022-2024 by offering significant financial support for installations at, but not limited to the following: affordable residential housing, entities that serve low income residents, food banks, shelters, and Title 1 public schools…. The Solar Incentive Program would complement the current opportunity with the Solar on Multifamily Affordable Housing (SOMAH) program by funding valuable new projects that are not eligible for SOMAH, including new multifamily residential projects.[33]

This recommendation will be negotiated through the GRC process.

c. Commission Direction of Actions

Liberty does not have any requested direction for the commission.

V. Lessons Learned

Liberty suggests that its circumstances are different enough from other CPUC-jurisdictional, CAISO-based LSEs that it should have its IRP and the procurement plan processed and approved in an expeditious manner, ahead of any Commission consolidated plan assessment for those LSEs that operate within CAISO. Liberty's procurement goals include high levels of renewable and low-GHG power supplies, so it is advancing the State's decarbonization efforts on a path faster than if it were simply meeting RPS compliance. Because it is outside of the CAISO BAA, Liberty's procurement does not need to address various RA product types.

[33] See Liberty 2022 General Rate Case Before the California Utilities Commission Chapter 5: Public Purpose Programs: https://california.libertyutilities.com/uploads/Liberty%202022%20GRC%20CHAP%205%20Public%20Purpose%20Programs%20(Guenther)%20(00547845-2xBA8E1).pdf.

Accordingly, from Liberty's perspective, it would benefit customers to have this proposed procurement approach carved out of any longer lead-time proceedings occurring in the IRP docket and for the Commission to authorize this pursuit of an expedited, high renewables procurement as soon as practicable.

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 Serving Entity (LSE)	Liberty Utilities (CalPeco Electric) LLC (U 933-E)
The LSE's abbreviation, provided in the Resource Data Template's workbook in the "lse_names" tab	LIB

Contact Person for Questions about this Filing	
Name	Casey Baker
Title	Manager, Energy Supply & Compliance
Email	Casey.Baker@libertyutilities.com
Telephone	(530) 721-5364

Back-Up Contact Person for Questions about this Filing (Optional)	
Name	Lindsay Maruncic
Title	Director, Renewable Energy Operations
Email	Lindsay.Maruncic@libertyutilities.com
Telephone	(530) 546-1789

Back-Up Contact Person for Questions about this Filing (Optional)	
Name	Andy Brown
Title	Attorney
Email	abb@eslawfirm.com
Telephone	(916) 447-2166

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.*

CONFIDENTIAL MATERIALS

EXHIBIT 1

COST AND RATE TABLES FOR IRP PLANS

[Redacted]

Revenue Requirements and Bundled System Average Rates for Baseline Scenario (2021 $)

Line No.	Cost Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Distribution													
2	Transmiss													
3	Generatio													
4	Demand Side Programs													
5	Other													
6 (sum lines 1-5)	Baseline Revenue Requirement													
7	System Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
8	Bundled Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
9	System Average Delivery Rate (¢/kWh)													
10	Bundled Generation Rate (¢/kWh)													
11	System Average Bundled Rate (¢/kWh)													

Revenue Requirements and Bundled System Average Rates for 30 MMT Preferred Conforming Portfolio A- "NVE Only" (2021 $)

Line No.	Cost Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Distribution													
2	Transmission													
3	Generation													
4	Demand Side Programs													
5	Other													
6 (sum lines 1-5)	Baseline Revenue Requirement													
7	System Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
8	Bundled Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
9	System Average Delivery Rate (¢/kWh)													
10	Bundled Generation Rate (¢/kWh)													
11	System Average Bundled Rate (¢/kWh)													

Revenue Requirements and Bundled System Average Rates for 30 MMT Preferred Conforming Portfolio B- "NVE plus CRA Program" (2021 $)

Line No.	Cost Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Distribution													
2	Transmission													
3	Generation													
4	Demand Side Programs													
5	Other													
6 (sum lines 1-5)	Baseline Revenue Requirement													
7	System Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
8	Bundled Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
9	System Average Delivery Rate (¢/kWh)													
10	Bundled Generation Rate (¢/kWh)													
11	System Average Bundled Rate (¢/kWh)													

Revenue Requirements and Bundled System Average Rates for 25 MMT Preferred Conforming Portfolio C - "NVE Only" (2021 $)

Line No.	Cost Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Distribution													
2	Transmission													
3	Generation													
4	Demand Side Programs													
5	Other													
6 (sum lines 1-5)	Baseline Revenue Requirement													
7	System Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
8	Bundled Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
9	System Average Delivery Rate (¢/kWh)													
10	Bundled Generation Rate (¢/kWh)													
11	System Average Bundled Rate (¢/kWh)													

Revenue Requirements and Bundled System Average Rates for 25 MMT Preferred Conforming Portfolio D "NVE plus CRA Program"(2021 $)

Line No.	Cost Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Distribution													
2	Transmission													
3	Generation													
4	Demand Side Programs													
5	Other													
6 (sum lines 1-5)	Baseline Revenue Requirement													
7	System Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
8	Bundled Sales (GWh)	558	558	561	565	569	572	576	579	584	588	591	595	599
9	System Average Delivery Rate (¢/kWh)													
10	Bundled Generation Rate (¢/kWh)													
11	System Average Bundled Rate (¢/kWh)													

End of Exhibit