

**BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA**

Application of NEVADA POWER COMPANY d/b/a NV Energy and SIERRA PACIFIC POWER COMPANY d/b/a NV Energy, seeking approval to add 600 MW of renewable energy and 480 MW of energy storage capacity, among other items, as part of their joint 2022-2041 integrated resource plan, for the three year Action Plan period 2022-2024, and the Energy Supply Plan period 2022-2024.

Docket No. 21-06\_\_\_\_

**VOLUME 4 OF 18**

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## **SUMMARY**

## SECTION I – EXECUTIVE SUMMARY

Nevada Power Company (“Nevada Power”) and Sierra Pacific Power Company (“Sierra,” and together with Nevada Power, the “Companies” or “NV Energy”) are filing this joint Integrated Resource Plan (the “2021 Joint IRP”). When the Companies filed its first joint triennial IRP in 2018 there was tremendous uncertainty. Nevada’s citizens were being asked to vote on a constitutional amendment to deregulate the energy market in the state of Nevada. At the same time a number of the Companies’ large customers were requesting Commission approval to take service from a provider of new electric resource pursuant to NRS Chapter 704B, leaving doubt on load and resource needs. In the past three years, much of this uncertainty has been resolved. Voters overwhelmingly denied deregulating the energy market. The Companies have worked with customers to meet their demands and needs, including reducing rates and offering more renewable options, to ensure stable load. In addition, the Companies have obtained Commission approval for more than 2.6 GW of renewable resources and an integrated transmission plan to meet the growing needs and policies of this state. These are all objectives the Companies support and strive to advance in the 2021 Joint IRP.

As the Companies prepare and file this 2021 Joint IRP, the uncertainty has been resolved but there are challenges and opportunities that remain. In particular, the state of Nevada instituted aggressive green energy policies and goals that impact the Companies. The Renewable Portfolio Standard (“RPS”) has increased considerably, with the current goal of 50 percent renewable energy by 2030. Similarly, the state set a goal of net-zero carbon emissions by 2050. Further, customers have been clear that they want more renewable energy and service options to meet their own sustainability goals. Finally, climate change is impacting the western energy markets, requiring the Companies and stakeholders to reevaluate established practices to ensure there is sufficient energy to meet peak demands during the summer.

To continue addressing these challenges and opportunities, the Companies have prepared this 2021 Joint IRP. The 2021 Joint IRP demonstrates how the Companies intend to meet the state’s green energy policies and meet the energy demands of their customers—

### **KEY ELEMENTS OF NV ENERGY’S 2021 INTEGRATED RESOURCE PLAN**

The 2021 Joint IRP adds 600 MW of new, solar generating facilities, along with 480 MW of co located storage, allowing for the retirement of North Valmy Generating Station and meeting the clean energy goals of the state, the Companies and their customers.

The plan also contains:

- Three grid tied battery storage systems to increase reliability and capacity.
- Combustion turbine upgrades to increase capacity of the Companies’ conventional fleet to meet the summer peak demand
- A roadmap to meet the state’s goal of being net zero carbon free by 2050

all while working to keep rates low. After analyzing several energy supply portfolios based on price impact, societal cost, economic development and reliability metrics, the Companies selected the Net-Zero plan as their Preferred Plan. The Net-Zero plan recommends the addition of two new company-owned solar generating resources, with co-located battery energy storage systems (“BESS”), transmission network upgrades for the new resources, three new BESS to improve reliability on the Companies’ grid and new upgrades at the Companies’ conventional fleet to increase generating capacity to address summer peak demand. In addition, the Companies’ Preferred Plan proposes ambitious energy efficiency programs and includes the Companies’ first requests for Commission approval in its distributed resources plan. The Net-Zero plan exceeds the current RPS in every year, achieves the state’s net-zero carbon dioxide emissions goal in 2050, and meets the 16 percent planning reserve margin for each utility. It also includes the replacement of the North Valmy Station (“Valmy”) coal-fired boilers with the new solar resources and BESS by 2025. The investment in renewable resources in the Net-Zero plan pays off in greater gains to the state economy and greater benefits to the environment. The Companies selected the Net-Zero plan as it is most closely aligned with Nevada’s evolving energy policy, delivers the resources its customers value, and its cost is balanced by its benefits to the state economy and the environment. NV Energy therefore asks that the Commission accept the Net-Zero Plan and authorize NV Energy to take all necessary steps in the Action Plan period to implement the Net-Zero Plan.

***1. The IRP process is a transparent public process designed to produce the best value plan for serving NV Energy’s customers***

Nevada’s IRP process is designed to optimize expenditures on energy efficiency programs and investments in electric system assets for the whole – that is, for all Nevadans. The IRP process starts with a forecast of customer loads and assesses a range of alternatives, including investments in energy efficiency, demand response, distributed resources, transmission, and energy supply to identify options for meeting customers’ energy needs over the next 20 years, although the Companies have provided models for a 30 year period to show how it can achieve net-zero carbon emissions by 2050. Broadly speaking, these investments fall into three categories: a demand side plan (energy efficiency and demand response programs to reduce demand), a distributed resources plan (comprised of non-wire alternatives to meet reliability concerns), and a supply side plan (comprised of generation and transmission alternatives to increase supply). Resource planners use a variety of modeling tools to determine the long-run impact of these alternative plans on the operation of the electric system, on electricity prices, on the state’s economy, and on the environment. After performing that analysis, NV Energy assesses the results and designates a Preferred Plan and at least one alternative plan.

Supply-side planning must take into consideration multiple needs and should take a long-term view. Good supply-side plans will advance several objectives, all while balancing the present

worth of revenue requirements and societal costs, in meeting those objectives. This is especially relevant when the state’s policy is to:

1. Encourage and accelerate the development of new renewable energy projects for the economic, health and environmental benefits provided to the people of this state;
2. Become a leading producer and consumer of clean and renewable energy, with a goal of achieving by 2050 an amount of energy production from zero carbon dioxide emission resources equal to the total amount of electricity sold by providers of electric service in this state; and
3. Ensure that the benefits of the increased use of renewable energy systems and energy efficiency measures are received by the residents of this state. Such benefits include, without limitation, improved air quality, reduced water use, a more diverse portfolio of resources for generating electricity, reduced fossil fuel consumption and more stable rates for retail customers of electric service.

The 2021 Joint IRP accounts for these goals on a variety of metrics.

The filing of an IRP in Nevada provides an opportunity for public review of the Companies’ analysis, strategies and proposals. The Commission conducts a public process through which stakeholders – governmental agencies, large customers, small customers, non-governmental interest groups and any other interested party – review, test, and comment on the Companies’ analytic rigor and decision-making. After a mandatory evidentiary hearing, the Commission has the power to accept the recommended plan, reject the plan, or propose modifications to the plan. The goal of the Commission’s process is to evaluate the impact of the proposed plan on customers, the state’s economy, and the environment and approve a plan that provides the best value to customers.

***2. The 2021 Joint IRP will build on the infrastructure approved in the Fourth Amendment to the 2018 Joint IRP (“Fourth Amendment”) with continued drive toward a “greener” system, serving customers with ever increasing amounts of low-cost renewable energy***

The 2021 Joint IRP plans to exceed the requirement for a 50 percent RPS by 2030 and target the state’s goal of net-zero carbon dioxide emissions by 2050. Greenlink Nevada, as approved in the Fourth Amendment, will facilitate fossil fuel retirements and enable more renewables in the portfolio, allowing NV Energy to present a net-zero carbon dioxide emissions plan. Through this 2021 Joint IRP, NV Energy acknowledges both customer and state desires for decarbonization.

As stated in the NV Energy Net-Zero Carbon Dioxide Emissions Goal Report,<sup>1</sup> NV Energy is the state’s largest electricity provider, serving approximately 90 percent of the state’s electric

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<sup>1</sup> See Docket No. 19-06010, report submitted November 13, 2020.

consumption and, consequently, NV Energy’s progress towards net-zero carbon emissions is inextricably tied to the state’s net-zero carbon dioxide emissions goal. Planning a portfolio that achieves net-zero carbon dioxide emissions is very different than planning a portfolio with a 25 or even 50 percent RPS. Zero carbon resources, and renewable resources in particular, are not typically firm dispatchable resources—resources that can supply electricity reliably on demand for hours, days, or weeks at a time. A reliable, resilient portfolio cannot be created in the absence of these resources. No combination of wind, solar, batteries, or demand flexibility can substitute for firm dispatchable resources. Even the vision of Los Angeles’ 100 percent renewable energy future recently presented by National Renewable Energy Laboratories (“NREL”)<sup>2</sup> incorporates a requirement for firm capacity resources as a key element of maintaining reliability. Therefore, a net-zero carbon dioxide emissions portfolio for NV Energy is envisioned to include variable renewable resources (e.g., solar, wind, and possibly geothermal), storage (e.g., batteries), and a very necessary small contingent of firm dispatchable resources. Low- or zero-carbon firm dispatchable resources may become candidates for inclusion in an NV Energy portfolio as technology develops in the future. Such resources might include combustion turbines paired with other renewable fuels (biogas, biofuel, green hydrogen) or carbon capture and sequestration technology.

While the Nevada Administrative Code (“NAC”) requires an IRP to present a 20-year plan,<sup>3</sup> the Companies also present a 30-year plan. This enables the Companies to show how their share of the state’s net-zero carbon dioxide emissions goal might be achieved. However, as pointed out by the Commission’s Regulatory Operations Staff’s (“Staff”) witness Mr. Paul Maguire at the Phase II hearing for the Fourth Amendment, “30 years is a host of time for this technology to change.”<sup>4</sup> Evolution in generation technology and cost will undoubtedly result in revision and refinement of this 30-year plan over time.

Much like technology, energy policy is not stagnant. The Companies are confident in the foundational strategy upon which the 2021 Joint IRP is built, and that the sound decision-making reflected in this filing provides the resources and flexibility to respond positively to changing policy directives.

Figures S-1 and S-2 illustrate the dramatic decarbonizing changes relative to the 2018 Joint IRP.

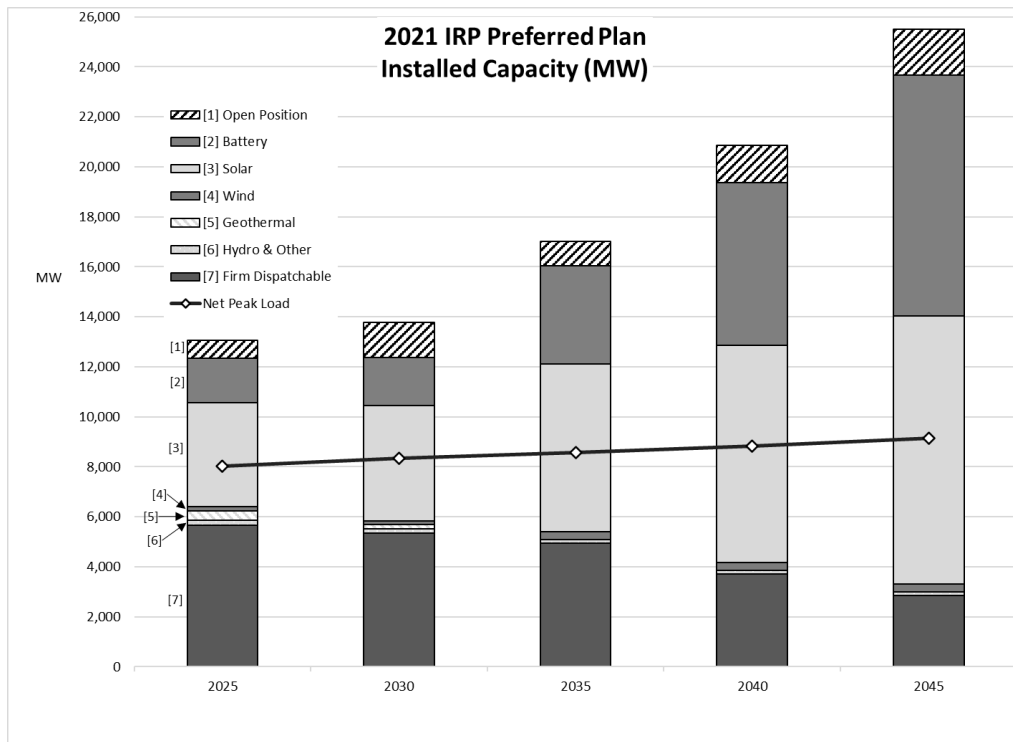
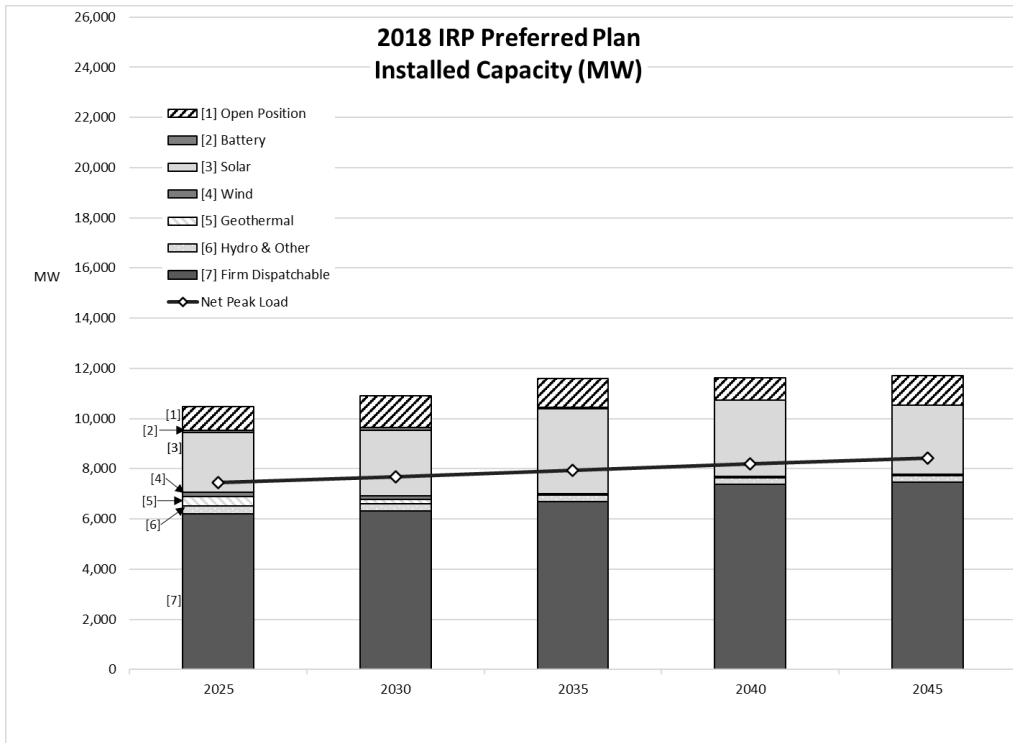
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<sup>2</sup> “LA100: The Los Angeles 100% Renewable Energy Study”, authored by NREL, <https://maps.nrel.gov/la100/report>, March 2021.

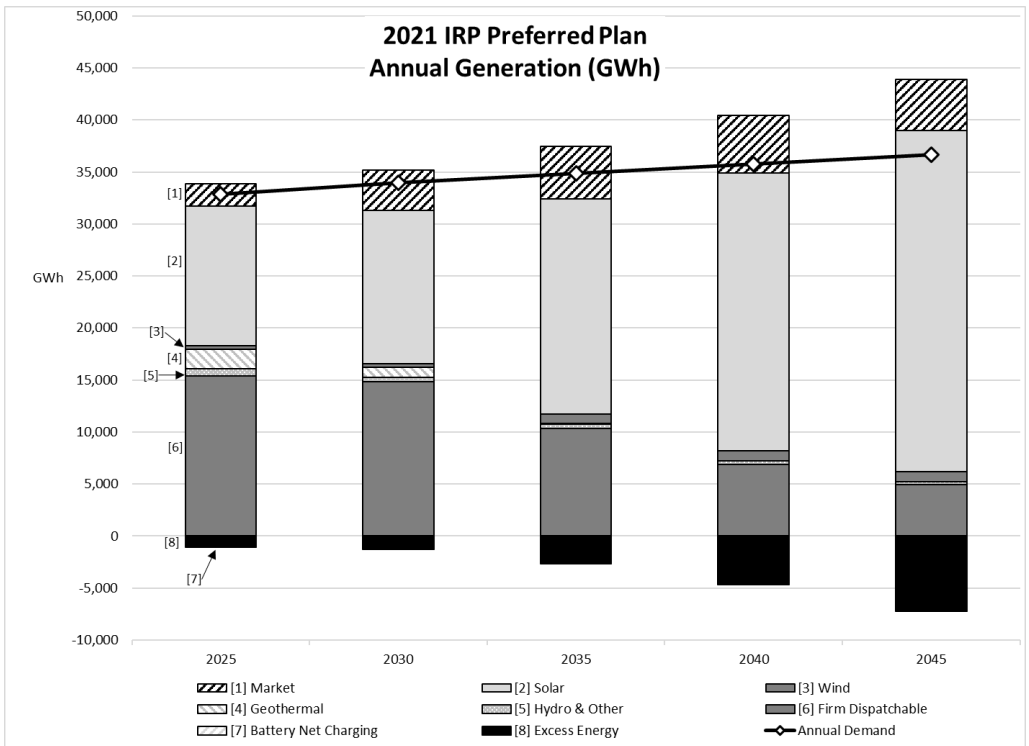
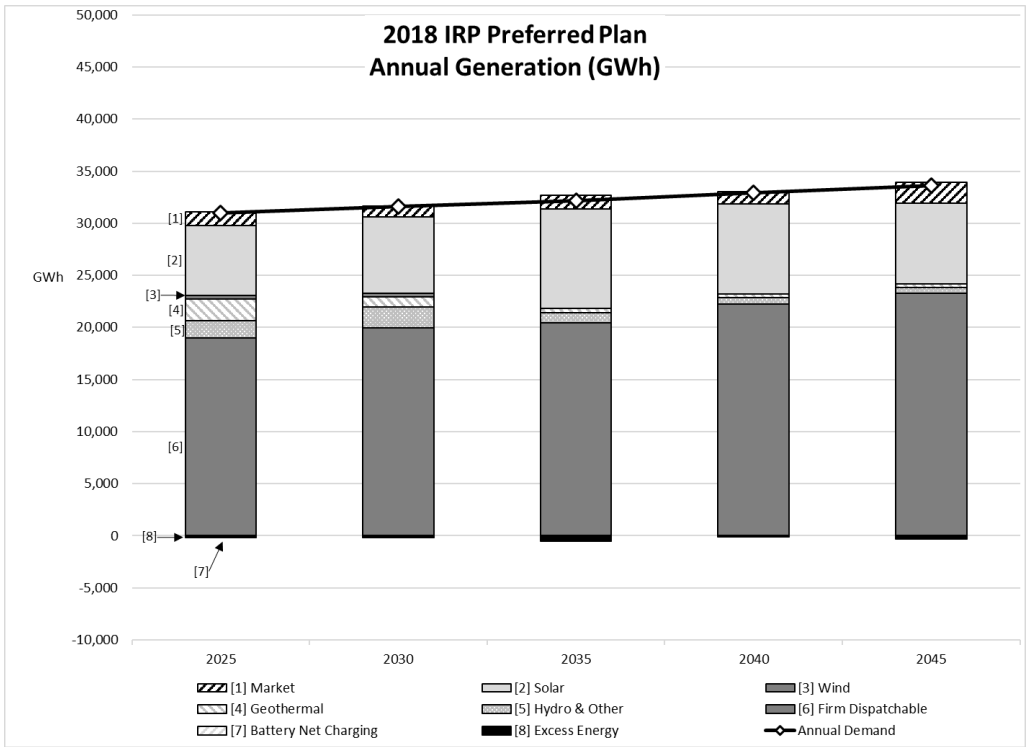
<sup>3</sup> NAC 704.9215.2.

<sup>4</sup> Docket 20-07023, Phase II hearing, February 24, 2021, p. 716 of transcript.

**FIGURE S-1  
COMPARISON OF PREFERRED PLANS, 2018 TO 2021, INSTALLED CAPACITY**



**FIGURE S-2  
COMPARISON OF PREFERRED PLANS, 2018 TO 2021, GENERATION**





***2. In light of the resource adequacy challenges across the west in August of 2020 and the increasing amount of variable resources in the NV Energy resource mix, the 2021 Joint IRP takes steps to further ensure reliability and resource adequacy companywide***

As further described in the filing, the 2021 Joint IRP makes use of new trended weather load forecasts and an updated planning reserve margin (“PRM”). To further ensure resource adequacy considering market purchases commitments that were not honored by sellers in August of 2020, the 2021 Joint IRP has a reduced reliance on market purchases relative to prior plans. Each plan includes 66 MW of grid-tied BESS and 192 MW of generation upgrades in the Action Plan period, which will increase capacity in the short term while also providing long-term resources.

In addition, due to the development of portfolios with large quantities of variable renewable resources in which available resources drop rapidly in the evening hours, a new paradigm is engaged for evaluation of the hour with the largest open position in addition to the traditional evaluation of the peak load hour to ensure reliability. Traditionally, these two hours were one and the same, but with increasingly renewable portfolios, these two hours have become distinct from each other, with the largest open position falling later in the evening.

These adjustments better position NV Energy for changing conditions due to climate change and increasing decarbonization in the west and Nevada, in particular, in addition to other factors.

***3. The Preferred and Alternate Plans presented in the 2021 Joint IRP set in motion the replacement of Valmy with renewable resources while maintaining regional transmission system reliability***

NV Energy evaluated a range of supply side investments and alternatives to replace the Valmy and increase the supply of electricity. The Companies’ primary analysis considered four alternative plans to pursue in a long-term planning scenario. Each plan meets or exceeds the current RPS in every year, meets the new 16 percent PRM for each utility, excludes Valmy 1 from economic dispatch as of December 31, 2021, and includes 66 MW of grid-tied BESS and 192 MW of generation upgrades in the Action Plan period.

- 1) **Iron\_Hot Plan:** The Companies propose two company-owned renewable generators to replace Valmy Units 1 and 2. The ownership of these units is shared between the Companies with 75 percent going to Nevada Power and 25 percent to Sierra.

- a. Iron Point – A 250 MW solar photovoltaic (“PV”) system paired with 200 MW of battery storage. The project has an in-service date of December 2023. Commercial operation of Iron Point is needed and intended to replace Valmy Unit 1.
  - b. Hot Pot – A 350 MW solar PV system paired with 280 MW of battery storage. The project’s in-service date is projected to be December 2024. Commercial operation of Hot Pot is needed and intended to replace Valmy Unit 2.
- 2) **Repower Valmy Plan:** This plan does not include Iron Point or Hot Pot, but instead the Companies propose to repower the Valmy coal-fired boilers to combust natural gas only. The repowered units will be available by summer 2026. The converted units will be retired at the end of 2033.
  - 3) **Net-Zero Plan:** This plan achieves the state’s net-zero carbon dioxide emissions goal in 2050. The plan includes the replacement of the Valmy coal-fired boilers with the Iron Point and Hot Pot, and battery storage projects as described in the Iron\_Hot Plan above.
  - 4) **Net-Zero with GEO (“Geo”) Plan:** This plan achieves the state’s net-zero carbon dioxide emissions goal in 2050. The plan includes the replacement of the Valmy coal-fired boilers with the Iron Point and Hot Pot and battery storage projects as described in the Iron\_Hot Plan. In addition, 500 MW of geothermal placeholders are included, displacing other placeholder resources used in the Net-Zero Plan. Further, this plan, combined with the Net-Zero Plan, satisfies a requirement in Directive 4 in the Commission’s March 22, 2021 Fourth Amendment Order.<sup>5</sup>

NV Energy selected the Net-Zero Plan as its Preferred Plan and the Iron\_Hot Plan as its Alternate Plan. Both plans assume Valmy Unit 1 is excluded from economic dispatch as of December 31, 2021, and replace the Valmy coal-fired boilers with clean renewable energy, effectively removing the last coal-fired units from the NV Energy portfolio. The plans are responsible, recognizing the critical services that generation located outside Winnemucca, Nevada provides to the northern Nevada bulk electric system, and the role Valmy plays in serving the Carlin Trend and the economies of Humboldt, Pershing, Churchill, Lander, Eureka and Elko counties. Both plans bolster clean generation in this part of the state with a combined 600 MW of solar PV and 480 MW of battery storage located in Humboldt County.

While the Iron\_Hot Plan is less expensive, the Net-Zero Plan goes much further in decarbonizing the electric grid in Nevada, realizing net-zero carbon dioxide emissions in 2050. It achieves the continued transition of the Companies’ energy supply portfolio, while also reducing costs and risk. Analysis by NERA Economic Consulting (“NERA”) indicates that the present value of environmental costs is, on average, 9 percent lower in the cases that achieve the state’s net-zero

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<sup>5</sup> See Docket No. 20-07023, Order, p.289, Directive 4 (March 22, 2021).

carbon goal, and the present worth of societal costs is lowest for the Net-Zero Plan. The Net-Zero Plan also leads to substantially greater annual average gains to the Nevada economy—including gross state product, personal income, state and local tax revenue, and employment—than the Iron\_Hot\_Plan. It is clear that the investment in additional renewable resources in the Net-Zero Plan pays off in greater gains to the state economy and greater benefits to the environment. NV Energy selected the Net-Zero Plan as it is most closely aligned with Nevada’s evolving energy policy and delivers the resources its customers value.

***4. The demand side management and distributed resources plans produce energy savings and deliver benefits to the Nevada communities that NV Energy serves***

NV Energy’s proposal cost-effectively meets the state’s 1.1 percent of retail sales energy savings goal by offering a wide variety of programs. The 2021 Joint IRP administers a strong demand response program, which reduces demand and supports system reliability, while expanding distribution level projects and programs. In total, NV Energy proposes to spend \$182 million on energy efficiency and demand response programs during the Action Plan period.

Investment in demand side management (“DSM”) programs benefits customers in several respects. First, they reduce the total cost of delivering electricity in the long-term. Second, they provide environmental benefits by reducing the consumption of, and therefore, the need to produce electricity. Third, energy efficiency programs provide direct and indirect economic benefits to the communities we serve. Fourth, energy efficiency programs provide direct bill savings to customers who participate in the programs. Overall, NV Energy estimates that this DSM plan produces \$504 million of net benefits over the Action Plan period to the communities the Companies serve. While DSM programs have the potential to reduce costs including social costs, they generally increase the rates paid by customers in the short-term.

In complying with the requirements of NRS § 704.741(5), the Companies’ are filing its’ first triennial IRP that incorporates a DRP. The DRP presents a thoughtful and structured approach to a new integrated planning paradigm ranging from the electric distribution system up to the energy supply level that cost-effectively facilitates increasing amounts of distributed energy resources (“DERs”) and leverages their benefits for both NV Energy and its customers.

***5. Conclusion***

The Net-Zero Plan provides NV Energy’s customers the best value. NV Energy respectfully requests that the Commission accept and approve this comprehensive integrated plan that the Companies recommend for first meeting the state’s clean energy policies and goals and then meeting the energy demands and needs of the communities and customers that NV Energy serves.

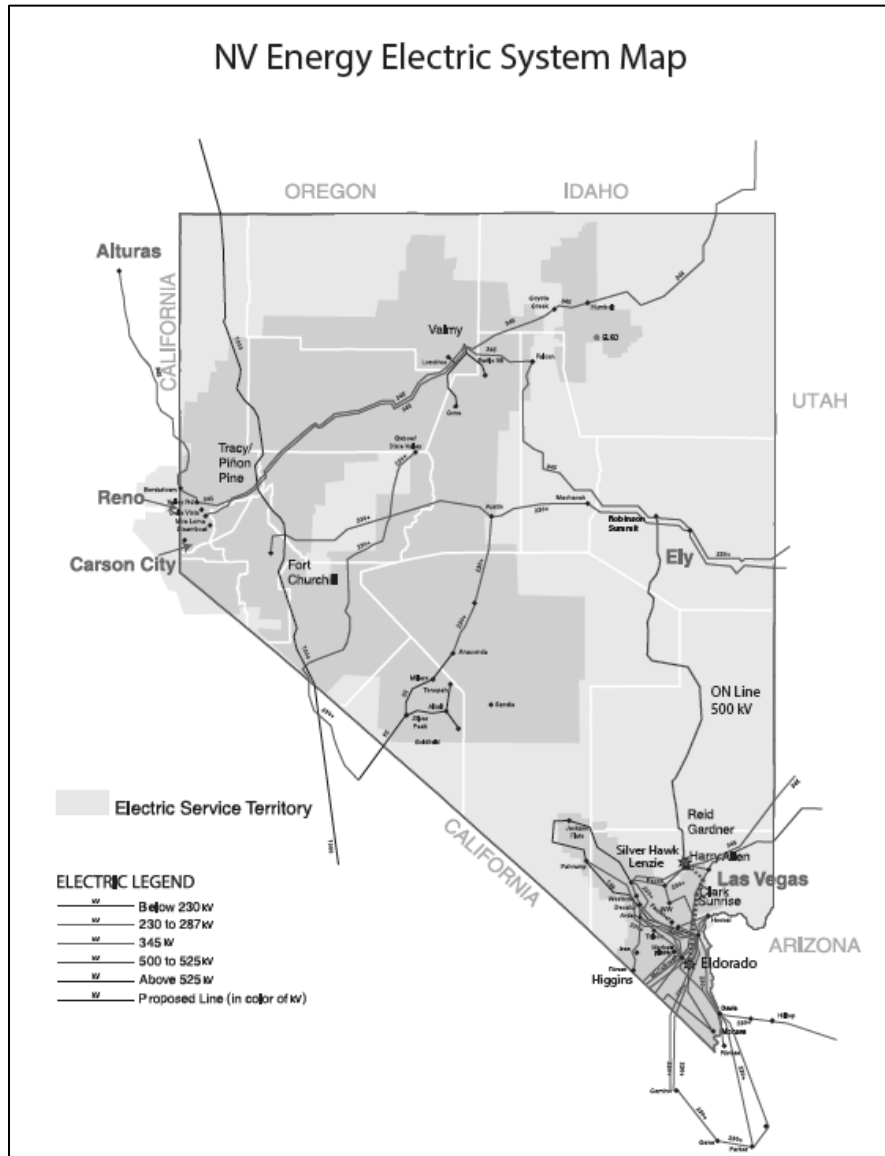
## SECTION II – INTRODUCTION TO COMPANIES: NAC § 704.9215(2)(a)

*Nevada Power and Sierra Described.* Nevada Power and Sierra are fully regulated “public utilities,” subject to the jurisdiction and oversight of the Commission and the Federal Energy Regulatory Commission (“FERC”). Jointly, Nevada Power and Sierra provide approximately 90 percent of Nevada’s electrical power.<sup>7</sup> Nevada Power and Sierra provide all-in electric service to residential, commercial and industrial customers in northern and southern Nevada at rates and under terms and conditions reviewed and approved by the Commission. Nevada Power and Sierra also provide distribution-only service to very large commercial customers that have received permission to procure their own energy through an alternative energy provider. Distribution-only service is provided to these large commercial customers at rates and under terms and conditions reviewed and approved by the Commission. Finally, Nevada Power and Sierra provide transmission service to customers who interconnect directly to the transmission system, or who use the transmission system to import or export energy into and out of Nevada. Transmission service is provided to transmission customers at rates and under terms and conditions reviewed and approved by the FERC.

The nearly 2,500 employees of Nevada Power and Sierra support the generation, transmission and distribution of electric energy to over 1.3 million bundled customers statewide, covering approximately 45,000 square miles. Together, Nevada Power and Sierra serve peak loads of 7,869 MW with capacity primarily sourced from a combination of more than 50 Nevada renewable resources, a small fleet of Nevada-based modern, clean-burning natural gas facilities, and market purchases. Between 2005 and 2020, the Companies have been transitioning away from conventional generation and into renewable energy, reducing Nevada’s carbon emissions from electric production by approximately 50 percent. The Companies have one remaining coal facility set to retire in 2025, which, if approved by the Commission, will be replaced with 600 MW of solar PV with 480 MW BESS.

A map of Nevada Power’s and Sierra’s electric service territories, as well as the bulk transmission system that delivers energy into and out of Nevada is set forth below in Figure S-3.

**FIGURE S-3  
NV ENERGY SERVICE TERRITORIES**



**Resource Planning Described.** Beginning in 1983, the Legislature gave the Commission oversight authority over the long-term planning for energy resources. Every three years, Nevada Power and Sierra formulate and present a Preferred Plan for meeting the long-term needs of customers. Until 2018, Sierra and Nevada Power prepared separate plans that they filed in staggered years. In 2017, the Nevada Legislature modified the resource planning statutes to require the Companies submit a joint IRP on or before June 1<sup>st</sup> every three years. Like the separate IRPs prepared in the past, this 2021 Joint IRP begins with projections of customers’ load requirements and the resources the Companies have under contract or own, with which they can serve customers’ load requirements. The Companies then prepared a long-term plan in which they lay out in detail their proposals for filling projected needs with programs that reduce energy consumption, and requests to build new

renewable generation and transmission to access these new resources. As mentioned above, the Companies' Preferred Plan in this 2021 Joint IRP proposes to meet the state's clean energy policies and goals, reduce energy consumption with a significant investment in DSM programs, and to meet the shortfall between load and resources with 600 MW of solar PV generation, 550 MW of battery storage, and nearly 200 MW of generation upgrades.

***IRP and Action Plan Period.*** This 2021 Joint IRP filing addresses the 30-year planning period 2022 to 2051. The Companies' Preferred Plan and Alternative Plans are formulated and compared to one another using advanced economic analysis techniques. This Joint IRP includes an "Action Plan," which details the steps that the Companies will take over the three-year period January 1, 2022 to December 31, 2024 to implement the Preferred Plan. The Action Plan filed with this 2021 Joint IRP, attached to this Summary Volume as Appendix A for convenience, includes a description of the costs, timeline, and planning activities for each recommended project. A more detailed description of each project is provided in detailed narratives that are included in the 2021 Joint IRP.

### **SECTION III - FORECAST OF GROWTH: NAC § 704.9215(2)(b)**

***Summary of Findings.*** Despite impacts from the COVID-19 pandemic in 2020, Nevada Power's and Sierra's respective service territories have experienced sales growth over the last five years, fueled at Nevada Power by retail growth, and at Sierra by mining, production facilities, data centers and other energy intensive industries. Nevada Power residential customer counts have increased at an annual average growth of 1.7 percent over the last five years while small commercial and industrial ("Small C&I") customers have grown at an average 1 percent rate. At Sierra, residential customers grew on average 1.1 percent and Small C&I customers at 0.5 percent over the same time period.

Nevada Power's residential weather-adjusted sales grew 0.4 percent. Sierra's residential sales grew at 0.8 percent per year on average over the last five years. Small C&I weather adjusted sales showed a slight decrease at Nevada Power and a nominal 0.1 percent increase at Sierra for the same time period.

Residential sales are expected to continue to grow over the next 10 years, but at a slow rate as customer additions are partially offset by declines in use-per-customer due to company-sponsored DSM and external energy efficiency initiatives (*e.g.*, changes in the LED light bulb standard that took effect in 2020). Residential sales over the next 10 years are expected to grow at an average annual rate of 0.5 percent at both Nevada Power and Sierra. Small C&I sales are projected to grow an average of 1.5 percent annually between 2021 and 2031 for Nevada Power and 0.8 percent for Sierra.

At Nevada Power, Large C&I sales have declined over the past five years due to decisions by several large customers moving to distribution only service (“DOS”). This trend is reversing as over the upcoming 10-year period 2021 through 2031, sales in this class are expected to increase at 2.2 percent on average at Nevada Power and 1.6 percent at Sierra, as a large mining customer is projected to transfer from bundled service to DOS in 2023.

At Nevada Power weather adjusted summer peak load is projected to increase from 5,880 MW in 2021 to 6,410 MW in 2031, a 10-year annual growth rate of 0.9 percent. At Sierra, the weather-adjusted summer peak load is projected to increase from 1,923 MW in 2021 to 1,972 MW in 2031.

***Basis for the Load Forecast.*** The 2021 IRP load forecast (“2021 IRP Forecast”) database was updated with actual data through December 2020. The 2021 IRP Forecast was completed in March 2021 and covers calendar years 2021 through 2041 with updates for a number of inputs from prior load forecasts. The 2021 IRP Forecast includes updates to the following important forecast inputs.

***Population Growth.*** Both Companies’ residential and Small C&I customer forecasts are driven by population. Sources for population history include the State Demographer and I.H.S. Global Insight (“GI”). Nevada Power models include a Clark County population forecast based on the historical population prepared by the State Demographer. The 2021 IRP Forecast is an extrapolation of historical population series using the annual growth rates obtained from the October 2020 release of the University of Nevada, Las Vegas’ Center for Business and Economic Research’s long-term forecast. Sierra’s models use northern Nevada’s population history and forecast, which is Nevada minus Clark County’s population. The forecast used a blended average of the GI and State Demographer growth rates, as the State Demographer forecasted growth was inconsistent with recent historical residential customer growth.

Figure S-4 shows the population forecasts for Nevada Power and Sierra from 2021 through 2041. For the 10-year period from 2021 through 2031, the Nevada Power Compound Annual Growth Rate (“CAGR”) used in the forecast is 1.7 percent. The Sierra CAGR used in the forecast for that time period is 1.4 percent.

**FIGURE S-4  
POPULATION FORECAST**

Year	Population		
	NVE	NPC	Sierra
2021	3,864,898	2,361,000	1,503,898
2022	3,938,307	2,403,000	1,535,307
2023	4,023,535	2,458,000	1,565,535
2024	4,101,062	2,509,000	1,592,062
2025	4,171,705	2,555,000	1,616,705
2026	4,235,818	2,598,000	1,637,818
2027	4,293,257	2,636,000	1,657,257
2028	4,346,101	2,671,000	1,675,101
2029	4,393,062	2,702,000	1,691,062
2030	4,435,717	2,731,000	1,704,717
2031	4,474,406	2,757,000	1,717,406
2032	4,510,054	2,781,000	1,729,054
2033	4,544,990	2,804,000	1,740,990
2034	4,579,006	2,826,000	1,753,006
2035	4,611,648	2,847,000	1,764,648
2036	4,644,328	2,868,156	1,776,172
2037	4,677,239	2,889,469	1,787,770
2038	4,710,383	2,910,941	1,799,442
2039	4,743,761	2,932,572	1,811,189
2040	4,777,375	2,954,364	1,823,011
2041	4,808,444	2,976,318	1,832,126
CAGR			
21-31	1.6%	1.7%	1.4%
21-41	1.2%	1.3%	1.1%

**Employment and Output Trends.** Real output drives the Small and Large C&I customer and sales forecasts. While the Nevada economy was shocked in 2020 by COVID-19, the state is recovering with estimated strong economic growth of 4.2 percent for Nevada Power and 3.5 percent at Sierra during the 2021 to 2031 period.

**Hotel/Motel Room Increasing.** Historically, the resort and hotel/motel industry has been a significant driver of growth in Nevada Power’s service territory. However, beginning in 2011, no major hotel/casino properties have been constructed as the industry moved to property renovations.



This condition is changing as Resort's World's 3,000 room property is opening in early summer 2021. While other properties are likely to move forward in the years to come, overall slow growth is assumed for the forecast absent Resorts World's opening.

**Large customer assumptions.** For Nevada Power, incremental additional load has been added to the forecast for Allegiant Stadium, the new Resorts World hotel in 2021, and data center sites planned to begin ramping up in 2022 and 2023. At Sierra, significant load growth is projected in the Tri-Center Industrial development park east of Reno, where distribution facilities capable of adding more than 1,000 GWh of load by 2023 have been requested.

**Normal Weather.** The regulations governing integrated resource planning require that forecasts of peak demand and energy consumption account for "normal" weather conditions. The 2021 IRP Forecast is based on a weather normalized peak demand and energy consumption based on historical and forecasted normal monthly heating degree days ("HDDs") and cooling degree days ("CDDs"). Normal weather concepts include monthly HDDs and CDDs, and peak day temperatures. Weather normalization for the 2021 IRP Forecast utilized the 20-year historical trended normal calculations over the January 2000 through December 2020 period.

**Distribution-Only Service.** Very large commercial customers who have received permission from the Commission to procure their own energy receive "wires only" service from Nevada Power and Sierra are termed DOS customers. Because they have elected to procure their own energy, DOS customers must be separately accounted for in the Companies' load forecast. The 2021 IRP Forecast has removed several large customers who have moved to DOS over the past few years from the historical bundled service database for use in developing the forecast. Further, a large mine in Sierra's territory is currently forecasted to take DOS beginning in 2023.

**DSM and Demand Reduction.** The incremental annual reductions in load attributed to DSM in the 2021 IRP Forecast are based on the 2021 DSM plan filed as a part of this Joint IRP filing. These forecasted reductions are based on the 1.1 percent of sales statewide goal. Figure S-5 compares the DSM savings estimated in the 2021 IRP Forecast compared to the level of DSM savings from the previous 2020 Fourth Amendment forecast. The reductions underlying this updated forecast are lower for residential customers while higher for commercial customers over the period.

**FIGURE S-5  
NV ENERGY DSM SAVINGS COMPARISON**

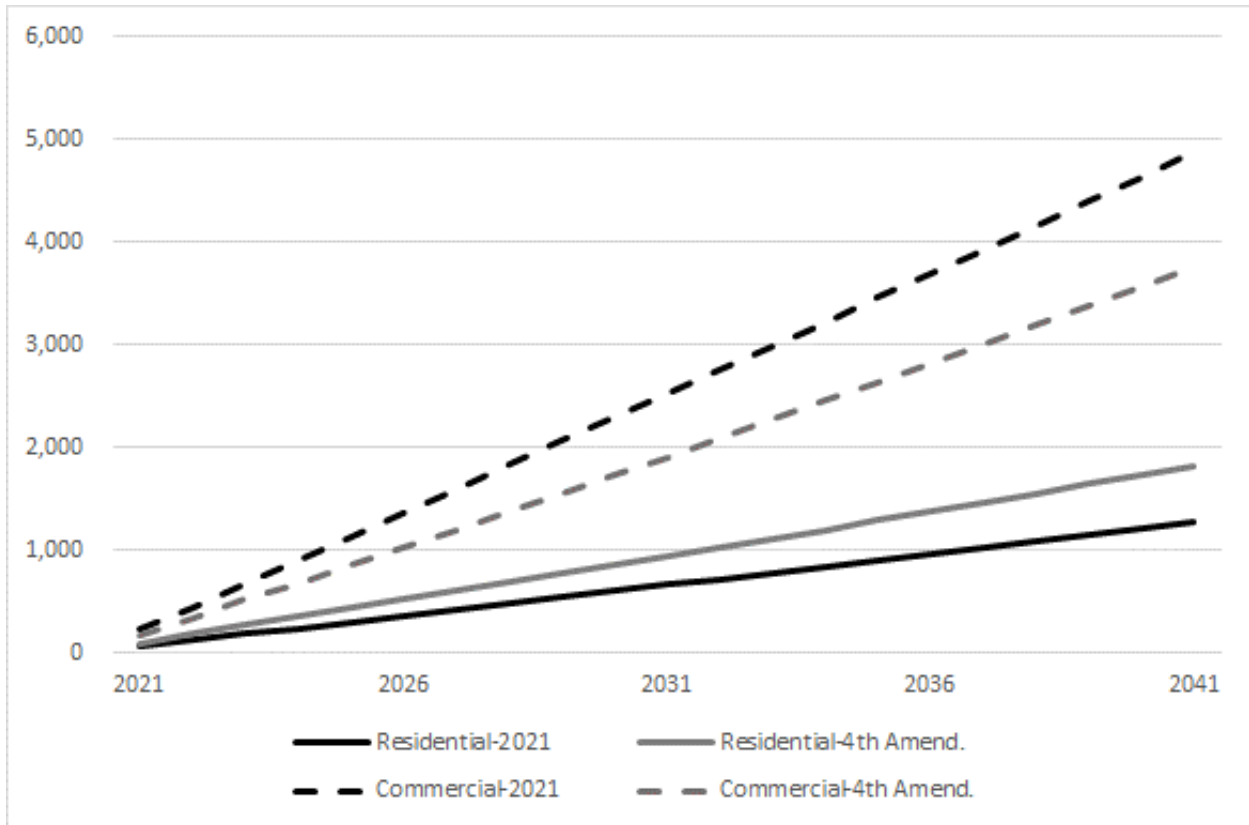


Figure S-6 summarizes the DSM savings by program for Nevada Power from years in the 2021-2041 range. Figure S-7 provides the same information for Sierra.

**FIGURE S-6  
NEVADA POWER DSM SAVINGS BY PROGRAM**

	2021	2022	2023	2024	2025	2030	2035	2040	2041
<b>Residential Portfolio</b>									
Residential Lighting	14,137	14,260	14,373	14,452	14,367	14,491	14,538	14,551	14,520
Residential Direct Install	1,325	1,337	1,347	1,355	1,347	1,359	1,363	1,364	1,361
HER	9,720	9,804	9,882	9,936	9,877	9,963	9,995	10,004	9,983
Energy Education- Kits	212	214	216	217	216	217	218	218	218
Energy Assessments	7,245	7,308	7,366	7,407	7,363	7,427	7,451	7,457	7,442
Low Income	1,366	1,378	1,389	1,396	1,388	1,400	1,404	1,406	1,403
Residential Air Conditioning	4,771	4,813	4,851	4,878	4,849	4,891	4,907	4,911	4,901
Pool Pumps	2,319	2,339	2,358	2,371	2,357	2,377	2,385	2,387	2,382
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
<b>Total Residential Portfolio</b>	<b>41,096</b>	<b>41,452</b>	<b>41,781</b>	<b>42,010</b>	<b>41,763</b>	<b>42,124</b>	<b>42,261</b>	<b>42,298</b>	<b>42,210</b>
<b>Commercial Portfolio</b>									
Business Energy Services	136,281	138,945	140,810	141,632	140,626	141,150	142,539	145,010	145,189
Schools Program	11,045	11,261	11,412	11,479	11,397	11,440	11,552	11,752	11,767
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
<b>Total Commercial Portfolio</b>	<b>147,326</b>	<b>150,206</b>	<b>152,222</b>	<b>153,111</b>	<b>152,023</b>	<b>152,590</b>	<b>154,091</b>	<b>156,762</b>	<b>156,956</b>
<b>Total Residential and Commercial</b>	<b>188,422</b>	<b>191,658</b>	<b>194,003</b>	<b>195,121</b>	<b>193,786</b>	<b>194,714</b>	<b>196,352</b>	<b>199,060</b>	<b>199,165</b>

**FIGURE S-7  
SIERRA DSM SAVINGS BY PROGRAM**

	2021	2022	2023	2024	2025	2030	2035	2040	2041
<b>Residential Portfolio</b>									
Residential Lighting	8,173	8,101	8,164	8,096	8,136	8,469	8,457	8,545	8,535
Residential Direct Install	701	694	700	694	697	726	725	732	732
HER*	5,838	5,787	5,832	5,783	5,812	6,050	6,041	6,103	6,097
Energy Education	140	139	140	139	139	145	145	146	146
Energy Assessments	2,370	2,349	2,368	2,348	2,360	2,456	2,453	2,478	2,475
Low Income	620	615	620	615	618	643	642	649	648
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
<b>Total Residential Portfolio</b>	<b>17,842</b>	<b>17,686</b>	<b>17,823</b>	<b>17,675</b>	<b>17,762</b>	<b>18,489</b>	<b>18,462</b>	<b>18,653</b>	<b>18,633</b>
<b>Commercial Portfolio</b>									
Business Energy Services	70,672	62,587	63,986	66,416	67,884	72,932	72,268	71,986	71,944
Schools Program	9,924	8,789	8,985	9,327	9,533	10,242	10,148	10,109	10,103
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
Placeholder	-	-	-	-	-	-	-	-	-
<b>Total Commercial Portfolio</b>	<b>80,596</b>	<b>71,376</b>	<b>72,971</b>	<b>75,743</b>	<b>77,417</b>	<b>83,174</b>	<b>82,416</b>	<b>82,095</b>	<b>82,047</b>
<b>Total Residential and Commercial</b>	<b>98,438</b>	<b>89,061</b>	<b>90,794</b>	<b>93,417</b>	<b>95,179</b>	<b>101,663</b>	<b>100,878</b>	<b>100,748</b>	<b>100,680</b>

***Solar PV Programs.*** Reductions in system demand and energy requirements reflect solar PV energy production that is used by customers at their premise. Forecasted solar PV penetration is based on recent installation counts and system sizes at both Nevada power and Sierra. The 2021 IRP Forecast assumptions are consistent with the Commission’s order in Docket No. 17-07026 and Assembly Bill 405 (“AB 405”) (2017 Legislature). The total (incremental from 2017) additional solar PV for Small and Large C&I customers, most of which is not covered under AB 405, amounts to about 340 MW across Nevada.

***Energy storage behind the meter.*** No assumption for energy storage was made in the 2021 IRP Forecast due to lack of data on the operating characteristics of storage, either stand-alone or coupled with solar PV. Storage will be included in future forecasts as storage operating data is collected from meters installed on all new storage devices to measure the impact of the device on customer usage and system operations.

***Low, Base and High Scenarios.*** Consistent with prior practice (and Commission regulations), high and low load forecast scenarios were developed for the 2021 IRP Forecast. The high and low load forecast scenarios are based on different assumptions of economic, demographic, hotel/motel room and large customer growth than the base forecast. The assumptions for demand response, electric vehicles, and net metering were not varied in these forecasts. The DSM assumptions were consistent with the expected 1.1 percent goal, so both the high and low forecasts have different DSM than the base forecast.

***704B Annual Limits.*** New in 2021 IRP Forecast is the addition of the calculation of annual limits for both Nevada Power and Sierra large C&I customers who are eligible to choose to exit bundled service and purchase energy from a third-party provider pursuant to NRS Chapter 704B. In this proceeding, the annual limits proposed are 97,172 MWh at Nevada Power and 0 MWh at Sierra, due to current transmission system import capacity constraints.

***Required Figures.*** The regulations governing resource planning require that certain figures be included in the IRP Summary. Figures S-8 and S-9 show the forecast of peak demand for each of the 20 years in the planning period, under the low, base, and high scenarios, with and without DSM, for Nevada Power and Sierra respectively, and summarizes the peak impacts by program. Figures S-10 and S-11 show the forecast of energy sales for each of the 20 years of planning period under the low, base, and high scenarios, both with and without DSM for Nevada Power and Sierra. Solar PV is not classified as DSM, so is included in the without DSM numbers.

**FIGURE S-8  
NEVADA POWER LOW, BASE, AND HIGH PEAK DEMAND SCENARIOS  
WITH AND WITHOUT DSM**

Year	Peak Demand (MW) With DSM/DR			Peak Demand (MW) Without DSM/DR		
	Low	Base	High	Low	Base	High
2021	5,860	5,880	5,904	6,025	6,046	6,070
2022	5,909	5,949	6,003	6,095	6,135	6,189
2023	5,957	6,038	6,119	6,175	6,256	6,337
2024	5,994	6,125	6,222	6,236	6,367	6,464
2025	5,949	6,127	6,236	6,224	6,402	6,511
2026	5,949	6,160	6,288	6,252	6,463	6,591
2027	6,005	6,243	6,396	6,342	6,581	6,733
2028	6,053	6,314	6,495	6,411	6,671	6,852
2029	6,061	6,337	6,552	6,454	6,731	6,946
2030	6,084	6,372	6,624	6,501	6,789	7,041
2031	6,113	6,410	6,703	6,562	6,859	7,151
2032	6,159	6,460	6,788	6,632	6,933	7,262
2033	6,201	6,504	6,875	6,671	6,974	7,345
2034	6,269	6,574	6,993	6,766	7,070	7,489
2035	6,284	6,590	7,060	6,794	7,100	7,570
2036	6,312	6,620	7,144	6,846	7,154	7,678
2037	6,355	6,663	7,242	6,889	7,197	7,777
2038	6,391	6,698	7,337	6,935	7,242	7,881
2039	6,458	6,758	7,460	6,959	7,259	7,960
2040	6,496	6,793	7,545	7,051	7,348	8,100
2041	6,548	6,844	7,652	7,105	7,401	8,209

**FIGURE S-9  
SIERRA LOW, BASE, AND HIGH PEAK DEMAND SCENARIOS  
WITH AND WITHOUT DSM**

Year	Peak Demand (MW) With DSM/DR			Peak Demand (MW) Without DSM/DR		
	Low	Base	High	Low	Base	High
2021	1,917	1,923	1,937	1,955	1,961	1,976
2022	1,781	1,801	1,830	1,835	1,855	1,884
2023	1,799	1,840	1,877	1,871	1,912	1,949
2024	1,820	1,876	1,920	1,907	1,963	2,008
2025	1,843	1,913	1,969	1,945	2,015	2,071
2026	1,800	1,876	1,949	1,916	1,993	2,066
2027	1,827	1,902	1,997	1,950	2,025	2,120
2028	1,865	1,939	2,061	2,011	2,085	2,207
2029	1,890	1,961	2,095	2,051	2,122	2,256
2030	1,893	1,964	2,096	2,069	2,140	2,272
2031	1,900	1,972	2,106	2,090	2,162	2,295
2032	1,901	1,972	2,105	2,091	2,162	2,295
2033	1,909	1,979	2,111	2,110	2,180	2,312
2034	1,917	1,988	2,121	2,134	2,205	2,339
2035	1,923	1,993	2,125	2,142	2,212	2,344
2036	1,933	2,004	2,135	2,155	2,226	2,357
2037	1,944	2,016	2,147	2,169	2,240	2,372
2038	1,950	2,021	2,151	2,162	2,233	2,363
2039	1,962	2,033	2,162	2,176	2,246	2,376
2040	1,971	2,041	2,170	2,202	2,272	2,401
2041	1,977	2,047	2,174	2,210	2,279	2,406

**FIGURE S-10**  
**NEVADA POWER LOW, BASE, AND HIGH SALES SCENARIOS**  
**WITH AND WITHOUT DSM**

Year	Peak Demand (MW) With DSM/DR			Peak Demand (MW) Without DSM/DR		
	Low	Base	High	Low	Base	High
2021	20,720	20,793	20,863	20,908	20,982	21,051
2022	21,205	21,382	21,554	21,585	21,762	21,934
2023	21,521	21,874	22,143	22,095	22,447	22,716
2024	21,689	22,236	22,571	22,457	23,005	23,339
2025	21,590	22,308	22,704	22,553	23,270	23,667
2026	21,610	22,423	22,919	22,766	23,579	24,075
2027	21,801	22,690	23,308	23,152	24,040	24,658
2028	21,910	22,860	23,613	23,455	24,405	25,158
2029	21,984	22,975	23,877	23,724	24,716	25,618
2030	22,051	23,074	24,134	23,986	25,009	26,069
2031	22,166	23,214	24,435	24,296	25,344	26,565
2032	22,339	23,403	24,744	24,665	25,728	27,069
2033	22,467	23,535	25,015	24,988	26,056	27,536
2034	22,611	23,687	25,318	25,328	26,404	28,035
2035	22,760	23,843	25,635	25,673	26,756	28,548
2036	22,947	24,041	26,001	26,057	27,151	29,112
2037	23,067	24,165	26,300	26,375	27,473	29,608
2038	23,219	24,317	26,637	26,724	27,823	30,143
2039	23,368	24,465	26,979	27,073	28,169	30,683
2040	23,543	24,640	27,353	27,446	28,543	31,257
2041	23,655	24,749	27,661	27,757	28,852	31,764

**FIGURE S-11  
SIERRA LOW, BASE, AND HIGH SALES SCENARIOS  
WITH AND WITHOUT DSM**

Year	Peak Demand (MW) With DSM/DR			Peak Demand (MW) Without DSM/DR		
	Low	Base	High	Low	Base	High
2021	10,457	10,474	10,598	10,555	10,572	10,696
2022	9,509	9,688	9,919	9,696	9,875	10,107
2023	9,595	9,945	10,259	9,873	10,224	10,537
2024	9,797	10,299	10,692	10,169	10,671	11,064
2025	9,933	10,551	11,051	10,400	11,018	11,518
2026	9,497	10,179	10,822	10,061	10,743	11,385
2027	9,728	10,415	11,262	10,390	11,077	11,924
2028	9,986	10,664	11,745	10,749	11,427	12,508
2029	10,171	10,840	12,037	11,036	11,704	12,902
2030	10,216	10,884	12,082	11,182	11,850	13,048
2031	10,234	10,903	12,101	11,301	11,971	13,168
2032	10,253	10,924	12,120	11,422	12,092	13,288
2033	10,271	10,942	12,138	11,541	12,211	13,407
2034	10,291	10,962	12,159	11,662	12,333	13,530
2035	10,314	10,987	12,184	11,786	12,458	13,656
2036	10,343	11,017	12,215	11,915	12,590	13,787
2037	10,366	11,042	12,239	12,039	12,715	13,912
2038	10,394	11,071	12,268	12,168	12,844	14,041
2039	10,425	11,101	12,298	12,299	12,976	14,173
2040	10,456	11,132	12,329	12,431	13,108	14,304
2041	10,480	11,157	12,352	12,556	13,233	14,428



**SECTION IV - DEMAND SIDE PLAN SUMMARY: NAC § 704.9215(2)(c)**

The DSM Plan as part of the 2021 Joint IRP represents an expansion of program activity over prior plans, and strikes a balance with energy savings and cost of those savings and impacts to NV Energy and its customers. Consistent with Senate Bill 150 and Assembly Bill 223 enacted by the 2017 Nevada Legislature, and the Commission’s regulations, the Companies are proposing programs to:<sup>6</sup>

- Achieve annual energy savings to reach an average of 1.1 percent of the weather normalized retail sales, by utility, over the three-year action plan period;
- Direct at least 5 percent of the total annual DSM portfolio expenditures towards low-income customers; and
- Achieve a DSM plan that optimize energy savings and is cost-effective as a whole.

The incremental investment represented by the proposed DSM Plan has a non-energy benefit total resource cost (“NTRC”) benefits-to-cost ratio of 2.55 and will bring a net benefit of \$180.7 million to the communities served by NV Energy. Figure S-12 below provides the proposed budget dollars and target 1.1 percent energy savings for Nevada Power, Sierra, and the combined Companies. NV Energy is requesting specific approval of the proposed budgets and energy savings for the DSM Plan for the Action Plan period.

**FIGURE S-12  
Budgets to Reach Energy Savings Targets**

<b>Nevada Power</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>Action Plan Total</b>
Budget	\$44,365,000	\$46,197,000	\$47,797,000	\$138,359,000
Retail Sales (kWh)	20,330,899,896	20,806,137,495	21,156,796,194	62,293,833,584
1.1% Target (kWh)	223,639,899	228,867,512	232,724,758	685,232,169
Energy Savings Target (kWh)	223,756,000	228,317,500	233,536,375	685,609,875
<b>% Energy Savings to Retail Sales</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>
<b>Sierra</b>				
Budget	\$13,934,000	\$14,631,000	\$15,146,000	\$43,711,000
Retail Sales (kWh)	8,553,322,061	8,804,856,380	9,135,310,851	26,493,489,292
1.1% Target (kWh)	94,086,543	96,853,420	100,488,419	291,428,382
Energy Savings Target (kWh)	94,655,000	96,845,000	99,937,000	291,437,000
<b>% Energy Savings to Retail Sales</b>	<b>1.11%</b>	<b>1.10%</b>	<b>1.09%</b>	<b>1.10%</b>
<b>NV Energy Combined</b>				
Budget	\$58,299,000	\$60,828,000	\$62,943,000	\$182,070,000
Retail Sales (kWh)	28,884,221,956	29,610,993,875	30,292,107,045	88,787,322,876
1.1% Target (kWh)	317,726,442	325,720,933	333,213,177	976,660,552
Energy Savings Target (kWh)	318,411,000	325,162,500	333,473,375	977,046,875
<b>% Energy Savings to Retail Sales</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>

<sup>6</sup> See Docket No. 17-08023, December 4, 2018.

NV Energy is proposing to deliver targeted savings by continuing its implementation strategies, which integrate energy efficiency and demand response programs by customer segment. Programs have been bundled into the following offerings: (1) Education Services; (2) Residential Services; and (3) Non-Residential Services. Budgets, savings, and cost-effectiveness have been presented at the program level to provide the same transparency as in prior year filings.

Pursuant to NAC § 704.9522, the Companies also request that the Commission review and approve the measurement and verification (“M&V”) reports for program year 2020 provided in Technical Appendix DSM-5 through DSM-17. NV Energy proposes to continue the same evaluation, measurement, and verification protocol or all of the proposed DSM programs for its 2022-2024 Action Plan period. NV Energy is proposing to update its current cost effectiveness model. The current cost effectiveness model (Portfolio Pro) has been used by NV Energy for more than 15 years. Given that technologies have significantly changed over the past 15 years, NV Energy is providing a new model (ACE guru <sup>TM</sup>) based on a more current technology.

#### **SECTION V - SUMMARY OF THE PREFERRED PLAN: NAC § 704.9215(2)(d)**

NAC § 704.937(8) requires that “the utility shall identify its preferred plan and fully justify its choice by setting forth the criteria that influenced the utility’s choice.” NAC § 704.937(6) requires that “the utility shall consider for each alternative plan the mitigation of risk by means of (a) flexibility; (b) diversity; (c) reduced size of commitments; (d) choice of projects that can be completed in short periods; (e) displacement of fuel; (f) reliability; (g) selection of fuel and energy supply portfolios; and (h) financial instruments or electricity products.” NAC § 704.948 requires that “a utility shall analyze its decisions, taking into account its assessment of risk and identifying particular risks with respect to: (a) costs, (b) reliability, (c) finances, (d) the volatility of the price of purchased power and fuel, and (e) any other uncertainties the utility has identified.”

The Companies have selected the Net-Zero Plan as the Preferred Plan, and the Iron\_Hot Plan as the Alternate Plan. The Action Plan period resources in each plan are listed below.

***Preferred Plan: Net-Zero Plan.*** This plan, which exceeds the RPS in every year, achieves the state’s net-zero carbon dioxide emissions goal in 2050 and meets the 16 percent PRM for each utility, includes:

- 1) 66 MW of grid-tied BESS, and
- 2) 192 MW of generation upgrades
- 3) Valmy Unit 1 is excluded from economic dispatch as of December 31, 2021.
- 4) Iron Point – A 250 MW PV system paired with 200 MW of battery storage. The project has an in-service date of December 2023. Commercial operation of Iron Point is needed and intended to replace Valmy Unit 1.

- 5) Hot Pot – A 350 MW solar PV system paired with 280 MW of battery storage. The project’s in-service date is projected to be December 2024. Commercial operation of Hot Pot is need and intended to replace Valmy Unit 2.

***Alternate Plan: Iron\_Hot Plan.*** This plan, which exceeds the RPS in every year and meets the 16 percent PRM for each utility, includes:

- 1) 66 MW of grid-tied BESS, and
- 2) 192 MW of generation upgrades
- 3) Valmy Unit 1 is excluded from economic dispatch as of December 31, 2021.
- 4) Iron Point – A 250 MW PV system paired with 200 MW of battery storage. The project has an in-service date of December 2023. Commercial operation of Iron Point is needed and intended to replace Valmy Unit 1.
- 5) Hot Pot – A 350 MW solar PV system paired with 280 MW of battery storage. The project’s in-service date is projected to be December 2024. Commercial operation of Hot Pot is need and intended to replace Valmy Unit 2.

While both plans contain the same resources in the action plan period, the Net-Zero Plan goes on to achieve the state’s 2050 net-zero carbon dioxide emissions goal. NV Energy selected the Net-Zero Plan as its Preferred Plan and the Iron\_Hot Plan as its Alternate Plan. The plans are responsible, recognizing the critical services that generation located outside Winnemucca, Nevada provides to the northern Nevada bulk electric system, and the role Valmy plays in serving the Carlin Trend and the economies of Humboldt, Pershing, Churchill, Lander, Eureka and Elko counties. Both plans bolster clean generation in this part of the state with a combined 600 MW of solar PV and 480 MW of battery storage located in Humboldt County.

Both plans exclude Valmy Unit 1 from economic dispatch as of December 31, 2021 and replace the Valmy coal-fired boilers with clean renewable energy. While the Iron\_Hot Plan is less expensive, the Net-Zero Plan goes much further in decarbonizing the electric grid in Nevada, realizing net-zero carbon dioxide emissions in 2050. It achieves the continued transition of the Companies’ energy supply portfolio, while also reducing costs and risk. NERA’s analysis indicates that the present value of environmental costs is 9 percent lower for the Net-Zero Plan than for the Iron\_Hot Plan. Indeed, the present worth of societal costs (present worth of revenue requirement plus present value of environmental costs) is lowest for the Net-Zero Plan of all four plans. The Net-Zero Plan also leads to substantially greater annual average gains to the Nevada economy—including gross state product, personal income, state and local tax revenue, and employment—than the Iron\_Hot Plan. It is clear that the investment in additional renewable resources in the Net-Zero Plan pays off in greater gains to the state economy and greater benefits to the environment. NV Energy selected the Net-Zero Plan as the Preferred Plan as it is most closely aligned with Nevada’s evolving energy policy and delivers the resources its customers value.

Figure S-13 shows the projected loads and resources (“L&R Tables”) under the Preferred Plan, assuming base load conditions. The Companies also developed high and low load sensitivities around the base load; the L&R Tables are presented in Technical Appendices.

**FIGURE S-13  
NV Energy Loads**

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Gross Peak	8,075	8,284	8,496	8,619	8,693	8,879	9,029	9,184	9,286	9,403	9,504	9,570	9,686	9,791	9,864	9,945	10,006	10,057	10,182	10,249
DSM	76	117	150	183	216	242	282	318	352	386	406	412	450	454	456	458	444	422	462	462
Private Generation	86	116	166	203	239	274	275	334	360	384	411	418	413	482	507	531	558	559	604	629
Avoided Capacity	163	173	180	193	202	218	220	235	239	251	255	257	261	271	277	277	284	285	281	267
Forecast System Peak	7,750	7,878	8,000	8,040	8,036	8,145	8,252	8,298	8,335	8,382	8,432	8,483	8,562	8,584	8,624	8,679	8,719	8,791	8,835	8,890
Sales Obligations																				
<b>NET System Peak</b>	<b>7,750</b>	<b>7,878</b>	<b>8,000</b>	<b>8,040</b>	<b>8,036</b>	<b>8,145</b>	<b>8,252</b>	<b>8,298</b>	<b>8,335</b>	<b>8,382</b>	<b>8,432</b>	<b>8,483</b>	<b>8,562</b>	<b>8,584</b>	<b>8,624</b>	<b>8,679</b>	<b>8,719</b>	<b>8,791</b>	<b>8,835</b>	<b>8,890</b>
Planning Reserves (16%)	1,240	1,261	1,280	1,286	1,286	1,303	1,320	1,328	1,334	1,341	1,349	1,357	1,370	1,373	1,380	1,389	1,395	1,407	1,414	1,422
<b>REQUIRED RESOURCES</b>	<b>8,990</b>	<b>9,139</b>	<b>9,280</b>	<b>9,326</b>	<b>9,322</b>	<b>9,448</b>	<b>9,572</b>	<b>9,626</b>	<b>9,669</b>	<b>9,723</b>	<b>9,781</b>	<b>9,840</b>	<b>9,932</b>	<b>9,957</b>	<b>10,004</b>	<b>10,068</b>	<b>10,114</b>	<b>10,198</b>	<b>10,249</b>	<b>10,312</b>
<b>AVAILABLE RESOURCES</b>	<b>7,114</b>	<b>7,157</b>	<b>8,372</b>	<b>8,643</b>	<b>8,624</b>	<b>8,634</b>	<b>8,570</b>	<b>8,274</b>	<b>8,286</b>	<b>8,523</b>	<b>8,429</b>	<b>8,639</b>	<b>9,207</b>	<b>9,015</b>	<b>9,274</b>	<b>9,300</b>	<b>9,521</b>	<b>9,070</b>	<b>8,779</b>	<b>8,945</b>
OPEN Position	1,876	1,982	908	683	698	814	1,002	1,352	1,383	1,200	1,352	1,201	725	942	730	768	593	1,128	1,470	1,367
Company	(All)																			
Sum of Value	Column Labels																			
Row Labels	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
existing																				
NVE.existing.Coal	134	134	134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NVE.existing.Gas	5,628	5,701	5,701	5,701	5,701	5,701	5,701	5,413	5,365	5,311	4,997	4,997	4,782	4,435	4,435	4,291	4,291	3,673	2,278	2,278
NVE.existing.Renewable.BESS	10	10	110	99	99	99	99	99	97	92	89	83	78	76	73	69	66	64	61	59
NVE.existing.Renewable.PV	5	4	35	30	30	29	29	29	27	26	25	24	22	22	21	20	20	20	20	17
NVE.existing.Renewable.WH	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	-
PPA.existing.Conventional	346	173	171	170	167	165	163	163	164	164	152	152	152	152	152	152	152	152	152	152
PPA.existing.Renewable.BESS	100	176	903	809	808	815	815	817	798	739	713	663	619	603	539	470	444	429	411	399
PPA.existing.Renewable.CSP	50	50	50	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PPA.existing.Renewable.GEO	174	162	162	162	154	143	132	121	70	70	60	5	5	5	5	5	-	-	-	-
PPA.existing.Renewable.HYDRO	9	9	9	6	6	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-
PPA.existing.Renewable.LFG	9	9	9	9	9	9	9	9	9	9	-	-	-	-	-	-	-	-	-	-
PPA.existing.Renewable.PV	624	638	744	623	616	593	586	588	566	544	523	491	464	447	414	387	346	339	328	327
PPA.existing.Renewable.WIND	20	20	20	20	20	20	20	20	20	20	20	-	-	-	-	-	-	-	-	-
existing Total	7,114	7,091	8,053	7,684	7,665	7,635	7,561	7,264	7,121	6,980	6,593	6,420	6,127	5,745	5,644	5,399	5,324	4,682	3,255	3,232
placeholder																				
NVE.placeholder.future	-	-	-	-	-	-	-	-	-	-	-	-	528	528	528	528	528	528	1,428	1,428
NVE.placeholder.renewable.BESS	-	-	-	314	313	315	316	316	437	781	1,022	1,326	1,637	1,806	2,128	2,364	2,606	2,775	2,982	3,145
NVE.placeholder.renewable.PV	-	-	-	49	49	88	99	99	144	207	249	308	364	396	453	505	579	612	656	693
PPA.placeholder.renewable.WIND	-	-	-	-	-	-	-	-	-	-	29	85	85	85	85	85	85	85	85	85
placeholder Total	-	-	-	363	362	403	415	415	581	988	1,300	1,719	2,614	2,815	3,194	3,482	3,798	4,000	5,151	5,351
Proposed																				
NVE.Proposed.renewable.BESS	-	66	266	489	489	491	491	492	484	459	444	413	384	375	360	345	325	314	303	293
NVE.Proposed.renewable.PV	-	-	53	107	108	105	103	103	100	96	92	87	82	80	76	74	74	74	70	69
Proposed Total	-	66	319	596	597	596	594	595	584	555	536	500	466	455	436	419	399	388	373	362

**SECTION VI – SUMMARY OF THE RENEWABLE ENERGY PLAN: NAC § 704.9215(2)(e)**

*Existing Fleet of Renewable Resources.* Nevada is fortunate to have significant and varying renewable resources, including some of the most abundant solar and geothermal potential in the nation. Through a combination of long-term purchased power agreements (“PPAs”) and company-owned facilities, the Companies have built a diverse and robust portfolio of renewable projects.

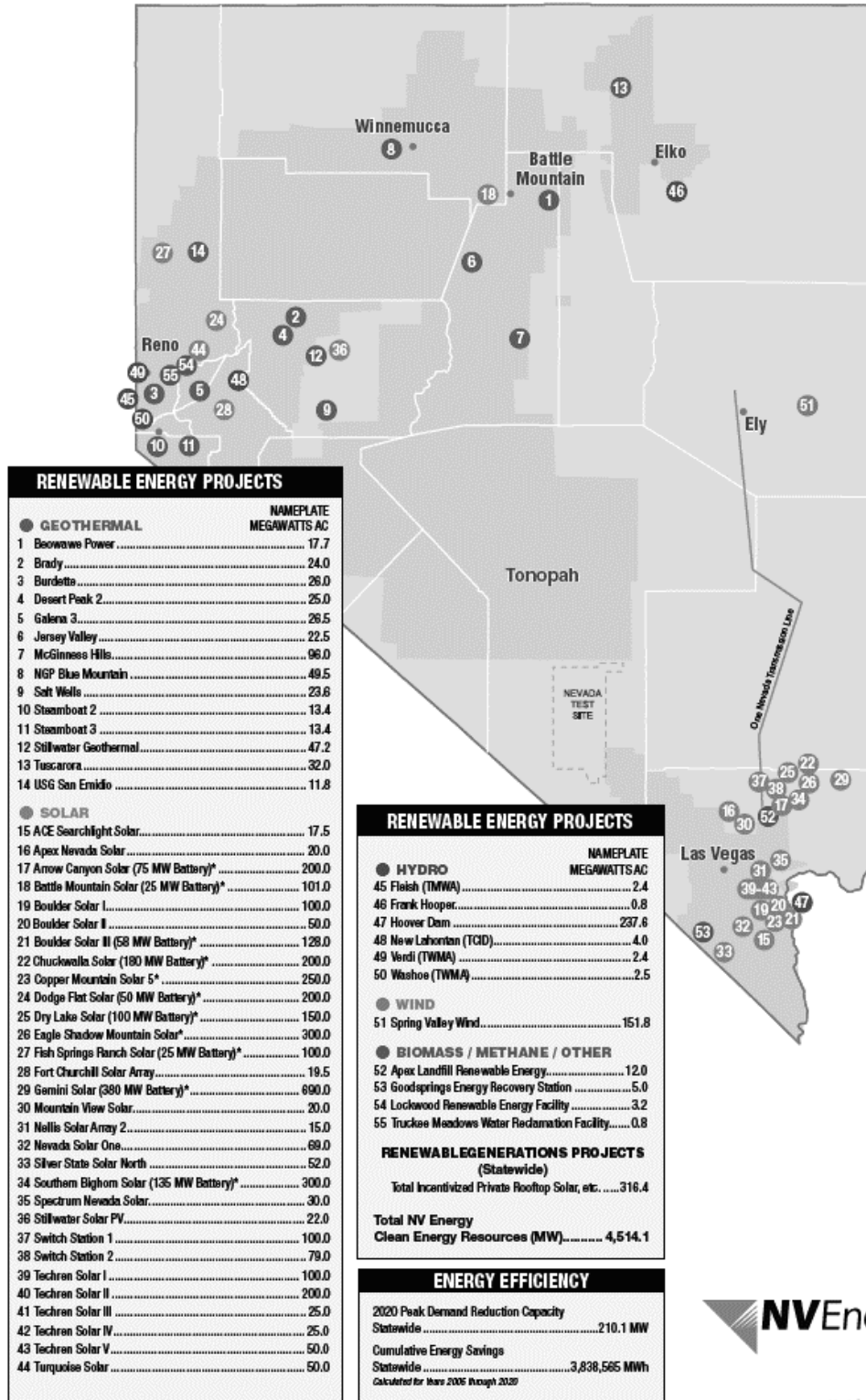
As of May 31, 2021, Nevada Power had approximately 1,320 MW of renewable generating resources operating and delivering renewable energy to meet the energy needs of its customers. In addition, Nevada Power also ended May 2021 with eight solar PV projects in various stages of development and construction, totaling an additional 1,958 MW of new generation. Six of these

projects include co-located BESS. As of May 31, 2021, Sierra had approximately 591 MW of renewable generating resources operating and delivering renewable energy to meet the energy needs of its customers. In addition, Sierra ended May 2021 with five solar PV projects in various stages of development and construction, totaling 661 MW of new generation. Over half of these projects include co-located BESS. Figure S-14 below is a map showing the location of all renewable energy projects that currently make up Nevada Power's and Sierra's renewable energy portfolios. Figures S-15 and S-16 list the renewable energy resources under long-term contract with Nevada Power and Sierra including projected costs for the IRP planning period.

# FIGURE S-14

## RENEWABLE ENERGY PROJECTS OWNED OR UNDER CONTRACT

### NV Energy's Clean Energy Commitment



\* In development or under construction.

Updated 05-26-2021



**FIGURE S-15**  
**NEVADA POWER LONG-TERM PURCHASE POWER AGREEMENTS**

Nevada Power Company d/b/a NV Energy Long Term Agreements						
Contract Name	Contract Type	Capacity (MW)	Commercial		Anticipated Remaining Cost (as of 1/1/22)	
			Operation Date	Termination Date		
<b>Renewable Purchase Agreements</b>						
<b>PPAs (Commercial)</b>						
ACE Searchlight <sup>QF</sup>	Solar <sup>S</sup>	17.5	12/16/2014	12/31/2034	\$ 96,364,263	
APEX Landfill <sup>QF</sup>	Methane	12.0	3/1/2012	12/31/2032	\$ 71,264,935	
Boulder Solar I <sup>EWG</sup>	Solar <sup>S</sup>	100.0	12/9/2016	12/31/2036	\$ 193,818,240	
Colorado River Commission-Hoover	Hydro	237.6	10/1/2017	9/30/2067	\$ 712,669,072	
Desert Peak 2 <sup>QF</sup>	Geothermal	25.0	4/17/2007	12/31/2027	\$ 28,233,537	
FRV Spectrum <sup>QF</sup>	Solar <sup>S</sup>	30.0	9/23/2013	12/31/2038	\$ 164,142,274	
Jersey Valley <sup>QF</sup>	Geothermal	22.5	8/30/2011	12/31/2031	\$ 52,321,075	
McGinness Hills <sup>QF</sup>	Geothermal	96.0	6/20/2012	12/31/2032	\$ 680,465,243	
Mountain View <sup>EWG</sup>	Solar <sup>S</sup>	20.0	1/5/2014	12/31/2039	\$ 130,124,531	
Nevada Solar One (NPC) <sup>QF</sup>	Solar <sup>T,X</sup>	46.9	6/27/2007	12/31/2027	\$ 101,446,756	
NGP Blue Mountain <sup>QF</sup>	Geothermal	49.5	11/20/2009	12/31/2029	\$ 168,634,780	
RV Apex <sup>QF</sup>	Solar <sup>S</sup>	20.0	7/21/2012	12/31/2037	\$ 136,032,115	
Salt Wells <sup>QF</sup>	Geothermal	23.6	9/18/2009	12/31/2029	\$ 56,121,833	
Silver State <sup>EWG</sup>	Solar <sup>F</sup>	52.0	4/25/2012	12/31/2037	\$ 314,191,892	
Spring Valley <sup>EWG</sup>	Wind	151.8	8/16/2012	12/31/2032	\$ 430,932,152	
Stillwater Geothermal <sup>1,QF</sup>	Geothermal	47.2	10/10/2009	12/31/2029	\$ 86,949,513	
Stillwater PV <sup>1,QF</sup>	Solar <sup>F</sup>	22.0	3/5/2012	12/31/2029	\$ 52,210,045	
Switch Station 1 <sup>EWG</sup>	Solar <sup>S</sup>	100.0	8/8/2017	12/31/2037	\$ 257,052,078	
Switch Station 2 (NPC) <sup>EWG</sup>	Solar <sup>S</sup>	0.0	10/11/2017	12/31/2037	\$ -	
Techren I <sup>EWG</sup>	Solar <sup>S</sup>	100.0	3/11/2019	12/31/2044	\$ 284,221,864	
Techren III <sup>QF</sup>	Solar <sup>S</sup>	25.0	10/7/2020	12/31/2045	\$ 57,454,769	
Techren V <sup>EWG</sup>	Solar <sup>S</sup>	50.0	12/31/2020	12/31/2045	\$ 97,108,264	
Tuscarora <sup>QF</sup>	Geothermal	32.0	1/11/2012	12/31/2032	\$ 143,123,915	
WM Renewable Energy-Lockwood <sup>QF</sup>	Methane	3.2	4/1/2012	12/31/2032	\$ 25,341,174	
		1283.8				
<b>PC Purchase Agreements</b>						
NPC-SPPC	Geothermal	2.3	10/30/2009	12/31/2028	\$ 3,673,550	
Nellis I (Solar Star) <sup>QF</sup>	Solar	13.2	12/15/2007	12/31/2027	\$ 40,079,374	
SunPower (LVVWD)	Solar	3.0	4/20/2006	12/31/2026	\$ 5,522,599	
		18.5				
<b>PPAs (Pre-Commercial)<sup>2</sup></b>						
Copper Mountain <sup>5EWG</sup>	Solar <sup>S</sup>	250.0	1/1/2022	12/31/2046	\$ 496,597,519	
Eagle Shadow Mountain <sup>EWG</sup>	Solar <sup>S</sup>	300.0	1/1/2022	12/31/2046	\$ 529,211,086	
Moapa (Arrowhead Canyon) Solar <sup>EWG</sup>	Solar <sup>S,X=75</sup>	200.0	12/1/2022	12/31/2047	\$ 527,039,532	
Southern Bighorn Solar <sup>EWG</sup>	Solar <sup>S,X=135</sup>	300.0	9/1/2023	12/31/2048	\$ 960,576,291	
Chuckwalla <sup>EWG</sup>	Solar <sup>S,X=180</sup>	200.0	12/1/2023	12/31/2045	\$ 627,159,119	
Boulder Solar III <sup>EWG</sup>	Solar <sup>S,X=58</sup>	128.0	12/31/2023	12/31/2035	\$ 159,240,898	
Gemini Solar <sup>EWG</sup>	Solar <sup>S,X=380</sup>	690.0	5/1/2024	12/31/2049	\$ 2,387,854,302	
		2068.0				
<b>Non-Renewable Purchase Agreements</b>						
Nevada Cogeneration Associates #1 <sup>QF</sup>	Natural Gas	85.0	6/18/1992	4/30/2023	\$ 106,319,937	
Nevada Cogeneration Associates #2 <sup>QF</sup>	Natural Gas	85.0	2/1/1993	4/30/2023	\$ 79,981,298	
Saguaro Power Company <sup>QF</sup>	Natural Gas	90.0	10/17/1991	4/30/2022	\$ 20,294,533	
		260.0				
<b>Renewable and Non-Renewable Sales Agreements</b>						
Switch NGR (Switch Station 1)	NGR Agreement (Sale of PCs)	100.0	8/8/2017	12/31/2037	\$ -	
Switch NGR-NPC (Switch Station 2)	NGR Agreement (Sale of PCs)	0.0	10/11/2017	12/31/2037	\$ -	
Notes:						
1. The geothermal and solar facilities are combined into <u>one</u> PPA.						
2. Facilities are either under development or construction (the dates shown are expected dates).						
QF=Qualifying Facility, EWG=Exempt Wholesale Generator, S=Single Axis Tracking, T=Solar Thermal (Tracking), F=Fixed Tilt, X=Storage						

**FIGURE S-16**  
**SIERRA'S LONG-TERM PURCHASE POWER AGREEMENTS**

Sierra Pacific Power Company d/b/a NV Energy Long Term Agreements					
Contract Name	Contract Type	Capacity (MW)	Commercial Operation Date	Termination Date	Anticipated Remaining Cost (as of 1/1/22)
<b>Renewable Energy</b>					
<b>PPAs (Commercial)</b>					
Beowawe <sup>QF</sup>	Geothermal	17.7	4/21/2006	12/31/2025	\$ 28,521,533
Boulder Solar II <sup>EWG</sup>	Solar <sup>S</sup>	50.0	1/27/2017	12/31/2037	\$ 120,674,737
Brady <sup>QF</sup>	Geothermal	24.0	7/30/1992	7/29/2022	\$ 2,258,558
Burdette <sup>QF</sup>	Geothermal	26.0	2/28/2006	12/31/2026	\$ 45,613,108
Galena 3 <sup>QF</sup>	Geothermal	26.5	2/21/2008	12/31/2028	\$ 67,919,749
Hooper <sup>1,QF</sup>	Hydro	0.75	6/23/2016	12/31/2040	\$ 774,228
Kingston <sup>1</sup>	Hydro	0.175	9/19/2011	12/31/2040	\$ -
Mill Creek <sup>1</sup>	Hydro	0.037	9/1/2011	12/31/2040	\$ 22,278
Nevada Solar One (SPPC) <sup>QF</sup>	Solar <sup>T,X</sup>	22.1	6/27/2007	12/31/2027	\$ 47,717,229
RO Ranch <sup>1,2</sup>	Hydro	0	3/15/2011	12/31/2040	\$ -
Rye Patch <sup>1</sup>	Hydro	0.75	5/2/2019	12/31/2040	\$ 10,794
Steamboat 2 <sup>QF</sup>	Geothermal	13.4	12/13/1992	12/12/2022	\$ 5,255,844
Steamboat 3 <sup>QF</sup>	Geothermal	13.4	12/19/1992	12/18/2022	\$ 5,346,985
Switch Station 2 (SPPC) <sup>EWG</sup>	Solar <sup>S</sup>	79.0	10/11/2017	12/31/2037	\$ 182,416,528
Techren II <sup>EWG</sup>	Solar <sup>S</sup>	200.0	10/4/2019	12/31/2044	\$ 514,924,068
Techren IV <sup>QF</sup>	Solar <sup>S</sup>	25.0	10/7/2020	12/31/2045	\$ 57,454,769
Turquoise <sup>EWG</sup>	Solar <sup>F</sup>	50.0	12/4/2020	12/31/2045	\$ 105,380,729
TCID New Lahontan <sup>QF</sup>	Hydro	4.0	6/12/1989	6/30/2025	\$ 1,254,098
TMWA Fleish	Hydro	2.4	5/16/2008	6/1/2028	\$ 7,601,359
TMWA Verdi	Hydro	2.4	5/15/2009	6/1/2029	\$ 8,018,031
TMWA Washoe	Hydro	2.5	7/25/2008	6/1/2028	\$ 4,151,950
USG San Emidio <sup>QF</sup>	Geothermal	11.75	5/25/2012	12/31/2037	\$ 131,395,085
		571.9			
<b>Leased Units</b>					
Fort Churchill Solar <sup>5</sup>	Solar <sup>S</sup>	19.5	8/5/2015	8/4/2040	\$ -
<b>PC Purchase Agreement</b>					
TMWRF	Methane	0.8	9/9/2005	12/12/2024	\$ 134,983
<b>PPAs (Pre-Commercial)<sup>3</sup></b>					
Battle Mountain <sup>EWG</sup>	Solar <sup>S,X=25MW</sup>	101.0	7/1/2021	12/31/2046	\$ 208,754,844
Dodge Flat <sup>EWG</sup>	Solar <sup>S,X=50MW</sup>	200.0	12/1/2021	12/31/2046	\$ 422,210,124
Fish Springs Ranch <sup>EWG</sup>	Solar <sup>S,X=25MW</sup>	100.0	12/1/2021	12/31/2046	\$ 223,235,497
		401.0			
<b>Non-Renewable Purchase Agreements</b>					
Nevada Gold Energy	Coal	174.0	6/1/2008	1/31/2022	\$ 1,704,653
Liberty (CalPeco) EBSA	Diesel	12.0	1/1/2011	12/31/2031	\$ 8,909,090
		186.0			
<b>Renewable &amp; Non-Renewable Sales Agreements</b>					
Liberty (CalPeco)	Full Requirements (Capacity/Energy/PCs)	See Note 4	12/30/2020	12/29/2025	\$ -
NPC-SPPC	Sale of PCs (Geothermal)	2.3	10/30/2009	12/31/2028	\$ -
Truckee Meadows Community College NGR (Techren I)	NGR Agreement (Sale of PCs)	See Note 6	12/1/2019	11/30/2022	\$ -
Apple NGR (Fort Churchill Solar)	NGR Agreement (Sale of PCs)	19.5	8/5/2015	8/4/2040	\$ -
Apple NGR (Boulder Solar II)	NGR Agreement (Sale of PCs)	50.0	1/27/2017	12/31/2037	\$ -
Switch NGR-SPPC (Switch Station 2)	NGR Agreement (Sale of PCs)	79.0	10/11/2017	12/31/2037	\$ -
Apple NGR (Techren II)	NGR Agreement (Sale of PCs)	200.0	10/4/2019	6/20/2044	\$ -
Apple NGR (Turquoise)	NGR Agreement (Sale of PCs)	50.0	12/4/2020	4/30/2045	\$ -
Notes:					
1. The illustrative termination date shown is subject to certain conditions, which may result in termination before or after December 31, 2040.					
2. RO Ranch Hydro facility is shut down indefinitely (the PPA is still active).					
3. Facilities are either under development or construction (the dates shown are expected dates).					
4. The current monthly contract demand ranges from approximately 70 MW (June) to 140 MW (December).					
5. Option to purchase on January 1, 2021.					
6. SPPC shall sell 7,200 kPCs per year for three years after PUCN approval.					
7. Soda Lake II was decommissioned by counterparty and awaiting legal options (the PPA is still active).					
QF=Qualifying Facility, EWG=Exempt Wholesale Generator, S=Single Axis Tracking, T=Solar Thermal (Tracking), F=Fixed Tilt, X=Storage					



***RPS Compliance Outlooks.*** Compliance with Nevada’s RPS is mandated by statute, and planning to comply with the RPS requires a significant planning effort. Nevada’s RPS is set forth at NRS § 704.7821 and is based on a percentage of the total amount of electricity sold to retail customers in Nevada. The RPS currently is set at 24 percent, meaning that not less than 24 percent of the energy Nevada Power and Sierra sell to their retail customers in Nevada must be generated, acquired or served from qualified renewable systems and sources. The RPS increases to 29 percent in 2022, 34 percent in 2024, 42 percent in 2027, and 50 percent in 2030 and beyond.

Nevada Power and Sierra both significantly exceeded the 2020 RPS requirement of 22 percent. Nevada Power ended 2020 with RPS compliance of 28.5 percent of retail sales. Sierra ended 2020 with RPS compliance of 30.2 percent of retail sales.

***Nevada Power RPS Compliance.*** Nevada Power’s compliance outlook can be summed up as positive. While the company has been very successful in building a pipeline of new projects to meet its future credit needs, Nevada Power’s compliance outlook is not without risk. Until the eight pipeline projects achieve commercial operation, there is the risk of delays or cancelations. Second, there is the risk that one or more of its operating projects could experience an unexpected issue, resource and/or mechanical, and fall short on its generating commitments. Finally, the company could experience higher than expected load growth. With higher RPS percentages on the horizon, even a small increase in retail load growth can increase the company’s credit need by thousands of credits.

***Sierra RPS Compliance.*** Sierra’s compliance outlook can be summed up as near-term cautiously optimistic, long-term bright. While Sierra has been very successful in building a pipeline of new projects to meet its future credit needs, its compliance outlook is not without risk. Until the five pipeline projects achieve commercial operation, there is the risk of delays or cancelations. Calendar year 2021 is especially critical with three of the five pipeline projects scheduled to declare commercial operation. Unlike Nevada Power, Sierra does not have a level of cushion in the event that one or more of these projects is delayed. There is the risk that one or more of its operating projects could experience an unexpected outage, resource and/or mechanical, and fall short on its generating commitments or Sierra could experience higher than expected load growth. Like Nevada Power, with the higher RPS percentages on the near horizon, even a small increase in retail load growth can increase the company’s credit need by thousands of credits. Finally, environmental events, such as forest fires, that could impact solar generation and renewable energy delivery are more likely for Sierra as compared to Nevada Power.

***NV Energy RPS Compliance.*** Nevada Power and Sierra will continue to closely monitor their RPS compliance outlooks, recognizing that there are a myriad of factors, some outside of the Companies' control, which will ultimately determine whether the Companies will have a sufficient number of PCs to satisfy their respective RPS credit obligations. The objective is to never be put into a reactive position where the Companies must acquire a large number of PCs in a short-time frame in order to maintain compliance.

***Renewable Resource Additions.*** The Companies have clearly articulated their goal of matching customer demand with carbon free generation by 2050. To this end, the Companies are seeking the approval of just and reasonable rates for two new solar with storage projects totaling approximately 600 MW in this 2021 Joint IRP of which Nevada Power would own 75 percent and Sierra would own 25 percent. This additional renewable capacity will allow the Companies to take advantage of current favorable renewable pricing for the benefit its customers and offset fossil-fueled generation, particularly that of Valmy. In addition, approval of these projects can safeguard the Companies' ability to meet its future RPS obligations under current law and positions it to achieve its goal of matching carbon free generation with customer demand. Both projects appear in the Preferred Plan.

## **SECTION VII - SUMMARY OF ENERGY SUPPLY PLAN: NAC § 704.9215(f)**

Pursuant to NAC § 704.9061, an Energy Supply Plan ("ESP") means a plan that:

1. Establishes the parameters of an energy supply portfolio for a utility for the three-year period covered by its Action Plan and which balances the objectives of:
  - a) Minimizing the cost of supply;
  - b) Minimizing retail price volatility; and
  - c) Maximizing the reliability of energy supply over the term of the energy supply plan.
2. Is composed of a purchased power procurement plan, fuel procurement plan and risk management strategy.

Pursuant to NAC § 704.9494, the Commission can determine that the ESP is prudent if the following requirements are met:

- The ESP balances the objectives of minimizing the cost of supply, minimizing retail price volatility and maximizing the reliability of supply over the term of the plan.
- The ESP optimizes the value of the overall supply portfolio of the utility for the benefit of its bundled retail customers.

- The ESP does not contain any feature or mechanism that the Commission finds would impair the restoration of the creditworthiness of the utility or would lead to a deterioration of the creditworthiness of the utility.

The 2021 ESP is based on a specially prepared short-term load forecast. The 2021 ESP includes a power procurement plan, a fuel procurement plan, and a risk management strategy, each of which was prepared to comply with the requirements of NAC § 704.9494.

### **Power Procurement/Sales Plan**

- Accept and approve the power procurement plan, which includes the following elements:
  - The Companies propose to continue the four-season laddering strategy to fill the remaining open positions in 2022 and 2023 and begin filling the 2024 open position. This plan is consistent with the laddering strategy for closing the open power position, which was most recently approved in Docket No. 20-09002. The power procurement laddering strategy will be executed in coordination with the physical gas procurement plan.
  - Efforts by the Companies to negotiate and transact directly with counterparties as a supplement to the current request for proposal process. This would be to seek non-standard firm energy products in an effort to address short-term supply challenges during the early evening net demand peak period (i.e., the hours past the gross peak when solar production is very low or zero).
  - A commitment by the Companies to continuously monitor the portfolio and seek to make short-term and forward purchases when economic, or needed to serve native load. Any proposed purchases of greater than three years in duration will be submitted to the Commission for approval in a resource plan filing or amendment in accordance with NAC §§ 704.9113 and 704.9512.
  - A strategy and plan to make purchases and sales to optimize the value of the overall supply portfolio for the benefit of retail customers.
  - An obligation on behalf of the Companies to monitor their renewable portfolios on a continuous basis to ensure that sufficient renewable energy and portfolio energy credits (“PCs”) are maintained to comply with the state’s RPS, and undertake cost-effective opportunities to fill any new needs that may arise. Current projections indicate that no additional purchases will be required during the ESP period to meet the RPS.

- Find, consistent with NAC § 704.9494(3), that the power procurement strategy is prudent.

### **Physical Gas Procurement Plan**

- Accept and approve the Companies' plan to implement the four-season laddering strategy originally approved by the Commission in Docket No. 09-09001 to procure physical gas. Projected physical gas requirements procured through the laddering strategy will be procured with indexed products, subject to a cap on the premium, which can be exceeded with prior approval from the Risk Committee. Consistent with the Stipulation in Docket No. 09-09001, if the Companies exceed the premium cap, and the procured gas that exceeded the premium cap is not the least cost supply alternative, they will provide written notice to the Commission's Staff and the Bureau of Consumer Protection ("BCP").
- Find, consistent with NAC § 704.9494(3), that the physical gas procurement strategy is prudent.

### **Gas Transportation Plan**

- Accept and approve the gas transportation plan, which includes the following elements:
  - Approval to maintain the Companies' current natural gas transportation portfolios. For Nevada Power, this requires authority to maintain 7 existing gas transportation contracts with Kern River Pipeline and 3 with Southwest Gas Corporation. At Sierra, this requires authority to maintain a total of 33 existing gas transportation and storage contracts with TC Energy – Alberta, TC Energy – Foothills, TC Energy Gas Transmission Northwest ("GTN"), TC Energy Tuscarora Gas Transmission Company ("Tuscarora"), Paiute Pipeline Company ("Paiute") and Northwest Pipeline LLC ("NWPL") pursuant to rights of first refusal and evergreen rights. The total projected annual costs for firm transportation contracts at both Nevada Power and Sierra are approximately \$113.4 million.
- Find, consistent with NAC § 704.9494(3), that the gas transportation strategy is prudent.

### **Gas Hedging Plan**

- Approval to continue the current hedging strategy and acquire no natural gas hedges covering the ESP Action Plan period. The Companies will continue to monitor the natural gas market fundamentals and recommend changes to the hedging strategy in a future ESP update or ESP amendment as necessary.

- The Companies will continue bi-annual workshops with Staff and BCP to review implementation of the approved no-hedge gas hedging strategy.
- An affirmative finding, consistent with NAC § 704.9494(3), that the Companies' gas hedging strategy is prudent.

### **Coal Supply Plan**

- Acceptance and approval of a coal supply plan for Sierra. The coal supply plan considers current and projected coal unit operations and the level of uncertainty surrounding these operations, as well as market conditions. The coal supply plan proposes Sierra fill Valmy's coal requirements via spot market solicitations.
- An affirmative finding consistent with NAC § 704.9494(3) that the coal procurement strategy is prudent.

### **Risk Management Strategy**

- Acceptance and approval of the Companies' risk management strategy and a finding that the strategy identifies risks inherent in procuring and obtaining a supply portfolio and establishes the means by which the utility plans to address and balance or hedge the identified risks related to cost, price volatility and reliability.
- An affirmative finding consistent with NAC § 704.9494(3) that the risk management strategy is prudent.

***This 2021 ESP balances the objectives of minimizing the cost of supply, minimizing retail price volatility and maximizing the reliability of supply over the term of the plan.*** Based on results of the PROMOD production cost forecasting model, Figure S-17 shows the estimated cost-to-serve for the recommended unhedged scenario under base, high, and low fuel and purchased power pricing scenarios.

**FIGURE S-17**  
**ESTIMATED COST TO SERVE (IN \$000)**

TOTAL FUEL AND PURCHASED POWER (F&PP) COSTS, EXCLUDING FIXED & VARIABLE OPERATIONS AND MAINTENANCE			
Year	Cost to Serve Assuming Low F&PP Prices (\$000)	Cost to Serve Assuming Base F&PP Prices (\$000)	Cost to Serve Assuming High F&PP Prices (\$000)
2022	\$1,120,093	\$1,306,445	\$1,633,751
2023	\$974,756	\$1,172,404	\$1,533,068
2024	\$947,255	\$1,183,584	\$1,718,507

The Companies also calculated the projected Base Tariff Energy Rates (“BTERs”) and Deferred Energy Accounting Adjustment (“DEAA”) rates for 2022-2024 under the low, base, and high fuel and purchased power price forecasts. The projected BTER and DEAA rates, along with estimated carrying charges, are presented in Technical Appendix GAS-2.

The expected cost-to-serve and BTER remain within a reasonable band under the Companies’ proposed procurement strategies. The ESP provides for the procurement of sufficient firm resources to ensure reliable service to retail customers.

The production cost, BTER, and DEAA calculations and analysis, show that this ESP balances the objectives of minimizing the cost of supply, minimizing retail price volatility, and maximizing the reliability of supply over the term of this plan.

***This 2021 ESP optimizes the value of the overall supply portfolio of the utilities for the benefit of their bundled retail customers.*** The Companies will continue to monitor and adjust the power portfolio in order to identify and account for changes in load, cost, volatility, reliability, and other commercial or technical factors. Day-ahead, day-of, or month-ahead power purchases are expected to be made if there is an open position, or if system costs of decremental energy exceed the additional cost of market purchases. Similarly, day-ahead or day-of power sales are expected to be made as opportunities arise, including spot, fixed price, indexed agreements, or ancillary services products, as specified in the Energy Risk Management and Control Policy (Technical Appendix RM-2). The Companies also intend to continue to seek opportunities for forward sales of heat rate call options and/or other products through direct negotiations with counterparties or the issuance of reverse requests for proposals (“RFPs”), as specified in the Forward Sales Procedures Manual (Technical Appendix POWER-1).

*This 2021 ESP does not contain any feature or mechanism that would impair the restoration of the creditworthiness of the utilities or would lead to a deterioration of the creditworthiness of the utilities.* Over the past several years, the Commission has implemented an ESP process and the Companies' credit has improved. Currently, the Companies are able to finance this ESP without impairing their creditworthiness, assuming timely recovery under the Commission's current rate recovery mechanisms.

## **SECTION VIII – SUMMARY OF DISTRIBUTED RESOURCES PLAN: NAC § 704.9215(2)(g)**

NV Energy's 2021 DRP represents the first filing of such a plan as part of the Companies' 2021 Joint IRP, the previous DRP being filed as an amendment to the Companies' 2018 Joint IRP. NRS § 704.741(5) sets forth five elements that must be included in a DRP, including:

- 1) evaluation of the locational benefits and costs of Distributed Energy Resources (“DERs”);
- 2) identification or proposal of tariffs, contract or other mechanisms for the deployment of cost-effective DERs;
- 3) proposal of cost-effective methods of coordinating existing Commission-approved programs, incentives and tariffs to maximize the locational benefits and minimize the incremental costs of DERs;
- 4) identification of additional spending necessary to integrate cost-effective DERs into planning processes to yield net benefit to the Companies and their customers; and
- 5) identification of barriers to the deployment of DERs.

Each of these requirements is addressed in NV Energy's DRP.

***DER Barriers and Solutions.*** NV Energy identified several potential barriers to the deployment of DERs related to: 1) integration/interconnection with the distribution grid, 2) market limitations on the ability of DERs to deliver benefits, and 3) distribution system operational and infrastructure capability. The Companies determined how the DRP can help address these barriers and provide the status of each of these activities.

***Cost-Effective Coordination with Commission-approved Program, Tariffs, and Incentives.*** NV Energy's existing Commission-approved DSM and clean energy programs and related tariffs leverage several DER technologies, including: 1) energy efficiency, 2) demand response (“DR”), 3) solar PV, 4) electric vehicles, and 5) BESS. The Companies have progressed in their integration of these programs with the goals, analyses, and requirements of the DRP to provide benefits and lower cost for both NV Energy and its customers. Through geo-targeted deployment, these

technologies support the locational benefits associated with mitigating certain forecasted constraints on the Companies' transmission and distribution systems. NV Energy performed its Grid Needs Assessment ("GNA"), Non-Wires Alternative ("NWA") analyses, and Locational Net Benefits Analysis ("LNBA") with these technologies (and additionally, Volt-Var Optimization/Conservation Voltage Reduction) embedded in the analyses of forecasted constraints in 2021 through 2027.

***Locational Benefits and Costs of DERs.*** NV Energy's LNBA was performed using a Present Worth of Revenue Requirement ("PWRR") analysis as a final component of the NWA analysis within the GNA process. The Companies quantified several benefits and costs associated with DERs, including: 1) transmission upgrade capital deferral value, 2) distribution upgrade capital deferral value, 3) transmission upgrade operation, maintenance, administrative and general ("OMAG") expense deferral value, 4) distribution upgrade OMAG expense deferral value, 5) avoided energy value, 6) avoided generation capacity value, and 7) energy arbitrage value.

***Systems and Incremental Investment to Integrate Cost-Effective DERs.*** While NV Energy's existing Advanced Distribution Management System and Demand Response Management System systems are in place to manage the Companies' distribution systems and the DR programs, respectively, new systems are required to properly monitor, control, and deliver new value streams from an expanded set of DERs in a scalable and extensible fashion and address the significant control and visibility gaps related to DERs that exist in these systems. NV Energy is developing the foundational technology required to efficiently manage a growing set of DERs through investigation into and implementation of a centralized Distributed Energy Resource Management System ("DERMS"). The DERMS would be complemented by United States Department of Energy ("DOE")-funded grid-edge systems and applications as part of Grid Services grant ("DOE Grid Services Grant") project.

NV Energy's DERMS would be implemented in three phases from 2020 through 2025 and has a potential total project cost of approximately \$15.5 million. The DRP contains the functional and financial comparative analyses the Companies performed in support of a recommendation to implement a DERMS.

In response to an application entitled "Optimization of Excess Solar & Storage Capacity for Grid Services," NV Energy was selected by the DOE for award negotiations to develop a new set of grid services (*i.e.*, energy arbitrage, frequency regulation, feeder peak load management, voltage support, feeder phase balancing, time-of-use bill management) to be delivered from aggregated DERs in a distributed communications and control architecture ("DCA"). NV Energy negotiated a cooperative agreement with DOE for an award of \$3 million and a cost share commitment of \$981,916 spread among its project partners over a three-year period from August 1, 2020, through July 31, 2023. The Companies' cost share is approximately \$2.76 million, which includes



\$376,000 for NV Energy’s participation in the grant effort and \$2.4 million for a 1 MW/4 MWh BESS to support the NWA and field demonstration.

To further support the goals of the DRP and integration with NV Energy’s DER-related programs and tariffs, the Companies are proposing a Distributed Solar + Storage Residential Demand Management Trial (“Trial”). This Trial would deploy locational DERs combined with integrated customer program treatments across the 2022-2024 2021 Joint IRP action plan period. This includes targeted recruitment of approximately 2,400 customers and the deployment of 5.8 MW of distributed solar and 4.1 MW of distributed energy storage resources into distribution constrained and low-income or historically underserved population areas for a three-year proposed trial budget of approximately \$42.2 million.

***Hosting Capacity Analysis (“HCA”).*** The HCA studies performed by NV Energy utilize two distinct systems: 1) the commercially-available Synergi Electric (“Synergi”) electrical simulation software to model and analyze the Companies’ electric distribution systems, and 2) NV Energy’s Geographic Information System mapping system to provide the electrical connectivity models of the distribution systems from the substation transformer down to the primary node level that are used as the source for the connectivity models in Synergi. The Companies performed three full-system HCA study processes: 1) modeling forecasted 2018–2025 conditions on the distribution system, 2) modeling forecasted 2019–2027 conditions, and 3) modeling forecasted 2020–2028 conditions. Extensive and time-consuming effort was undertaken to prepare the models and necessary data. In the DRP narrative, NV Energy provides detailed explanation of the above activities, the HCA analytical method and outcomes, and its monthly HCA update process satisfying the requirement for “real-time” data, with all the results and data publicly-available via NV Energy’s DRP web portal.

***Load and DER Forecasting.*** NV Energy has a rigorous process for forecasting electric load growth on its distribution feeders and medium-power substation transformers, which is accomplished at the local level and then aggregated up to the substation level. No specific or new distribution facility load forecasts were produced for the DRP. Rather, “snapshots” of the load forecasts that are updated on a daily basis by NV Energy’s Distribution Planning department from May 18, 2020 and March 15, 2021 were used as the basis for the analyses within the Grid Needs Assessment, Non-Wires Alternative analyses, and Locational Net Benefits Analysis. The forecasts just prior to each of the three full-system HCA studies noted above were used in those studies. Technical Appendix DRP-2 provides forecasted peak loads as of October 23, 2020 for 2021 to 2027 on NV Energy’s substation transformers and feeders, covering the required minimum six-year timeframe following the year of the filing of the DRP.

The DRP does not present new or updated forecasts of penetration or potential load impacts for Demand Response, Energy Efficiency, electric vehicles, customer-owned generation, or energy

storage. Instead, the forecasts used for the DRP and the support behind them are included in the Load Forecast of this 2021 Joint IRP filing.

## **SECTION IX – A SUMMARY OF THE ACTIVITIES, ACQUISITIONS, AND COSTS INCLUDED IN THE ACTION PLAN OF THE UTILITY: NAC § 704.9215(2)(h)**

The Companies seek Action Plan approval of a number of items, which in order to implement the Preferred Plan, must be taken within the Action Plan period, January 1, 2022 through December 31, 2024. The Companies also seek Commission approval of actions as described in the ESP, which will be undertaken during the 2021 ESP period January 1, 2022 through December 31, 2024. The Action Plan, which is also an exhibit to the Application, is reproduced in its entirety and the end of this Summary Volume.

## **SECTION X – INTEGRATED EVALUATION: NAC § 704.9215(2)(i)**

In selecting its Preferred and Alternate plans, the Companies have evaluated various factors that are set forth in the Commission’s regulations, including:

- The Present Worth Revenue Requirement for each alternative (see NAC § 704.937(3))
- The Present Worth of Societal Costs for each alternative (see NAC § 704.937(4))
- Whether the plan mitigates risk (see NAC § 704.937(6))
- Whether the plan provides adequate reliability (see NAC § 704.937(7)(a))
- Regulatory and financial constraints (see NAC § 704.937(7)(b))
- Whether the plan meets the RPS (see NAC § 704.937(7)(c))
- Whether the plan meets the requirements for environmental protection (see NAC § 704.937(7)(d))

In addition, NAC § 704.948 requires that “a utility shall analyze its decisions, taking into account its assessment of risk and identifying particular risks with respect to: (a) costs, (b) reliability, (c) finances, (d) the volatility of the price of purchased power and fuel, and (e) any other uncertainties the utility has identified.”

In accordance with NAC § 704.948(2), the Companies considered the relationship among the factors used in selecting the Preferred and Alternate Plans, including the relationship between mitigating risk, minimizing cost and volatility, and maximizing reliability. The Companies selected Preferred and Alternate plans that provide the best combination of attributes, without assigning specific weights to any particular factor. Utilizing the results of the long-term load forecast, the DSM Plan, the DRP and the Supply Side Plan, the Companies identified their resource requirements over the planning period. This analysis indicates that Nevada Power and Sierra need

to add incremental supply side resources. The Companies developed four alternative plans for meeting its projected needs for incremental capacity and energy.

This 2021 Joint IRP demonstrates just how the Companies intend to meet the state's green policies and meet the energy demands of their customers while keeping rates low. The Net-Zero Plan – the Preferred Plan – recommends the addition of two new company owned solar generating resources with co-located BESS, transmission network upgrades for the new resources, three new BESS to improve reliability on the Companies' grid and new upgrades at the Companies' conventional fleet to increase generating capacity to address summer peak demand. In addition, the Companies' Preferred Plan proposes ambitious energy efficiency programs and includes the Companies' first items for Commission approval in its distributed resources plan. The Net-Zero Plan exceeds the current RPS in every year, achieves the state's net-zero carbon dioxide emissions goal in 2050, and meets the 16 percent planning reserve margin for each utility. It also includes the replacement of Valmy with the new solar resources and BESS.

## APPENDIX A TO SUMMARY VOLUME

### ACTION PLAN

Nevada Power Company d/b/a NV Energy  
Sierra Pacific Power Company d/b/a NV Energy

2021 Joint Integrated Resource Plan  
Docket No. 21-06 \_\_\_\_\_

**Action Plan Period January 1, 2022 to December 31, 2024**

### SECTION I

#### INTRODUCTION — NAC § 704.9489(1)(a)

Nevada Power Company (“Nevada Power”) and Sierra Pacific Power Company (“Sierra” and together with Nevada Power the “Companies” or “NV Energy”) are filing this joint integrated resource plan (“2021 Joint IRP”). The 2021 Joint IRP is guided by the Companies’ six core principles: customer service, employee commitment, environmental respect, regulatory integrity, operational excellence, and financial strength. In determining their Preferred Plan and preparing its Action Plan, the Companies developed four long-term primary expansion plans for meeting customers’ demands, and tested them to determine how each performed across the range of potential load, purchased power price, fuel price and carbon cost scenarios. The Companies have selected as their Preferred Plan the Net-Zero Plan, the centerpiece of which is:

- 1) The replacement of Valmy with 600 MW of solar PV and 480 MW of battery storage by December 2024.
- 2) Near term projects totaling 66 MW of grid-tied BESS and 192 MW of generation upgrades.
- 3) Achievement of the state’s net-zero carbon dioxide emission goal in 2050.
- 4) DSM programs that deliver energy savings of 1.1 percent of the weather normalized retail sales over the Action Plan period by utility and allocate 5 percent of its total Action Plan budget to its standalone Low Income Program—Qualified Appliance Replacement.
- 5) A DRP that meets the statutory and regulatory objectives and continues to evolve as the Companies, the Commission and stakeholders become more familiar with the technologies.

A complete list of all Action Plan items follows in Section II.

## **SECTION II**

### **ACTION PLAN ITEMS — NAC § 704.9489(1)(b)**

#### ***LOAD FORECAST – IRP & ESP***

- Approval of the long-term base load forecast presented in the Load Forecast and Market Fundamentals volume of this filing as being the most accurate information upon which to base long-term planning decisions through the Action Plan period.
- Approval of the Companies recommended annual limits on the total amount of energy and capacity that eligible NRS Chapter 704B customers may be authorized to purchase from providers of new electric resources during the Action Plan period, and the proposed Net-Base Tariff Energy Rate and the Variable O&M Credit (Charge) for the Action Plan period.
- Approval of the three-year base load forecast presented in the 2021 Energy Supply Plan (“2021 ESP”) as being the most accurate information upon which to base near-term planning decisions through the Action Plan period.

#### ***FUEL AND PURCHASED POWER PRICE FORECASTS – IRP & ESP***

- Approval of the base long-term fuel and purchased power forecasts presented in FPP-1 as presenting the best and most accurate information upon which to base long-term planning decisions through the Action Plan period.
- Approval of the base three-year fuel and purchased power forecast presented in the 2021 ESP as presenting the best and most accurate information upon which to base near-term planning decisions through the Action Plan period.

#### ***GENERATION – IRP***

- Approval of the Companies’ Preferred Plan, which does not include the acquisition or construction by the Companies of new conventional generation resources.
- Approval of the continued operation of Valmy Unit 1 until solar PV/BESS can ensure reliable systems operations; however, Valmy 1 is excluded from economic dispatch as of December 31, 2021, and will be used only for system support.
- Expedited approval of the upgrades on the Lenzie Power Block 2, Silverhawk and Tracy Combined Cycle by September 1, 2021.
- Approval of the turbine upgrades on Harry Allen Combined Cycle.

## ***RENEWABLES – IRP***

The Companies propose that the Commission approve the pricing as just and reasonable for two renewable energy projects, Sierra’s acquisition of Fort Churchill Solar, and Sierra’s acquisition of three new grid-tied BESS projects. Specifically, the Companies request:

- A finding that price for the energy produced by the Iron Point solar facility is just and reasonable, a renewable energy facility to be jointly owned by the Companies (Nevada Power 75 percent ownership share and Sierra 25 percent) under the provisions of NRS § 704.752. Iron Point is a 250 MW (nameplate, AC) solar PV facility, with an additional 200 MW capacity of co-located battery storage. Commercial operation is expected by December 31, 2023, with a 25-year term at a flat energy price of \$25.86 per MWh. The 200-MW, 800-MWh battery storage rate is \$6,800 per MW-month for the term. As part of this request, the Companies further request that the Commission exclude any capital investment associated with Iron Point from the rate base of Nevada Power and Sierra, and expenses associated with Iron Point from the revenue requirement of Nevada Power and Sierra.
- A finding that price for the energy produced by the Hot Pot solar facility is just and reasonable, a renewable energy facility to be jointly owned by the Companies (Nevada Power at a 75 percent ownership share and Sierra at 25 percent) under the provisions of NRS § 704.752. Hot Pot is a 350 MW (nameplate, AC) solar PV facility, with an additional 280 MW capacity of co-located battery storage. Commercial operation is expected by December 1, 2024, with a 25-year term at a flat energy price of \$24.99 per MWh. The 280-MW, 1,120-MWh battery is \$6,800 per MW-month for the term. As part of this request, the Companies further request that the Commission exclude any capital investment associated with Hot Pot from the rate base of Nevada Power and Sierra, and expenses associated with Iron Point from the revenue requirement of Nevada Power and Sierra.
- That the Commission’s order include (a) a provision that the Companies must exclude any capital investment and expenses associated with Iron Point and Hot Pot from the rate base and revenue requirement of the utilities in accordance with NRS 704.752; (b) performance terms and conditions for Iron Point and Hot Pot as proposed by the Companies; (c) a finding that the term during which the Companies may recover the just and reasonable price for Iron Point and Hot Pot is 25 years; (d) a finding that Iron Point and Hot Pot are not public utility property as defined in Section 168(i) of the Internal Revenue Code, 26 U.S.C. § 168(i); and (e) a finding that the Companies provided a valid comparison of the rate impact on its customers between utility ownership of Iron Point and Hot Pot pursuant to NRS 704.752 and inclusion of Iron Point and Hot Pot within its rate base.

- Approval of Sierra's acquisition of Fort Churchill Solar for a purchase price of \$17.14 million.
- The creation of regulatory asset for the Fort Churchill Solar acquisition, with carrying charges, an amount that reflects a return on the Companies' investment in the facility, depreciation of the Companies' investment in the facility and the cost of operating and maintaining the facility until it is included in rates as a part of Sierra's next general rate review and the rates become effective.
- Approval of Sierra's acquisition of the 26 MW Chukar Phase II BESS project for a purchase price of \$36.9 million to be included in rate base.
- Approval of Sierra's acquisition of the 30 MW Brunswick BESS project for a purchase price of \$45.5 million to be included in rate base.
- Sierra's acquisition of the 10 MW Steamboat BESS project for a purchase price of \$ 19.3 million to be included in rate base.
- The creation of regulatory assets for the Chukar, Brunswick and Steamboat BESS Projects, with carrying charges, an amount that reflects a return on the Companies' investment in the facility, depreciation of the Companies' investment in the facility and the cost of operating and maintaining the facility until it is included in rates as a part of Sierra's next general rate review and the rates become effective.

### ***TRANSMISSION — IRP***

- The Companies request approval to construct the transmission network upgrade facilities necessary to interconnect two renewable energy projects to the Companies' system. These renewable projects connect at Valmy substation and are identified as Iron Point and Hot Pot. Network upgrades will be necessary to complete the interconnection of these two projects. Cost estimates are:
  - Iron Point Solar \$4.56 million
  - Hot Pot Solar \$6.88 million
- Approval to discontinue participation in WestConnect and simultaneously join the Northern Grid Planning group effective January 1, 2022. This participation in these groups maintains the Companies compliance with FERC Order 1000. The Action Plan budget for Northern Grid membership is \$132,000 annually in 2022, 2023, and 2024 for a total of \$396,000.

### ***DEMAND SIDE PROGRAMS — IRP***

- The Companies request approval of the DSM and the Sierra conservation and energy efficiency (“C&EE”) Plans as part of the Companies’ Action Plan. The Companies are requesting specific approval of the budgets and energy savings for the DSM Plans for the 2022-2024 Action Plan period: Nevada Power \$44.4 million, \$46.2 million, and \$47.8 million in 2022, 2023, and 2024 respectively; Sierra \$13.9 million, \$14.6 million, and \$15.1 million in 2022, 2023, and 2024 respectively; and NV Energy combined \$58.3 million, \$60.8 million, and \$62.9 million in 2022, 2023, and 2024 respectively.
- The Companies also request that the Commission review and approve the Measurement and Verification (“M&V”) reports provided in Technical Appendices DSM-5 through DSM-17 for the DSM programs delivered during the 2020 program year.

### ***2021 JOINT ENERGY SUPPLY PLAN — ESP***

***Power Procurement Plan.*** Based on the 2021 ESP Forecasts, Nevada Power has open power positions in the summers of 2022-2024. Note that any open positions in the spring or fall period of each year are “maintenance-driven,” rather than “load-driven,” and occur during lower system load conditions when wholesale power market supplies are generally available. The Companies propose to close the respective anticipated 2022-2024 summer open positions with firm products prior to respective summers.

The Companies propose to implement a four-season laddering strategy to close the remaining open power positions in 2022-2024 with the procurement of physical power and/or capacity acquired through a competitive bidding process. In addition, the Companies propose to negotiate and transact directly with counterparties as a supplement to the current request for proposal process. This would allow the Companies to seek custom non-standard firm energy products to help address short-term supply challenges during the early evening net demand peak period (i.e., the hours past the gross peak when solar production is very low or zero). Any proposed purchases of greater than three years in duration will be submitted to the Commission for approval in accordance with NAC §§ 704.9113 and 704.9512. Additional information regarding the closing of the open positions in the power procurement plan is provided in Section 4.C.

Additionally, the Companies monitor the portfolio seasonally, monthly, weekly, daily, and hourly, and when economic, seek to make short-term and forward sales of resources not expected to be needed to serve native load. This practice will be continued over the ESP period.

The Companies anticipate meeting their RPS credit obligations throughout the ESP planning period. This ESP incorporates the current regulations governing the Companies’ ability to use PCs to meet the RPS and the calculation of the PCs. The plan also contemplates that Nevada Power will continue repaying its outstanding credit obligation to the joint pool for the benefit of Sierra.



For more detail on the purchased power procurement plan, see Section 4. For more detail on the RPS compliance outlook see Section 2.D.

**Fuel Procurement Plan.** The fuel procurement plan is made up of three components: (1) a physical gas procurement plan, (2) a gas transportation plan, (3) a gas hedging plan and (4) coal supply plan.

- 1) **Physical Gas Procurement Plan.** The Companies employ a four-season laddering strategy for physical gas purchases, through which 25 percent of projected monthly gas requirements per season are procured, subject to the availability of conforming bids and the willingness of suppliers to accept reasonable commercial terms. The Companies will continue to solicit physical gas supplies sourced from geographically diverse gas supply basins.

Additional information regarding the Companies' physical gas procurement plan is provided in Section 5.A.

- 2) **Gas Transportation Plan.** Nevada Power is connected directly to the interstate pipeline systems with several major gas producing regions including the Permian, San Juan, and the Rocky Mountain supply basins, as well as California gas supply. The largest producing region with the best connectivity into and through Nevada Power's control area is the Rocky Mountain supply basin. The Kern River pipeline connects the Rocky Mountain basin through Nevada into southern California with a design capacity of 2,166,575 million British thermal units ("MMBtu") per day. This pipeline deliverability capacity is large in comparison to Nevada Power's daily needs.

Sierra is well poised to access the dominant supply basins serving the Pacific Northwest with its existing firm gas transportation assets. These gas supply basins are the Rocky Mountain Basin, the San Juan Basin, British Columbia and the Western Canadian Sedimentary Basin. Sierra receives gas supplies directly from two interstate natural gas pipelines: Paiute and Tuscarora. Paiute receives gas supplies upstream from Williams Gas Pipelines – Northwest, which sources its gas supplies from British Columbia, the San Juan Basin, and the Rocky Mountain region of Wyoming, Utah and Colorado. Tuscarora receives gas supplies from Gas Transmission Northwest, near Malin, Oregon, which is connected to the gas producing regions of the Western Canada Sedimentary basin.

The Companies are seeking approval to maintain their current natural gas transportation portfolios. The contracts are listed in Figures ESP-38 and ESP-39. Additional information regarding the Companies' gas transportation plan is provided in Section 5.B.

- 3) **Gas Hedging Plan.** The Companies are proposing to continue the current approved hedging strategy and acquire no natural gas hedging products during the ESP period. The Companies will continue to monitor the natural gas market fundamentals and recommend changes to the hedging strategy in a future ESP update or ESP amendment as necessary.
- 4) **Coal Supply Plan.** The coal requirements for Valmy are discussed in Section 2.H. Planned operation of Valmy is described in detail in the supply side plan in the 2021 Joint IRP.

Valmy's coal requirements will be filled via spot market solicitations through RFPs transmitted to a list of qualified suppliers. In order to minimize the total cost of Valmy's coal supply, the Companies will not issue an RFP for a long-term coal supply contract.

**Risk Management Strategy.** The Companies' risk management strategy includes:

- Detailed corporate governance and risk control policies and procedures,
- Compliance with approved supply plans,
- Reduced reliance on volatile wholesale markets,
- Use of competitive procurement processes,
- Gas hedging strategies, and
- Market monitoring.

For more detail on risk management strategy, see Section 7.

**Determination of Prudence.** Pursuant to NAC §§ 704.9508(2) and 704.9494, the Commission can determine that the elements of an ESP are prudent if:

- The ESP balances the objectives of minimizing the cost of supply, minimizing retail price volatility and maximizing the reliability of supply over the term of the plan.
- The ESP optimizes the value of the overall supply portfolio of the utility for the benefit of its bundled retail customers.
- The ESP does not contain any feature or mechanism that the Commission finds would impair the restoration of the creditworthiness of the utility or would lead to a deterioration of the creditworthiness of the utility.

This ESP satisfies the prudency requirements of NAC §§ 704.9508(2) and 704.9494 for each of the three elements, as discussed in detail in Section 8. The Companies acknowledge that the prudence of their implementation of an approved ESP will be determined in a future deferred energy proceeding. In addition, pursuant to NAC § 704.9504, the Companies may deviate from an approved ESP or ESP update "to the extent necessary to respond adequately to any significant change in circumstances not contemplated by the energy supply plan."

***Continue To Conduct Gas Hedging Workshops.*** The Companies continue to conduct workshops bi-annually with the Staff and BCP and provide updates in the form of presentations for the remaining two quarters. Several topics are addressed, including energy market fundamentals, a monitoring matrix for potential gas hedging strategies, forward sales activity, gas procurement, and the most recent management decision on hedging.

### **SECTION III**

#### **FORECASTING DATA — NAC § 704.9489(1)(c)**

The Companies will continue to pursue improvements to its forecast models including economic and price projections for all customer classes, end-use saturations and efficiency trends.

### **SECTION IV**

#### **TIMETABLE AND BUDGET FOR PROGRAMS — NAC § 704.9489(1)(d), (3), (4)**

The following figure shows the Action Plan timetable and budget by Action Plan year. Further details regarding the project schedules and milestones for capital projects is set forth in the Supply-Side Plan. Further details regarding the Demand Side Management Plan budget can be found in the Demand Side volume. Further details regarding the Distributed Resources Plan budget can be found in the Distributed Resources Plan volume.

### ACTION PLAN BUDGET

Action Plan Items	(Millions excluding AFUDC)			
	2022	2023	2024	3-Year Total
<b>Nevada Power</b>				
Energy Efficiency and Conservation				
Education Services	\$ 2.43	\$ 2.43	\$ 2.43	\$ 7.28
Residential Services	\$ 24.99	\$ 26.72	\$ 28.22	\$ 79.93
Non-Residential Services	\$ 16.95	\$ 17.05	\$ 17.15	\$ 51.15
<b>Total Energy Efficiency and Conservation</b>	<b>\$ 44.37</b>	<b>\$ 46.20</b>	<b>\$ 47.80</b>	<b>\$ 138.36</b>
Distributed Resources				
DERMS	\$ 3.48	\$ 2.79	\$ 2.78	\$ 9.05
DOE Grid Services Grant	\$ 2.51	\$ 0.12	-	\$ 2.64
Distributed Solar+Storage Trial	\$ 0.69	\$ 35.27	\$ 0.92	\$ 36.88
<b>Total Distributed Resources</b>	<b>\$ 4.18</b>	<b>\$ 38.06</b>	<b>\$ 3.70</b>	<b>\$ 48.57</b>
Plan for Supply				
Combustion Turbine Upgrades	\$ 93.10	\$ 48.30	-	\$ 141.40
Iron Point Transmission	\$ 1.37	\$ 2.05	-	\$ 3.42
Hot Pot Transmission	\$ 2.06	\$ 2.58	\$ 0.52	\$ 5.16
<b>Total Plan for Supply</b>	<b>\$ 96.53</b>	<b>\$ 52.93</b>	<b>\$ 0.52</b>	<b>\$ 149.98</b>
<b>Totals</b>	<b>\$ 145.07</b>	<b>\$ 137.19</b>	<b>\$ 52.01</b>	<b>\$ 336.91</b>
<b>Sierra</b>				
Energy Efficiency and Conservation				
Education Services	\$ 1.19	\$ 1.19	\$ 1.19	\$ 3.57
Residential Services	\$ 5.28	\$ 5.90	\$ 6.42	\$ 17.60
Non-Residential Services	\$ 7.46	\$ 7.54	\$ 7.54	\$ 22.54
<b>Total Energy Efficiency and Conservation</b>	<b>\$ 13.93</b>	<b>\$ 14.63</b>	<b>\$ 15.15</b>	<b>\$ 43.71</b>
Distributed Resources				
DERMS	\$ 0.39	\$ 0.31	\$ 0.25	\$ 0.95
Distributed Solar+Storage Trial	\$ 0.11	\$ 5.04	\$ 0.14	\$ 5.29
<b>Total Distributed Resources</b>	<b>\$ 0.50</b>	<b>\$ 5.35</b>	<b>\$ 0.39</b>	<b>\$ 6.24</b>
Plan for Supply				
Grid-Tied Batteries	\$ 27.46	\$ 74.24	-	\$ 101.70
Combustion Turbine Upgrades	\$ 53.00	-	-	\$ 53.00
Iron Point Transmission	\$ 0.46	\$ 0.68	-	\$ 1.14
Hot Pot Transmission	\$ 0.69	\$ 0.86	\$ 0.17	\$ 1.72
Fort Churchill Solar	\$ 17.14	-	-	\$ 17.14
<b>Total Plan for Supply</b>	<b>\$ 98.74</b>	<b>\$ 75.79</b>	<b>\$ 0.17</b>	<b>\$ 174.70</b>
<b>Totals</b>	<b>\$ 113.18</b>	<b>\$ 95.77</b>	<b>\$ 15.71</b>	<b>\$ 224.66</b>
<b>NV Energy</b>				
Energy Efficiency and Conservation				
Education Services	\$ 3.62	\$ 3.62	\$ 3.62	\$ 10.85
Residential Services	\$ 30.27	\$ 32.62	\$ 34.64	\$ 97.54
Non-Residential Services	\$ 24.41	\$ 24.59	\$ 24.69	\$ 73.69
<b>Total Energy Efficiency and Conservation</b>	<b>\$ 58.30</b>	<b>\$ 60.83</b>	<b>\$ 62.94</b>	<b>\$ 182.07</b>
Distributed Resources				
DERMS	\$ 3.87	\$ 3.10	\$ 3.03	\$ 10.00
DOE Grid Services Grant	\$ 2.51	\$ 0.12	-	\$ 2.64
Distributed Solar+Storage Trial	\$ 0.81	\$ 40.31	\$ 1.06	\$ 42.18
<b>Total Distributed Resources</b>	<b>\$ 4.67</b>	<b>\$ 43.41</b>	<b>\$ 4.09</b>	<b>\$ 54.82</b>
<b>Total Plan for Supply</b>	<b>\$ 195.28</b>	<b>\$ 128.72</b>	<b>\$ 0.69</b>	<b>\$ 324.68</b>
<b>Totals</b>	<b>\$ 258.25</b>	<b>\$ 232.96</b>	<b>\$ 67.73</b>	<b>\$ 561.57</b>

**SECTION V**  
**CHANGES IN METHODOLOGY — NAC § 704.9489(1)(e)**

While some modeling techniques have been improved, especially in the areas of load forecasting and DSM planning, the Companies are not proposing any changes in basic planning methodologies.

**SECTION VI**  
**ACQUISITION OF NEW MODELING INSTRUMENTS — NAC § 704.9489(1)(f)**

NV Energy is transitioning its production cost modeling software. As the complexity of the electric system increases with the integration of renewable resources, battery storage systems, distributed generation resources, and other technologies, production cost modeling needs to evolve. A discussion of the Companies' intentions in this area is included in the testimony of Anita Hart.

**SECTION VII**  
**DEMAND SIDE PLAN PROGRAMS — NAC § 704.9489(1)(g)**

A description of continued planning efforts and the plan to carry out and continue selected conservation and DSM measures is set forth in Section II. The Companies have not attempted to claim or calculate imputed debt associated with energy efficiency contracts in the Preferred Plan.

**SECTION VIII**  
**ACQUISITION OF RESOURCES — NAC § 704.9489(1)(h)**

During the Action Plan period, the Companies plan to construct two solar PV with storage generating resources totaling 600 MW with 480 MW of storage, construct three battery energy storage projects totaling 66 MW, and acquire one existing 19.5 MW solar PV facility that is currently leased to Sierra.

**SECTION IX**  
**DISTRIBUTED RESOURCES PLAN — NAC § 704.9489(2)**

In its DRP, NV Energy requests Commission approval of the following projects:

- 1) Investigation into the implementation of a DERMS as described in Section 9.B and the associated cost of approximately \$15.5 million as detailed in Technical Appendix DRP-6 of the DRP (approximately \$10.0 million within the Action Plan period);
- 2) Participation in the DOE Grid Services Grant project as described in Section 9.C, the Companies' associated cost of approximately \$2.76 million as detailed in DRP-Table 58 (approximately \$2.64 million within the Action Plan period), and the field demonstration described in Section 10.H of the DRP; and
- 3) Proposal to develop and conduct a new integrated Distributed Solar + Storage Residential Demand Management Trial as described in Section 10.I and the associated cost of approximately \$42.2 million as detailed in DRP-Table 66 of the DRP (all dollars within the Action Plan period).

## **SECTION X**

### **RENEWABLE ENERGY ZONE TRANSMISSION ACTION PLAN — NAC 704.9489(5)**

In response to the requirements provided for in NAC § 704.9489(5), regarding the development of transmission facilities to serve renewable energy zones within the state of Nevada, the Companies have prepared a Conceptual Renewable Energy Zone Transmission Plan (“REZTP” or “Plan”).

The REZTP is a conceptual plan for transmission facilities that shows possible transmission access to areas of Nevada that have been designated as renewable energy zones. The REZTP does not request any funds construction nor does it request Commission approval of any facilities associated with the REZTP.

The Companies did not produce new studies for the REZTP for this 2021 Joint IRP. There has been no interest by any parties outside the Companies to pursue any studies with respect to this plan. Upon a new identification of renewable energy zones by the Commission, or new interest by outside parties, the Companies will revisit the REZTP and update accordingly.

## **SECTION XI**

### **ASSET RETIREMENT PLAN — NAC 704.9489(6)**

Nevada Power and Sierra hold ownership interests in three generation assets that meet the criteria of NAC § 704.9489(6), specifically:

- Brunswick Diesel Plant - Sierra: The Brunswick Diesel Plant is a 6 MW Emergency “Black Start Only” plant, comprised of three reciprocating diesel fired engines located on approximately 10 acres in Carson City, Nevada. This Plant is operational; however, since

it is black start only, it cannot be used to serve customer load and so does not provide system capacity.

- Mohave Generating Station – Nevada Power: The Mohave site is located in Laughlin, Nevada and is the previous site of a 1,500 MW coal-fired generating plant. The site is co-owned by Southern California Edison (56 percent), Salt River Project (20 percent), Nevada Power (14 percent) and Los Angeles Department of Water and Power (10 percent). Mohave ceased operations in January 1, 2006 and has been decommissioned. In 2015, the co-owners agreed to proceed with selling the majority of the property through a public sale process. The property was listed by a nationwide commercial real estate firm in October 2016. No sales transactions have been executed at this time.
- Reid Gardner Generating Station – Nevada Power: The last unit at the Reid Gardner Generating Station ceased operations in March 2017 and the plant is in a state of Post-Operational Reserve. The units are currently being dismantled. Dismantling and demolishing will be completed over the next 18 months and site remediation will follow. The Commission approved plan remains as presented in Docket 15-05004. A final disposition plan for the site will be developed as the site remediation scope becomes better known.