



Energy Choice and Considerations for Resource Adequacy

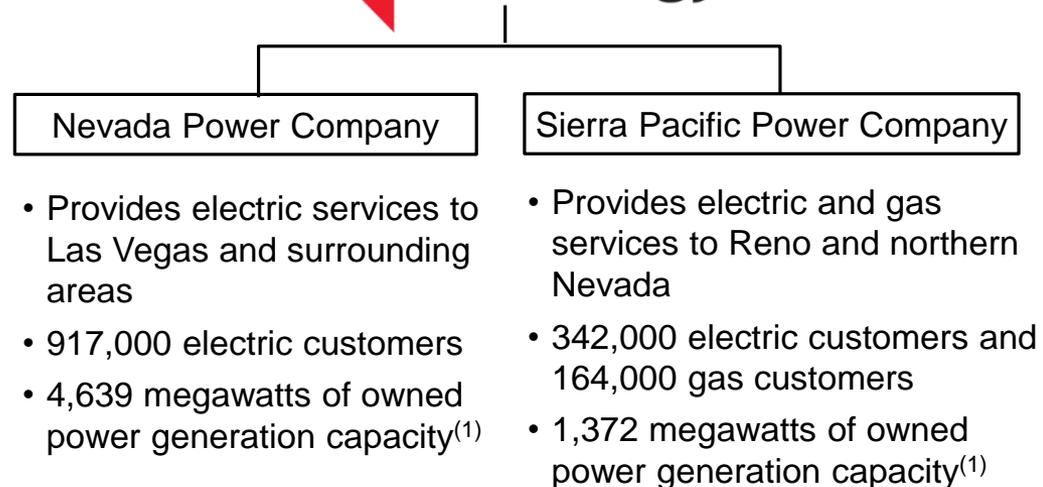
Kevin Geraghty SVP, Energy Supply
September 13, 2017

NV Energy Overview



- NVE SPPC Electric Service Territory
- NVE NPC Electric Service Territory
- NV Energy Gas Service Territory
- Coal Plants
- ◆ Natural Gas Plants
- ▲ Energy Recovery Plant
- ★ Solar Energy Plant

- Headquartered in Las Vegas, Nevada, with territory throughout Nevada
- 2,436 employees
- 1.26 million electric and 164,000 gas customers
- Service to 90% of Nevada population, along with tourist population in excess of 45 million
- 6,011 megawatts of owned power generation (91% natural gas, 9% coal/renewable/other)



Nevada Power Company

- Provides electric services to Las Vegas and surrounding areas
- 917,000 electric customers
- 4,639 megawatts of owned power generation capacity⁽¹⁾

Sierra Pacific Power Company

- Provides electric and gas services to Reno and northern Nevada
- 342,000 electric customers and 164,000 gas customers
- 1,372 megawatts of owned power generation capacity⁽¹⁾

⁽¹⁾ Net summer peak megawatts owned in operation as of March 1, 2017

Agenda



- Energy Supply versus Resource Adequacy
- Energy Supply
- Resource Adequacy
 - Demand and Consumption
 - Resources
 - Uncertainty
- Considerations for Resource Adequacy and Energy Supply
- Appendix

Energy Supply versus Resource Adequacy

Throughout this presentation, NV Energy’s management of energy supply and resource adequacy are discussed in the context of the planning horizon and not the day-ahead or real-time environments

- **Energy Supply – “The Economics of Electricity”**
 - Relates to total consumption – typically across a calendar year – that a customer needs or desires from the load-serving entity
 - Includes fuel used for power generation and contracts between NV Energy and third-party suppliers
 - Cost of energy supply is determined by the prices of the underlying commodities: Electricity, coal, gas, chemicals and their optimized delivery to the load
 - More economics than reliability, but the two go hand in hand
- **Resource Adequacy – “The Reliability of Electricity”**
 - Relates to the maximum amount of electricity that customers can “demand” at any one precise point in time and the necessity for any market to have firm generation resources capable of producing enough electricity to meet that demand
 - Demand “peaks” normally occur on the hottest or coldest days of the year
 - NV Energy’s historical peaks occur in June or July, weekday between 5 p.m. and 6 p.m. when temperatures are above 112 degrees in Las Vegas and/or above 102 degrees in Reno
 - Peak reliability planning requires a safety margin, a reserve margin, due to the uncertainty of predicting system conditions in Nevada and across the Western interconnect, customer demand and resources at a precise moment of time in the future

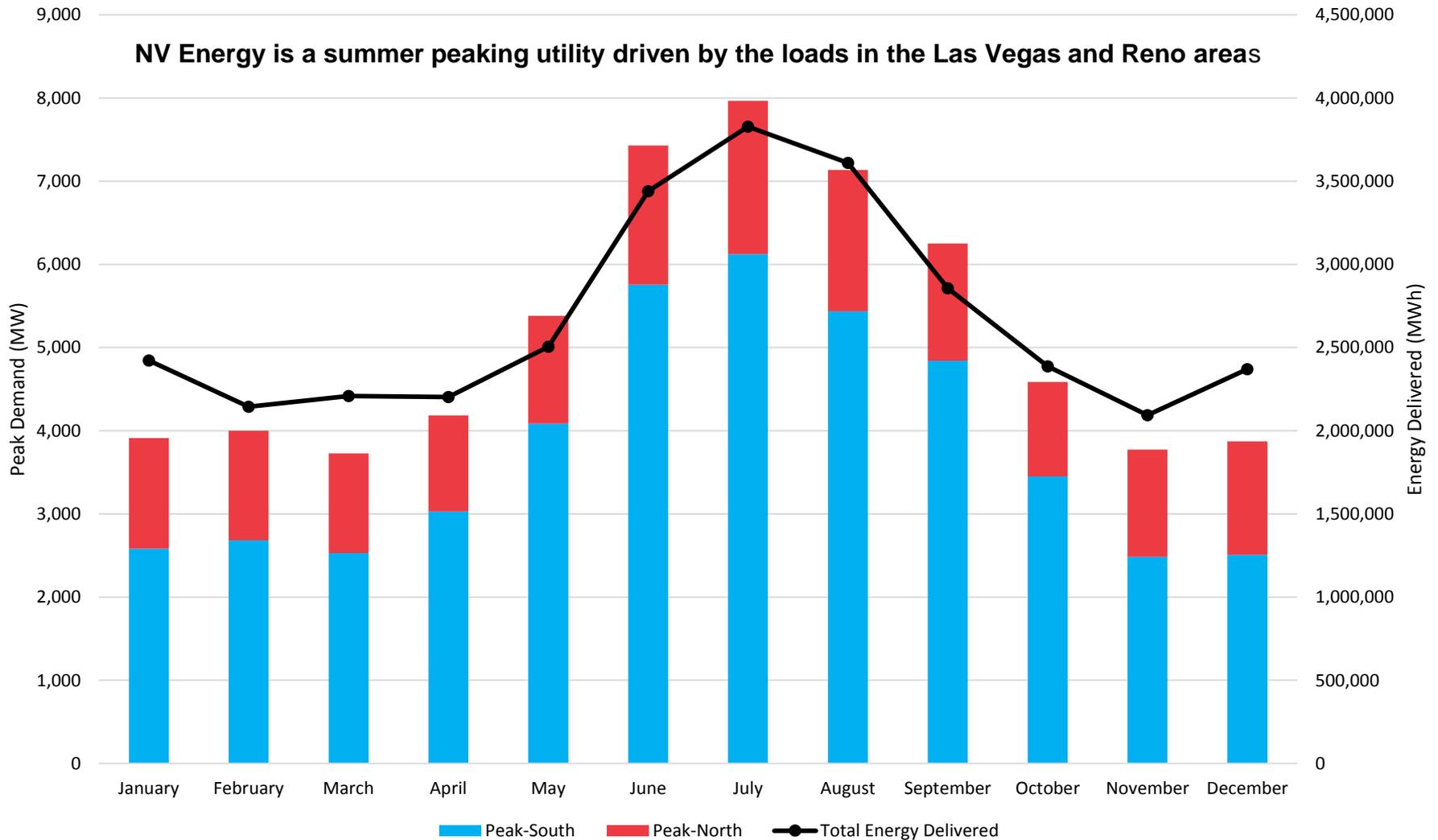
Energy Supply versus Resource Adequacy

- Most customers will never experience an interruption in service because there is not enough energy available. Most service interruptions, whether minor or major, are related to inclement weather, equipment failures or other issues at the distribution level
- However, high prices related to scarcity or the chances that resources (or capacity) are being exhausted at the peak-demand requirement can and do happen
 - There were several in the West in June 2017
- Limited fuel supply is rare, but the recent events demonstrate what may be possible
 - The Aliso Canyon natural gas storage issue created a scarcity concern in California
 - Hurricane Harvey created the same scarcity concern across the Southwest
- Western energy crisis was an extreme event, as was the Polar Vortex, but shows the outcome of a severely constrained market

2016 Monthly Retail Customer Demand



2016 Monthly Peak Demand (MW) and Energy Delivered (MWh)



Energy Supply



- As an outcome of the Western Energy Crisis, and mandated by statute, NV Energy works through the Public Utilities Commission of Nevada and other stakeholders to produce a three-year energy supply plan to assure a reliable and economical solution for customers given the uncertainty that exists in any commodity market
 - NV Energy must provide more than 30 million gigawatt-hours of electricity to our customers annually
 - How much is needed any hour-to-hour, week-to-week and month-to-month is highly variable but predictable when taken against a longer term weather and usage pattern
- NV Energy can create this energy, contract for this energy or buy this energy in a just-in-time fashion. Below is the 2016 annual supply breakdown
 - 65.7% - Company-owned generating facilities (economical)
 - 12.8% - Long-term contracted renewable generation resources
 - 20.4% - Long-term contracted thermal (gas or coal) generation resources
 - 1% - Short-term market purchases that could be from any resource type

Energy Supply



- The biggest cost and reliability concern in supplying this electricity over the year is natural gas procurement and delivery
 - NV Energy does not currently financially hedge the price it pays for natural gas
 - NV Energy, along with the Public Utilities Commission of Nevada, Bureau of Consumer Protection and stakeholders, monitors natural gas fundamentals to determine whether a change in hedging strategy should be made
- Computer models help resource optimization teams make the best decision on when and where to buy or create the most economical megawatt
- Computer systems also monitor the reliability of the electric grid and its reliability often requires “un-economic” resource decisions to meet North American Electric Reliability Corporation reliability criteria
 - Sometimes this includes predetermined reliability-must-run units, but often happens either due to changing real-time conditions associated with the electric grid or loss of generation
 - Maintenance, a wildfire or a microburst weather condition may drop a transmission circuit which then necessitates a specific generation resource to supply electricity regardless of its economic standing. This may also be predicated on the generation unit ramp rate to meet the need at the time needed

What is Resource Adequacy



- Resource adequacy is having enough supply-side and demand-side resources available to reliably serve the electricity demands of customers at almost all times and under a diverse set of conditions, including the uncertainty of predicting future outcomes
- A simplified equation would be resource adequacy equals available resources to serve customer demand (at peak) minus the expected demand at peak
 - Resource adequacy is achieved if the outcome is a positive number – more resources than demand
 - In order to assure that a load-serving entity has resource adequacy and taking into account uncertainty, the safety factor – or reserve margin - is used to ensure that demand can be met
- Therefore, the complete equation would be resource adequacy equals available resources to serve customer demand (at peak) minus the expected demand (with North American Electric Reliability Corporation reliability criteria and reserve margin added) at peak
- This peak condition that drives resource adequacy in Nevada happens very few hours and days out of the year – but can be very impactful from a price and cost to customer standpoint

Customer Demand and Consumption



- Customer demand is constantly changing – higher and lower
- What raises demand
 - Air temperature, time of day and time of year
 - Improving economy
 - Automation of manual processes
 - Storage and manipulation of data
 - New businesses and/or new business processes
 - Population growth
 - Customer behaviors associated with rooftop solar or storage devices like batteries and electric vehicles
- What lowers demand
 - Air temperature, time of day and time of year
 - Economic recession
 - Population decline
 - Customer generation – solar or batteries
 - Energy efficiency
 - Demand-side management or shifting load to different times
 - Customer decisions to receive distribution only
 - Customer behaviors associated with rooftop solar or storage devices like batteries and electric vehicles

Resources at Peak Demand



- Capacity Resources
 - Thermal – highest of availability at peak demand
 - Hydro – high availability depending on the resource type – Hoover is very high
 - Storage – high availability for short periods – similar to Hoover
 - Solar – 35% (plus or minus) availability at peak in Nevada
 - Wind – 10% (plus or minus) availability at peak in Nevada
 - Neighboring load-serving entities with different peaks
- Load-Modifying Resources
 - Rooftop solar installations
 - Air conditioning load management
- Energy Efficiency Resources
 - Very predictable results based on deployment analysis
- Emergency Load-Modifying Resources
 - Not included as a resource to serve peak load, but in emergencies can be deployed
 - Irrigation systems, lighting systems, rolling brown-outs and black-outs, and other large customer demand response programs
 - Public communication and outreach

What are the Uncertainties



- Reserve margins are determined so that the power system can respond, with a high probability of success, to generation and transmission equipment outages, load volatility, variable energy resources, and other reasonably foreseeable events
 - Generation outages
 - Transmission outages, including loss of transmission interconnections with other electric transmission entities
 - Customer behaviors – energy efficiency, customer generation, population
 - Economic health of the region and state
 - Transmission ties to other regions with different load shapes
 - Fuel supply, hydro supply
 - Policy
 - Retirements and additions
 - Extreme weather – temperatures, wildfires, microburst, drought
- Load-serving entities must look at these issues from a regulatory and historical perspective and also from an emerging trend point of view to develop an appropriate probabilistic reserve margin that assures resource adequacy given their specific set of uncertainties

Reserve Margin



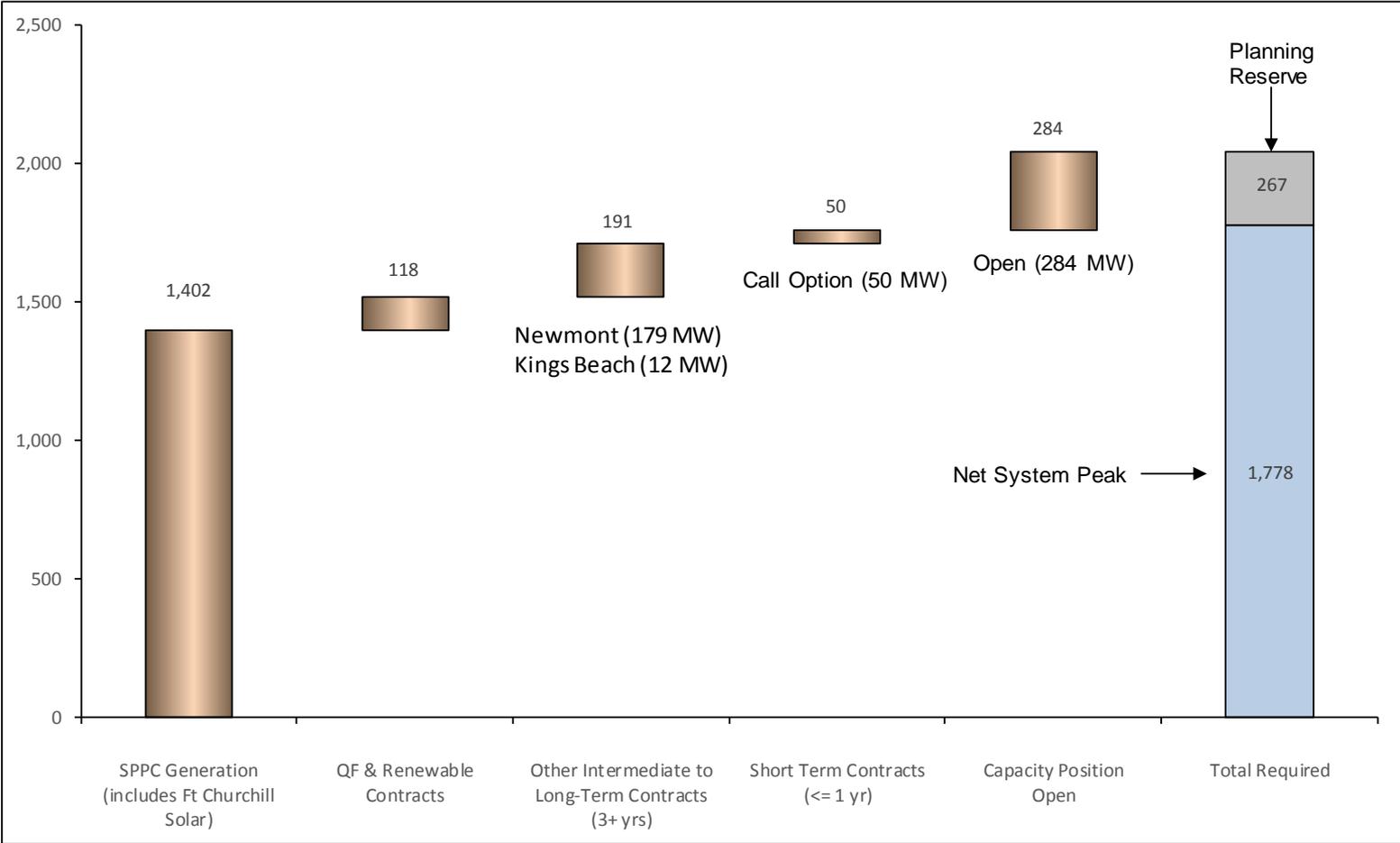
- Reserve margins between 10% and 20% are the norm for utilities
- For NV Energy, a 15% reserve margin (at 102 degrees) is used for Sierra Pacific Power Company and 12% (at 112 degrees) for Nevada Power Company
 - The higher reserve margin for Sierra Pacific Power is indicative of the limitations associated with import capabilities
- It should be noted that there are very few load-serving entities who must model their resource adequacy at these extreme temperatures
 - At these extreme temperatures, it is normal to see the entire Southwest region and sometimes the entire West gripping with the same issue, and the ability to depend on the market and other load-serving entities is limited
- NV Energy's greatest challenge and concern, though, is when the temperatures soar above 112 degrees in Las Vegas. A condition which has been seen many times, and with increasing frequency, the last few years
 - At temperatures above 112 degrees, customer behaviors change, most resources lose capability (even solar) rapidly so there is the potential to go from having resource adequacy to deficiency very, very quickly. NV Energy's gas fleet capability can reduce by up to 250 megawatts at 117 degrees
 - Several Western load-serving entities declared energy emergency alerts on June 20 and/or June 21, 2017
 - NV Energy was very close to deficiency, and this was while its resources were almost all available

Resource Adequacy at NV Energy

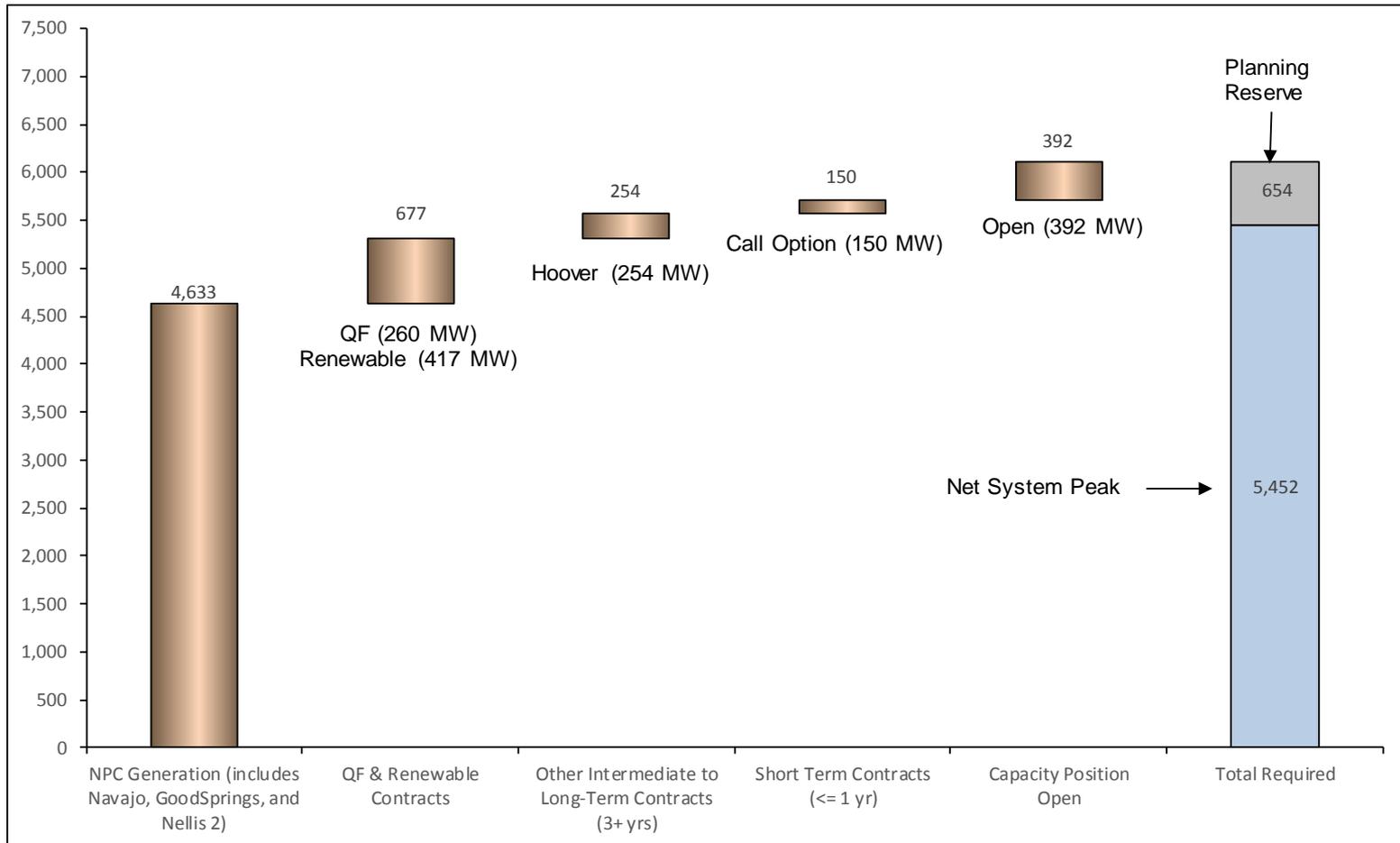


- NV Energy is not currently achieving resource adequacy (including reserve margins) for the next three years:
 - 2018 is currently 676 megawatts deficient (or short) of achieving resource adequacy
 - 2019 is currently 810 megawatts deficient (or short) of achieving resource adequacy
 - 2020 is currently 1,178 megawatts deficient (or short) of achieving resource adequacy
- This assumes Navajo Generating Station (255 megawatts) retires in December 2019, and there is no retirement of a unit at North Valmy
 - Idaho Power Company is required to negotiate with NV Energy to retire Unit 1 by the end of 2019
- Citing energy choice as a driver, the Public Utilities Commission of Nevada rejected the purchase of the 504 megawatt South Point Energy Center facility by a 2-1 vote
 - Requires NV Energy to propose short-term solutions to deal with the lack of resource adequacy
- Long-term development of resources to improve NV Energy's resource adequacy deficiency is at a near standstill while energy choice is being considered and will likely continue until a market is put in place
 - Long-term resources, whether generation, transmission or demand side, take a long time to develop to support load growth and retirements
 - No market will address resource adequacy on day one. Proper pricing signals will need to trigger investment and time will pass until those market-derived resources are available

Sierra Pacific Power Company (Electric) Summer (July) 2018 Capacity Position (MW)



Nevada Power Company Summer (July) 2018 Capacity Position (MW)



Short-term Considerations for Resource Adequacy



- On September 1, 2017, NV Energy filed an update to the Energy Supply Plan to create a deterministic process to achieve resource adequacy via market solicitations. This same deterministic process is used to purchase natural gas
- NV Energy intends to update its integrated resource plan later this fall to offer additional solutions to manage the longer term lack of resource adequacy
 - NV Energy must continue investment in existing company-owned resources to assure reliability is maintained at the highest level possible
 - Transmission investment – especially focused on northern Nevada – needs to be fast-tracked
- Firm gas supply transportation contracts must be maintained for southern Nevada – provides an option for our state while we examine market-derived resource adequacy
 - Northern Nevada long-term gas supply contracts will likely shift to the local distribution company as a result of energy choice – this will likely raise the cost of service to gas customers but also provides a hedge for electricity resource adequacy that can be considered in the market-derived resource adequacy solution

Interim Period (If Energy Choice is Approved)



- Focus needs to be on creating a large, effective and diverse wholesale marketplace
 - Nevada needs to decide up front how its market design will ensure resource adequacy
 - Existing organized wholesale markets employ a variety of resource adequacy models
 - PJM and ISO New England: Forward capacity auctions
 - Electric Reliability Council of Texas: Energy-only market with high price caps (\$9,000/MWh) and scarcity pricing
 - California & Midwest ISO: Load-serving entities are required to provide evidence of adequate qualifying capacity and reserves in accordance with independent system operator tariff provisions
 - The Western Energy Crisis was the result of insufficient resources or at very least the lack of economically priced resources. This is unique to the US Southwest (extreme peaks, lack of diversity AND growth) and Nevada must have a plan to administratively assure resource adequacy until the market can be trusted to do so
 - The 2011 Western event was related to significant reliance on import from an adjacent state and the loss of the transmission intertie between states

Interim Period

(If Energy Choice is Approved)



- Assess the reliability-must-run units
 - These units should remain under the control of Nevada (not the market) to maintain grid reliability for customers
 - The conditions associated with the reliability-must-run status can be mitigated through ownership and/or market design or through other investments in transmission resources
- A stakeholder-driven divestiture process should focus on resource adequacy and consider how the timing of resource sales impact long-term resource adequacy
 - The new generating asset owners may be incented to sell capacity into other regions where resource adequacy requirements result in a higher value, making Nevada's resource adequacy even worse
 - As an example, neighboring utilities, looking to secure resource adequacy for customers, could acquire one of the Nevada power plants
 - Two large resources located in Nevada were purchased from merchant generators by California utilities for the benefit of their customers

Market Considerations for Resource Adequacy



- The resource adequacy component of the wholesale market must create the environment that attracts new generation investment quickly
 - Nevada may be the only state that restructures without the benefit of a preexisting large, diverse, effective wholesale marketplace WHILE already being resource deficient AND experiencing economic and population growth
 - There may not be a restructured state example that fits the conditions Nevada will experience
- Resource adequacy has a cost – it is a physical hedge – that customers ultimately bear
 - Nevada must weigh embedding this fixed cost which reduces volatility and assures higher reliability versus allowing for lower reserve margins, higher volatility and allow the marketplace to develop proper scarcity pricing to attract investors
- Nevada will be gas dependent for a long time – probably more so than any state that restructured to retail choice
 - Nevada's market design must account for this emerging issue – gas reliability is tied to electric reliability
 - Should Nevada count on a market resource that does not have firm delivery of its gas supply
 - How should the firm gas supply held by the local distribution company in the future be made available for electric use
- Resource adequacy requirements should be defined well in advance of the open market to ensure electric providers are in compliance and allow time for new resources to be placed in service

Market Considerations for Resource Adequacy



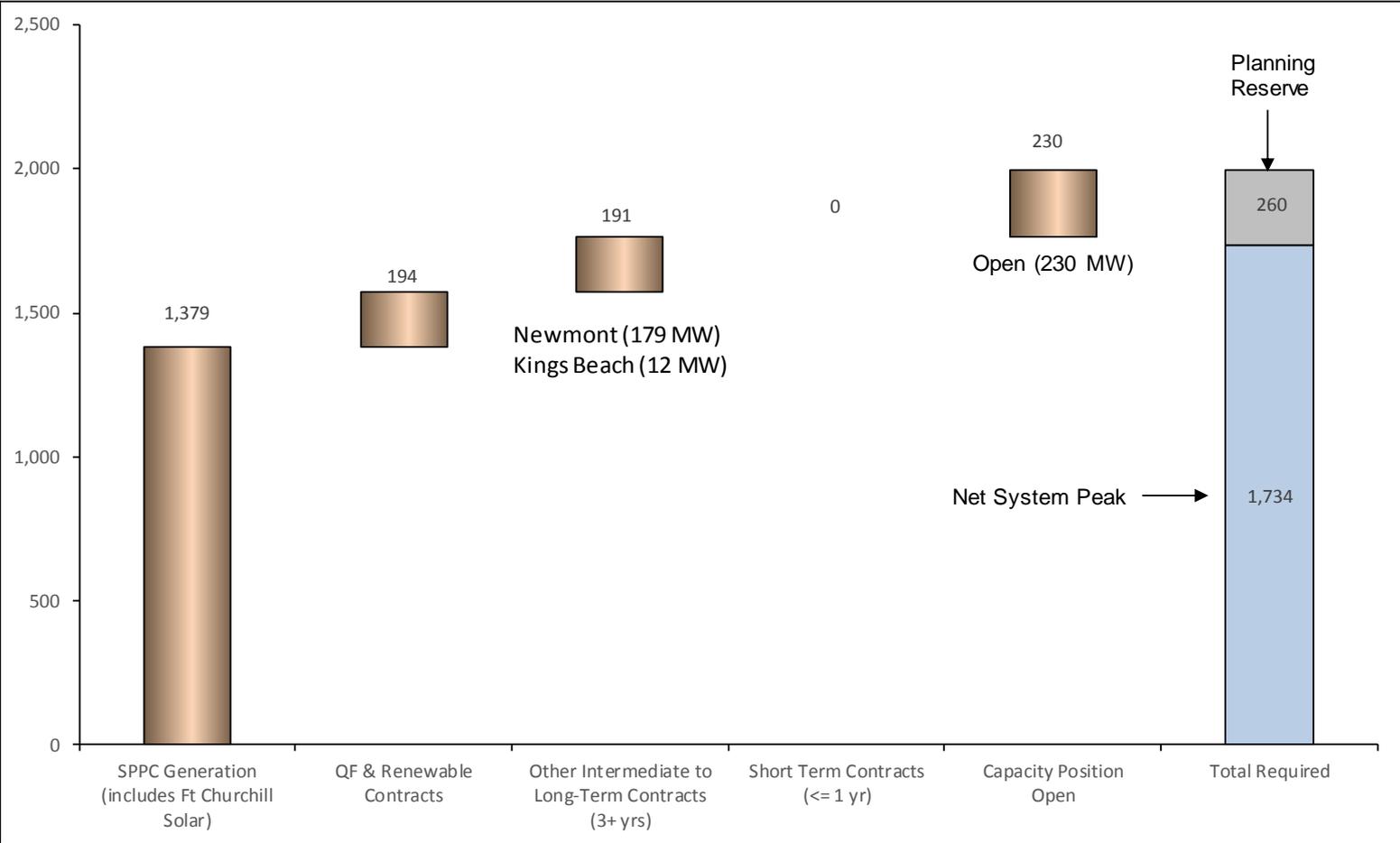
- Nobody in retail choice states is obligated to plan or build resources (generation or transmission) for the long-term load projections
- States with retail choice that have attempted to ensure resource adequacy via administrative solutions have been rejected by the Federal Energy Regulatory Commission
 - State programs to incent renewable energy have also come into conflict with the Federal Energy Regulatory Commission's pricing authority in organized wholesale markets
- Nevada's market must require load-serving entities to have dependable capacity now and into the future
 - Timely and accurate signals must be sent with sufficient lead time to allow for planning, development, construction and/or aggregation to achieve resource adequacy
- Most, with Texas maybe being the exception, restructured states are rust belt states that experienced a significant reduction in load prior to the timing of restructuring, which resulted in large reserve margins
 - Only recently, with coal plant retirements, does one see declining reserve margins in these restructured markets. The nuclear plant subsidy initiatives evidence this issue
 - Some of those states have considered adjustment toward regulated service



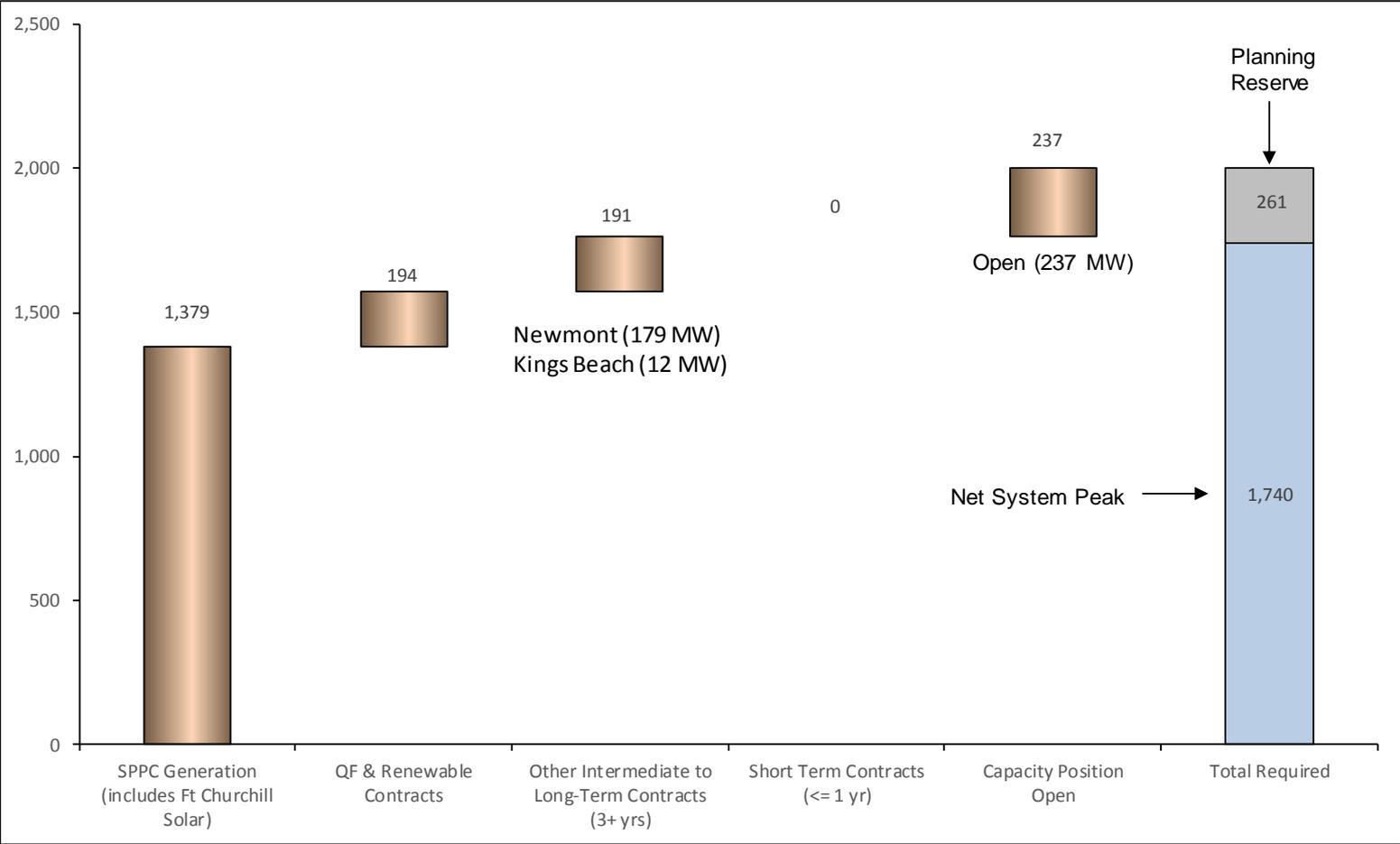
Appendix



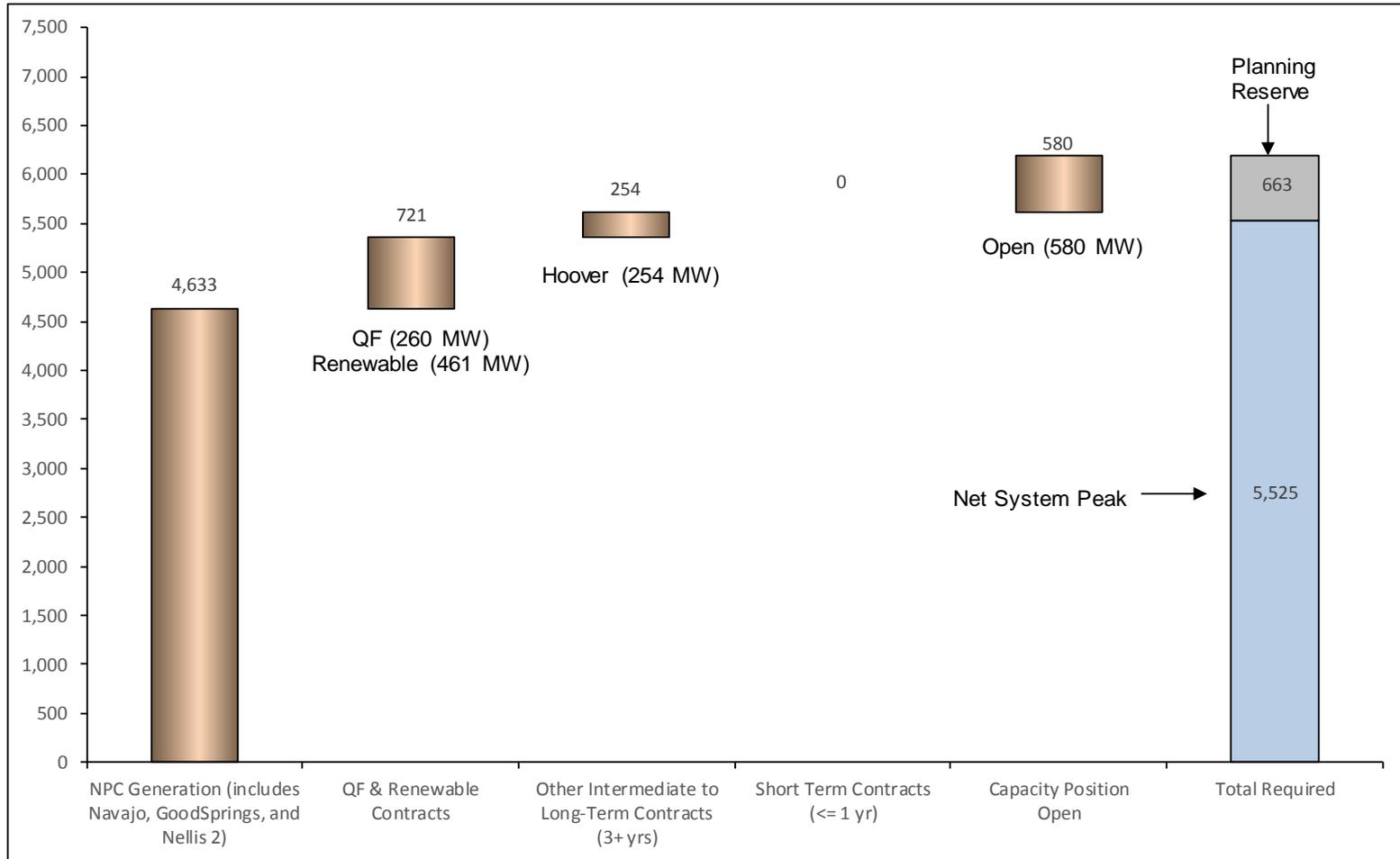
Sierra Pacific Power Company (Electric) Summer (July) 2019 Capacity Position (MW)



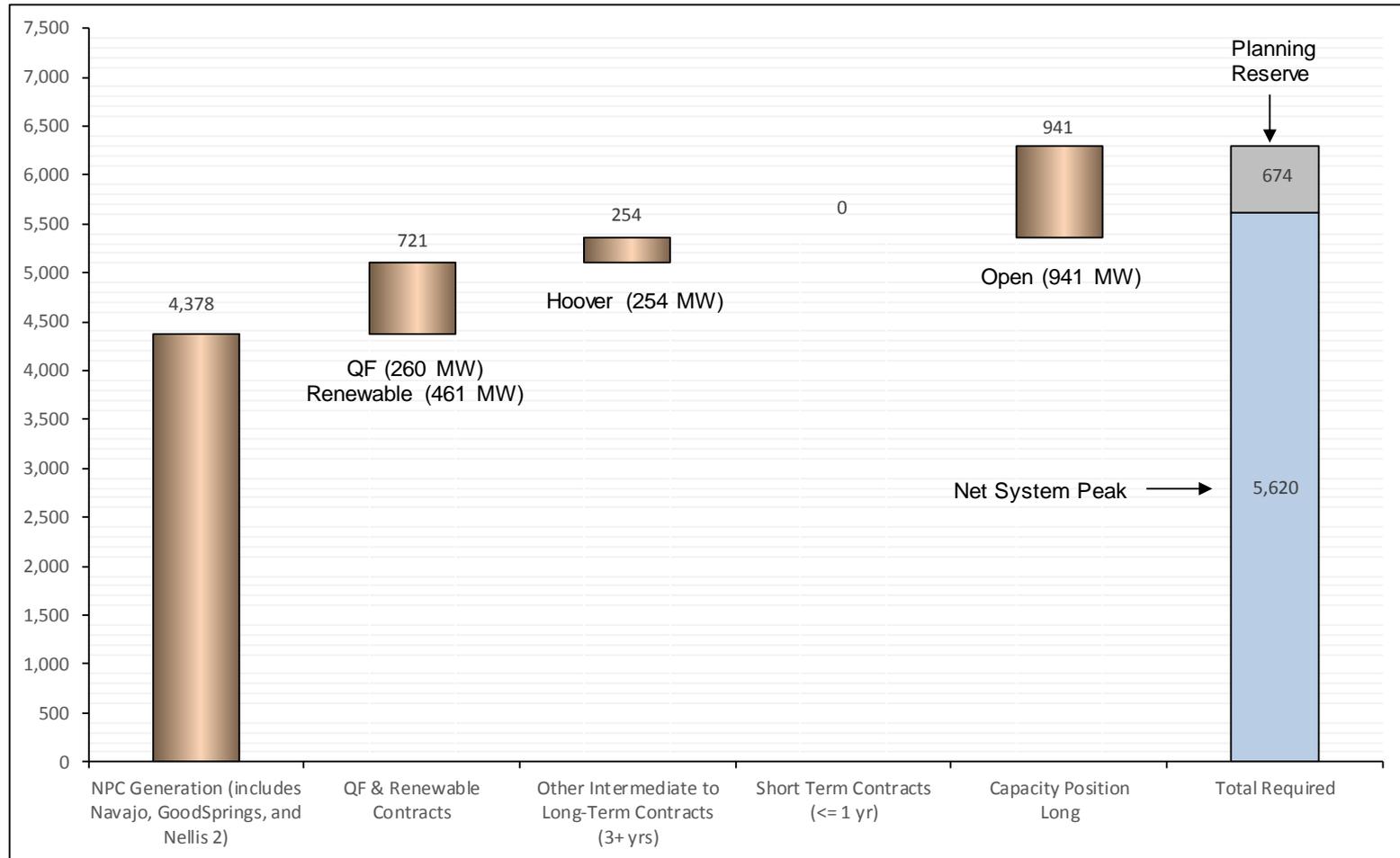
Sierra Pacific Power Company (Electric) Summer (July) 2020 Capacity Position (MW)



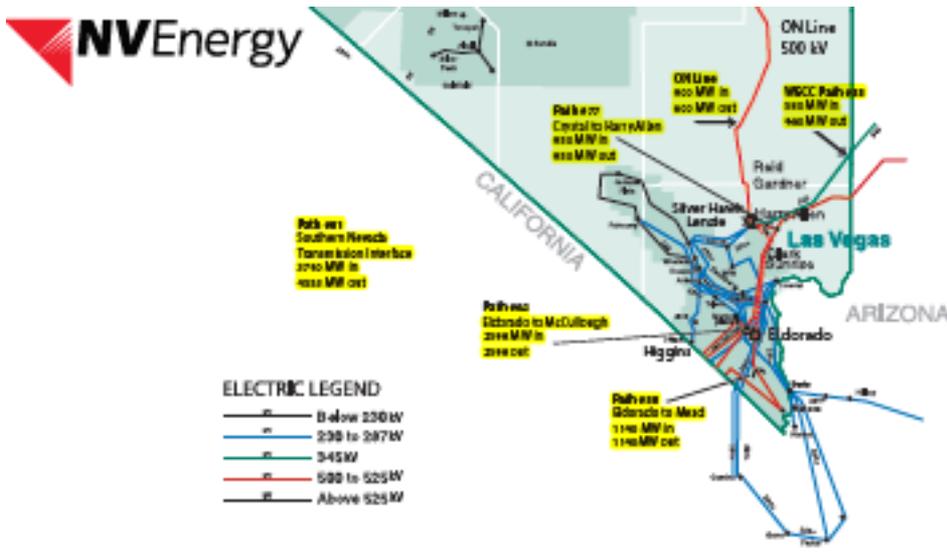
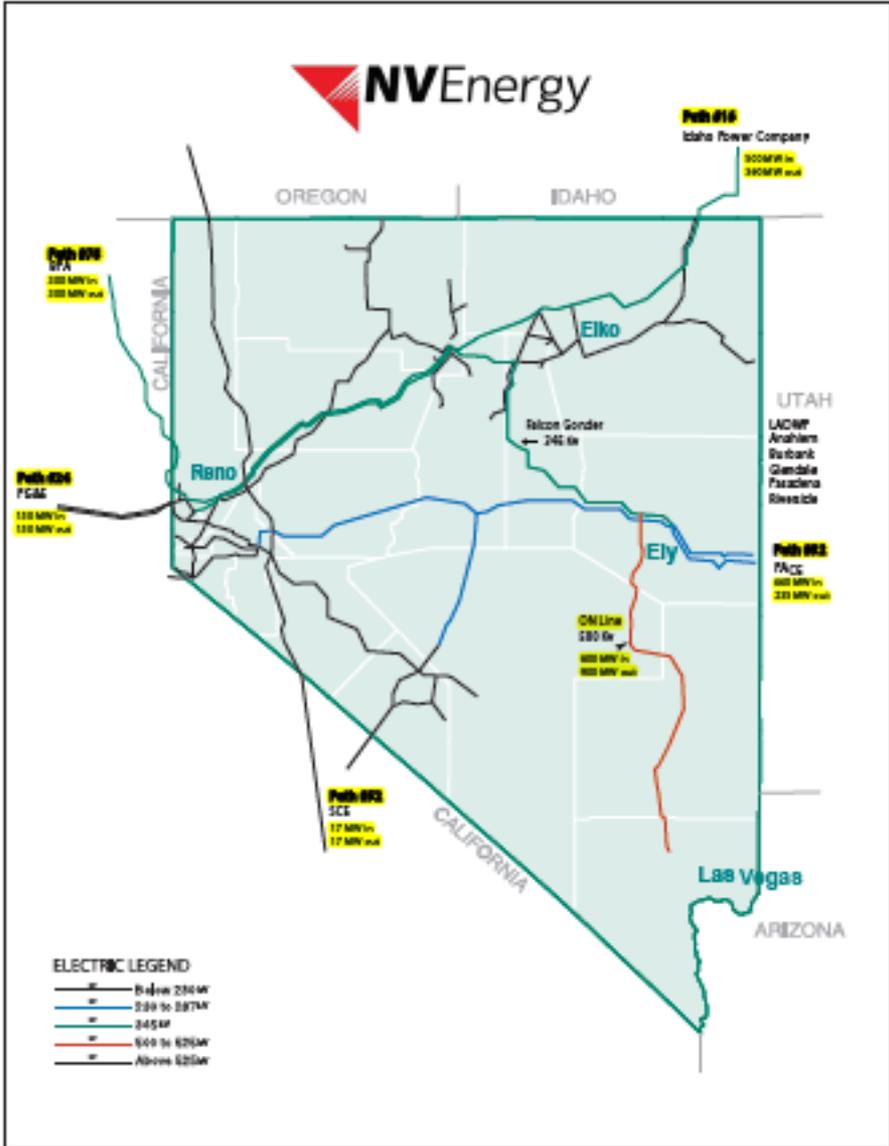
Nevada Power Company Summer (July) 2019 Capacity Position (MW)



Nevada Power Company Summer (July) 2020 Capacity Position (MW)



NV Energy Import Capability



Northern Nevada is limited to 1,000 megawatts of imports versus an all-time peak of 1,842 megawatts (July 2016)

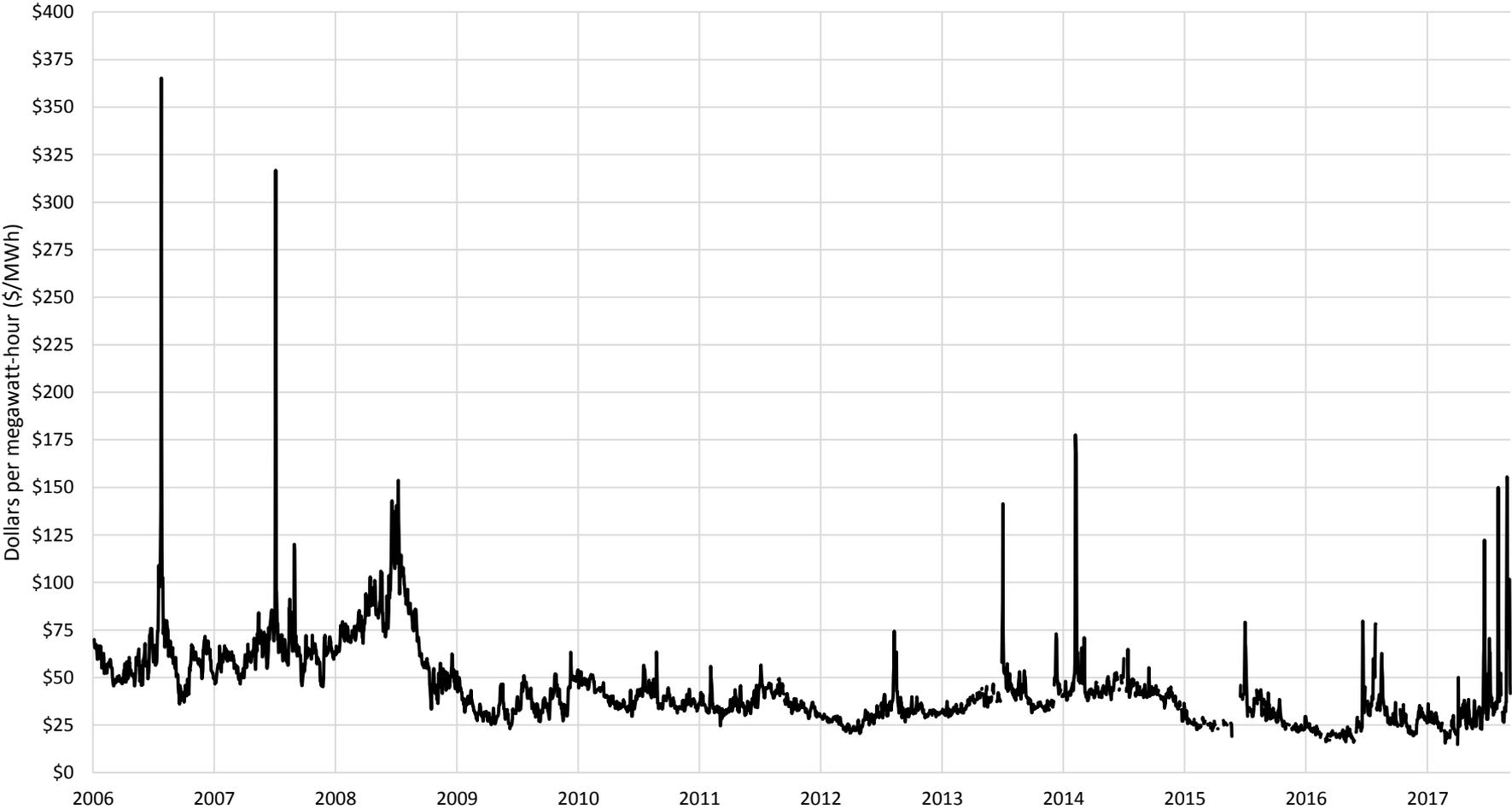
Southern Nevada is limited to 5,331 megawatts of imports versus an all-time peak of 6,142 megawatts (July 2016)

The all-time coincident peak was 7,961 megawatts (July 2016)

Mead On-peak Electricity Prices



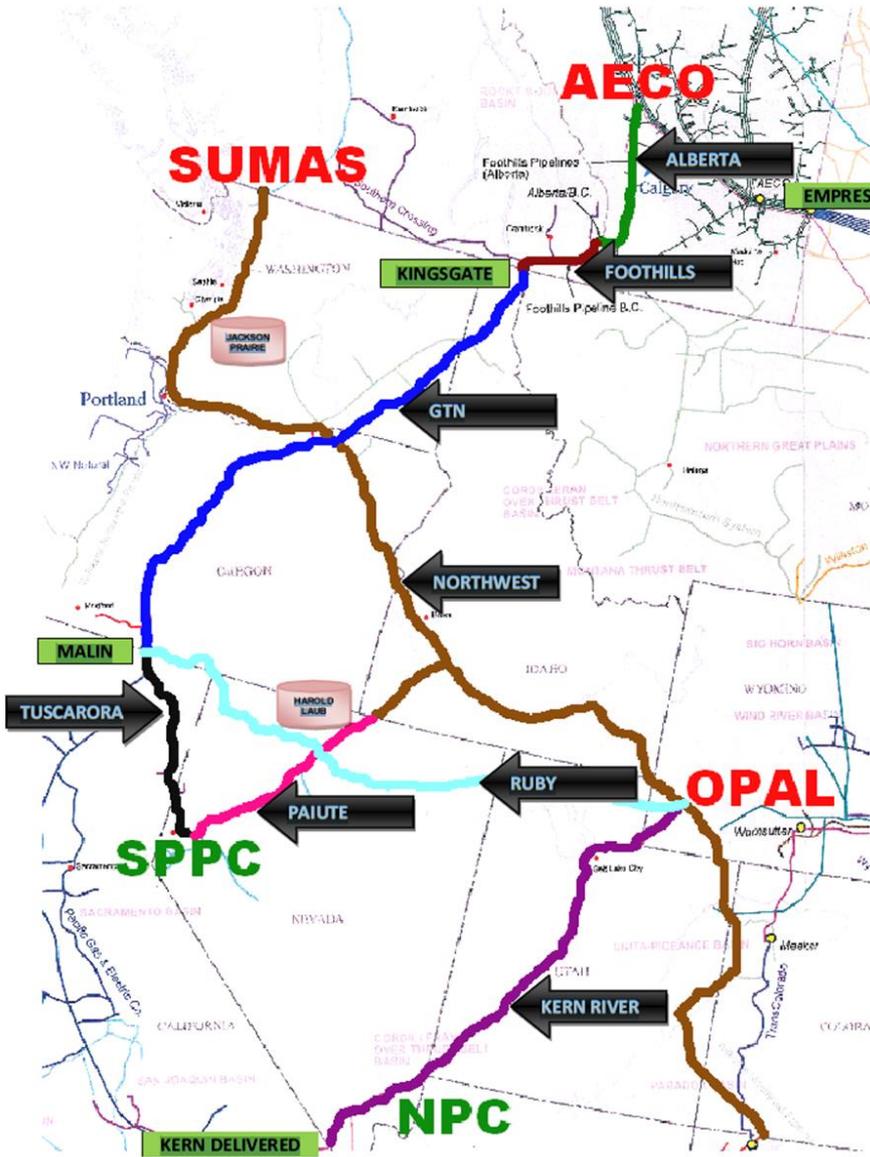
Mead Electricity Hub
On-peak day ahead index



Source: Intercontinental Exchange (ICE)

* Gaps indicate no trades executed on the ICE trading platform

Gas Transportation Contracts



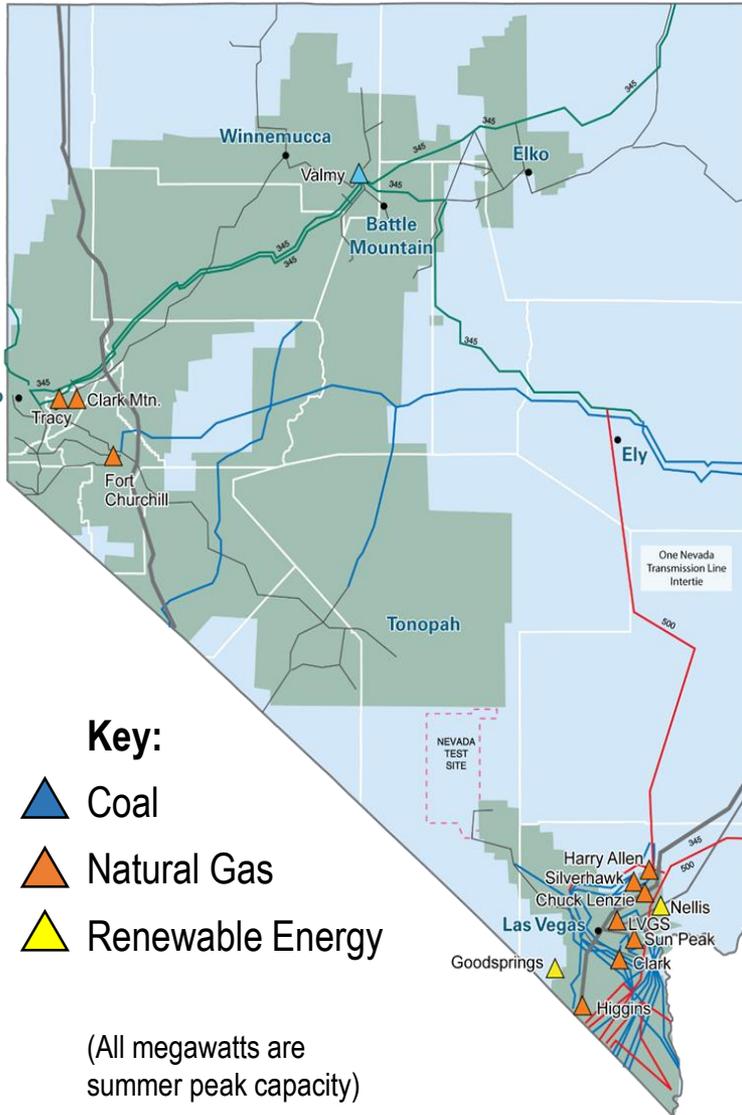
Northern Nevada

- 29 contracts with 6 pipelines
- 100 % of needs covered by uninterrupted service
- Provides services to 162,000 gas customers highly consolidated in Reno/Sparks area
- Peak gas heating load is 163,574 decatherms
- Peak electric need is 135,694 decatherms
- The majority of the gas transportation costs are borne by electric customers

Southern Nevada

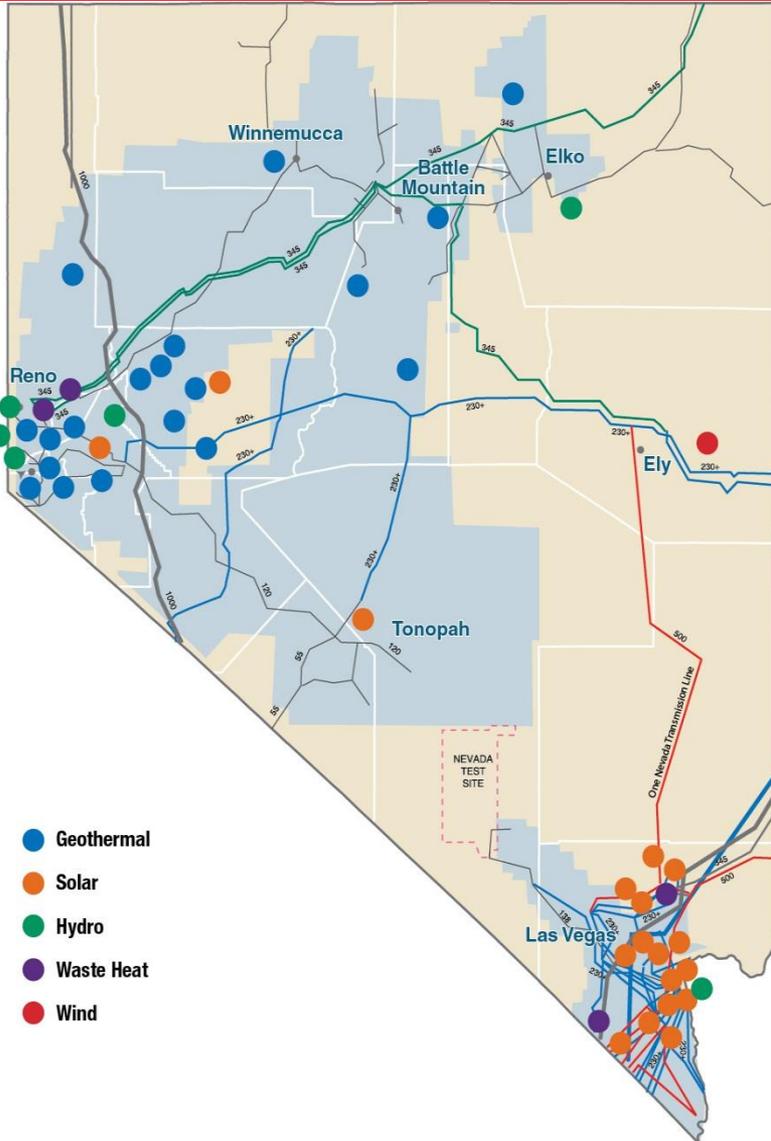
- 7 contracts with 1 pipeline
- 76 % of needs covered by uninterrupted service
- Peak electric need is 556,258 decatherms

Generation Assets



▲ Chuck Lenzie Generating Station	North Las Vegas	1,102 MW
▲ Clark Mountain Combustion Turbines	Sparks	132 MW
▲ Edward W. Clark Generating Station	Las Vegas	1,102 MW
▲ Fort Churchill Generating Station	Yerington	226 MW
▲ Frank A. Tracy Generating Station	Sparks	753 MW
▲ Goodsprings Energy Recovery Station	Goodsprings	5 MW
▲ Harry Allen Generating Station	North of Las Vegas	628 MW
▲ Las Vegas Generating Station	North Las Vegas	272 MW
▲ Navajo Generating Station <i>(NVE owns 11.3%; SRP is operator)</i>	Arizona	255 MW
▲ Nellis Solar Array II	Northeast of Las Vegas	15 MW
▲ North Valmy Generating Station Valmy <i>(Idaho Power owns 50% of 522 MW total)</i>		261 MW
▲ Silverhawk Generating Station	North of Las Vegas	520 MW
▲ Sunpeak Generating Station	Las Vegas	210 MW
▲ Walter M. Higgins Generating Station	Stateline	530 MW

Power Purchase Agreements - South



- Geothermal
- Solar
- Hydro
- Waste Heat
- Wind

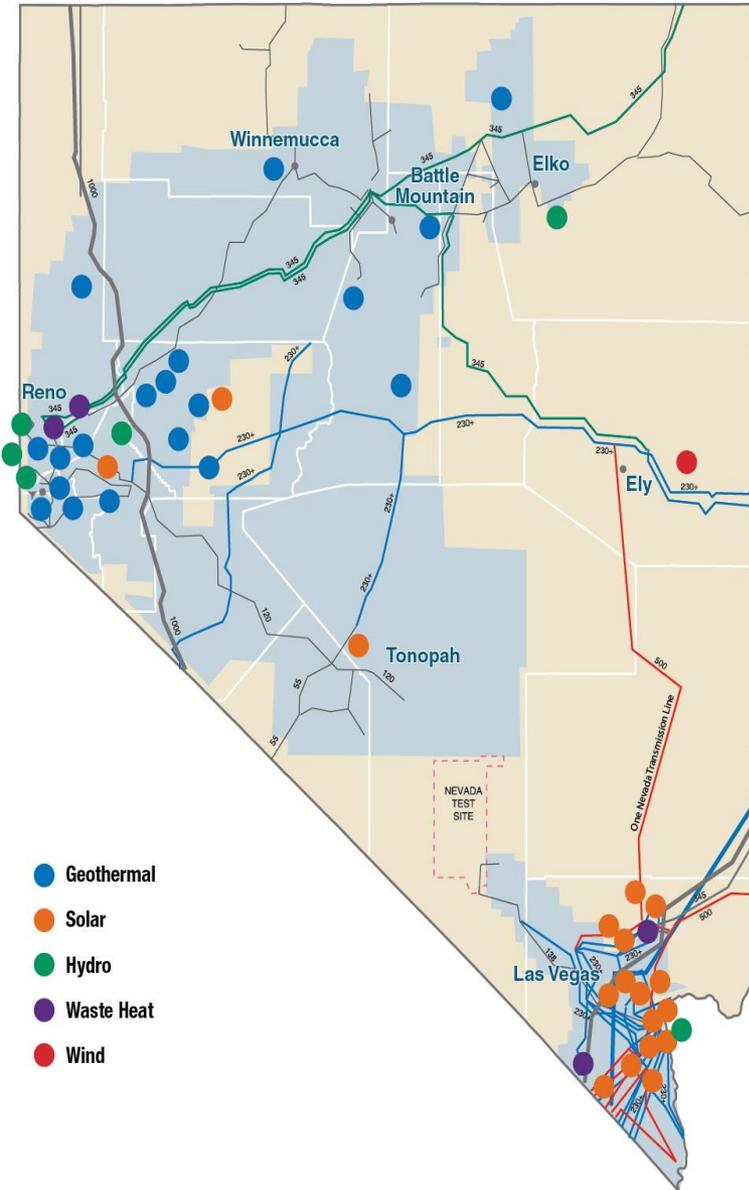
Nevada Power Company d/b/a NV Energy Long Term Agreements

Contract Name	Contract Type	Capacity (MW)	2017 Rate	Commercial Operation Date	Termination Date
Renewable Purchase Agreements					
PPAs (Commercial)					
ACE Searchlight ^{QF}	Solar ^S	17.5	\$ 139.75	12/16/2014	12/31/2034
APEX Landfill ^{QF}	Methane	12.0	\$ 99.69	3/1/2012	12/31/2032
Boulder Solar I	Solar ^S	100.00	\$ 46.00	12/9/2016	12/31/2036
Colorado River Commission-Hoover (RPS Excluded)	Hydro	235.2	Varies	6/1/1987	9/30/2017
Desert Peak 2 ^{QF}	Geothermal	25.0	\$ 49.50	4/17/2007	12/31/2027
FRV Spectrum ^{QF}	Solar ^S	30.0	\$114.65	9/23/2013	12/31/2038
Galena 2 ^{QF}	Geothermal	13.0	\$ 47.50	5/2/2007	12/31/2027
Jersey Valley ^{QF}	Geothermal	22.5	\$ 67.49	8/30/2011	12/31/2031
McGinness Hills ^{QF}	Geothermal	96.0	\$ 87.16	6/20/2012	12/31/2032
Mountain View	Solar ^S	20.0	\$119.46	1/5/2014	12/31/2039
Nevada Solar One (NPC) ^{QF}	Solar ^T	46.9	\$195.83	6/27/2007	12/31/2027
NGP Blue Mountain ^{QF}	Geothermal	49.5	\$ 83.70	11/20/2009	12/31/2029
RV Apex ^{QF}	Solar ^S	20.0	\$134.28	7/21/2012	12/31/2037
Salt Wells ^{QF}	Geothermal	23.6	\$ 67.70	9/18/2009	12/31/2029
Silver State	Solar ^F	52.0	\$138.28	4/25/2012	12/31/2037
Spring Valley	Wind	151.8	\$102.31	8/16/2012	12/31/2032
Stillwater Geothermal ^{QF}	Geothermal	47.2	\$ 72.52	10/10/2009	12/31/2029
Stillwater PV ^{1-QF}	Solar ^F	22.0	\$ 30.48	3/5/2012	12/31/2029
Tonopah Crescent Dunes	Solar ^T	110.0	\$136.41	11/9/2015	12/31/2040
Tuscarora ^{QF}	Geothermal	32.0	\$ 92.41	1/11/2012	12/31/2032
WM Renewable Energy-Lockwood ^{QF}	Methane	3.2	\$ 84.92	4/1/2012	12/31/2032
		1129.4			
PC Purchase Agreements					
NPC-SPPC	Geothermal	2.3	\$ 22.87	10/30/2009	12/31/2028
Nellis I (Solar Star)	Solar	13.2	\$ 91.79	12/15/2007	12/31/2027
Steamboat 1A	Geothermal	2.0	N/A	12/13/1988	12/13/2018
SunPower (LVVWD)	Solar	3.0	\$ 88.57	4/20/2006	12/31/2026
		20.5			
PPAs (Pre-Commercial)²					
Switch Station 1	Solar ^S	100.00	\$ 38.70	7/31/2017	12/31/2037
Switch Station 2 (NPC)	Solar ^S	27.70	\$ 38.70	9/30/2017	12/31/2037
Techren 1	Solar ^S	100.0	\$ 33.99	1/1/2019	12/31/2043
		227.70			
Non-Renewable Purchase Agreements					
Nevada Cogeneration Associates #1 ^{QF}	Natural Gas	85.0	\$ 97.26	6/18/1992	4/30/2023
Nevada Cogeneration Associates #2 ^{QF}	Natural Gas	85.0	\$ 73.28	2/1/1993	4/30/2023
Saguaro Power Company	Natural Gas	90.0	\$ 79.74	10/17/1991	4/30/2022
Griffith Energy	Natural Gas (Gas Tolling-Summer Only)	570.0	Varies	6/1/2008	9/30/2017
		830.0			
Renewable and Non-Renewable Sales Agreements					
City of Las Vegas NGR (Boulder Solar I)	NGR Agreement (Sale of PCs)	See Note 3		12/9/2016	12/31/2019
Switch NGR (Switch Station 1) ²	NGR Agreement (Sale of PCs)	100.0		7/31/2017	12/31/2037
Switch NGR-NPC (Switch Station 2) ²	NGR Agreement (Sale of PCs)	27.7		9/30/2017	12/31/2037

Notes:

1. A solar facility was added to the Stillwater PPA.
 2. Facilities are either under development or construction (the dates shown are expected dates).
 3. NPC shall sell 43,200 kPCs for three years.
- S=Single Axis Tracking, T=Solar Thermal (Tracking), F=Fixed Tilt

Power Purchase Agreements - North



Sierra Pacific Power Company d/b/a NV Energy Long Term Agreements						
Contract Name	Contract Type	Capacity (MW)	2017 Rate	Operation Date	Termination Date	
Renewable Energy						
PPAs (Commercial)						
Beowawe ^{QF}	Geothermal	17.7	\$ 59.49	4/21/2006	12/31/2025	
Boulder Solar II	Solar ^S	50.0	\$ 39.90	1/27/2017	12/31/2037	
Brady ^{QF}	Geothermal	24.0	\$ 75.86	7/30/1992	7/29/2022	
Burdette ^{QF}	Geothermal	26.0	\$ 54.91	2/28/2006	12/31/2026	
Galena 3 ^{QF}	Geothermal	26.5	\$ 63.32	2/21/2008	12/31/2028	
Homestretch ^{QF}	Geothermal	5.58	\$132.01	6/1/1987	12/31/2018	
Hooper ^{1, QF}	Hydro	0.75	Varies	6/23/2016	12/31/2040	
Kingston	Hydro	0.175	\$ 21.21	9/19/2011	12/31/2040	
Mill Creek	Hydro	0.037	\$ 21.67	9/1/2011	12/31/2040	
Nevada Solar One (SPPC) ^{QF}	Solar ^T	22.1	\$195.83	6/27/2007	12/31/2027	
RO Ranch ²	Hydro	0	N/A	3/15/2011	12/31/2040	
Sierra Pacific Industries ^{2, QF}	Biomass	0	N/A	11/8/1989	11/7/2019	
Soda Lake I ^{QF}	Geothermal	3.6	\$ 58.09	12/31/1987	12/31/2018	
Soda Lake II ^{QF}	Geothermal	19.5	\$ 59.84	8/4/1991	8/4/2021	
Steamboat 1A ^{2, QF}	Geothermal	0	N/A	12/13/1988	12/13/2018	
Steamboat Hills ^{QF}	Geothermal	14.55	\$118.59	2/23/1988	2/22/2018	
Steamboat 2 ^{QF}	Geothermal	13.4	\$ 69.34	12/13/1992	12/12/2022	
Steamboat 3 ^{QF}	Geothermal	13.4	\$ 67.76	12/19/1992	12/18/2022	
TCID New Lahontan ^{QF}	Hydro	4.0	\$ 72.42	6/12/1989	6/11/2039	
TMWA Fleish ^{QF}	Hydro	2.4	\$ 71.76	5/16/2008	6/1/2028	
TMWA Verdi ^{QF}	Hydro	2.4	\$ 71.11	5/15/2009	6/1/2029	
TMWA Washoe ^{QF}	Hydro	2.5	\$ 71.87	7/25/2008	6/1/2028	
USG San Emidio ^{QF}	Geothermal	11.75	\$ 93.94	5/25/2012	12/31/2037	
		260.3				
Leased Units						
Fort Churchill Solar	Solar ^S	19.5	Varies	8/5/2015	8/4/2040	
PC Purchase Agreement						
TMWRF	Methane	0.8	\$ 5.00	9/9/2005	12/12/2024	
PPAs (Pre-Commercial)³						
Switch Station 2 (SPPC)	Solar ^S	51.3	\$ 38.70	9/30/2017	12/31/2037	
Techren 2	Solar ^S	200.0	\$ 31.15	7/1/2019	12/31/2044	
		251.30				
Non-Renewable Purchase Agreements						
Newmont Nevada Energy Investment	Coal	179.0	\$ 26.88	6/1/2008	5/31/2023	
Liberty (CalPeco) EBSA	Diesel	12.0	Varies	1/1/2011	12/31/2031	
		191.0				
Renewable & Non-Renewable Sales Agreements						
Liberty (CalPeco)	Full Requirements (Capacity/Energy/PCs)	See Note 4		1/1/2016	4/30/2022	
NPC-SPPC	Sale of PCs (Geothermal)	2.3		10/30/2009	12/31/2028	
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) ³	NGR Agreement (Sale of PCs)	51.3		9/30/2017	12/31/2037	
Apple NGR (Techren 2) ³	NGR Agreement (Sale of PCs)	200.0		7/1/2019	12/31/2044	
Notes:						
1. Short Term Agreement rolled over annually through perpetuity per legal.						
2. Sierra Pacific Industries, RO Ranch Hydro and the Steamboat 1A facilities are shut down indefinitely (the PPAs are 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).						
S=Single Axis Tracking, T=Solar Thermal (Tracking), F=Fixed Tilt						