

NEVADA ENERGY STORAGE POLICY

STORAGE POLICY SNAPSHOT

Does Nevada have an renewables mandate?	YES; 50 percent by 2030
Does Nevada have a state mandate or target for storage?	NO, although the Nevada PUC appears to be in the process of evaluating.
Does Nevada offer financial incentives for energy storage development?	YES
Does Nevada have a policy for the strategic deployment of Non-Wires Alternatives or Distributed Energy Resources to defer, mitigate, or obviate need for certain T&D investments?	NO
Does Nevada have a policy addressing multiple use applications for storage?	NO
Does Nevada have a policy on utility ownership of storage assets?	NO
Does Nevada allow or mandate the inclusion of energy storage in utility IRPs?	YES, mandated
Has Nevada modified its permitting or interconnection requirements specific to energy storage?	YES
Does Nevada allow customer-sited storage to be eligible for net metering compensation?	YES
Has Nevada revised its rate structures to drive adoption of behind-the-meter storage	UNCLEAR
Approximate development of storage capacity in Nevada	?

STORAGE POLICY ASSESSMENT

The energy sector in Nevada has experienced a rather tumultuous evolution over the last few years. While seeking to make systemic changes to its regulatory structure and its approach toward grid planning and operations, the state has experienced some very public setbacks with regard to its market and policy initiatives for clean energy. However, despite these setbacks, Nevada now appears to be back on track toward assuming a leading position in developing innovative energy storage policies while simultaneously supporting what is clearly a rapidly growing sector for clean energy development. Within these broader initiatives Nevada has also assumed its current position as a market leader for energy storage. What makes Nevada an important case study today is the extent to which voluntary, business-driven decisions to expand renewables and energy storage solutions has been spearheaded by the primary utilities in the state. This is in contrast to how the development of renewables and energy storage has evolved in other states, which has typically been driven through policy directives.

While Nevada is currently considered a leader in both the clean energy space generally and in renewables and energy storage specifically, its path within these sectors has not been a straight line toward success. Further, while the inherent characteristics that define Nevada's energy sector also make it fundamentally unique, the state still provides an important experience that in a number of ways may foreshadow the development of energy storage policy that is still yet to be developed in other states.

Let's first remind ourselves of the key characteristics that make Nevada and its energy sector unique. These factors include:

- The population concentration of the state. Almost three-fourths of Nevada's residents live in Clark County, which includes the city of Las Vegas.
- Nevada is one of the fastest-growing states in the U.S.
- Nevada is a net importer of energy (in 2016, about 87 percent of the energy consumed in the state came from outside sources).
- There has been a rapid increase of solar development in the state. Hydro remains the prominent source for renewables-based generation, but the use of solar has been steadily increasing and recently moved past geothermal as the second-largest contributor to renewables generation in the state behind hydro.

In addition, Nevada is also rather unique in the sense that it does not produce much of its own energy (the state ranks in the bottom ten in terms of states that produce their own energy). Compared to neighboring states, Nevada has very little generation capacity in-state, and reportedly nine-tenths of Nevada's power comes from outside of the state. Moreover, Nevada has no significant fossil fuel reserves. Rather, natural gas is the primary fuel for power generation in the state, with the majority of the state's remaining power plants primarily

relying on this fuel source. In 2017, about 72 percent of Nevada's generation mix came from natural gas; and only about 7 percent came from coal.

This fossil-fuel base still overshadows renewables, which in 2017 accounted for approximately 18 percent of the energy mix. In Nevada, renewables have mostly meant hydro, solar, and geothermal. Even though it is one of the driest states in the nation, historically most (over 80 percent) of Nevada's renewable resources have come from hydroelectric power plants, primarily the Hoover Dam. This unique energy mix, particularly the need to import power, has made the state dependent on transmission capacity that can deliver power from other regions. Further, the lack of its own power resources or long-term commitments to traditional forms of generation arguably has positioned Nevada as state that can move to a completely clean energy mix more seamlessly than others.

The move toward a clean energy environment in Nevada has its roots in economic analysis, and thus even in the absence of stringent requirements the main utilities in the state have been moving away from carbon-intense energy sources for a number of years. Perhaps illustrating this point best is the recent announcement from NV Energy, the primary utility in Nevada, which stated it will no longer own any coal generation plants moving forward.

The future of renewables in Nevada is now pointed toward the sun. Solar continues to develop rather rapidly in Nevada and is expected to supply an increasing share of Nevada's net generation. About one-fourth of Nevada's utility-scale electricity is now generated from renewable resources, and about half of those renewables are now coming from utility-scale solar resources. In fact, according to most rankings, Nevada leads other states in terms of solar power potential, and has generally ranked within the top five states for installed solar capacity.

NV Energy (which operates through its two regulated utilities, NV Power and Sierra Pacific Power), provides about 81 percent of the state's electricity and is clearly the dominant utility operation in the state. NV Energy has publicized aggressive, voluntary plans for solar + storage development through its integrated resource plans, placing it in a lead position among utilities that are pursuing hybrid solutions. NV Energy is owned by Warren Buffett's Berkshire Hathaway Companies (which also owns PacifiCorp in the Northwest and MidAmerican Energy in Iowa). Berkshire Hathaway has established an over-arching strategy across its utility subsidiaries to strategically move away from coal-fired generation into a renewable-centric generation portfolio.

The new plan is part of the company's long-term goal, as outlined in its Integrated Resource Plan approved by the PUCN in December 2018, of serving its customers with 100-percent renewable energy. Again, in the absence of an enforced mandate via the legislature or PUCN, NV Energy is opting to pursue this increase of renewables and storage on its own accord.

In the near term, NV Energy announced the addition of nearly 1,200 MW of new solar PV generation to be built in the state, along with 590 MW of battery storage. The renewable

energy will come from three projects, all expected to enter commercial operations by 2023 (still pending approval from the PUCN):

- Arrow Canyon Solar: 200 MW solar PV project with a 75-MW, five-hour battery storage system. (Developed by EDF Renewables North America.)
- Gemini Solar + Battery Storage: 690 MW of solar energy coupled with a 380-MW battery storage system. If completed, this project could earn status as the largest solar plant in the United States. (Quinbrook Infrastructure in collaboration with Arevia Power will develop and manage the project.)
- Southern Bighorn Solar & Storage Center: 300 MW of generating capacity including a 135-MW, four-hour Li-Ion battery storage system. (Built by 8minute Solar Energy).

This utility activity preceded but was ultimately validated by increases to the state's renewables target. Nevada's initial renewable portfolio standard (RPS), set in 2009, required that annually increasing percentages of the electricity sold to retail customers in the state come from renewable resources, reaching 25 percent of retail electricity sales by 2025. Additionally, the RPS originally required that 6 percent of the renewable requirement, 1.5 percent of the state's total net generation, had to come from solar power by 2016. That requirement was exceeded and almost half of the utility-scale and distributed renewable generation in Nevada—11 percent of the total state net generation—was solar-powered in 2017.

However, it is the solar industry in the state that has been the focus of what has arguably been the greatest setback to the development of clean energy initiatives in Nevada. In December 2015, the PUCN voted in favor of a new tariff structure that reduced net metering rates — the rates NV Energy pays to buy back excess energy generated by those with rooftop solar. It also increased the monthly service charge for those solar customers.

The PUC ruling was considered a major setback for the industry. It caused a number of solar companies (most notably Sunrun and SolarCity) to leave the state entirely, leading to the loss of hundreds of jobs. In 2017, Nevada fell from the No. 4 state for overall solar jobs to No. 10, according to The Solar Foundation. The net metering program was reinstated in late 2017, but in many respects the damage to the solar sector in the state was already done.

Public support for more renewables in Nevada was confirmed in November 2018 when a ballot initiative was approved that would require electric utilities to acquire at least 50 percent of their electricity from renewable sources by 2030. However, because it amends the Nevada Constitution, the ballot measure must be approved by voters twice in order for the requirement to go into effect. Nevada voters will vote on the measure again in 2020. Subsequent legislation (SB 358) enacted this increase into law.

A key part of Nevada's renewables law, which positions the state as an innovative leader in the energy storage realm, is that every kilowatt-hour of energy delivered by a qualified storage device will count double for the purpose of meeting the RPS requirement. This is a very

innovative approach; Nevada may in fact be the only state to have enacted such a provision allowing energy storage to be eligible for a renewables requirement in such a significant way. There are two ways in which storage can meet the renewables requirement in Nevada: 1) if the energy storage system charges from renewable generation and discharges during a peak load period or 2) if the energy storage system performs ancillary grid services that enable the integration of renewable generation.

This policy alone positions Nevada among the ranks of other important storage markets (e.g., California, New York, Massachusetts) as in practice it will position storage devices as renewable energy assets that can deliver energy. It should be noted that the law caps the role of energy storage at 10 percent of the electricity eligible for RPS compliance, meaning that the majority of energy eligible for RPS compliance will still be generation.

Nevertheless, without a statewide storage mandate in place, this legislation in Nevada (SB 358) should be viewed as the leading policy measure that is now driving storage development in the state. In the absence of a statewide procurement mandate for energy storage (as of September 2019 the Public Utilities Commission of Nevada (PUCN), directed by state legislation under the enacted SB 205 in June 2017, is still evaluating the appropriateness of a mandate), this increased mandate for renewables is still viewed as a much-needed jolt for the solar + storage market in Nevada.

Nevada policymakers continue to vet the question of whether or not mandates for energy storage should be adopted statewide. It is expected that a decision along these lines should be made in early 2020. Meanwhile, behind the scenes, Nevada lawmakers, regulators, utilities and environmental and consumer stakeholders have also been putting together a plan to integrate distributed energy resource (DERs) into the state's grid planning and operations. The PUCN has called NV Energy to evaluate hosting capacity, grid needs, and potential DER impact and values of each circuit and feeder line across its 1.3 million-customer territory. If approved, the distribution planning plan (DRP) requirements would put Nevada in a small club of states — California, New York and Hawaii — that are actively asking their investor-owned utilities to bring DERs into their grid plans on a number of levels.

EXECUTIVE DIRECTIVES

Over the last decade Nevada has seen two leaders at the executive level: Brian Sandoval (R) who served as governor from 2011 until 2019 and Stephen Sisolak (D), who assumed office on January 7, 2019. While both publicly supportive of clean energy initiatives, albeit for different reasons, the Sandoval administration is generally viewed as not having made the level of gains toward clean energy, renewables and energy storage expansion in the state as his successor has pledged to achieve. Sisolak's campaign that found him elected governor in Nevada

2018 included the pledge to be the “governor that wants Nevada to lead the nation on clean energy.”

Under the Sandoval administration, the rooftop solar / net metering debacle certainly was a blemish on the clean energy scorecard. Sandoval had been publicly supportive of clean energy initiatives based primarily on economic analyses concluding that building out renewables infrastructure would be good for the Nevada economy. As noted, Nevada does not have significant generation resources within the state; in order to pursue energy development, renewables would likely be the most economically feasible strategy. Unlike many other Western states, Nevada does not have a thriving coal or petroleum industry. So, put another way, if Nevada wanted to get into energy development, it had to look toward renewables.

Sandoval supported the effort to expand renewables in Nevada primarily through financial subsidies that his administration endorsed. For example, under the Sandoval administration, the state saw \$7.8 billion in total investment, including capital, payroll and taxes, for new renewable projects. At the same time, the state issued about \$861 million in tax abatements to help get renewable energy projects off their feet.

However, from a policy perspective, the Sandoval administration was criticized for not sending clear messages to the public and for blocking legislation that would have accelerated renewables development. To illustrate this, the other perceived failure of the Sandoval administration was a veto of efforts to increase the state’s renewables requirement. As noted, Nevada’s Renewable Portfolio Standard was originally established in 2009 with a goal of 25-percent renewables by 2025. Efforts to increase the RPS via legislation to 40 percent by 2030 was vetoed by Gov. Brian Sandoval after the 2017 legislative session. The Sandoval veto, which also nixed a provision to include a community solar program, was driven by concerns about a 2018 ballot question that would have turned Nevada into a competitive electric retail market and removed NV Energy’s monopoly (which ultimately failed). The dismantling of the net metering program, along with his veto of the legislation to increase the renewables requirement in the state, left many observers to conclude that Gov. Sandoval had not gone far enough to help create a clean energy market in Nevada.

In contrast, Gov. Sisolak fulfilled his campaign promises early in his tenure when, in April 2019, he signed legislation (SB 348), which increased the requirement to at least 50 percent renewable energy by 2030. The bill signing came more than a month after Sisolak signed the state onto a multi-state agreement to fulfill greenhouse gas reduction goals set in the Paris Climate Agreement, which President Donald Trump announced the U.S. would begin to withdraw from in 2017. Joining the "U.S. Climate Alliance" commits Nevada to an effort to reduce greenhouse gases by at least 26 to 28 percent from 2005 levels by 2025, monitoring and reporting progress on emission reduction efforts and committing to speeding up efforts to cut emissions and expand clean energy adoption.

LEGISLATION

Nevada has a comparatively short legislative session of 120 days and fairly long interim periods between legislative sessions. Nevertheless there have been a handful of important pieces of legislation that have helped to define the energy storage marketplace in the state.

SB 145 (May 2017):

- Provided funding for storage, electric vehicles, and solar.
- Restructures an incentive fund to support clean energy battery projects. The law also ensures some of the funds support clean-energy projects for lower-income customers.
- Combined the amounts of allocations for the Wind, Solar, and Waterpower Programs and allowed funding for new programs as follows:
 - The Energy Storage Program includes funding for the Electric Vehicle Demonstration Program and other energy storage systems, for a total of \$15 million.
 - The Low-Income Solar Program for \$1 million per year until 2023.
- The PUCN regulations directed by this legislation are intended to increase access to residential and commercial-scale energy storage systems; develop an electric vehicle infrastructure program; and provide broader access to energy storage systems for low-income customers.

SB 204: (May 2017)

- Required the PUCN to study whether it should establish a program mandating that the state's electric utilities procure energy storage systems.
- Requires the PUCN to study whether or not utilities companies should have energy storage targets to increase storage of solar energy and, if so, what that target should be.

SB 65 (June 2017)

- Revised utility integrated resource planning processes to require information related to customer exposure to the potential costs of carbon.
- Requires that the PUCN give preference to utility plans that includes supply sources that reduce customer exposure to the potential costs of carbon.
- Requires the PUCN to prioritize energy decisions that provide the greatest economic and environmental benefits to the state, diversify the electric supply, and reduce exposure to the volatile prices of fossil fuels.

AB 405 (June 2017):

- Establishes right for customers to interconnection storage systems
- Modified the net metering rate structure effective June 15, 2017.
- Allows utility customers who choose to net meter to fall under a rate structure codified in the law.
- The rate structure applies to renewable energy systems of 25 kW or less.
- The new net metering rate structure is tiered and will decrease over time as the amount of electricity produced by net metering reaches a 80 MW benchmark.
- The first tier offers a net metering rate that is 95 percent of the retail rate. As of April 26, 2018, nearly 20 MW of installed capacity had been applied toward the first 80-MW tier. The net metering rate for the second tier is 88 percent of the retail rate, with tiers three and four crediting 81 percent and 75 percent, respectively.

SB 146: (June 2017):

- Calls on IRPs to include distribution planning process and DER integration.
- Mandates that Nevada Power Company and Sierra Pacific Power Company (both subsidiaries of NV Energy) file a joint Integrated Resource Plan.
- Required that before April 1, 2019, an IRP or IRP amendment include a distribution resource plan, defined as a plan for “distributed generation systems, energy efficiency, energy storage, electric vehicles, and demand-response technologies.”
- Requires IOUs to submit a plan that identifies the costs, benefits, and barriers to adopting technologies like rooftop solar and other small-scale DG.

SB 358 (April 2019)

- Senate Bill 358 was fast-tracked through the Democrat-dominated Legislature as an "emergency measure," allowing Gov. Sisolak to sign it on Earth Day.
- Enacted into law the increase in the state’s RPS that was approved in a public ballot initiative in November 2018.
- Requires state electric producers to buy or generate 50 percent of their power from solar, wind and other renewable power sources by 2030. It goes on to set a goal of zero carbon emissions from energy producers by 2050.
- The bill also requires electric cooperatives and public power districts to meet the higher renewable standards once they reach a 1 million MW threshold.
- In another major change, the bill will also count electricity generated from hydroelectric sources — including the Hoover Dam — to count toward the RPS (that source of power was previously excluded from the RPS formula), while excluding any potential new hydropower generation or plants.
- In his signing address, Governor Sisolak pointed out that Nevada now ranks among the states with the highest RPS in the country, a move that is seen to help it cut its greenhouse gas emissions and create new jobs.

REGULATIONS

In early 2015, the PUCN opened an Investigation Regarding Energy Storage Technologies to investigate battery storage technologies. The ongoing investigation involves a series of stakeholder meetings and workshops to discuss such storage-related issues as interconnection, valuation and integration into utility planning.

Other significant regulatory initiatives include the fact that Nevada is considering changing its interconnection standard (Rule 15) to include storage in the definition of generation resources for purposes of interconnecting to the distribution grid.

Docket No. 17-08022 (July 2018)

- Opened to address the implementation of SB 146
- Includes an order requiring NV Energy to incorporate Distributed Energy Resources (DERs), such as solar and energy storage, into its three-year system plan.
- Requires NV Energy to submit a Distributed Resources Plan (DRP) as part of its triennial integrated resource plan. Requirements of the DRP include the following components:
 - Forecast of net distribution system load and DER penetration (both energy and nameplate capacity) at the system, substation, and feeder levels.
 - Hosting Capacity Analysis, to determine the amount of DERs that can be accommodated on each feeder section without adverse impacts.
 - Locational Net Benefits Analysis that supports a location-specific cost-benefit analysis of DER projects, which will serve as the basis for comparison between Non-Wires Alternatives (NWAs) and traditional solutions
 - Grid Needs Assessment (GNA) that will combine the three components above for analysis of NWAs; the GNA will identify constraints on the electric grid and infrastructure upgrades and/or DER projects that may provide solutions to those constraints
- The regulation does not prescribe what utilities will do with DER, but lists all the information and analyses the utilities need to include in their distributed resources plans filed with the commission.
- NV Energy was expected to file its initial DRP in April 2019.
- This Order puts Nevada alongside leading states, such as California, Hawaii, and New York, in requiring that utilities take DERs into consideration as part of their system planning processes.

Docket 17-07013 / 17-07026 (2017/2018)

- Opened to implement AB 405
- On March 14, 2018, the PUCN approved numerous new time-variant rates pursuant to AB 405. The rates are designed to incentivize the use of battery storage at residential and small commercial sites.

- Under the new structure, utility customers with battery storage are allowed to shift their grid usage to times when energy is less costly. The result is a reduced load on the system during peak times coupled with energy savings for the customer.

Docket No. 17-07014 (December 2018)

- Opened to implement SB 204; Evaluation of Storage Targets
- The PUCN is considering establishing an energy storage target, in response to the legislative directive to undergo such a consideration that was enacted under SB 204.
- Subsequent to the passage of SB 204 in 2017, the Brattle Group prepared a report for the PUCN and the Nevada Governor’s Office of Energy in October 2018. Brattle’s conclusion / recommendation was that a statewide deployment of up to 175 MW of utility-scale storage could be cost effective in 2020, based on an analysis that identified four key energy storage benefits and utilizing lithium-ion batteries with 4-hour storage capacity, costing less than \$1,800/kW in 2020 and dropping to less than \$1,300/kW in 2030. With declining battery costs, by 2030 Brattle projected that a deployment of between 700 MW-1,000 MW could also be cost-effective.
- The four benefits of energy storage that Brattle identified were:
 - Avoided distribution outages;
 - Delayed T&D investments;
 - Production cost savings; and
 - Avoided capacity investments
- PUCN held a workshop on May 1, 2019, to discuss target implementation that the PUCN recommended despite staff’s recommendation that a target was not necessary because the electric companies are already planning to install significant amounts of storage.
- Whether or not the PUCN ultimately opts to impose a statewide energy storage procurement mandate will likely be conditioned on the PUCN determining that the benefits of energy storage exceed the costs. It is expected that the PUCN will consider such potential benefits as a reduction in peak generation, T&D infrastructure deferral, reduced greenhouse gas emissions, and consideration of multiple use applications for storage and their own unique values.
- If, after this evaluation, the PUCN determines that storage will provide a net benefit to the state, concurring with the Brattle report, then it is likely that a regulatory procurement target will follow.

Docket No. 19-06050 (June 2019):

- Opened to implement SB 145 and the associated fees for non-compliance with the legislation.
- The PUCN had ruled that NV Energy had “failed to comply with a Commission order” implementing SB 145 creating and mandating incentive payments aimed at spurring development in residential and large-scale energy storage systems.
- In the order, members of the commission wrote that NV Energy had agreed but then failed to set aside \$10 million in funding from the utility’s existing incentive funding pool

to use toward energy storage incentive programs. Despite the utility agreeing to the order in a docket implementing SB 145 and in its 2018 annual plan (including signing a stipulation), the utility ultimately never set aside the funds for the nascent program.

- The PUCN ordered all remaining program funds be dedicated to the energy storage program (save \$1 million for a low-income solar program and a separate electric vehicle plan exempted from the \$295 million limit), but it's unclear how long or whether incentive funds for the energy storage systems will continue to last.

THE FUTURE OF ENERGY STORAGE IN NEVADA

Along with the current ongoing dockets to address energy storage targets, the PUCN is likely to consider the following issues related to energy storage policy through 2020:

- Revision of interconnection standards for distributed generation (e.g., adoption of IEEE 1547 standards).
- Along with including energy storage in utility integrated resource plans, the PUCN will also likely consider more stringent requirements to have utilities evaluate the cost effectiveness of storage along specific locations on the distribution grid where it would offer the greatest value.
- Consideration of multiple use applications for storage and how those multiple uses should be valued differently.
- Continue to develop financial incentives for energy storage.
- Finalization of utility distribution resource plans (DRPs), including how utilities will gather data on how much DERs different circuits can support.
- Continued consideration of opening up retail competition in the state.
- Continued coordination with regional wholesale markets to determine the role that energy storage can play in RTOs/ISOs.

Updated September 4, 2019