Nevada Policy Research Institute
analysis

Power plant proposal would hike burden on Nevada ratepayers

by David G. Tuerck, PhD and Paul Bachman, MSIE

Executive Summary

Nevada's electric monopoly, NV Energy, has asked the state Public Utilities Commission to approve a controversial proposal to build a new 706-megawatt natural gas power plant that could cost up to $1 billion.

Compared to the alternative of purchasing natural gas power from existing power plants, the marginal cost to ratepayers of NV Energy's plan for a new power plant would be $115 million in 2020 alone.

Building the new power plant would reduce employment by 1,614 jobs, and lower investment in Nevada by $18 million. Electricity rates would increase by 3.2 percent, costing the average consumer each year an additional $31 and the average industrial rate payer $9,970. From 2020-2025, the increased cost to ratepayers will total $604 million.

The push for the new plant is driven by the Nevada Legislature's 2013 passage of Senate Bill 123, mandating the closing of coal-fired power plants currently providing over 800 megawatts of power, which is to be replaced by electricity from gas-powered and renewable sources.

However, when three casinos, during the 2015 Legislative Session announced their intention to exit the NV Energy monopoly system, as permitted by legislation passed in 2001, the Legislature passed Assembly Bill 498, cutting the amount of power production mandated by SB123.

Yet, even as modified by AB498, SB123 still imposes substantial costs on all consumers. The electric monopoly's new power plant would still cost ratepayers $206 million in 2020, reduce employment by 2,925 jobs and lower investment in Nevada by $33 million. Rates are projected to increase by 5.8 percent, costing the average consumer an additional $55 a year and the average industrial rate payer $17,906 a year. From 2020-2025, ratepayers will be cost another $1.086 billion.

Even if the PUC rejects NV Energy's plan for a new power plant, requirements built into AB498 will still cost ratepayers $91 million in 2020. High power prices will reduce employment by 1,311 jobs, and it will lower investment in Nevada by $15 million. Building the new power plan will cause rates to increase by 3.2 percent, which will cost the average consumer $24 a year and the average industrial rate payer $7,936 a year. From 2020-2025, these requirements will cost Nevada consumers $438 million.

Introduction

NV Energy, the firm with a state-granted monopoly over most electrical energy purchased by businesses and consumers, on July 1, 2015 submitted its Triennial Energy Supply Plan (TESP) to the Public Utilities Commission of Nevada (PUC).[1] The TESP contains NV Energy's proposed 20-year plan to meet the demands of Nevada consumers for electricity. NV Energy included in this plan a proposal to build a new 706-megawatt (MW) natural gas power plant that could cost up to $1 billion.[2]

NV Energy's plan to build a new natural gas plant has generated enormous controversy.[3] Consumer advocates and ratepayers throughout Nevada are questioning why NV Energy needs to build a new gas power plant when it is ending a current arrangement with Star West Generation that provides natural gas power from its Arizona plants.

Star West has even offered to sell the plant to NV Energy, but Nevada's electricity monopoly has not accepted that proposal.

Consumer advocates and businesses throughout Nevada have suggested that NV Energy's proposal is being driven by a desire to boost its bottom line while increasing costs to energy customers.

Current debate driven by past legislative mandates

Regulatory decisions regarding government-regulated utilities must consider previous legislative mandates. The Nevada legislature has passed several laws that require NV Energy to produce and procure electricity that is more expensive than alternatives, such as electricity from coal-powered plants.

One such mandate is Nevada's Renewable Portfolio Standard (RPS), which requires that certain renewable energy resources must make up 25 percent of NV Energy's total

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[1]NV Energy submission to Public Utilities Commission of Nevada, "Nevada Power Application Seeking Approval of its Triennial Integrated Resources Plan and Triennial Energy Supply Plan ("Application"), http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/3621.pdf

[2] Kyle Roerink, "NV Energy's planned natural gas power plant sparks rate-hike fears," The Las Vegas Sun, Sept. 11, 2015, http://lasvegassun.com/news/2015/sep/11/nv-energy-may-build-new-natural-gas-power-p/.

[3] John Burnett, "Is Warren Buffet's Nevada Utility Fleecing Consumers?," Sept. 24, 2015, http://www.thestreet.com/story/13299347/3/is-warren-buffett-s-nevada-utility-fleecing-consumers.html.

retail electricity by 2025. Of that requirement, at least 6 percent must be from solar energy.

As shown in a previous study done by Beacon Hill Institute (BHI) economists and released by the Nevada Policy Research Institute, Nevada's RPS has and will cost consumers over $2 billion from 2013 to 2025 and reduce employment by 1,930 jobs.[4]

In 2013, Nevada lawmakers passed SB123, which forced NV Energy to wind down its current coal plants and replace those power sources with new natural gas and renewable power plants. A study by BHI economists and released by NPRI earlier this year showed SB123 will cost Nevada an additional 2,630 jobs by 2020 and increase the price of power by over $100 million a year in 2020.[5] That study didn't include the cost of building a new gas-fired power plant, as NV Energy now proposes.

During the 2015 session, three casinos that consume over 2,000 gigawatt hours of electricity from NV Energy, or over five percent of the company's annual sales, announced their intention to purchase energy directly on the wholesale market.[6]

As a result, near the end of the 2015 Legislative Session, lawmakers passed AB498, reducing SB123's green-energy mandates.

NV Energy's current proposal to build a new power plant should not be considered in a vacuum. Without SB123's order to shut down cheap and reliable coal power plants, no new natural gas plant would even be under consideration.

This economic analysis examines the cost to consumers of building a new natural-gas power plant by first examining the impact of SB123 and AB498 on electricity prices and Nevada's economy.

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[4] David G. Tuerck, Paul Bachman and Michael Head, "RPS: A Recipe for Economic Decline," April 25, 2013, http://www.npri.org/docLib/20130424_RPS-ARecipeforDecline.pdf.
[5] Paul Bachman and Michael Head, "The Economic Effects of Session 2013's SB123," April 9, 2015, http://www.npri.org/docLib/20150409_EconomiceffectsofSB123.pdf.
[6] Sean Whaley, "Casino companies would pay $131M to leave Nevada Power," *Las Vegas Review Journal*, August 20, 2015 http://www.reviewjournal.com/business/energy/casino-companies-would-pay-131m-leave-nevada-power.

How utility monopolies make money

NV Energy is a private company. Its goal is to maximize profit for its investors. Millions of companies around the country have the same goal, but as a regulated utility NV Energy's way of making a profit differs dramatically from most companies.

While most firms make their profits by providing desired products at competitive prices, this is not the case for NV Energy. As a regulated monopoly, it has no competitors and thus faces little of the cost and price discipline exerted by competitive markets. All Nevadans — with the exception of extremely large businesses that lawmakers have legally allowed to exit the monopoly — are required to purchase their electricity from NV Energy.

In 2013, NPRI research director Geoffrey Lawrence analyzed SB123 and explained how NV Energy increases its profits:[7]

> As a regulated monopoly, NV Energy is guaranteed a return on equity of 10.5 percent. It is from this return on equity that NV Energy's shareholders derive their profits.
>
> This regulatory structure gives NV Energy and similarly regulated utilities a perverse incentive: It financially rewards them if they can get state lawmakers to impose on them *more costly and inefficient* production methods.
>
> The math is simple: If the utility is required to produce through more *costly* means and shareholder profits are guaranteed as a percentage of those *costs*, then shareholders make more money by producing *less* efficiently. Ratepayers — facing a private, yet government-enforced monopoly — have no choice among providers and so are effectively forced to pay the higher rates that result.
>
> This recognition is why Nevada and most other states require utilities to receive permission from a public utilities commission — where they are opposed by a state funded consumer advocate — before the monopolies are permitted to take almost any action. The traditional role of the utilities commission, in this sense, is to ensure the utility is financially viable while also protecting consumers against the excesses of monopolistic privilege. ...

[7] Geoffrey Lawrence, "NV Energy plan would impose big, new hidden costs on ratepayers," May 22, 2013, http://www.npri.org/docLib/20130522_NVEnergyPlan-BaitandSwitch.pdf.

> However, a key objection to NVision (SB123) from the Attorney General's Bureau of Consumer Protection — the state's consumer advocate — is that the plan would allow NV Energy to replace the power-purchase agreements it holds with many independent power producers with newly constructed facilities owned directly by NV Energy.
>
> Significantly, ratepayers aren't obliged to provide a return on equity for power that NV Energy purchases on the wholesale market. They are, however, obliged to do so for facilities that are owned directly by the utility. (Emphasis in the original.)

While burdensome regulations often increase the prices consumers pay for electricity, NV Energy can use these same regulations to guarantee significant increases in profit for its private shareholders.

Laws that created the current controversy

Nevertheless, on June 11, 2013, Nevada lawmakers adopted Senate Bill 123, setting in motion a plan to close down the remaining coal-fired power plants controlled by NV Energy. The law stipulates that 800 MWs of coal capacity must be closed by 2020 and replaced with 350 MWs of renewable electricity generation technologies and 550 MWs from other sources.[8]

As of December 31, 2014, NV Energy had closed 300 MWs of capacity from three generating units at Reid Gardner. The company intends to close the fourth unit in 2017. NV Energy has also committed to divest from the Navajo Generating Station near Page, Arizona by 2019. In all, the utility company plans to end its association with 812 MWs of coal fired generation by 2020.[9]

NV Energy plans to replace the lost capacity by buying two natural gas power plants, LV Cogen Unit 2 and Sun-Peak Generating, for $147 million and by acquiring the proposed 350 MW Moapa Solar Energy Center near the site of the Reid Gardner power station.

[8]Nevada Senate, 77th (2013) Session, Senate Bill 123, http://www.leg.state.nv.us/Session/77th2013/Bills/SB/SB123_EN.pdf.

[9] Ibid.

PUC, however, has twice rejected the Moapa Solar Energy Center plan. The commissioners voting against the plan cited the cost of the plan, the lack of need for the electricity and lack of strong economic impact.[10] Nevertheless, SB123 still called for the replacement of the lost power with 550 MWs of conventional electricity generation and 350 MWs of renewable electricity generation.

NV Energy plans to comply with SB123 were further complicated by applications to exit from the utility monopoly filed by SWITCH, a cloud computing services company, and three major casinos under a 2001 law. The casino companies intend to purchase electricity on the open market at presumably lower prices than those offered by NV Energy, while SWITCH said it would purchase all of its electricity from renewable sources. However, it signed a three-year deal to remain with NV Energy when that company agreed to supply SWITCH with only renewable energy. Nevertheless, the three casinos consume over 2,000 gigawatt hours of electricity from NV Energy each year or over five percent of the utility company's annual sales.[11]

In response to the new developments, state policymakers enacted AB498, directing the PUC to approve future generation-capacity additions by NV Energy.[12] As a result, the company in a recent filing[13] abandoned plans to add 54 MWs of conventional generation capacity and 135 MWs of renewable generation capacity. Despite the potential loss of nearly five percent of its power sales through the exits of the casinos, NV Energy continues to call for the construction of a 706 MW gas-fired power plant before 2020 in its "Triennial Integrated Resource Plan."[14]

SB123, even as modified by AB498, costly to consumers

In light of these recent changes to the Nevada electricity market, BHI reexamined its April 2015 findings on the costs of SB123, now including the cost of building a new gas-fired power plant and 2013 data from Energy Information Administration (EIA). BHI

[10] Cy Ryan, "Commission rejects $438 million plan to build solar plant in Moapa Valley," *The Las Vegas Sun*, October 29, 2014, http://www.lasvegassun.com/news/2014/oct/29/reid-says-rejection-solar-plant/.

[11] Sean Whaley, "Casino companies would pay $131M to leave Nevada Power," *Las Vegas Review Journal*, August 20, 2015, http://www.reviewjournal.com/business/energy/casino-companies-would-pay-131m-leave-nevada-power.

[12] Nevada Assembly, 78th (2015) Session, Assembly Bill 498, https://www.leg.state.nv.us/App/NELIS/REL/78th2015/Bill/3362/Overview.

[13] Public Utilities Commission of Nevada Electronic Filing for Nevada Power Company, July 1, 2015, (Vol. 2) http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/3615.pdf.

[14] Public Utilities Commission of Nevada Electronic Filing for Nevada Power Company, July 1, 2015, (Vol. 4) http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/3640.pdf.

then examined the cost of SB123 as modified by AB498. Both of these plans include the costs of building the 706 MW gas-fired power plant proposed by NV Energy.

The dollar values appear in 2013 Net Present Value dollars using a 5 percent discount rate. Table 1 displays the cost estimates and economic impact data for 2020.

Table 1: Cost and price of SB123 and AB498 on Nevada (2013 $)

Net cost	**S.B 123**	**AB498**
	New Plant	**New Plant**
Total net cost to Nevada in 2020	$218 million	$206 million
Total net cost 2020-2025	$1.15 billion	$1.086 billion
Electricity Price (per kWh)	8.67¢	8.64¢
Electricity price change (per kWh)	.50¢	.47¢
Percent change	6.1%	5.8%
Total Employment (jobs)	-3,076	-2,925
Investment	-$35 million	-$33 million
Real Disposable Income	-$259 million	-$247 million
Annual cost to ratepayers in 2020		
Residential Ratepayer	$58	$55
Commercial Ratepayer	$307	$289
Industrial Ratepayer	$18,992	$17,906

This analysis shows that SB123 would have cost Nevada's electricity consumers $218 million in 2020 and driven up electricity prices in Nevada by .50 cents per kilowatt hour, a 6.1 percent increase. AB498 lowers this cost increase to $206 million — for a savings of $12 million — but still results in electricity price increases of .47 cents per kilowatt hour, a 5.8 percent increase. From 2020-2025, the total cost increase would have been $1.15 billion.

These increases in energy prices would inflict harm on the Nevada economy. As of 2020, the state economy under SB123 can be expected to have shed at least 3,076 jobs. The job losses and price increases would combine to reduce real incomes — as Nevada firms, households and governments would be required to spend more of their limited

finances on energy and less on everything else. The result is that real disposable income would fall by $259 million per year by 2020. Furthermore, annual investment in the state would have fallen by $35 million. Only mildly are the investment losses offset by the state-coerced increased investment in other electricity technologies.

AB498 will slightly mitigate the negative economic impact of SB123, with employment falling by an estimated 2,925 jobs, real disposable income declining by some $247 million and investment by around $33 million. From 2020-2025, the total cost increase will top $1 billion.

The bottom of Table 1 shows how SB123 would have affected the average annual electricity bills of households and businesses in Nevada. In 2020, SB123 would have cost families an additional $58 per year; commercial businesses $307 per year; and industrial businesses $18,992 per year. AB498 lowers the annual cost increases to $55 per household, $289 per commercial business and $17,906 per industrial business.

Proposed power plant would cost consumers $115 million in 2020

Lastly, BHI examined the cost of SB123, as modified by AB498, without building a new gas-fired power plant. The removal of the power plant from the AB498 scenario reduces the 2020 cost of the legislative mandates to $91 million, a 2.6 percent increase in prices.

Table 2: Cost, price and marginal cost of a new natural gas power plant on Nevada (2013 $)

Net cost	**AB498**	**AB498**	**Building a new gas-powered plant**
	New plant	**No new plant**	
Total net cost to Nevada in 2020	$206 million	$91 million	$115 million
Total net cost 2020-2025	$1.086 billion	$438 million	$604 million
Electricity Price increase (per kWh)	8.64¢	8.39¢	.25¢
Electricity price change (per kWh)	0.47¢	0.21¢	0.26¢
Percent change	5.8%	2.6%	3.2%
Total Employment (Jobs)	-2,925	-1,311	-1,614
Investment	-$33 million	-$15 million	-$18 million
Real Disposable Income	-$247 million	-$111 million	-$136 million
Cost to ratepayers in 2020			
Residential Ratepayer	$55	$24	$31
Commercial Ratepayer	$289	$128	$161
Industrial Ratepayer	$17,906	$7,936	$9,970

Removing the new power plant from the AB498 scenario would mitigate the negative economic impact even further. While the mandates of SB123, even as modified by AB498, will still cause negative impacts, not building a new power plant will reduce the damage.

Rather than some 2,925 jobs being lost, employment would decline by some 1,311 jobs, meaning about 1,614 jobs would be saved in Nevada. Real disposable income would drop by $111 million, rather than $247 million, keeping $136 million in the pockets of Nevadans. Investment would decline by $15 million, instead of $33 million, saving $18 million for capital investment. From 2020-2025, ratepayers would save $604 million, if the power plant isn't built.

The bottom of Table 2 shows how removing the new power plant from the AB498 scenario will reduce the damage done to Nevada's families and businesses by the legislative mandates. Not building a power plant would lower the annual cost increases to $24 per household, $128 per commercial business and $7,936 per industrial business. That's a yearly difference of $31 per household, $161 per commercial business and $9,970 per industrial business.

Conclusion

Over the next decade, Nevada lawmakers will have forced hundreds of millions of dollars in higher electricity costs on consumers through SB123, even as modified by AB498. Higher electricity prices will reduce employment and real disposable income throughout Nevada.

Unfortunately, the PUC can't undo *all* the damage caused by Carson City politicians. The decision to build or not build a new 706 MW gas-fired power, however, does give the commission the ability to mitigate some of the expensive mandates forced on consumers by SB123 and AB498.

The marginal cost of NV Energy's preferred plan — building a new 706 MW natural gas power plant, instead of purchasing power from existing providers — is $115 million in higher electricity prices in 2020. Higher electricity prices from building the plant would ripple throughout Nevada's economy and easily result in 1,614 jobs lost, $18 million in reduced investment and a $136 million in real disposable income.

If policymakers want to fully protect Nevada's consumers, they should repeal SB123 as modified by AB498. This would save 2,925 Nevada jobs by 2020 and prevent annual real disposable income from decreasing by $247 million by 2020.

Methodology

To calculate the cost of SB123 and AB498, we need to compare the cost of the new solar plant required by the law with the value of that new electricity to Nevada's electricity grid. First, we transform the nameplate capacity from MWs into Megawatt hours (MWhs). To do so, we multiply the nameplate capacity by the potential production per year, which is 24 hours multiplied by 365 days in a year and the actual capacity that was produced per year in 2013, 38 percent for solar, 43 percent for natural gas and 32 percent for coal.

In its July 1, 2015 filing, NV Energy has entered into contracts to purchase solar power from Bolder Solar and Playa Solar 2 at a cost of $48.69 per MWh and $48.61 per MWh respectively. The figures include the cost of connecting the two sources to the electricity grid.[15] The filing also states that "for every 100 MW of nameplate capacity solar resources, the Company adds four MW of spinning reserve requirements" to accommodate the variability of the resource.[16] We use these figures to calculate the cost of the new solar generations.

With this calculation in place, we examined the cost of each type of generation technology, or the Levelized Cost of Electricity (LCOE) versus the value of that MWh, or the Levelized Avoided Cost of Electricity (LACE).[17] Using annual projections of the Northwest Powerpool/North LCOE and LACE Reference case we were able to determine the economic value of the 200 MWs of solar power relative to the coal power that these replaced.

Since the coal power at the Reid Gardener plants are over 50 years old and already connected to the grid, we eliminate capital and transmission costs from our calculation of the avoided cost and only use the fixed and variable operations and maintenance costs, or $27.92 per MWh.

We use the same LCOE data and method to estimate the cost of the 700 MW plant contained in the "Triennial Integrated Resource Plan." The 2020 LCOE for an advanced natural gas plant in the region is $71.80 per MWh.

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[15] Ibid, 22, 32.

[16] Ibid, 14.

[17] Energy Information Administration, "Assessing the Economic Value of New Utility-Scale Electricity Generation Projects," *(July 2013) http://www.eia.gov/renewable/workshop/gencosts/pdf/lace-lcoe_070213.pdf.

To calculate the avoided cost of the proposed 706 MW gas power plant, we assume that the power plant would replace all of the summer output (June through September) that NV Energy purchases from the 570 MW Griffith Energy Plant operated by Star West Generation.[18] We convert the MWs into MWHs by multiplying the 122 days in the period by 24 hours and a capacity factor of 85 percent, assuming the plant has very little down time in the period. To estimate the cost of the electricity we use the Chicago Mercantile Exchange futures Palo Verde Day-Ahead Peak Calendar-Month 5 MW price for 2020 over the same months and average them, for a total of $38.30 per MWh.[19]

NV Energy already had a contract to buy the power from the LV Cogen 2 plant, according to the Federal Energy Regulatory Commissions purchase filings.[20] Therefore, we assume that the acquisition of the gas-fired plants Cogen I, Cogen II and Sun Peaking will simply replace the electricity that NV Energy was purchasing from the existing owners, so that this transaction is essentially a wash. We only consider the Sun-Peak unit and its 222 MWs of nameplate capacity as replacement cost.

The total cost of the policy divided by the amount of electricity that we estimate will be sold in the state yields a percent cost of the policy. This percentage is applied to the anticipated average cost of electricity in 2020, or 8.17 cents per kWh.

[18] See Star West Generation, Griffith Energy Plant, at http://www.starwestgen.com/2013/06/griffith-power-plant/

[19] See Palo Verde Day-Ahead Peak Calendar-Month 5 MW Future Quotes (Globex) available at http://www.cmegroup.com/trading/energy/electricity/palo-verde-day-ahead-peak-calendar-month-5-mw-futures.html

[20] U.S. Federal Energy Regulatory Commission, Docket No. EC14-84-000, Order Conditionally Authorizing the Acquisition and Deposition of Jurisdictional Facilities, (October 29, 2014):3, http://www.ferc.gov/CalendarFiles/20141029152459-EC14-84-000.pdf.

Ratepayer Effects

To calculate the effect of the policy on electricity ratepayers, we used EIA data on the average monthly electricity consumption by type of customer: residential, commercial and industrial.[21] The monthly figures were multiplied by 12 to compute an annual figure. We inflated the 2013 figures for each year using the regional EIA projections of electricity sales.[22]

We calculated an annual per-kWh increase in electricity cost by dividing the total cost increase — calculated in the section above — by the total electricity sales for each year. We multiplied the per-kWh increase in electricity costs by the annual kWh consumption for each type of ratepayer for each year. For example, we expect the average residential ratepayer to consume 11,566 kWh of electricity in 2020 and the expected percent rise in electricity is 7.9 percent of the baseline residential electricity price of 8.17 cents per kWh in the same year. Therefore, we expect residential ratepayers to pay an additional $73 in 2020 had SB123 remained in place.

[21] Energy Information Administration, "Electric Sales, Revenue, and Average Price," at http://www.eia.gov/electricity/sales_revenue_price/.

[22] Energy Information Administration, "Table 94. Electric Power Projections by Electricity Market Module Region," http://www.eia.gov/forecasts/aeo/tables_ref.cfm.

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