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RASH RATEMAKING: LESSONS FROM NEVADA'S NEM REFORMS

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EXECUTIVE SUMMARY

In a December 2015 order, the Public Utilities Commission of Nevada (PUCN) made drastic changes in its policies governing net energy metering (NEM), the process under which consumers are credited for generating their own electricity from non-dispatchable sources like wind and solar.¹ The order came in response both to a filing by Berkshire Hathaway subsidiary NV Energy, the state's largest electric utility, and to a legislative order that the regulator make a decision on solar NEM rates by the end of the year.

The commission's changes reduced the compensation that owners of rooftop solar systems receive when they produce more energy than they consume and sell the excess back to the utility. It also tripled the fixed portion of their electric bills. The Nevada regulator based its decision on analyses that found the prior NEM rates shifted costs from NEM ratepayers to non-NEM ratepayers.

1. Public Utility Commission of Nevada, "Notice of Utility Agenda Meeting," Docket No. 15-07041, Dec. 21, 2015. <http://pucweb1.state.nv.us/PDF/AXImages/Agendas/25-15/6262.pdf>

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This paper offers a critique of the PUCN decision-making process and articulates a number of lessons learned. The goal is to ensure that other states considering similar changes first integrate all of the principles of good rate design.

INTRODUCTION

Vertically integrated electric utilities long have operated under a regulatory compact: the utility is granted a protected monopoly, in exchange for strict regulation that permits it to recover the cost of serving customers, plus a reasonable return on investment. Utilities must invest in sufficient generation, transmission and distribution facilities to satisfy peak system demand and they incur system-operating and other costs to ensure reliable service. Marginal system-operating costs vary by location and the level of demand, which fluctuates within each hour. Conventional retail rates, which generally must be approved by public utility commissions, ensure utilities recover these combined costs from ratepayers with a flat charge based on the volume of use (a "volumetric usage" charge).

So-called “bundled” rates reflect the average cost to serve a particular class of ratepayers. They are allocated according to the costs the specific class imposes on the power grid. For example, distribution-system costs are higher for residential than industrial ratepayers. When ratepayers are relatively homogenous within each class, the bundled retail rate is an equitable way to distribute these system costs.

But ratepayers are not strictly homogenous within classes. They vary in how much they contribute to peak loads and they consume energy at different times of day. The bundled rate cannot reflect these differences, which fluctuate based on real-time grid conditions.

IMPACT OF ROOFTOP SOLAR

Advances in solar technology have introduced distributed generation (DG),² which allows ratepayers to self-generate electricity to reduce their net consumption. At times of higher solar output, DG customers can be net producers of energy. DG can reduce a utility’s costs, including system-operating costs, facilities-capacity costs, fuel-price volatility and the environmental-compliance costs associated with fossil fuels. At substantial penetration levels, DG may create costs for the utility, such as the need to upgrade distribution systems.

Nearly every state provides access to net energy metering (NEM) for DG customers. Under NEM, a DG ratepayer is billed for their net consumption and, in essence, credited at the bundled retail rate for any excess generation. Because DG ratepayers consume less and must be compensated for excess generation, the net effect is to decrease a utility’s revenue. NEM ratepayers would have no impact on retail rates only in the case where the combination of that lost revenue, plus any costs that DG imposes on the utility, is equal to the total benefits the utility receives from avoided costs. If the combination of lost revenues and the additional costs imposed by NEM is either greater than or less than the avoided costs, retail rates would need to be adjusted to reflect the net effects of NEM.

Some argue that, from the perspective of the utility, the lost revenues and additional costs from NEM exceed the benefits DG offers. If this is true, then NEM ratepayers are overcompensated, leading to increased rates for all ratepayers. The contention that DG shifts costs to non-NEM ratepayers was central to the controversy in Nevada, where DG adoption has grown precipitously in recent years.

At the time of NV Energy’s original filing, its subsidiaries Nevada Power Co. (NPC) and Sierra Pacific Power Co. (SPPC) had nearly 15,000 and more than 2,000 NEM rate-

payers, respectively. It should be noted this still constituted less than 1 percent of all ratepayers.

PUCN DECISION

The Nevada Legislature’s S.B. 374, signed by Gov. Brian Sandoval in June 2015,³ directed the PUCN to establish NEM rates and charges to avoid, reduce or eliminate any unreasonable cost-shifting from NEM ratepayers to non-NEM ratepayers. The bill also required NV Energy to file a marginal cost-of-service study (MCSS)⁴ with the PUCN to support a rate tariff that included the charge to provide service to NEM ratepayers.

The PUCN’s ratemaking process employed five principles of rate design: economic efficiency, equity, bill/rate stability, utility revenue stability and customer satisfaction. Economic efficiency and equity align with the common ratemaking principle of “cost causation.”

The PUCN found the MCSS filed by NV Energy provided reasonable estimates for the marginal costs of providing service to NEM ratepayers and the regulator used that study as the basis for revising NEM rates. The study’s findings supported increasing the revenue requirement allocated to NEM ratepayers, which merited some combination of increased charges and/or reduced net-energy compensation. The PUCN found the disparity between the existing and MCSS revenue requirements for NEM ratepayers constituted a monthly subsidy to NEM ratepayers that ranged from \$9 to \$114, which the regulator found unreasonable.

NV Energy proposed a three-part tariff: an increased basic service charge, a new demand charge and a reduction in the volumetric energy charge. They also sought the option to have time variation in the demand and energy charges. The PUCN rejected that proposal and instead adopted a rate design from the commission’s regulatory-operations staff, who recommended rolling the proposed demand-charge increases into the basic-service charge, thus creating a new class of NEM ratepayers. The Attorney General’s Bureau of Consumer Protection (BCP) and a variety of other parties opposed most or all the major proposed rate-design changes.

The reforms that ultimately were approved roughly tripled the basic-service charge and cut the compensation for excess generation by about three-quarters for the standard NEM rate. The PUCN also approved an alternative time-of-use program that NEM ratepayers could opt in to. The PUCN applied these reforms to existing and new NEM ratepayers

3. Nevada Legislature, “SB 374,” June 5, 2015. <https://www.leg.state.nv.us/Session/78th2015/Reports/history.cfm?ID=821>

4. The PUCN uses a utility’s marginal-cost-of-service study (MCSS) to allocate utility-revenue requirements to specific customer classes based on the economic principles of ratemaking.

2. Distributed generation is a fuel-neutral term. However, for this paper, “DG” refers only to rooftop solar.

alike, refusing to “grandfather” existing NEM ratepayers’ rates. The PUCN initially approved phased implementation with a final transition year of 2020. Facing a large public backlash and protest from parties that included the BCP, the PUCN instead opted to phase-in the changes for NEM ratepayers over a 12-year period, through 2028.

The PUCN decision was rooted in faulty cost-of-service analyses conducted by NV Energy and the commission’s regulatory-operations staff. These flaws undermined the ability to detect whether costs were shifted from NEM ratepayers and, if so, to make prudent rate adjustments based on the magnitude of costs those ratepayers created.

COST-OF-SERVICE METHODOLOGY

NV Energy submitted the MCSS to guide the development of revenue requirements and rate design for each ratepayer class. Every party in the case, other than NV Energy, urged the PUCN to reject the flawed MCSS based on methodological and input faults. The proceedings contained sufficient data on only two of 11 quantifiable variables to determine the value and detriment of NEM for ratemaking. The PUCN called for these variables to be quantified in future rate cases involving NEM, but also found (inappropriately) that the incomplete analysis was enough to determine the amount of costs shifted to non-NEM ratepayers, as well as to establish new NEM rates.

TABLE I: PUCN DETERMINATIONS OF INFORMATIONAL ADEQUACY

NEM value variable	Informational sufficiency
Avoided energy	Adequate
Energy losses/line losses	Adequate
Avoided capacity	Inadequate
Ancillary services	Inadequate
Transmission and distribution capacity	Inadequate
Avoided criteria pollutant costs	Inadequate
Voided carbon dioxide emission cost	Inadequate
Fuel hedging	Inadequate
Utility integration and interconnection costs	Inadequate
Utility administration costs	Inadequate
Environmental costs	Inadequate

An independent 2014 study prepared for the PUCN examined the net benefits of NEM and quantified variables in its base case that were left undetermined in NV Energy’s 2015 MCSS, including avoided system capacity, transmission capacity and ancillary services.⁵ It also included in a

5. Snuller Price, Katie Pickrell, Jenya Kahn-Lang, Zachary Ming and Michele Chait, “Nevada Net Energy Metering Impacts,” Energy and Environmental Economics, July 2014. http://puc.nv.gov/uploadedFiles/pucnv.gov/Content/About/Media_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf?pdf=Net-Metering-Study

sensitivity analysis an estimate of the avoided costs to distribution capacity. For purposes of the NEM proceeding, this information was already dated. But it demonstrates that an expert third party was able to find sufficient information to quantify the benefits of DG adoption, derived largely from publicly available NV Energy data.

Despite rejecting the MCSS and having no evidence of additional costs imposed by NEM ratepayers, PUCN staff concluded that a cost-shift to non-NEM ratepayers was likely because of the need to recover lost utility revenues. This perspective ignores the costs that DG adoption allowed the utility to avoid. Correctly detecting a cost-shift would require a long-run comparison of the utility costs avoided by DG with the costs imposed by NEM and the utility revenues lost due to NEM.

Given the MCSS deficiencies, PUCN staff substituted their own method to develop a proposed NEM rate structure. They used the MCSS from the last approved NV Energy general rate case, which was dated and did not provide sufficient information on DG avoided costs. The method also included a review of net-metering dockets in Hawaii, Massachusetts, South Carolina, Minnesota, Ohio, Oregon and Texas, even though the avoided costs and revenue losses of DG vary by utility system. This extrapolation of external results lacks the validity to justify a new rate structure.

NV Energy claimed it could not account for many benefits of DG due to its broad geographical distribution and low penetration. PUCN staff noted that no short-run benefits by NEM ratepayers were given by other parties; instead, such benefits are expected to come in the future. But the PUCN rejected the future benefits of DG as being unquantified, despite the MCSS containing sensitivity analysis on avoided transmission and distribution costs and NV Energy forecasts revealing that DG systems do reduce peak demand.

This reveals two challenges for DG valuation. First, while the utility has the information and expertise to evaluate DG benefits, it also has financial incentives to leave them unquantified. Second, utility resource planning is a process to guide resource decisions within the utility’s control, not a fair rate valuation of DG resources outside of the utility’s control. The PUCN fairly suggested that future DG benefits be evaluated in the resource-planning process, but incorrectly assumed that such benefits could not be estimated in the meantime and incorporated into rates.

In its decision, the PUCN stated that other parties’ proposals gave no weight to the standby service that the utility must provide NEM ratepayers. This service results in a cost-shift to non-NEM ratepayers that the PUCN found to be unreasonable and not in the public interest. NV Energy and PUCN staff assumed that the standby load for NEM ratepayers should be based on their presumed load if their DG

system were offline. DG systems do trip offline periodically, but never coincidentally across all NEM customers at once.

An appropriate alternative would be to use an expected value of NEM ratepayer load, based empirically on observed load patterns and DG outage rates. For example, if DG systems were offline 5 percent of the time during peak-load conditions, the NEM-ratepayer peak load would be calculated based on 95 percent of maximum DG output at the peak period.⁶ The assumption that all NEM systems fail concurrently greatly perverts the MCSS results.

PUCN staff and the BCP both argued that the proper forum for allocating DG costs and establishing rates is a general rate case, where all parties can thoroughly analyze data and provide sound recommendations based on robust analysis. The PUCN should have found the MCSS deficient and required corrections, or found insufficient evidence to support NV Energy’s proposal and encouraged revisiting the subject in a general rate case. Instead, the PUCN found a cost shift to non-NEM ratepayers and enacted rate-design changes based on deeply flawed MCSS and substitute staff analyses.

NEM REDESIGNED

The cost-shifting conclusion of the flawed MCSS and staff analyses prompted the PUCN to redesign rates in a way that dramatically shifted the cost recovery and ratepayer-incentive structure. The PUCN compounded this mistake by adopting poor rate design to recover avoidable costs that the utility presumably was undercollecting from NEM ratepayers. The decision opened the door, however, to a better valuation of net-excess energy.

TABLE 2: NPC’S NEM RATES FOR SINGLE-FAMILY RESIDENTIAL

Year	Basic service charge (\$)	Volumetric charge (¢/kWh)	Excess energy credit (¢/kWh)
Prior rate	12.75	11.3	-
2016	17.90	11.1	9.2
2019	23.05	10.8	7.4
2022	28.21	10.6	5.7
2025	33.36	10.4	4.2
2028	38.51	10.2	2.6

Source: NV Energy.⁷ The prior rate’s excess-energy credit was effectively the avoided volumetric charge of \$0.113/kWh. This reflects the standard monthly NEM rate design, not time-of-use option.

Basic service charge – The prior NEM rates contained a fixed charge, but relied predominantly on a bulk volumetric energy

6. This is analogous to traditional resource-adequacy planning based on the outage rates of central-station power plants, where the expected value of a resource’s availability determines its contribution to peak load.

7. NV Energy, “Net Metering,” accessed March 22, 2016. <https://www.nvenergy.com/renewableenvironment/renewablegenerations/NetMetering.cfm>

charge for cost recovery. In contrast, a demand charge is based on the maximum volume a ratepayer consumes. A volumetric energy charge provides an incentive for customers to conserve energy, whereas a demand charge encourages reductions during periods of peak demand.

TABLE 3: NPC’S FIXED AND DEMAND CHARGES FOR NEM SINGLE-FAMILY RESIDENTIAL

Charge	Prior rate	NV Energy proposal		PUCN approved
		NEM flat rate	NEM time-of-use rate	
Basic service charge (\$)	12.75	18.13	-	38.51
Max demand rate (\$/kW)	-	14.30	4.03	-
Summer on-peak demand rate (\$/kW)	-	-	22.10	-

Note: This reflects the standard monthly rate design.

The PUCN expanded the fixed basic service charge to cover customer, facilities and primary and high-voltage distribution costs, which it characterized as fixed costs. Of course, this failed to recognize that many of these costs are caused by customer behavior and are avoidable in the long term. Generation, transmission and demand-capacity costs are a function of peak load, which is within a ratepayer’s control. The shift of demand-cost recovery from an avoidable volumetric charge to an unavoidable fixed charge removes the incentive to reduce peak demand and overall consumption. The effect is likely to be increased consumption, peak load and associated utility costs. The PUCN decision took no note of this.

Demand charges should reflect the degree to which specific ratepayers contribute to capacity costs. As NV Energy noted, the charges should send price signals that reflect demand-driven costs. An efficient demand charge would reflect the cost an individual ratepayer imposes on the utility for it to meet peak demand. This makes a time-varying charge a critical component of a demand charge. NV Energy made clear that components of its proposed demand charges should not be equated with fixed costs.

The benefits of a demand charge, relative to a fixed charge, will grow over time. NV Energy’s modeling indicated that DG penetration, which currently is aligned with peak load, will by 2017 cause peak load to shift into the early evening. A demand charge would offer incentives for DG output to shift toward these evolving peak-system conditions. This may offer an efficient way to mitigate the solar “duck curve”⁸ through alternative DG-system configurations, such as alternative mounting orientation and small storage devices.

8. The duck curve refers to a load curve, net DG output, which results in two high-load periods with steep curves. Dispatching generation with this steep curve requires a high degree of generation ramp and increases the integration cost of solar resources substantially.

The PUCN believed a demand charge in lieu of a fixed charge would be too complex for NEM ratepayers and would require an education program to implement. This finding represents a shortsighted sacrifice of rate-design efficiency for simplicity's sake. NV Energy noted that ratepayers have demonstrated understanding and behavioral responses to consumption price signals in the Nevada Dynamic Pricing Trial and certainly could learn to interpret and respond to peak-demand-based price signals. The PUCN's dismissal of demand charges and its expansion of the fixed charge does not appropriately reflect the utility cost structure, rendering it economically inefficient.

Excess-generation compensation – The PUCN correctly noted that the changing technology landscape makes time-variant pricing an important element of future NEM rate design. Basing the credit for avoided energy costs on the marginal system energy cost better reflects the value of excess solar generation. The PUCN ordered NV Energy to determine the credit by modeling the average annual marginal energy cost and adding avoided distribution-system-line losses. This method may undercompensate excess-solar generation. Marginal energy cost fluctuates by season and time of day, with periods of high solar output typically exceeding the average marginal energy cost.

The PUCN noted that estimating hourly avoided energy costs may enhance the price signal to NEM ratepayers. The commission also provided for an optional alternative to the annual cost method. The alternative would require NV Energy to calculate time-of-production rates, grouped into seasonal periods. This method better approximates the value of long-term avoided energy costs from NEM ratepayers and provides a framework to adjust compensation as increased DG penetration, along with other variables, affect the value of avoided energy costs. This could serve, in the long term, as a steppingstone to dynamic pricing, which would compensate ratepayers directly based on real-time marginal energy costs.

RETROACTIVE APPLICATION

Arguably the most surprising aspect of the PUCN's initial decision was to begin applying the new NEM rate immediately to existing NEM ratepayers. This went against the requests of most other parties, including NV Energy. Given the magnitude of the NEM charge and compensation changes, this made thousands of previously rational investments suddenly uneconomic. The result was large public protests and the immediate departure of DG service providers from the Nevada market, including SolarCity and Sunrun. Revisiting the decision in February 2016, the PUCN opted to extend the new NEM rate phase-in period to 12 years, citing concerns for bill stability. But the PUCN still applied the rate changes to existing NEM ratepayers and exaggerated the downside

of implementing different rates for existing and new NEM ratepayers, calling it illogical and potentially confusing.

The decision to alter rates for existing NEM ratepayers is not uncalled for, as the PUCN correctly notes that utility rates are, by nature, subject to change. There also is strong precedent in the ratemaking principle of horizontal equity to support all ratepayers of the same class equally. But there is a substantial public-interest case to separate new and existing NEM ratepayers into distinct classes, or at least, to ensure existing NEM ratepayers can still recover the cost of DG systems when there is a major change in NEM policy.

Traditional cost-of-service regulation guarantees that utilities can recover the cost of an investment deemed prudent at a particular point in time. This serves to insulate them from regulatory and market risk. NEM ratepayers, in providing public benefits via avoided utility costs, deserve at least some degree of equal consideration, which may require revisiting the regulatory compact.

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Existing NEM ratepayers should be shielded from some regulatory risk, although not necessarily market risk. NEM rate adjustments that are based on economic conditions, such as changes in avoided marginal energy costs, efficiently alter rates based on predictable market variables. Rate redesign is the outcome of regulatory discretion, a noneconomic risk factor that distorts efficient investment.

Generally, rate changes do not have significant impact on major residential and commercial investment decisions. DG owners are the exception, making the principle of rate stability especially salient in NEM reforms that render existing investments uneconomic. Rate stability can contradict economic efficiency, as the PUCN noted. However, reducing regulatory risk via rate predictability also can serve to support economic efficiency. This counts as an argument in favor of treating existing and new NEM ratepayers differently when

9. The regulatory compact is the premise that a public utility will subject itself to strict regulation and legal obligations in exchange for a monopoly franchise. This was premised on the natural-monopoly model, where least-cost electric service was presumed to come from a single provider. Evolving solar technology disrupts this model, where numerous consumers now can provide electric-service benefits as part-time producers.

a change in rates comes about due to regulatory factors, rather than economic ones.

The PUCN could have improved the efficiency of investments in DG resources by allowing the new NEM tariff to phase-in at a level sufficient for existing NEM ratepayers to recover their investments. The BCP recommended grandfathering existing NEM ratepayers for at least eight to 10 years, or roughly equivalent to the payback period for NEM systems. In refusing to do so, Nevada's retroactive NEM redesigns create regulatory risk that will undermine the efficiency of future DG investments.

SEPARATE NEM RATEPAYER CLASS

The PUCN established a new NEM ratepayer class, on the basis that NEM ratepayers differed materially in cost and usage from non-NEM ratepayers. While the cost differentiation analysis is flawed, this determination can be made on usage differentiation alone. Historically, the PUCN established separate, optional rate schedules for partial-requirements ratepayers, whose electric needs are partially or completely met by nonutility generation.

NEM ratepayers are distinct from non-NEM ratepayers, both on an hourly usage basis and in terms of overall consumption. This suggests there is value in evaluating NEM ratepayers independently, which a separate ratepayer class may help make possible. It also could help to quantify the benefits and costs of NEM ratepayers and to improve the quality of future rate-design decisions. One party noted there may be substantial heterogeneity among NEM customers, which could validate creating multiple NEM ratepayer class divisions. Creating an NEM ratepayer class may allow a closer examination of variances in NEM usage and excess-production profiles, which would improve the benefit-cost estimates of DG in future potential NEM reforms.

LESSONS LEARNED

Nevada's NEM reforms provide several lessons for other state PUCs and stakeholders.

1. **NEM reform should be comprehensive and based on robust methodology.** NEM reform is likely an iterative process, but minimizing the pitfalls of abrupt, ad hoc ratemaking must be a priority. Expediency should not sacrifice quality in rate-design reforms. Initial errors in NEM reform will compound regulatory uncertainty for current and prospective NEM ratepayers and DG providers. Suboptimal NEM design changes are more likely to require major

subsequent corrections that undermine rate stability, revenue stability and customer satisfaction.¹⁰

2. **Third-party analysis is invaluable to developing a robust DG cost-benefit methodology.** Public utility commissions have recognized the value of independent analyses to determine optimal demand-side management programs, in the face of chronic utility evaluation failures. DG is no different; vertically integrated utilities have a financial interest not to accommodate, and even to resist, the proliferation of DG. Third-party analysis would bring particular value to areas where utilities have poor incentives to perform a robust evaluation, including DG avoided costs, integration costs and DG performance. Failure to evaluate these variables properly led the PUCN to adjust rates based on simple, overly pessimistic assumptions. The only independent study on NEM net benefits in Nevada used a more complete methodology and reached a very different result; it detected no clear cost-shift to non-NEM ratepayers.¹¹
3. **Modifying NEM is not always appropriate, despite its shortcomings.** NEM is not the most economically efficient rate design, but it is not inherently inequitable. Its simple design generally yields customer satisfaction and can provide bill and utility-revenue stability. To the extent that DG adoption may result in inequitable NEM impacts, the issue is rooted in applying bundled volumetric rates to heterogeneous ratepayers; the problems of NEM are problems of legacy ratemaking. The fact that cost-shifting exists is not, by itself, enough to justify changes to NEM; alternatives to existing NEM policy must demonstrate better collective alignment with all the core principles of ratemaking to justify change, not equity alone.
4. **NEM reform should be highly mindful of rate stability.** Retroactively applied NEM reforms must account for rate stability in the context of the impact of changes on investor confidence and the potential for disruption to render existing DG suddenly uneconomic, especially where these investments were economic under prior regulatory design. Rate predictability is an essential element of any iterative NEM reform program. It's crucial to avoid unnecessary regulatory risk for prospective investors.
5. **NEM reform should not expand fixed charges to cover behavior-dependent costs.** Rolling avoidable costs into unavoidable fixed charges is economically

10. Suboptimal changes should only be made if deferment to obtain acceptable rate-making methodology would result in more severe consequences than inferior interim rate-design changes. Excessive cost-shifting between ratepayer groups could trigger this condition, but lacked evidence in the case of Nevada.

11. Price, 2014.

inefficient and has a perverse effect on energy and demand patterns. Costs that stem from ratepayer behavior are better represented in unbundled volumetric or demand charges that reflect the timing of peak conditions, individual ratepayer consumption or excess self-production. Demand charges may require customer-education efforts, but they better align with the long-term vision for efficient DG tariffs.

6. **NEM alterations should be done in context of long-term DG rate design.** Optimal rate design should incorporate projected long-term considerations in the context of evolving technologies, avoided costs determinants and customer sophistication. The PUCN noted that the changing technology landscape makes time-variant pricing an important element of future NEM design, but ignored other elements that are essential to send efficient DG investment signals.

CONCLUSION

The PUCN decision's negatives outweighed its positives. It may worsen rate equity, given its shift in cost allocation despite the utter lack of convincing evidence of cost-shifting. It worsens the economic efficiency of rates, largely by raising fixed charges to cover behavior-dependent costs. It clearly compromised the principles of rate stability and customer satisfaction. Premature NEM reform without robust methodological support leaves Nevada's future with a piecemeal approach to DG policy that undermines rate predictability.

However, some positives did emerge from the proceeding and the decision. The creation of a separate NEM ratepayer class may allow the collection of more and better information. The shift to align excess generation with wholesale prices is better aligned with cost causation/avoidance. NV Energy also provided insight into the benefits of demand charges in lieu of fixed charges to cover demand-driven costs.

The PUCN ultimately chose a path that was worse than both the status quo and NV Energy's own proposal. This case study highlights the dangers of making rushed NEM reforms based on faulty analysis. The PUCN's DG legacy to date may, in fact, benefit the industry and out-of-state ratepayers if other states learn to avoid making the same mistakes.

ABOUT THE AUTHOR

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Devin previously worked at the Federal Energy Regulatory Commission (FERC), where he conducted economic analysis of wholesale electricity markets. His specialties included renewables integration, environmental regulation, coordination of natural gas and electric industries, and capacity-market performance and design evaluation.

Before FERC, Devin worked at the Indiana Utility Regulatory Commission, where he spearheaded the initiative to modernize Indiana's electric-resource planning rule. He led research on risk and uncertainty management, as well as advanced technologies, including electric vehicles, carbon capture and storage, energy storage and distributed generation.

Devin served as a fellow at the U.S. Environmental Protection Agency, conducting air-emissions cost-benefit analysis. He has also advised, provided research and worked on issue-based campaigns for various energy and environmental nonprofit organizations.

Devin graduated from Iowa State University with majors in economics, political science and environmental studies. He completed an M.P.A. and M.S. in environmental science at Indiana University, concentrating in environmental policy, policy analysis and energy systems and policy. His volunteer activities include serving on the council of the National Capital Area Chapter of the U.S. Association for Energy Economics; advising and teaching courses for the Clean Energy Leadership Institute; and serving as a member of the Climate, Energy and Environment Policy Committee that advises the Metropolitan Washington Council of Governments.