UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New England Ratepayers Association	)	No. EL20-42

PROTEST OF THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

INTRODUCTION

Net metering is a retail service provided by local distribution utilities under which the retail electric service they provide is measured by, and is billed based on, the net delivery of electricity to the retail customer during a retail service billing period, and the utility manages any outflow from retail customers' local generation, typically located behind the meter. Net metering has been an established feature of retail electric rates and state energy policy across the nation for decades.[1] Nearly every state has enacted a net metering program to promote renewable resources and distributed generation within its boundaries. Federal law recognizes that the decision to allow or require utilities to offer net metering service is one for the states, and lies outside the Commission's jurisdiction. Indeed, the Energy Policy Act of 2005 ("EPAct 2005") affirmatively encouraged "[e]ach state regulatory authority" to include net metering service among its regulatory policies and as part of the local utility services that it regulates.[2] The Commission, too, has for nearly 20 years acknowledged states' authority and held that net metering does not involve wholesale sales subject to its jurisdiction. Relying on that settled law, states and utilities have developed and implemented net metering programs, and millions of Americans have made long-term investments in solar panels and other distributed generation for their homes and businesses.

Based on court decisions dating from 2010 and 2012, Petitioner asks the Commission to disregard established law and that reliance, to effectively declare the net metering programs, rates, and regulations in nearly every state to be unlawful, and to impose uniform and rigid federal regulation in their place. Petitioner's main complaint appears to be that the state-jurisdictional

[1] Those programs are not all alike. While sharing the core features identified in federal law, their diversity reflects the diversity of the states and their local needs and priorities. This diversity provides a unique laboratory for exploring new program designs and features—exactly the kind of local variation that federalism is intended to promote.

[2] 16 U.S.C. § 2621(a), (d)(11).

retail rates charged to the retail customers it claims to represent are too high, allegedly because of net metering. That complaint, however, belongs before state regulators and state legislatures. This Commission has no regulatory interest in addressing grievances regarding retail rate design, and indeed, no jurisdiction to do so. Moreover, Petitioner identifies no specific net metering program that it is challenging. Instead, it sweeps broadly and asks this Commission to issue an abstract declaration "find[ing] unlawful, and therefore reject[ing], state net metering laws which assert jurisdiction over … wholesale sales,"[3] without ever identifying which state net metering laws it has in mind.

An abstract attack on net metering laws, divorced from any concrete controversy, may make for a stimulating law review article. But it is not grounds for a declaratory order. Far from resolving uncertainty, the relief requested by the Petitioner will generate widespread uncertainty and litigation. States will be left to determine whether the programs they have enacted, encouraged by Congress and Commission precedent, fall within the terms of the theoretical declaration demanded by Petitioner, and millions of homeowners and small businesses will attempt to mitigate the impact of the ruling on their individual investments. Accordingly, the Commission should not entertain this Petition.

To the extent the Commission nevertheless does entertain the Petition, there are at least three reasons it should reaffirm its longstanding precedent and reject the Petition's legal theory. **First**, in *MidAmerican* and again in *Sun Edison*, the Commission correctly rejected the very same theory Petitioner advances here. As the Commission then explained, the outflow of energy from a retail customer to its local distribution utility is not a wholesale sale. Netting those outflows against inflows when measuring the retail service provided during a billing cycle does not set a

[3] Petition at 45.

wholesale rate. Congress, acting with the backdrop of the *MidAmerican* ruling, confirmed states' jurisdiction in EPAct 2005. Unlike portions of the Public Utility Regulatory Policies Act ("PURPA") that authorize the Commission to take federal action, EPAct 2005 recognizes state jurisdiction over net metering programs and encourages states to exercise that jurisdiction by adopting those programs.

Second, even if the Commission decided to ignore Congress and abandon its own precedent to assert jurisdiction over outflows of energy from a retail customer to its local utility, it still could not issue the requested declaration. The only possible impact of asserting federal jurisdiction would be that the owners of net-metered generation would become entitled to wholesale compensation for flows of energy that currently are not regarded as sales at all. Asserting that jurisdiction would not, and could not, prevent states from continuing to measure state-jurisdictional retail service based on the net inflow to the retail customer. Of course, Petitioner does not want to give net-metered homes and businesses a <u>new</u> wholesale revenue stream—it wants the Commission to <u>prohibit</u> states from using a netting convention when measuring retail service. In effect, Petitioner wants the Commission to dictate that states must recognize a greater quantity of retail sales than state-regulated retail tariffs allow. But even if the Commission could regulate outflows from net metering customers as wholesale sales, it has no power whatsoever to dictate the terms of retail service.

The D.C. Circuit's decisions in the 2010 and 2012 station power cases—cited by Petitioner as the sole reason why the Commission should in 2020 revisit *MidAmerican* and *Sun Edison*—only confirm the impropriety of Petitioner's requested declaration. In those cases, the D.C. Circuit confirmed that the Commission had no jurisdiction to displace the state's netting rules for measuring whether retail sales had occurred. States are entitled to define the terms of retail service,

and to measure retail service as they see fit. The Commission may not interfere. It may not "specif[y] terms of sale at retail"—this "is a job for the States alone."[4]

Third, the Commission cannot issue the requested declaration because a homeowner or business does not engage in interstate commerce when energy flows out from the home or business to the local utility's distribution system, and the Commission has no jurisdiction to regulate the local outflow from these net metered facilities. The Petition brushes that obstacle aside on the theory that the energy in the local utility's distribution network previously traveled in interstate commerce, but that is irrelevant. To assert jurisdiction over the outflow of energy from a retail customer to a utility, the Commission must find—and the Petitioner must prove—that the outflow from the net metered facility is in interstate commerce. The Petitioner does not and cannot so prove. Neither precedent nor fact supports such a notion. To be sure, when a utility sells commingled energy, it is selling, at retail, electricity that has flowed in interstate commerce. But a net metered customer is not flowing any commingled energy onto the grid. Nor does the net metered customer intend or expect that its outflow will subsequently leave its neighborhood distribution facilities, let alone cross state lines. Accordingly, the homeowners and businesses using retail net metering service are not engaged in interstate commerce, and their outflows are outside of the Commission's jurisdiction.

Finally, the Commission cannot overlook the fact that state and federal legislatures, state regulatory commissions, utilities, and millions of retail customers have acted in reliance on the law and this Commission's established precedent. When the Commission reverses a prior legal interpretation on which the public has relied, it must take account of that reliance and explain why, nevertheless, a change in position is warranted. Here, nothing has happened requiring a change in

[4] *FERC v. Elec. Power Supply Ass'n*, 136 S. Ct. 760, 775 (2016).

Commission policy, except that more states, and myriad more Americans, have invested in small-scale distributed generation, in reliance on retail net metering programs. Against those reliance interests, the Petitioner balances only abstract claims that states' retail rates are too high and misallocate costs among retail customers—matters over which this Commission has no regulatory authority. Disrupting the net metering programs in place in 48 states and potentially upending the reliance of millions of consumers is wholly unjustified.

FACTUAL BACKGROUND

Net metering is a means of measuring the retail electric service used by a utility customer. Net metering has been implemented in many variations, but the common feature is that retail service to an electric consumer is measured so that "electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period."[5] The primary purpose of net metering is to enable retail customers to self-supply a portion of their electricity needs,[6] typically in a manner consistent with state clean-energy, environmental, and economic development objectives, while maintaining the reliability and efficiency of the distribution system.

[5] 16 U.S.C. § 2621(d)(11). *See also* Exhibit A (Affidavit of Carl Pechman, Ph.D. in Support of the Protest of the National Association of Regulatory Utility Commissioners) at 3-4.

[6] *See Sun Edison LLC*, 129 FERC ¶ 61,146 at P 17 (2009), *modified on reh'g by* 131 FERC ¶ 61,213 (2010). Efficiency is achieved by allowing interconnection with the standard bi-directional meter instead of requiring the homeowner/owner of distributed generation to install multiple meters and establish multiple billing protocols with its local utility.

The first net metering programs date back to the early 1980s.[7] After the EPAct 2005 formally encouraged states to consider the adoption of net metering policies,[8] adoption by states and participation by customers accelerated. By 2015, 43 states and the District of Columbia had adopted net metering policies,[9] and over 500,000 customers had enrolled.[10] By year-end 2018, over two million customers were participating in net metering programs nationwide.[11] Today, net metering programs are available in 48 states and the District of Columbia. Net metering customers represent approximately 1.5% of electric utility customers nationwide.[12]

While Petitioner attacks a construct it calls "full net metering," there is no one-size-fits-all approach to net metering and the Petition does not identify any particular state's program as problematic. In reality, net metering programs are diverse and carefully designed to advance each state's individual policy goals and address local needs. States use net metering programs to advance policy goals including to allow customers to self-supply a portion of their own electricity

[7] Minnesota was the first state to enact a net metering program, in 1983, although Iowa, Idaho, Arizona and Massachusetts were also early adopters. Solar Electric Power Ass'n, *Ratemaking, Solar Value and Solar Net Energy Metering – A Primer* at 1 (2013), https://perma.cc/6LMH-5FQ9. *See also* Richard L. Revesz & Burcin Unel, *Managing the Future of the Electricity Grid: Distributed Generation and Net Metering*, 41 Harv. Envtl. L. Rev. 43, 59 (2017).

[8] 16 U.S.C. § 2621(d). In 2003, there were fewer than 7,000 net metering customers nationwide. The number increased to approximately 100,000 by 2010. J. Heeter et al., *Status of Net Metering: Assessing the Potential to Reach Program Caps*, Nat'l Renewable Energy Lab. at 1 (2014), https://perma.cc/2KPV-KC2M.

[9] Benjamin Hanna, *FERC Net Metering Decisions Keep States in the Dark*, 42 B. C. Envtl. Aff. L. Rev. 133, 142 (2015).

[10] J. Heeter et al., *Status of Net Metering, supra* n. 8, at 1.

[11] U.S. Energy Information Administration, *Electric Power Annual 2018*, Table 4.10 Net Metering Customers and Capacity by Technology Type (Oct. 2019), https://www.eia.gov/electricity/annual/pdf/epa.pdf.

[12] At year-end 2018, there were 153,339,118 electric utility customers nationwide, 133,893,321 of whom were residential customers. U.S. Energy Information Administration, *2018 Total Electric Industry – Customers*, https://www.eia.gov/electricity/sales_revenue_price/pdf/table1.pdf. Thus, net metering customers represented approximately 1.5% of residential electric utility customers nationwide.

needs, to promote diversification of in-state generation resources, to enhance the resilience of the distribution grid by encouraging distributed energy resources, and to mitigate the environmental impacts of electricity generation.[13] More recently, states have used net metering programs to help advance distribution system technology ancillary to distributed generation, such as smart inverters and distributed storage.[14] Net metering programs also vary in how they measure the net quantity of retail electric service provided, how they calculate the retail charges participating customers pay, and in some cases the means of interconnecting retail customers' on-site distributed generation to the local distribution network.

The diversity in key features of net metering programs across the country underscores the impossibility of treating net metering service as a uniform, abstract concept, as the Petition tries to do. For example, many net metering programs offset excess energy production against only volumes, or only volumetric charges; non-volumetric charges such as customer charges must continue to be paid.[15] Some states enable customers to retain renewable energy credits ("RECs")

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[13] *See, e.g.*, Mont. Code Ann. § 69-8-601 (Montana) (making a legislative finding that net metering is in the public interest because it encourages private investment in renewable resources, stimulates economic growth, and enhances diversification of energy resources); R.I. Gen. Laws § 39-26.4-1 (Rhode Island) (stating the purpose of the net metering statute is to promote installation of customer-sited renewable generation, support customer development of renewable generation, reduce environmental impacts and carbon emissions, diversify energy generation sources, improve distribution system resilience and reliability, and reduce distribution system costs); Wash. Rev. Code § 80.60.005 (Washington) (stating that the purpose of net metering law is to encourage private investment in renewable energy resources and continue the diversification of energy resources used in the state).

[14] *See, e.g., In re Instituting a Proceeding to Investigate Distributed Energy Resources Policies*, Hawaii PUC, Docket No. 2014-0192, Decision and Order No. 33258 (Oct. 12, 2015) (adopting (i) a "smart export" program, which is available to customers who have both a distributed energy resources and a battery storage system, compensates these customers for energy exported to the grid only in the evening and overnight, and offers a streamlined interconnection process; and (ii) a "customer grid supply" program that provides credit for exports at any time of day, but requires the customer to install an advanced inverter that allows the utility to control output to the grid).

[15] Arizona (Ariz. Admin. Code § R14-2-2301); Missouri (Mo. Rev. Stat. § 386.890; 20 CSR 424.20.065); Washington (Wash. Rev. Code § 80.60.005).

associated with their generation, while others prescribe that RECs belong to the utility as soon as they are created.[16] Many net metering programs cap the size of the individual behind-the-meter resources that are eligible for net metering, but the size limitations differ among programs.[17] Many states also cap the total level of participation in net metering by limiting the number of customers or the total capacity of distributed generation eligible for net metering, while others impose no cap or leave the matter to utility discretion.[18] These varying policies reflect the diverse goals of individual states as well as the need to thoughtfully tailor distributed generation policy based on an understanding of the implications for the distribution systems of each local utility.

State net metering programs also differ in measuring the quantity of retail service taken by retail customers, and in determining customers' retail service bills. Many, if not all, programs enable customers to use outflows onto the local distribution network to offset their consumption over the course of a billing period on a one-for-one, kilowatt-hour for kilowatt-hour basis.[19] If a

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[16] Delaware (CDR 26-3000-3001, Sec. 15.1 (providing that net-metered customers retain RECs)); Illinois (220 ILCS 5/16-107.5 (same)); Pennsylvania (52 Pa. Code 75.13). *Compare* 20 CSR 424.20.065 (Missouri) (providing that customers who receive a solar rebate for their net-metered system are deemed to have transferred all RECs to the utility for a ten-year period, but providing that customers who do not receive a solar rebate retain RECs).

[17] In California, net metered resources may be greater than 1 MW, so long as they are sized to the onsite load and there is no significant impact on the distribution grid. Cal. Pub. Util. Code § 2827.1(b)(5). In Delaware, the size limitations for net metered resources differ by customer class. CDR 26-3000-3001, Sec. 15.1.2.1. In Kansas, facilities installed at a residential customer's premises after 2014 may be no larger than 15 kW; facilities installed before 2014 may be up to 25kW. Kan. Stat. Ann. § 66-1267. In Colorado, net metered resources must be sized to serve no more than 120% of the customer's average annual consumption. 4 Colo. Code Regs. 723-3, § 3652(ff).

[18] Maryland law caps net metering at 1500 MW state-wide. Md. Code Ann. Pub. Utils. 7-306(d). Alaska caps enrollment at 1.5% of the offering utility's total load. Alaska Admin. Code tit. 3, § 50.910(b). Delaware utilities can choose to stop enrolling customers in net metering when the total generating capacity of net metering customers reaches 5% of monthly peak demand. CDR 26-3000-3001, Sec. 15.3.7.

[19] Arizona (Ariz. Admin. Code § R14-2-2306(C)); Arkansas (126 03 CAR 023, Rule 2.04(B)); Colorado (4 Colo. Code Regs. 723-3, § 3664(a)-(b)); Delaware (CDR 26-3000-3001, Sec. 15.3); Florida (Fla. Admin. Code Ann. § 25-6.065(8)(d)); Illinois (220 ILCS 5/16-107.5(d), (d-5), (e), (e-5)); Indiana (170 Ind. Admin. Code § 4-4.2-7); Maine (CMR 65-407-313); Maryland (COMAR 20.50.10.04); Missouri (Mo. Rev. Stat. Ann. § 386.890; 20 CSR 424.20.065); New Jersey (N.J. Stat. § 48:3-112; N.J. Admin. Code § 14:8-4.3); Rhode Island (R.I. Gen. Laws § 39-26.4-1 et seq. (providing, for energy up to 100% of the customer's

customer consumes more than it produces over the netting period, it pays the retail rate only for the net amount it consumes.[20] But, beyond that, some programs provide that if the customer produces more than it consumes in the netting period, it can receive a credit to its utility account that can be used to offset net consumption in a future period. Many assign a value to each credit, which again, varies from state to state both in size and what it represents.[21] For example, in Nevada, credits are equal to a percentage of the retail rate, with the percentage decreasing incrementally as more customers enroll in net metering.[22] In Mississippi, credits are equal to the avoided cost of wholesale power, plus a 2.5-cent adder for "non-quantifiable expected benefits."[23] In Vermont, the base credit is valued at a weighted average per-kilowatt-hour rate, and adjusted up or down by several cents per kilowatt-hour based on factors evaluated by the state commission

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usage, credit equal to the per-kWh charges for standard offer service, distribution, transmission, and transition charges)).

[20] Most states require net metered customers to pay customer charges and similar items not charged on a per-kWh basis, regardless of whether they are net consumers or net producers.

[21] Alaska (Alaska Admin. Code tit. 3, § 50.930 (per-kWh credit equal to the utility's non-firm power rate)); Delaware (CDR 26-300-3001, Sec. 15.3 (per-kWh credit equal to volumetric components of the delivery and supply services components of retail rates)); Kansas (Kan. Stat. Ann. § 66-1266(b) (for net metering customers who installed facilities after 2014, credits equal the utility's monthly system average cost of energy)); Maryland (COMAR 20.50.10.05 (credits equal the generation or commodity portion of the rate applicable to the customer)); Massachusetts (220 Mass. Code Regs. § 18.04 (credits vary by type of facility and total statewide enrollment; per-kWh credits for solar facilities while statewide enrollment remains below 1600 MW are equal to the sum of default service, distribution, transmission, and transition charges; per-kWh credits after total statewide enrollment reaches 1600 MW are equal to 60% of that sum)); Minnesota (Minn. Stat. 216B.164 (dollar value for per-kWh credit set by the Commission); Missouri (20 CSR 424.20.065) (credits must be at least equal to the utility's avoided cost)); Nebraska (RRS Neb. 7-2003(4) (credits are equal to the utility's avoided cost of electricity supply); Ohio (Ohio Admin. Code § 4901:1-10-28) (perk-kWh credits are equal to the energy component of the utility's standard service offer)); Oklahoma (O.A.C. § 165.40-9-3) (credits are equal to the utility's avoided cost); Rhode Island (R.I. Gen. Laws § 39-26-4.2 (credits are equal to the distribution company's standard offer service per-kWh charge applicable to the customer; credits are available only up to 125% of the customer's consumption).

[22] Nev. Rev. Stat. Ann. § 704.7732(3) (between 2017 and the date total net metering capacity in the state equals 80 MW, credits are equal to 95% of the retail rate; the credit is equal to 88% of the retail rate for the next 80 MW of customers; 81% for the next 80 MW of customers; and 75% thereafter).

[23] CSMR 39-000-004, Subpart II, Chapter 3, Secs. 106-107.

in approving each net metering facility.[24] Some programs provide credits of different values to different classes of customers.[25] Some programs permit a customer to carry credits into the future indefinitely,[26] others have credits that expire after a time if not used.[27] Many programs require the utility to "cash out" a customer's credit balance annually, on customer election, or when the customer leaves the system.[28] The value of these cashed-out credits often differs from the value

[24] CVR 30-000-5100 Ch. 5.126(2) (providing that positive siting or REC adjustment factors, approved when the net-metered facility is approved, will be applied to each kWh produced for 10 years after the system is commissioned, and that negative siting or REC adjustors will be applied to each kWh for the life of the system).

[25] Illinois (220 ILCS 5/16-107.5(d)-(e-5) (calculating credits differently depending on whether the customer takes hourly-priced service or not, and whether the customer is a member of a class that has been declared by the Commission to be competitive or not)); Rocky Mountain Power (Idaho), Electric Svc. Sch. No. 135, Net Metering Service (providing credits to residential customers at the retail rate, but crediting non-residential customers at 85% of monthly weighted average price for non-firm energy).

[26] Alaska (Alaska Admin. Code tit. 3, § 50.930(b)); Indiana (170 Ind. Admin. Code § 4-4.2-7(3)); Kentucky (Ky. Rev. Stat. § 278.466); Nevada (Nev. Rev. Stat. Ann. § 704.775(2)(c)(3)); Ohio (Ohio Admin. Code Ann. § 4901:1-10-28(B)(9)(c)).

[27] Illinois (220 ILCS 5/16-107.5(d)(3) (credits expire once per year)); Kansas (Kan. Stat. Ann. 66-1266(a)(4) (credits earned by net metering customers who established service before 2014 expire once per year)); Maine (CMR 65-407-313 (credits expire 12 months after they are earned)); Missouri (Mo. Code Regs. tit. 20, § 4240-20.065(7)(D) (credits expire 12 months after they are earned)); Oregon (Or. Admin. R. 860-039-0005 (once per year, all remaining credits are deemed granted to the utility for distribution to customers in low-income assistance programs)); Pennsylvania (52 Pa. Code § 75.13 (once per year, remaining credits expire)); Utah (Utah Code § 54-15-101 (credits expire after 12 months, and the value is granted to low-income assistance programs)); Vermont (CVR 30-000-5100, Ch. 5.129(B) (credits revert to the utility after 12 months)); Washington (Wash. Rev. Code § 80.60.030(5) (once per year, any remaining credits revert to the utility)).

[28] Arizona (Ariz. Admin. Code § R14-2-2306(F) (once each year, utility must issue a check or billing credit equal to carried-forward kWh credits multiplied by the utility's avoided cost rate)); Arkansas (126 03 CARR 023, Rule 2.04(3) (customer may elect to have utility purchase kWh credits older than 24 months at the utility's avoided cost rate, if the total is greater than $100)); California (Cal. Pub. Util. Code § 2827(h)(3) (customers may choose to have any balance of credits compensated once per year at a rate equal to the 12-month average rate for energy, or let the credits revert to the utility)); Delaware (CDR 26-3000-3001, Sec. 15.3.2 (once per year, customer may request payment of balance of credits at the weighted average of summer and winter supply service charges, excluding non-volumetric charges)); Florida (Fla. Admin. Code § 25-6.065(8)(f) (at the end of each calendar year, utility must pay for balance of credits at average annual rate based on its as-available energy tariff)); Maryland (COMAR 20.50.10.05(E) (credits must be paid out once per year, at a rate equal to the commodity portion of the applicable rate)); Michigan (Mich. Admin. Code R. 460.650, 450.652 (credits must be refunded to customers if they leave the system or terminate service)); Minnesota (Minn. R. 7835.4017(3) (any net input remaining at the end of the calendar year must be compensated at the utility's avoided cost rate)); Mississippi (CMSR 39-000-004 Ch. 3, Sec. 108 (credits

of banked credits. For example, California law provides that credits accrue and are used on a one-for-one kilowatt-hour basis, but credits are cashed-out annually at the 12-month average of the rate for energy.[29] Colorado law enables customers to elect an annual cash-out at the utility's average hourly incremental cost of supply over the most recent calendar year, or choose to roll their credits forward indefinitely, but provides that a customer with rolling credits will receive no cash-out if they terminate service.[30] In Minnesota, New York and Wyoming, credits are cashed-out at the utility's avoided cost rate.[31] The Petition, painting with a broad brush, ignores all of this variation.

Net metering programs have also evolved over time. Initially, programs often focused on early adoption of distributed generation, frequently small rooftop solar, and so established standardized, low-cost interconnection requirements, standard practices for calculating the net usage of electricity by the customer, and standard application of the retail rate to net usage. As distributed generation has become more common, opportunities to use distributed resources for distribution purposes have grown, and as state regulators have gained greater familiarity with the associated costs and benefits, states continue to refine their net metering programs. Indeed, just recently, Iowa and Arkansas revised their programs to better advance state policy.[32] The pace and

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remaining when the customer closes their account are paid to the customer)); Nebraska (Neb. Rev. Stat. § 70-2003(4) (credits are paid out once per year)); New Jersey (N.J. Admin. Code § 14:8-4.3 (once per year, the supplier must compensate customer for remaining credits at the avoided cost of wholesale power)); Wyoming (Wyo. Stat. Ann. § 37-16-101 (at year-end, all unused credits are sold to the utility at the utility's avoided cost)).

[29] Cal. Pub. Util. Code § 2827(h)(3). In Delaware, the cash-out value of a credit is equal to the weighted average of summer and winter supply services charges, excluding non-volumetric charges. CDR 26-3000-3001, Sec. 15.3.2. In Florida, the cash-out value of a credit is equal to the average annual rate under the utility's as-available energy tariff. Fla. Admin. Code § 25-6.065(8)(f).

[30] 4 Colo. Code Regs. 723-3, § 3664(b).

[31] Minnesota (Minn. R. 7835.4017(3)); New York (NY CLS Pub. Ser. 66-j, 66-l); Wyoming (Wyo. Stat. § 37-16-101).

[32] *See* Iowa Code § 476.49 (effective July 1, 2020) (establishing new "inflow-outflow billing" and "net billing" practices); *In re Net Metering and the Implementation of Act 827 of 2015*, Ark. Pub. Serv. Comm'n

type of experimentation across the states, again, reflects the differing policy preferences and implementation challenges faced by individual states. But, in doing so, states consistently take into account the fact that net metering customers have made significant investments with the expectation that regulatory treatment would remain the same.[33]

ARGUMENT

I. THE PETITION FOR DECLARATORY ORDER SHOULD BE DISMISSED.

The Petition does not satisfy the Commission's standard for issuance of a declaratory order. The Commission issues declaratory orders when doing so can eliminate uncertainty and clarify parties' rights and obligations in order to terminate a controversy.[34] The Commission has no obligation to entertain a petition for declaratory order, and it routinely dismisses petitions that present merely academic questions,[35] are speculative or premature,[36] or fail to provide a sufficient

Docket No. 16-027-R, Order No. 28 (June 1, 2020) (establishing a net metering rate structure effective until at least December 31, 2020; after that date, utilities may individually request alternative structures).

[33] *See, e.g.*, Kan. Stat. Ann. § 66-1263 (differentiating between net-metered facilities installed prior to 2014 and those installed in 2014 and after, with respect to size limitations and value of credits).

[34] *See* 5 U.S.C. § 554(e) ("The agency, with like effect as in the case of other orders, and in its sound discretion, may issue a declaratory order to terminate a controversy or remove uncertainty."); 18 C.F.R. § 385.207(a)(2) (providing for a party to petition for "[a] declaratory order or rule to terminate a controversy or remove uncertainty").

[35] *Phillips Petroleum Co.*, 58 FERC ¶ 61,290 at 61,932 (1992) (rejecting a request for declaratory order that presented "a question which is purely academic").

[36] *See Advanced Energy Econ.*, 167 FERC ¶ 61,032 at P 18 (2019), *citing S. Md. Elec. Coop.*, 162 FERC ¶ 61,048 at P 13 (2018); *City of Boulder*, 144 FERC ¶ 61,069 at P 32 (2013) (denying petition where ruling on stranded cost obligation "would be premature and speculative" in the absence of agreement with executed power requirements contract); *Lynch v. ISO New England, Inc.*, 107 FERC ¶ 61,24 at P 14 (2004) (dismissing Rhode Island Attorney General's petition for declaratory order as premature, noting that to grant the petition would inappropriately circumvent established procedures in New England); *Turlock Irrigation Dist. v. Pac. Gas & Elec. Co.*, 64 FERC ¶ 61,183 at 62,544, *reh'g denied*, 65 FERC ¶ 61,016 at 61,227 (1993) (declining to issue a declaratory order regarding a proposed rate design in the absence of a rate filing)).

basis for a generic interpretation of the law.[37] In determining whether to grant a petition, the Commission may consider the likely value of its order, and the potential consequences: when a declaratory order will "generate controversy, not remove it," or would engender additional litigation, the Commission can and does reject it.[38]

Under these standards, the Petition should be dismissed. Petitioner has not demonstrated any uncertainty to be eliminated, nor any controversy to be terminated. To the contrary, for nearly two decades, this matter has been settled: the Commission has recognized state authority to develop and implement net metering programs. EPAct 2005 confirmed and underscored that state authority when Congress included net metering service among the programs it encouraged states to enact.[39] State legislatures, regulatory commissions, utilities, and retail customers have acted in reliance on that law and precedent over many years. Even the case law that Petitioner claims requires the Commission to revisit its precedents is ten years old.[40] Far from settling a controversy, Petitioner seeks to create a new uncertainty by undermining settled law.

Moreover, the harms asserted by Petitioner—ostensibly a group of retail ratepayers—have little to do with the Federal Power Act. Petitioner claims that net metering makes "it more difficult

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[37] *See Morgan Stanley Capital Grp., Inc.*, 119 FERC ¶ 61,298, at P 17 (2007) (rejecting a request for declaratory order on the basis that "the Petitioners have not provided sufficient basis for our issuing a declaratory order providing a generic interpretation … . First, Petitioners' application provides no basis upon which to interpret the … contracts. Second, because of the individual circumstances surrounding the negotiation and execution of individual legacy Seller's Choice contracts, we find that these contracts are not susceptible to generic resolution through a declaratory order proceeding.").

[38] *Phillips Petroleum Co.*, 58 FERC ¶ 61,290, at 61,932 ("[A]ll declaratory orders are applications of the law to a particular set of facts as described by the petitioner and, thus, are of limited use when applied to different factual circumstances. In the event, and to the extent, that factual circumstances differ, now or in the future, from those upon which an opinion is premised, the value of the order would be diminished. [Here,] a declaratory order would likely generate controversy, not remove it.").

[39] *See* 16 U.S.C. § 2621(d)(11).

[40] *S. Cal. Edison Co. v. FERC*, 603 F.3d 996 (D.C. Cir. 2010); *Calpine Corp. v. FERC*, 702 F.3d 41 (D.C. Cir. 2012).

to achieve carbon reduction goals," "increases the cost of distribution due to the need to re-design distribution systems to accommodate two-[way]flows of power," and shifts costs between classes of retail customers.[41] But the Federal Power Act "leaves to the States alone, the regulation of … any retail sale[ ]of electricity."[42] Given that the Petition concerns retail rate design, these policy arguments must be directed to state legislatures or state regulators. Petitioner's alleged injuries cannot support a dramatic redrawing of jurisdictional lines established by Congress and on which millions of Americans have relied.

Petitioner also touches on an argument that "full net metering" places at a "competitive disadvantage" the resources "required for reliability."[43] To the bulk power system, the vast majority of net metering simply reduces the distribution system load it supplies.[44] Energy produced by net metered facilities simply does not flow onto the transmission system.[45] And while Petitioner may think that net metering leads to "over-investment" in distributed resources,[46] the cost of that investment is borne almost exclusively by the net metering customers themselves. Moreover, the policy preference for certain resources falls squarely within state authority over generation facilities. States have many means of encouraging distributed resources, so even if the Petition were granted, Petitioner's grievance would likely go unredressed. For example, nothing would prevent states from promoting small distributed generation through rebates, or from including the cost of such rebates in retail rates. In short, Petitioner seeks Commission action to

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[41] Petition at 39, 42-43.

[42] *Elec. Power Supply Ass'n*, 136 S. Ct. at 766.

[43] Petition at 42.

[44] *See* Exhibit B (Affidavit of Sam Wheeler in Support of the Protest of the National Association of Regulatory Utility Commissioners).

[45] *Id.*

[46] Petition at 42.

bypass Congress and upend decades of settled law rather than seeking recourse in the legislative halls and state commission proceedings where that debate should properly occur.

Far from clarifying parties' rights, granting this Petition would only create uncertainty and ignite controversy. Petitioner has asked for a generic declaration about a concept—"full net metering"—wholly disconnected from any particular state program. Because the Petition fails to acknowledge the diversity among the net metering programs across the country, it leaves the Commission and parties to speculate as to precisely which features of net metering Petitioner finds problematic, as well as which net metering programs have such features. Without that detail, the Commission lacks a record to justify any action on Petitioner's request. Moreover, any generic action taken in the absence of such detail would no doubt set off a litigation blitz in almost every state, with commissions and courts left to figure out how Petitioner's academic legal theory applies to and affects actual statutes, regulations, orders, and tariffs, which, as noted above, vary significantly from state to state.

While the Commission does not require petitioners to satisfy the requirements of Article III standing, doctrines like standing and ripeness—which limit adjudications to a concrete controversy causing concrete injury and prevent courts from "entangling themselves in abstract disagreements"[47]—serve the important jurisprudential purpose of ensuring that the decision maker "can see what legal issues it is deciding, what effect its decision will have on the adversaries, and some useful purpose to be achieved in deciding them."[48] These basic elements of sound decision making and judicial economy are equally important in the context of an adjudicatory body like the

[47] *Abbott Labs. v. Gardner*, 387 U.S. 136, 148 (1967), *overruled on other grounds by Califano v. Sanders*, 430 U.S. 99 (1977).

[48] *Pub. Serv. Comm'n of Utah v. Wycoff Co.*, 344 U.S. 237, 244 (1952).

Commission.[49] Without these limits, courts and agencies alike could be "called upon to decide abstract questions of wide public significance even though … intervention may be unnecessary."[50] The Commission too should avoid disagreements that are "nebulous or contingent" and will result in "futile or premature interventions," especially where, as here, the effects of the requested ruling will "reach far beyond the particular case."[51] The Commission consistently has been guided by these considerations when deciding whether to take up or dismiss a petition for declaratory order. Indeed, in 2016, the Commission dismissed another petition for declaratory order raising similar arguments, focused on a specific state program, as "premature" and "speculative."[52] This Petition—which does not point to any individual state program from which the alleged injuries arise—is far more speculative and abstract.

Petitioner's failure to identify any concrete controversy is not only fatal to the Petition under the Commission's precedent, but also under the Administrative Procedure Act ("APA"). If the Commission grants Petitioner's request, the Commission will have violated the APA by effectively issuing a "rule" without observing the APA's prerequisites for rulemaking.

The APA defines a "rule" as "an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy."[53] Rulemakings are "for the purpose of promulgating policy-type rules or standards" and involve a "basically

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[49] *See Climax Molybdenum Co. v. Sec'y of Labor, Mine Safety & Health Admin.*, 703 F.2d 447, 451 (10th Cir. 1983) (in determining whether an issue before an agency is moot, the agency "receives guidance from the policies that underlie the 'case or controversy' requirement of [A]rticle III" and "is informed by an examination of the proper institutional role of an adjudicatory body and a concern for judicial economy").

[50] *Warth v. Seldin*, 422 U.S. 490, 500 (1975).

[51] *Wycoff Co.*, 344 U.S. at 243-44.

[52] *S. Md. Elec. Coop., Inc.*, 157 FERC ¶ 61,118 at P 26 (2016), *clarified on denial of recons.*, 162 FERC ¶ 61,048 (2018).

[53] 5 U.S.C. § 551(4).

legislative-type judgment, for prospective application only."[54] When an agency promulgates such a rule, it must follow a defined set of procedures.[55] In contrast, adjudications are "designed to adjudicate disputed facts in particular cases."[56] The agency cannot "escape" the requirements applicable to rulemaking "by labeling its rule an 'adjudication.'"[57] Instead, a court will decide the nature of the agency proceeding and "shall … hold unlawful and set aside" agency action that fails to observe the "procedure required by law."[58]

Here, though denominated a petition for declaratory order, Petitioner requests that the Commission effectively issue a new rule. First, Petitioner would have the Commission reject state net metering laws and programs without focusing concretely on the characteristics of any particular state program, and without any showing of actual injury from the supposedly-wholesale sales, making the Commission's order a rule of general applicability rather than an adjudication of any particular case.[59] Second, Petitioner asks the Commission to entangle itself in policy arguments—another hallmark of rulemaking.[60] Finally, the Petitioner appears to seek an action with only prospective effect—that is, to have the Commission hold that PURPA or Federal Power Act pricing must govern future alleged "wholesale sales."[61] This, too, is a defining feature of a rule.

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[54] *United States v. Fla. E. Coast Ry. Co.*, 410 U.S. 224, 245-46 (1973). Put another way, an agency action is a "rule" if it is "generally applicable" and has "only 'future effect.'" *Safari Club Int'l v. Zinke*, 878 F.3d 316, 332-33 (D.C. Cir. 2017).

[55] *See* 5 U.S.C. § 553.

[56] *Fla. E. Coast Ry. Co.*, 410 U.S. at 245.

[57] *Safari Club Int'l*, 878 F.3d at 332.

[58] 5 U.S.C. § 706(2)(D).

[59] *See Safari Club Int'l*, 878 F.3d at 333 (an agency action was a final rulemaking, in part, because it would affect a wide range of individuals but did not "adjudicate any dispute between specific parties").

[60] *See, e.g.*, Petition at 44 (alleging that metering programs have "multiple adverse public policy implications"); *see also id.* at 37-44 (raising policy arguments).

[61] *Id.* at 44-45.

In the past, the Commission has rightly rejected petitions that, like this one, seek to pass off a rule of general applicability as a declaratory order. In *Texas Eastern Transmission Corp*., for instance, the Commission denied a petition requesting "what would be in effect a binding norm or rule" because an "adjudicatory proceeding is not the proper forum for such rulemaking activity."[62] Likewise, in *ITC Grid Development, LLC*,[63] the Commission held that a declaratory order was "not the appropriate means" to address "important policy issues" or create "a generally applicable determination" with "binding" effect.[64] The APA requires the Commission to follow the same course here.[65]

To the extent Petitioner is actually aggrieved by some feature of a state net metering program, and can demonstrate harm to its membership, and to the extent that the alleged injury is actually connected to the purposes of the Federal Power Act, Petitioner can bring a complaint seeking redress. The Commission would then have the opportunity to evaluate Petitioner's jurisdictional theories in light of a specific state program and concrete facts. But the Commission should not entertain a petition seeking declarations about an abstract concept, divorced from any real world dispute, whose only effect would be to induce uncertainty and generate controversy. The Petition should be dismissed.

[62] 62 FERC ¶ 61,196 at 62,390 (1993).

[63] 154 FERC ¶ 61,206 (2016).

[64] *Id.* at PP 42, 45-46.

[65] Petitioner cannot avoid this outcome by arguing that the declaratory order it seeks will have no binding effect and will not carry the force of law, but is instead akin to a guidance document. Such a position would only underscore the absence of any actual controversy to be resolved or injury to be remedied.

II. NET METERING SERVICE DOES NOT INVOLVE THE "SALE" OF ELECTRICITY.

If the Commission nevertheless considers the Petition, the Commission should reject it on the merits and affirm its precedent. The keystone of the Petition is the premise that, when energy flows from retail customers to their local utilities, those flows are "sales" by the retail customers to the utilities. According to the Petition, these "sales"—occurring "whenever a customer generates more energy than it consumes"[66]—are wholesale sales subject to the Commission's exclusive jurisdiction, but take place at a rate the Commission has not approved. It is not clear whether the Petitioner thinks that an outflow for an instant is a sale, or whether Petitioner is asserting that only net outflows over its preferred netting period are sales. But, regardless, Petitioner seeks a declaration that all state net metering laws are preempted. This argument is flawed for at least two reasons.

First, it rests on a basic misunderstanding of net metering service. As the Commission recognized in *MidAmerican*,[67] and as Congress recognized in EPAct 2005, net metering programs are part of the retail service provided by the local utility and netting is a manner of measuring and billing used to determine the amount owed for that retail service. A retail customer does not engage in a "sale" every instant that power flows from an on-site generator onto the grid.[68] Nor does a utility pay a "rate" when it allows a customer's meter to run bi-directionally, or when it calculates the amount owed by the customer for the retail service the utility has provided based upon the net energy consumed during a monthly billing period. Indeed, Petitioner's attempt to recast as a

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[66] Petition at 19, 21.

[67] *MidAmerican Energy Co.*, 94 FERC ¶ 61,340 (2001).

[68] In acknowledging that netting is permissible, and urging the Commission to apply its own netting intervals, Petitioner concedes that a measurement period is essential in determining the amount of a service provided to customers.

wholesale sale what is actually an element of retail service and a retail billing convention would lead the Commission to intrude into the heart of the authority reserved by the Federal Power Act for states.

Second, even if Petitioner's premise were accepted such that a wholesale sale did occur each instant that power flowed from a behind-the-meter generator onto the local distribution network, Petitioner still would not be entitled to the requested declaration that state net metering programs are unlawful. Instead, accepting Petitioner's faulty premise would require the Commission to assert its jurisdiction and set a rate to be paid to retail customers for those "sales"—"sales" that, under *Mid-American*, are not occurring at all. As a result, owners of generators participating in net metering programs would, under Petitioner's theory, receive a federal revenue stream that they currently do not receive. But the state would remain free to apply whatever netting convention and pricing methodology it selects for the retail service provided. The Commission has no authority to mandate that state retail tariffs recognize a greater quantity of retail sales than the state determines is proper. That authority is reserved exclusively to the states.

Ironically, the cases on which Petitioner relies most heavily—*Calpine*[69] and *Southern California Edison*[70]—establish that very point. The upshot of those cases is that the Commission cannot use its own jurisdiction to override states' regulation of the retail market—including states' use of netting to establish retail charges. As *Calpine* explains, netting "simply determines under what conditions generators will be assessed … retail charges."[71] And while the regulation of

[69] *Calpine*, 702 F.3d 41.

[70] *S. Cal. Edison Co.*, 603 F.3d 996.

[71] *Calpine*, 702 F.3d at 50.

transmission charges and wholesale rates "is undoubtedly within FERC's jurisdiction, retail charges are not."[72]

A. The Commission Has Long Correctly Held That Net Metering Does Not Involve "Sales" of Electricity.

For almost two decades, the Commission has correctly held that outflows from net metered generators do not constitute Commission-jurisdictional sales. In the *MidAmerican* case, decided in 2001, the Commission rejected the precise argument made by Petitioner here: MidAmerican "argue[d] that every flow of power constitutes a sale, and, in particular, that every flow of power from a homeowner or farmer to MidAmerican must be priced consistent with the requirements of either PURPA or the [Federal Power Act]."[73] The Commission found "no such requirement" in either PURPA or the Federal Power Act.[74] As the Commission correctly recognized, MidAmerican, "[i]n essence," had asked the Commission "to declare that when, for example, individual homeowners or farmers install small generation facilities to reduce purchases from a utility, a state is preempted from allowing the individual homeowner's or farmer's purchase or sale of power from being measured on a net basis, *i.e.*, that PURPA and the [Federal Power Act] require that two meters be installed in these situations, one to measure the flow of power from the utility to the homeowner or farmer, and another to measure the flow of power from the homeowner or farmer to the utility."[75] But, as the Commission explained, netting was simply the practice by which the utility accounted for the customer's retail usage.[76] At times, power flowed

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[72] *Id.*

[73] *MidAmerican*, 94 FERC ¶ 61,340 at 62,263.

[74] *Id.*

[75] *Id.*

[76] *Id.*

from the utility to the customer; at other times, power flowed the opposite direction, offsetting the customer's total retail usage.[77] Accordingly, the Commission held that "no sale occurs when an individual homeowner or farmer (or similar entity…) installs generation and accounts for its dealings with the utility through the practice of netting."[78]

The Commission reaffirmed that holding eight years later in *Sun Edison LLC*.[79] The Commission again explained that "net metering is a method of measuring sales of electric energy."[80] And "[w]here there is no net sale over the billing period, the Commission has not viewed its jurisdiction as being implicated; that is, the Commission does not assert jurisdiction when the end-use customer that is also the owner of the generator receives a credit against its retail purchases from the selling utility."[81] That is because "where there is no net sale over the applicable billing period to the local load-serving utility, there is no sale."[82]

The Commission has it right. Net metering is a means by which states define and measure their retail service. The local utility uses net metering to determine the quantity of the retail service provided to local customers during a billing period, and thus the retail rates to be paid to the local utility. The question of "how to measure"[83] retail transactions falls squarely within the state's jurisdiction over retail service and does not implicate the Commission's jurisdiction.

The Petition nevertheless attempts to recharacterize the states' lawful retail service and billing conventions as a series of separate sales, claiming that every time power flows from a net-

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[77] *Id.*

[78] *Id.*

[79] 129 FERC ¶ 61,146 (2009), *modified on reh'g by*, 131 FERC ¶ 61,213 (2010).

[80] *Id.* at P 18.

[81] *Id.*

[82] *Id.* at P 19.

[83] *MidAmerican*, 94 FERC ¶ 61,340, at 62,262.

metered generator onto the local distribution network, a "sale" to the utility has occurred.[84] Petitioner erroneously conflates a flow of power with a sale of power. When state governments chose to encourage customer-sited generation, they faced the question of how to address outflows from the generators onto the distribution system. Managing those outflows is part of the retail service that the local utility provides, and states deemed it fair, as a matter of retail ratemaking, to recognize those outflows as restoring to the local utility energy that had previously flowed to the customer.

Significantly, Petitioner does not identify any of the indicia one would expect to see if energy outflows were, as its theory asserts, sales of energy. For example, Petitioner makes no claim that such "sales" are taxed; that title to the energy formally is transferred; or that the utility records a cost associated with "acquiring" power that flows to it. And even if Petitioner were able to disinter some state statute or tariff that contained such features, that would hardly justify the broad and abstract declaratory relief it seeks—relief detached from a challenge to any particular program, let alone a program that actually affects Petitioner.[85]

B. Congress Has Confirmed That Net Metering Programs Do Not Trigger Commission Jurisdiction.

In EPAct 2005, Congress confirmed the Commission's view that state net metering programs do not implicate the Commission's jurisdiction. Congress added to Section 111(d) of

[84] Petition at 18-24.

[85] Petitioner also hints at the possibility that outflows may qualify as wholesale sales because they involve "exchanges" of energy, Petition at 21-23, but then undercuts its own position by conceding that "in the case of FNM … there is nothing that can properly be characterized as an exchange because the utility's retail sale is not just energy, but is a firm, bundled service." *Id.* at 24. Petitioner gets this one point exactly right: net metering is part of the retail service that local utilities provide, and a means of measuring the retail rates owed by customers in a billing cycle.

PURPA a provision directing states to consider whether to adopt net metering programs.[86] Both the definition of "net metering" and the placement of the provision in Title I of PURPA demonstrate Congress's understanding that net metering programs do not trigger federal jurisdiction over wholesale sales.

The definition of net metering makes clear that Congress regards net metering as a retail service, not a wholesale sale. Accordingly, Congress defined the term to mean "service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period."[87]

Congress then placed its discussion of net metering in the portion of the statute that encourages states to enact certain programs in the exercise of their retail jurisdiction. Congress did not impose—or authorize the Commission to impose—net metering as part of the federal authority over wholesale sales. Thus, the statute asks or requires nothing of this Commission when it comes to net metering, but instead requires "[e]ach State regulatory authority" to "consider each standard established by subsection (d)" and determine "whether or not it is appropriate to implement such standard."[88] The list of standards set forth in subsection (d) includes, in addition to net metering programs, many other retail ratemaking matters that obviously lay solely within the state's jurisdiction to enact. These include, for example, retail rate design intended to reflect the cost of service; time-of-day rate design; integrated resource

[86] *See* 16 U.S.C § 2621(d)(11).

[87] *Id.* (emphasis added).

[88] *Id.* § 2621(a) (emphasis added).

planning; investments in conservation and energy efficiency; the development of retail rate design and incentives to encourage energy efficiency, including home energy audits; minimization of dependence on a single fuel source; increased efficiency for fossil fuel generation; and investments in smart grid technologies.[89]

In a gross misreading of the statute, the Petition argues that Section 111(d) does not apply to any type of net metering program other than one that provides an offset for energy valued at the PURPA avoided-cost rate—and that federal law preempts all other types of net metering programs.[90] Title II of PURPA governs "[c]ertain Federal Energy Regulatory Commission and Department of Energy [a]uthorities," and sets forth the requirement concerning avoided-cost rates, which applies to wholesale sales by small power production facilities.[91] Congress made no mention of net metering in Title II—because Congress understood that net metering does not involve a wholesale sale. Instead, Congress included net metering in Title I of PURPA, which discusses "[r]etail [r]egulatory [p]olicies [f]or [e]lectric [u]tilities," and directs states to consider standards for retail regulation without preempting state authority.[92]

As the Supreme Court explained in *FERC v. Mississippi*, "Titles I and III of PURPA require only consideration of federal standards."[93] Although "Congress could have pre-empted the field" if it wished, and imposed the Title I standards as mandates, "Congress adopted a less intrusive scheme and allowed the States to continue regulating in the area."[94] Thus, by its express terms,

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[89] *Id.* § 2621(d).

[90] Petition at 35-36.

[91] *See* Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, title II, 92 Stat. 3117, 3134.

[92] *See* 95-617, tit. I, 92 Stat. at 3120; *see also* 16 U.S.C. § 2621.

[93] *FERC v. Mississippi*, 456 U.S. 742, 764 (1982).

[94] *Id*. at 765.

the statute does not limit states' authority to adopt a different standard than the one described by Congress.[95] Petitioner would have the Commission contravene Congressional intent and intrude into an area expressly reserved for the states.

It is unsurprising that Congress understood net metering as a component of retail service that does not implicate the Commission's jurisdiction over wholesale sales.[96] After all, that is the very position that the Commission itself had taken in *MidAmerican.* The notion that Congress instead implicitly overruled *MidAmerican* when it encouraged states to exercise their retail ratemaking authority to adopt net metering programs, and expressly reserved state authority to adopt programs that deviated from those proposed, is almost laughable.

Petitioner's theory is inconsistent not only with Congress's treatment of net metering in the EPAct of 2005, but also with the purpose of the Federal Power Act. The Federal Power Act was enacted to fill the gap in regulation recognized by the U.S. Supreme Court in *Attleboro.*[97] That gap involved interstate sales of electricity, which states had no power to regulate under the dormant Commerce Clause. While filling that gap with federal regulation, the Federal Power Act left undisturbed state authority to regulate essentially local service.[98] Congress extended federal jurisdiction only to those matters not otherwise subject to regulation by the states, stating that the Commission's jurisdiction to regulate interstate wholesale sales "shall not apply to any other sale

[95] Section 117 states that "[n]othing in this chapter prohibits any State regulatory authority or nonregulated electric utility from adopting, pursuant to State law, any standard or rule affecting electric utilities which is different from any standard established by this subchapter." 16 U.S.C. § 2627(b).

[96] *See generally* Comments of G. Dotson in Opposition to the April 14, 2020 Petition for Declaratory Order by NERA (filed June 13, 2020).

[97] *See Elec. Power Supply Ass'n*, 136 S. Ct. at 767 (citing *Pub. Util. Comm'n of R.I. v. Attleboro Steam & Elec. Co.*, 273 U.S. 83 (1927)).

[98] *See* 16 U.S.C. § 824(b)(1).

of electric energy."[99] Consequently, "the Commission may not regulate either within-state wholesale sales or … retail sales of electricity (*i.e.,* sales directly to users). State utility commissions continue to oversee those transactions."[100]

Net metering is precisely the kind of essentially local matter that Congress intended to leave to the states. It concerns the relationship between the retail customer and the local utility: how to measure the quantity of energy provided by the utility, the amount due for that retail service, and the terms of that service. The necessary implication of Petitioner's argument is that federal law prohibits utilities from installing or allowing customers to use bidirectional meters, and instead requires "that two meters be installed in these situations, one to measure the flow of power from the utility to the homeowner or farmer, and another to measure the flow of power from the homeowner or farmer to the utility."[101] The Commission cannot commandeer state commissions into enforcing a two-meter requirement, and the drafters of the Federal Power Act could not have envisioned the new federal agency, designed to fill the "*Attleboro* gap" in regulating the interstate sale of electricity, taking legal action to compel the installation of new meters on individual homes and businesses across the country.

The economic rationale for federal rate regulation also has no application to net metering programs. The purpose of granting the Commission power to review and set just and reasonable rates was to prevent natural monopolies from exploiting their market power and overcharging customers.[102] Section 205 of the Federal Power Act protects the consumer interest "in being

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[99] *See id*.

[100] *Elec. Power Supply Ass'n*, 136 S. Ct. at 768 (internal citation omitted).

[101] *MidAmerican*, 94 FERC ¶ 61,340, at 62,263.

[102] *See New York v. FERC*, 535 U.S. 1, 5 (2002) ("In 1935, when the [Federal Power Act] became law, … most [utilities] operated as separate, local monopolies subject to state or local regulation").

charged non-exploitative rates."[103] But when it comes to net metering, there is no monopoly seller, and Petitioner does not complain about wholesale rates, much less that those rates are "exploitative." Instead, Petitioner complains about the effects of net metering on retail rates. Yet Petitioner's interest in avoiding retail rates is, "at best, 'orthogonal' to the purposes of" the federal rate regulation."[104] Nor is there any need for uniform federal regulation because of the possibility of conflicting state authority, as there was in *Attleboro*, where two states could equally claim the authority to regulate. When it comes to net metering, there is no potential for conflict between dueling state regulators each trying to regulate the same activity.

The Petition, and Petitioner's expert, spill much ink arguing that net metering is bad policy because it allegedly misallocates costs among retail customers.[105] Assuming the Petitioner could identify a net metering program that negatively impacts its members, that argument must be made to a state regulator or state legislature; it cannot be made to the Commission. The Commission has no statutory mandate to address the allocation of costs among retail customers, and no authority to second guess states' retail ratemaking decisions. The costs that are included in retail rates, the policies they are designed to promote, and the allocation of costs among particular ratepayers or classes of ratepayers are all matters of state authority.[106]

Furthermore, despite complaining about the supposed effects of net metering programs on wholesale markets, the Petition does not advance any argument that the Commission should assert

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[103] *Grand Council of Crees (of Quebec) v. FERC*, 198 F.3d 950, 956 (D.C. Cir. 2000) (quoting *Jersey Central Power & Light Co. v. FERC*, 810 F.2d 1168, 1178 (D.C. Cir. 1987)).

[104] *Nw. Requirements Utils. v. FERC*, 798 F.3d 796, 809 (9th Cir. 2015) ("wholesale energy customers" interested in "reduc[ing] [their utility's] costs, which are passed on to them by statutory mandate," lacked prudential standing under the Federal Power Act).

[105] Petition at 42-44.

[106] *See Elec. Power Supply Ass'n*, 136 S. Ct. at 766 (the Federal Power Act "leaves to the States alone[] the regulation of … any retail sale[ ]of electricity").

its "effects" jurisdiction,[107] and for good reason: because net metering has the same indirect effect on wholesale markets as a reduction in demand, the Commission could not properly assert its "effects" jurisdiction to regulate the practice.[108] Indeed, from the standpoint of the Bulk Power System, the effect of net metering is identical to a demand-side measure such as energy efficiency or retail demand response.[109] All of these programs simply reduce the load drawn by the local utility from the interstate power grid, and the Commission lacks the authority to regulate them merely because they effect wholesale rates. As the Supreme Court has found, "markets in just about everything—the whole economy, as it were—might influence [utilities'] demand. So if indirect or tangential impacts on wholesale electricity rates sufficed, FERC could regulate now in one industry, now in another, changing a vast array of rules and practices to implement its vision of reasonableness and justice. We cannot imagine that was what Congress had in mind."[110] The Commission should not expand its "wholesale sale" jurisdiction to cover a practice whose effects on the wholesale market are so peripheral as to place it outside the Commission's "effects" jurisdiction.

C. Even if Net Metering Did Trigger the Commission's Jurisdiction, Preemption Would Still Be Unwarranted.

Petitioner's theory suffers from another problem as well: it erroneously presumes that if the Commission finds that outflows are wholesale sales subject to the Commission's jurisdiction,

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[107] Instead, the Petition only suggests that "[a] reasonable argument" for effects jurisdiction "could be made." Petition at 11, fn.15. But it does not develop that argument.

[108] The Commission cannot regulate on the basis of "indirect or tangential impacts on wholesale electricity rates." *Elec. Power Supply Ass'n*, 136 S. Ct. at 774. Instead, "'affecting' jurisdiction [is limited] to rules or practices that '*directly* affect the [wholesale] rate.'" *Id.* (citation omitted) (bracket in original).

[109] *See* Exhibit B (Affidavit of Sam Wheeler) at 4-5.

[110] *Elec. Power Supply Ass'n*, 136 S. Ct. at 774.

then state net metering programs must be preempted.[111] That syllogism is incorrect. If the Commission were to abandon *MidAmerican*'s holding that no jurisdictional sale occurs when usage is netted against output, the Commission would need to set a rate for payments to the customer for the newly recognized wholesale sales. States, however, would still be entitled to apply whatever billing conventions they might wish in measuring retail service and setting retail rates. Thus—perhaps ironically—if Petitioner is correct, the only effect would be that net metering participants gain access to a new revenue stream: compensation for sales that, under current law, are not being made.

Petitioner seeks a declaration that goes far beyond the recognition of an outflow as a wholesale sale. Petitioner instead requests a ruling that states may not apply netting rules when measuring the extent of the retail service they regulate—that, in effect, states must charge retail customers for consuming a greater quantity of electricity at retail than the state has authorized in its retail tariffs. But the Commission has no power to tell states when retail sales have occurred or what retail rates should be charged. The Supreme Court has made clear that the Commission may not "specif[y] terms of sale at retail"—this "is a job for the States alone."[112] The Federal Power Act "places beyond FERC's power, and leaves to the States alone, the regulation of … any retail sale[ ]of electricity."[113] Thus, the requested declaration—forcing the state to charge for retail sales that the state does not recognize—would not "just sideswipe state jurisdiction; it attacks it frontally."[114]

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[111] *See* Petition at 44-45 (requesting that the Commission "find unlawful, and therefore reject, state net metering laws").

[112] *Elec. Power Supply Ass'n*, 136 S. Ct. at 775.

[113] *Id.* at 766 (citing 16 U.S.C. § 824(b)).

[114] *S. Cal. Edison*, 603 F.3d at 1001.

The cases on which Petitioner places the greatest reliance—*Southern California Edison* and *Calpine*—in fact underscore the fatal flaw in its position. In both decisions, the D.C. Circuit held that the Commission lacked jurisdiction to decide whether a retail sale has or has not occurred.[115] As the D.C. Circuit made clear in *Calpine*, the Commission has no power to decide the "circumstances" in which "a generator [can] be charged retail rates for either drawing from the grid or self-supplying its [own] power."[116] "While the regulation of transmission charges is undoubtedly within FERC's jurisdiction, retail charges are not."[117]

In placing such great weight on these cases, Petitioner fundamentally misinterprets their holdings and how those holdings bear on the declaration requested here. According to Petitioner, after *Calpine*, the Commission has no discretion to employ netting to determine whether a wholesale sale has occurred.[118] But at issue here is not whether the Commission can employ netting with regard to wholesale sales, but rather whether the Commission may intervene to prevent states from employing netting with regard to retail sales. In *Calpine* and its predecessor case, *Southern California Edison*,[119] the D.C. Circuit rejected just this kind of gross intrusion into the states' regulatory authority.

In *Southern California Edison*, the Commission sought to apply its own netting policy to determine that no retail sale had taken place when a greater quantity of power was transmitted by the power plant than consumed as station power during a billing cycle. The court rejected the

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[115] *See Calpine*, 702 F.3d at 50 ("retail charges are not" within FERC's jurisdiction); *S. Cal. Edison*, 603 F.3d at 1002 (FERC had yet to explain how its general concern about competition "c[ould] be grounds to preempt the state's authority to set the netting period for station power—i.e., the pricing mechanism—in the retail market").

[116] *Calpine*, 702 F.3d at 43, 50.

[117] *Id.* at 50.

[118] *See* Petition at 18.

[119] *S. Cal. Edison Co.*, 603 F.3d 996.

Commission's "insist[ence] that it c[ould] determine that no retail sale has taken place."[120] The court acknowledged that the Commission was free to use whatever netting policy it wished to measure transmission charges,[121] but held that the question of whether a retail sale had occurred was one left to the state as regulator of the retail market. The court also noted the Commission's argument that state policy recognizing a retail sale might affect the wholesale markets, but chided the Commission for failing to explain "why that general concern can be grounds to preempt the state's authority to set the netting period for station power—*i.e.*, the pricing mechanism—in the retail market."[122]

When this issue reappeared at the court in *Calpine*, the Commission conceded that "it lacked a jurisdictional basis to determine when the provision of station power constitutes a retail sale."[123] In *Calpine*, an independent generator resisted that conclusion, arguing that FERC had jurisdiction to apply a netting interval to station power because doing so would regulate the wholesale market. According to the generator, "the amount of consumed energy that may be netted against gross power directly determines how much energy is deemed available for sale at wholesale, so a netting interval is really just a regulation of the wholesale market."[124] The D.C Circuit rejected that claim as confusing a retail billing convention with regulation of the wholesale market: "The netting interval is, in essence, a kind of billing convention that determines (at the end of the month) how much a generator will be assessed for transmission and retail charges," but

[120] *Id.* at 999, 1001.

[121] *Id.* at 998 ("FERC has the undeniable right to approve the netting methodology to determine how much electricity generators deliver to and take from the grid for transmission purposes").

[122] *Id.* at 1002.

[123] *Calpine*, 702 F.3d at 45.

[124] *Id.* at 48.

it "does not determine how much energy is actually available at wholesale."[125] In sum, *Calpine* concluded that netting "simply determines under what conditions generators will be assessed … retail charges …. While the regulation of transmission charges is undoubtedly within FERC's jurisdiction, retail charges are not."[126] The court again upheld the state's power to apply the accounting convention of its choice in defining its retail service and again confirmed the Commission's lack of authority to preempt the state's choice.

Petitioner's argument here is weaker than the generator's argument in *Calpine*. In *Calpine*, the state had recognized a retail sale that, according to the generator, reduced the amount of power available for the generator to sell at wholesale. Still, the D.C. Circuit affirmed the state's right to recognize whatever retail sales it wished for its own retail billing purposes. Here, the state is declining to recognize certain retail sales. Petitioner is insisting that the state cannot do so, and instead must recognize more retail sales than the state thinks has occurred. The Commission's jurisdiction over wholesale sales offers no conceivable ground for compelling a state to recognize the existence of a retail sale.

Thus, even if Petitioner is right that the Commission should recognize outflows from a home or business to a utility as wholesale sales, and arrange for a rate to be paid for those "sales," the state would still be free to offset such outflows from inflows when measuring the amount owed for retail service. As *Southern California Edison* and *Calpine* affirm, the Federal Power Act does not preclude states from applying a netting interval for retail charges that is different from the

[125] *Id.* at 49.

[126] *Id.* at 50.

netting rule applied by this Commission to determine wholesale charges.[127] There is no basis for the Commission to provide the requested declaration.

III. NET METERING DOES NOT INVOLVE SALES IN "INTERSTATE COMMERCE."

The Petition fails for another, independent reason: even if the utility's management of any outflow of energy from a rooftop solar panel or similar small injection of energy onto the distribution system were deemed to be a wholesale sale, such a wholesale sale would not be one in interstate commerce. Thus, the Commission would have no jurisdiction over it. The Federal Power Act extends federal jurisdiction only to matters not subject to state jurisdiction, and only to wholesale sales "in interstate commerce."[128] As the Supreme Court has explained, "the Commission may not regulate … within-state wholesale sales."[129] The Commission bears the burden of establishing that a wholesale sale occurs in interstate commerce.[130]

Petitioner brushes aside this issue by asserting that a wholesale sale automatically occurs in "interstate commerce" if the sale is made to a utility that "comingles the energy with other energy sources on the interstate electric grid."[131] Petitioner again misstates the law and its relevance to the case at hand. A wholesale sale is "in interstate commerce" on the basis of

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[127] *S. Cal. Edison*, 603 F.3d at 1002; *Calpine*, 702 F.3d at 48.

[128] *See* 16 U.S.C. § 824(a) (federal regulation of the sale and transmission of electric energy in interstate commerce "extend[s] only to those matters which are not subject to regulation by the States"); *id.* § 824(b) (granting the Commission jurisdiction over "the sale of electric energy at wholesale in interstate commerce"); *Fed. Power Comm'n v. S. Cal. Edison Co.*, 376 U.S. 205, 215-16 (1964) (finding the Federal Power Act extended FPC jurisdiction "to all wholesale sales in interstate commerce except those which Congress has made explicitly subject to regulation by the States").

[129] *Elec. Power Supply Ass'n*, 136 S. Ct. at 768.

[130] *See Fed. Power Comm'n v. Fla. Power & Light Co.*, 404 U.S. 453, 455, 459 (1972); *Conn. Light & Power Co. v. Fed. Power Comm'n*, 324 U.S. 515, 532 (1945).

[131] Petition at 19-21.

commingling with out-of-state energy only if that commingling occurs upstream of the sale.[132] Here, that standard is not satisfied because there is nothing upstream of the net metered generation resource.

Downstream commingling cannot convert an intrastate sale to one made in interstate commerce, unless the upstream seller knows that the energy will be transmitted across state lines and intends that result. As discussed in Section III.B, below, the cases finding interstate commerce based on downstream commingling involve upstream sellers who intend to make an interstate sale but have structured the sale to use in-state intermediaries in an attempt to avoid the Commission's jurisdiction. Net metering is easily distinguishable. A customer participating in a net metering program is completely indifferent to what the local utility does with any outflows, and has no reason to think that such energy will be transmitted across state lines. And in fact, backflow from the local distribution network to the interstate grid is highly unusual.[133] Thus, the standard for "interstate commerce" is not satisfied.

A. A Wholesale Sale of Energy Is Not "In Interstate Commerce" on the Basis of Commingling When There Is No Commingling Upstream of the Sale.

Whether commingling with out-of-state energy converts an intra-state wholesale sale into one "in interstate commerce" depends on whether the electricity being sold was commingled, upstream of the sale, with electricity that flowed in interstate commerce. For instance, in *Federal Power Commission v. Southern California Edison Company*, the Supreme Court upheld the Federal Power Commission's ("FPC") assertion of jurisdiction over wholesale sales to the City of Colton where the record showed "that out-of-state energy from Hoover Dam was included in the

[132] *See, e.g., S. Cal. Edison Co.*, 376 U.S. at 208-10 (upholding the exercise of FERC jurisdiction over wholesale sales that included out-of-state energy).

[133] *See generally* Exhibit B (Affidavit of Sam Wheeler).

energy delivered … to Colton."[134] Likewise, in *Pennsylvania Water & Power Co. v. Federal Power Commission*, the Court held that a Pennsylvania utility's wholesale sales to Pennsylvania customers were "in interstate commerce" because the utility relied on energy from out of state to meet its power supply needs.[135] Because the utility's power flow was "commingled" with out-of-state sources upstream of the sales, the sales were within FPC jurisdiction.[136] Circuit courts have applied this upstream commingling test to determine if a wholesale sale qualifies as "in interstate commerce."[137] And, the Commission has asserted jurisdiction over the sale of electricity from a utility to an entity connected by a low-voltage system when the electricity had crossed state lines upstream of the sale.[138] That test makes practical sense: the Commission, after all, regulates the sale, and so the Commission's jurisdiction over the sale turns on whether the electricity sold by the seller has traveled in interstate commerce upstream of the sale.

Here, this test for interstate commerce indisputably cannot be satisfied. Net metered customers' energy output is not commingled with out-of-state power before the point of sale, because there is no power upstream from the customer. At the moment of discharge onto the local distribution network—the moment when Petitioner claims the electricity is sold[139]—the electricity is purely intrastate in character.[140]

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[134] *S. Cal. Edison Co.*, 376 U.S. at 208-09.

[135] *See Pa. Water & Power Co. v. Fed. Power Comm'n*, 343 U.S. 414, 419-20 (1952).

[136] *Id.* at 420.

[137] *See, e.g., Ark. Power & Light Co. v. Fed. Power Comm'n*, 368 F.2d 376, 379 (8th Cir. 1966) (stating that "[t]he basic question" in analyzing whether an Arkansas' utility's wholesale sales occurred in interstate commerce was "whether the Commission's finding that all of the twenty-three wholesale purchasers received interstate energy [wa]s supported by substantial evidence").

[138] *See People's Elec. Coop.*, 84 FERC ¶ 61,229, at 62,109, 62,107-14, 62,131 (1998).

[139] *See* Petition at 21.

[140] The Commission's decision in *California Public Utilities Commission* is not to the contrary. *See Cal. Pub. Utils. Comm'n*, 132 FERC ¶ 61,047 (2010), *order clarified on reh'g by*, 133 FERC ¶ 61,059 (2010).

B. Petitioner's "Downstream" Commingling Theory of Jurisdiction Is Unsupported by Law.

The Petitioner nevertheless claims that net metering involves wholesale sales "in interstate commerce" because, once transferred to the local utility, the energy joins a commingled pool of energy that has traveled in interstate commerce.[141] That theory improperly subjects an upstream seller to Commission jurisdiction because of downstream actions taken by the buyer. The case law does not support Petitioner's theory.

Petitioner cites *Florida Power & Light* for its broad interpretation of the Commission's jurisdiction, but its reliance on that case is misplaced.[142] The Federal Power Act "unambiguously authorizes [the Commission] to assert jurisdiction over two separate activities—transmitting and [wholesale] selling."[143] *Florida Power & Light* evaluated whether a Florida utility had engaged in a transmission in interstate commerce, not whether it had made a wholesale sale in interstate commerce. That distinction is significant because the Federal Power Act specifically defines energy transmitted in interstate commerce as energy "transmitted from a State and consumed at any point outside thereof."[144] Thus, the key question in *Florida Power & Light* was whether any

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There, the Commission refused to exempt distribution-level facilities and distribution-level feed-in tariffs from the Commission's jurisdiction. *Id.* at P 72. The Commission discussed its jurisdiction over these facilities and tariffs in a single, cursory paragraph that did not address whether the resales at issue were "in interstate commerce." *Id.* Two of the three cases on which the Commission relied concerned the "local distribution facilities" exception to federal jurisdiction, rather than the requirement that wholesale sales take place in interstate commerce. *See id.* at P 72 n.100 (citing *Transmission Access Policy Study Group v. FERC*, 225 F.3d 667, 695-96 (D.C. Cir. 2000), *aff'd sub nom. New York v. FERC*, 535 U.S. 1 (2002); *Detroit Edison Co. v. FERC*, 334 F.3d 48, 51 (D.C. Cir. 2003)). The third case, *Florida Power & Light Co.*, 404 U.S. 453, likewise did not resolve whether wholesale sales including no out-of-state energy can qualify as in interstate commerce, for the reasons given below.

[141] *See* Petition at 20-21.

[142] *See id.* at 20 n.40 (citing *Fla. Power & Light Co.*, 404 U.S. at 457-58).

[143] *New York v. FERC*, 535 U.S. at 19-20.

[144] 16 U.S.C. § 824(c) (emphasis added).

output from the utility reached an out-of-state recipient—or, as the Court put it, whether "any [of the utility's] power," "no matter how small the quantity," "ha[d] reached Georgia."[145] The Supreme Court held federal jurisdiction to be proper because the FPC provided sufficient evidence "that some FP & L power [went] out of state."[146]

Florida Power & Light does not allow the Commission to assert jurisdiction over net metering programs, for three reasons. **First**, as discussed above, the test for wholesale sales is different than the test for interstate transmission. A wholesale sale is in interstate commerce if the electricity sold crossed state lines upstream of the sale, while a transmission occurs in interstate commerce if the transmitted energy crosses state lines downstream of the transmission. To the extent *Florida Power & Light* bears on the interstate nature of a wholesale sale (rather than a transmission), the case exemplifies the established rule that a wholesale sale is "in interstate commerce" only if the seller's energy has commingled with out-of-state energy upstream of the sale.[147] Because FP&L commingled its energy with out-of-state sources through its interconnection with Georgia Power, any wholesale sales FP&L made to customers in Florida would have drawn on a commingled pool of energy and thus would have qualified as sales "in interstate commerce." That same cannot be said of energy generated by net metering customers and transferred to the local distribution utility.

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[145] *Fla. Power & Light Co.*, 404 U.S. at 461 n.10. The Court reached a similar result in *Jersey Central Power & Light Co.*, holding that a New Jersey utility was a public utility subject to federal regulation under the Federal Power Act because some of the power it produced was transmitted to New York. *Jersey Cent. Power & Light Co. v. Fed. Power Comm'n*, 319 U.S. 61, 68-69 (1943). The *Jersey Central* Court relied heavily on the definition of interstate transmission in reaching that conclusion. *Id.* at 71-72.

[146] 404 U.S. at 461, 463.

[147] *See S. Cal. Edison Co.*, 376 U.S. at 208-09.

Second, in the rare cases where courts have found a wholesale sale to be in interstate commerce because of what occurs downstream of the sale, federal jurisdiction has never attached merely because the energy joined a pool of other energy that previously traveled in interstate commerce. Instead, to assert jurisdiction, the Commission must demonstrate that the seller knew that the energy sold would cross state lines and intended that result. Where the "connection of the seller with the steps taken by the buyer after the sale" is "too remote," the sale retains its intrastate character.[148]

In *Hartford Electric Light Company v. Federal Power Commission*, for instance, the Second Circuit held that a Connecticut energy producer was engaged in sales in interstate commerce because the producer was "fully aware" with "no mere indifferent knowledge" that some of the energy it provided to an in-state purchaser was "unavoidably destined by the buyer for interstate use."[149] The court stressed that it was "not … saying that a mere sale by A, within a state, to B, who ships the commodity in interstate commerce, would necessarily be a sale in interstate commerce."[150] Rather, the court emphasized that the proper classification of a

[148] *Superior Oil Co. v. Miss. ex rel. Knox*, 280 U.S. 390, 396 (1930). Courts interpreting other federal statutes with interstate commerce elements likewise have recognized that sales within a state generally qualify as intrastate. *See, e.g.*, *Veney v. John W. Clarke, Inc.*, 28 F. Supp. 3d 435, 443-44 (D. Md. 2014) (under the Fair Labor Standards Act, "[w]hether the transportation is of an interstate nature can be determined by reference to the intended final destination of the transportation" and "[m]ere contemplation that property may be further shipped from where it was delivered does not amount" to the "fixed and persisting intent" required on the part of the shipper (internal quotation marks omitted)); *Safari Club Int'l v. Salazar*, 852 F. Supp. 2d 102, 121 (D.D.C. 2012) (the Endangered Species Act generally "does not regulate 'purely intrastate activities'" and thus plaintiffs would be able to "sell [animals] to another party within the state without a permit" (citation omitted)).

[149] *Hartford Elec. Light Co. v. Fed. Power Comm'n*, 131 F.2d 953, 960 (2d Cir. 1942) (emphasis added; internal quotation omitted).

[150] *Id.* at 958.

transaction may turn on "the character and extent of the seller's knowledge of the purpose of the purchaser to ship across state lines."[151]

In the same vein, the Supreme Court held, in *United States v. Public Utilities Commission of California*, that wholesale sales by a California generator to the Navy and to a Nevada county were "in interstate commerce."[152] The Court noted that the California generator sold the energy "for consumption" in Nevada, but had structured the transaction so that the purchasers "figuratively" assumed control in California, before the power reached the border.[153] The Court held that this was "irrelevan[t]" to the jurisdictional issue, in the context of a transaction the entire purpose of which was to sell power generated in California to be used in Nevada.[154] *PUC of California* thus confirms the common-sense conclusion that Commission jurisdiction attaches when a seller knows and intends that a purchaser will transport energy out of state for resale.

Other cases reflect the same principle. For example, in the pre-Federal Power Act case of *Attleboro*, the Supreme Court held that the sale of locally produced electricity was in interstate commerce when the sale was made "with knowledge that the buyer would utilize the energy extrastate."[155] Additionally, in *Connecticut Light & Power Co.*, the Commission held (although the Court did not reach the question) that a company was a public utility in part because the company sold energy to a municipal entity that, "with knowledge of the Company, resold a portion of this energy to a corporation which transmitted it" out of state.[156]

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[151] *Id*. at 958-59 ("A distinction has been taken between sales made with *a view to a certain result* and those made simply with indifferent knowledge that the buyer contemplates that result.").

[152] 345 U.S. 295, 299 (1953).

[153] *Id.* at 297 (emphasis added).

[154] *Id.* at 300.

[155] *Jersey Central*, 319 U.S. at 69 (citing and discussing *Attleboro*, 273 U.S. at 86).

[156] 324 U.S. at 520-21, 535.

Thus, to the extent the Petition seeks to establish jurisdiction based on what happens downstream from the transfer to the local utility, federal jurisdiction does not attach merely because the energy flows from a retail customer's on-premise generation onto a local distribution network containing energy that previously flowed in interstate commerce. Rather, to establish jurisdiction, Petitioner would need to demonstrate that (a) the energy placed onto the local distribution network by the net metering participant subsequently flowed across state lines, and (b) the net metering participant knowingly intended that result.

C. Petitioner Fails to Show That Outflows Cross State Lines, or That Net Metering Participants Knowingly Intend That Result.

The Petition does not even attempt to meet its burden to show that outflows from net-metered facilities cross state lines, or that net metering participants knowingly intend to sell excess power in interstate commerce. That is unsurprising, since the Petition could not possibly establish such facts. As to the first—the requirement that, to be a wholesale sale in interstate commerce, the energy sold by the net metering participant must subsequently flow across state lines—small outflows on the distribution system will not cross state lines in the ordinary course.[157] Indeed, most local distribution networks are engineered to prevent such backflow onto the interstate transmission network.[158] And even if one could construct a case when there could be backflow that would migrate beyond upstream local distribution equipment and cross the boundary onto the bulk power system, the burden lies with the Petitioner to establish, and the Commission to find based on substantial evidence, that such backflow has occurred with respect to a particular program

[157] *See generally* Exhibit B (Affidavit of Sam Wheeler).

[158] Frank R. Lindh & Thomas W. Bone Jr., *State Jurisdiction Over Distributed Generators*, 34 Energy L.J. 499, 537 (2013); *see also* Exhibit B (Affidavit of Sam Wheeler) at 4-5.

and utility.[159] As the Petition does not provide such evidence, the Commission cannot issue the broad declaration sought.

Second, even if there were occasionally backflow on a particular system, Petitioner would still need to establish that the net metering program customer—the "seller" alleged to have engaged in a wholesale sale in interstate commerce—knew of that possibility and intended its electricity to be transmitted across state lines. As the Supreme Court explained almost a century ago, "[a] distinction has been taken between sales made with a view to a certain result and those made simply with indifferent knowledge that the buyer contemplates that result."[160] It is absurd to think that Petitioner could ever establish such knowledge and intent among net metering participants, as a national matter or even as general matter among customers using net metering within a state. Net metering participants are indifferent to where their outflows go, and likely expect that any excess electricity they produce and transfer to their utility will be delivered to their neighbors and possibly other utility customers on the same local distribution system. That is especially so given the fact that any backflow onto the interstate transmission grid would be an unpredictable, highly unusual aberration.[161]

For these reasons, the Petition fails to establish that net metering programs involve transfers of power "in interstate commerce."

IV. A RULING IN FAVOR OF PETITIONER WOULD HAVE PROFOUNDLY DISRUPTIVE CONSEQUENCES.

Millions of Americans—homeowners, farmers, businesses, school districts, hospitals, and state, local, and federal government facilities—have invested in small-scale, behind-the-meter,

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[159] *See Fla. Power & Light Co.*, 404 U.S. at 455.

[160] *Superior Oil Co.*, 280 U.S. at 395.

[161] *See generally* Exhibit B (Affidavit of Sam Wheeler).

distributed generation in reliance on state net metering programs. In turn, many of those programs are available to customers because state legislatures and regulatory commissions have acted in reliance on the Commission's decisions in *Sun Edison* and *MidAmerican,* and on Congressional direction that states consider adopting net metering programs. A change in Commission policy would disrupt those reliance interests, and that is something the Commission must consider. Yet the Petition fails to address these reliance interests at all.

A. Retail Customers Have Made Significant Investments In Reliance on Net Metering Programs

A home solar photovoltaic array costs between $15,000 and $40,000, depending on size and location – a hefty investment for the average residential retail customer.[162] The investment is also long-term, since the useful life for such a system is approximately 20 years.[163] Whether customers choose to own or lease their systems, they make these substantial, long-term investments in reliance on the structure and pricing under the net metering programs made available to them.[164] Particularly in states where utilities are required by law or regulation to provide net metering—the vast majority of states—those customers' assumptions are eminently reasonable. Granting the Petition would profoundly disrupt significant investment decisions made by millions of individual retail customers.

B. Legislatures and Regulatory Commissions Have Relied on the Commission's Precedent

States began adopting net metering programs in the early 1980s, shortly after PURPA was enacted. Neither this Commission nor Congress acted to limit the adoption of those programs, or

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[162] *See* Exhibit A (Affidavit of Carl Pechman, Ph.D.) at 10, n.19.

[163] *Id.*

[164] *See id.*

alter the terms of the programs. To the contrary, in 2001, this Commission, in *MidAmerican*, confirmed states' understanding that federal law does not preempt them from permitting retail service to be measured on a net basis.[165] Shortly thereafter, Congress enacted the EPAct of 2005, which not only left existing state net metering programs unimpaired, confirming the Commission's holding in *MidAmerican*, but expressly called on all states to consider adopting net metering programs at the state level. After 2005, states could also rely on the fact that Congress also directed that they could enact, and in fact must consider enacting, net metering programs.[166] Indeed, it is likely that Congress itself acted in light of the Commission's findings in *MidAmerican* that net metering fell outside of its jurisdiction under the Federal Power Act and PURPA, and its decades of forbearance from interfering with state net metering policy, in choosing to direct the net metering provisions of the EPAct of 2005 to states rather than to the Commission. And, in keeping with that unbroken history, in 2009, this Commission again confirmed its understanding that net metering is within the province of states.[167]

Over decades, states have responded to this direction, carefully crafting new net metering programs and revising existing programs, acting in reasonable reliance on the Commission's findings and on federal law. The Petition completely fails to recognize this context.

C. The Commission Must Take Account of the Practical Implications of the Requested Declaration

The Petition's willful blindness to context is a fatal flaw. Although agencies are empowered to alter their existing policies, they must remain "cognizant that longstanding policies may have engendered serious reliance interests that must be taken into account," and provide a

[165] *MidAmerican*, 94 FERC ¶ 61,340, at 62,263.

[166] *See* 16 U.S.C. § 2621(d)(11).

[167] *Sun Edison*, 129 FERC ¶ 61,146, at 61,620-621.

reasoned explanation if they "disregard[] facts and circumstances that underlay or were engendered by the prior policy."[168] The Petition fails to acknowledge, let alone justify disregarding, the fact that retail customers and state and federal policy makers have relied for decades on this Commission's determination that net metering falls within state retail ratemaking jurisdiction. Petitioners ignore the potential disruption that would result from a changed interpretation.

To grant the Petition, the Commission must address the fact that the Petition would federalize much retail energy policy, an unreasonable result that is inconsistent with the dual system of regulation. An order granting the requested declaration would require the more than two million retail customers with net metered facilities to choose between: (i) registering under PURPA; (ii) investing in behind-the-meter storage or designing their systems so as to avoid any outflow; or (iii) filing for a federal cost-based rate for their exported energy. The requested declaration could render obsolete, or at least materially reduce the usefulness and value of, utilities' significant investment in technologies to modernize the grid and enable bidirectional flows of power. It could lead to the federalization of many initiatives to support the electrification of transportation, including vehicle-to-grid capabilities currently under development. It could encourage customers to develop otherwise uneconomic or inefficient microgrids that involve minimal or no interaction with distribution utilities to avoid the added layers of regulation Petitioner would have this Commission impose.

Along with the harm to customers' reasonable reliance, these ripple effects of Petitioner's jurisdictional theory counsel strongly in favor of rejecting the Petition.

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[168] *Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2126 (2016), quoting *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515-16 (2009).

CONCLUSION

The Petition should be dismissed, or alternatively should be denied on the merits.

Dated: June 15, 2020

Respectfully submitted,

/s/ Suedeen G. Kelly

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in these proceedings.

Dated: June 15, 2020

By: /s/ Suedeen Kelly
Jenner & Block LLP

Exhibit A

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New England Ratepayers Association	)	No. EL20-42

AFFIDAVIT OF CARL PECHMAN, PH.D., IN SUPPORT OF THE PROTEST OF THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

I, Carl Pechman, Ph.D., declare:

1. I am Director of the National Regulatory Research Institute ("NRRI").

2. I have been involved in the economic analysis of the electric utility industry and the practice of regulation since the early 1970s. During that time, I have participated in all aspects of the industry's transformation. My activities have included:

- Member of the Blue Ribbon Task Force Strategizing an Electric Energy Policy and Regulatory Framework in Puerto Rico;
- Analyst/co-author of U.S. department of Energy Quadrennial Energy Review (QER) – 1.1: Transforming U.S. Energy Infrastructures in a Time of Rapid Change and 1.2: Transforming the Nation's Electricity System;
- Analysis of the future of the distribution utility and utility business model, including new planning paradigms, the emergent role of distribution system operators, and the role of utilities in developing electric vehicle charging infrastructure;
- Developed method and supervised modeling of "Avoided Costs" pursuant to Public Utilities Regulatory Policies Act of 1978 (PURPA) in New York;
- Led multi-party technical development of blueprint to create the NYISO and restructure the New York electric utility industry;
- Consultant to the Speaker of the California State Assembly on resolving the California Energy Crisis, including addressing issues such as the role of bonds to repay the state budget for dollars spent to purchase power, developing strategies to avoid bankruptcy and return Southern California Edison to financial health, and restructuring wholesale power markets;
- Led review and release of "Enron Trader Tapes," and made them public in testimony in EL03-180;

- Author of white paper for the Public Policy Institute of California on the state's restructuring of utility regulation and resource acquisition in response to the "Energy Crisis";
- Created "cost effectiveness test" for demand response, relied on by the Supreme Court in affirming FERC Order 745 in *FERC v. EPSA*; and,
- Pro bono consultant to the City of Santa Cruz School system on entering into power purchase agreements for development of a solar array on school building.

3. My book, *Regulating Power: The Economics of Electricity in the Information Age*, (Kluwer Academic Publishers, 1993) explains how market design can be used as an instrument for gaining market power. It introduced the concept of "jurisdictional ambiguity" to explain the complex interaction between state and federal electricity regulators. And, it provides the first explanation of the need for differential locational installed reserve requirements in New York State, which were a precursor to locational capacity markets.

4. I earned my Ph.D. in Resource Economics from Cornell University in 1990. My curriculum vitae is attached as Attachment 1.

I. PURPOSE OF AFFIDAVIT, SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

5. I have been asked by counsel for the National Association of Regulatory Utility Commissioners ("NARUC") to analyze, from an economic and regulatory perspective, the petition for declaratory order submitted to the Federal Energy Regulatory Commission (the "Commission") by the New England Ratepayers Association ("NERA"), and the supporting expert report by Ashley C. Brown ("Brown Report").

6. I conclude that, contrary to NERA's assertions, the practice of net metering is a retail service that is properly regulated at the state level. NERA's attempt to characterize certain components of net metering service as a wholesale sale ignores reality. Furthermore, adoption of NERA's position would upset states' efforts to advance legitimate state policy goals, and individual customers' reasonable reliance on the net metering programs available to them. It would create jurisdictional ambiguity where none currently exists, to the detriment of utilities, competitive providers, and ratepayers.

II. NET METERING IS A RETAIL SERVICE

7. Net metering is a means of measuring the retail electric service used by a utility customer. Net metering is available in almost every state, and while the details of the programs differ from state to state and even utility to utility, they all share the common feature that retail service is measured so that "electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period."[1]

8. The primary purpose of net metering is to enable retail customers to self-supply a portion of their electricity needs, typically in a manner consistent with state environmental objectives, while maintaining the reliability of the distribution system. Each net metering program is designed to advance these regulatory objectives in a manner tailored to the unique circumstances facing the utility and the state in which the service is provided.

A. NERA Draws a Misleading Distinction between Full Net Metering and Other Net Metering Programs

9. The Petition attacks a version of net metering it entitles "full net metering" ("FNM"). The Brown Report defines FNM as a mechanism "in which the costs that are netted out … as compensation for the energy they deliver to the grid reflect all of the costs in bundled retail rates, including not only energy, but all fixed, demand, and other variable costs as well."[2]

10. "Net energy metering," ("NEM"), on the other hand, the Brown Report finds acceptable. According to the Brown Report, NEM is a mechanism under which "all fixed costs are recovered on a fixed basis, all demand costs are recovered on a demand basis, and only variable costs, primarily energy, are recovered on a volumetric basis … but the energy component of the bill would be adjusted to net the energy purchased off the grid against the energy produced on premises."[3]

11. Thus, according to the Brown Report, the difference between appropriate net metering – which presumably may continue uninterrupted by the Commission's determination on the Petition

[1] 16 U.S.C. § 2621(d)(11).

[2] Brown Report at 9.

[3] *Id.*

– and inappropriate net metering is whether the program provides a credit to the customer that can be used to offset components of the customers' bill above the cost to the utility of energy supply.

12. The net metering programs in effect today do not neatly correspond to the categorization set forth in the Brown Report. Instead, crediting mechanisms are far more complex than the Report and the Petition imply. The complexity is apparent from even the few examples of supposedly-FNM programs cited in the Petition: California; New Hampshire; Connecticut; Rhode Island; and Massachusetts. Indeed, it's not clear that any of the cited examples satisfy the criteria set forth in the Petition for FNM.

- California: Customers receive credits to their utility account for excess energy, above their consumption during the netting period, on a per-kWh basis, but continue to pay all non-bypassable charges; once per year, any unused credits are "cashed-out" to the customer at a per-credit value equal to the 12-month average rate for wholesale energy supply in the California ISO.[4]
- New Hampshire: Customers receive credits to their utility account on a per-kWh basis. Once per year, customers with credit for more than 600 kWh may elect to receive economic compensation. The utility may elect to compensate customers who installed their systems prior to September 2017 at the default service rate for energy supply, or at annually-updated values for energy and capacity that are based on costs in ISO-NE markets.[5] Customers who installed their systems after that date receive credits equal to 100% of the value of kWh charges for energy and transmission service, and 25% of the value of distribution service. All net metering customers continue to pay all non-bypassable charges for all electricity imports from the grid, including the monthly fixed customer charge.[6]

[4] California Public Utilities Commission, *Net Energy Metering (NEM)*, https://www.cpuc.ca.gov/NEM/ (accessed June 12, 2020).

[5] New Hampshire Code of Admin. Regs., Chapter PUC 900, Net Metering for Customer-Owned Renewable Energy Generation Resources of 1,000 Kilowatts or Less, §PUC 903.02(i), https://www.puc.nh.gov/Regulatory/Rules/PUC900.pdf (accessed June 15, 2020). Those provisions are applicable under the standard net metering tariff available to customer-generators until September 2017, and those grandfathered under that standard net metering tariff, pursuant to N.H. Public Utilities Commission Order No. 26,029 (June 23, 2017) issued pursuant to waiver authority granted in N.H. Rev. Stat. Ann. §362-A:9, XVI.

[6] N.H. Public Utilities Commission Order No. 26,029 (June 23, 2017); https://www.eversource.com/content/general/about/about-us/doing-business-with-us/builders-contractors/interconnections/new-hampshire-net-metering, (accessed June 15,, 2020); and, https://new-

- Connecticut: There is no statewide net metering law or regulation, but utilities have proposed and obtained approval for individual net metering tariffs. Under the Eversource tariff, for example, customers receive credits for excess energy on a per-kWh basis; once per year, unused credits are "cashed out." For net metering customers with solar PV systems, credits are based on the average real-time Locational Marginal Price in the Connecticut ISO-NE zone between 10 a.m. and 4 p.m. during the previous 12-month period; for all other generation resources, credits are based on the average of real-time locational marginal price ("LMP") in all hours. And, net metering customers pay the monthly customer charge.[7]
- Rhode Island: Customers receive credits for excess energy, but only up to 125% of the customer's usage during the billing period. Customer charges, and demand charges if any, are non-bypassable. The value of these credits is equal to the utility's avoided cost rate, defined as is standard offer service kWh charge. Alternatively, utilities may offer an elective monthly billing plan that reflects expected credits so that monthly billings are even over a 12-month period, regardless of actual production and usage.[8]
- Massachusetts: Net metering systems are classified depending on the generation technology used (*e.g.*, solar, wind, agricultural digesters, hydro), system size, and whether they begin operation after a pre-determined capacity cap is reached, for each regulated utility company. Depending on the class of the facility, customers receive credits for excess energy that are equal to either 100% or 60% of the basic service kWh charge in the ISO-NE load zone where the customer is located, plus distribution, transmission, and transition per-kWh charges. Net metering customers remain responsible for customer charges, kW-based charges, and system benefit charges.[9]

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hampshire.libertyutilities.com/acworth/commercial/my-account/my-bill/rates-tariffs/net-metering.html, (accessed June 14, 2020).

[7] Eversource, *Connecticut Net Metering*], https://www.eversource.com/content/ct-c/about/about-us/doing-business-with-us/builders-contractors/interconnections/connecticut-net-metering (accessed June 12, 2020)

[8] *National Grid Net Metering Provision, RIPUC No. 2207 Compliance Filing*, RI PUC Docket 4790 (Aug. 9, 2018, Sheet 9 (¶8), http://www.ripuc.ri.gov/eventsactions/docket/4790-NGrid-Net%20Metering-Compliance(8-9-18).pdf (accessed June 15, 2020).

[9] Massachusetts 220 CMR 18.00, *Net Metering*, https://www.mass.gov/files/220_cmr_18.00_final_12-1-17_1.pdf (accessed June 15, 2020). *See especially* § 18.04.

13. And none of these states refer to or understand their programs to be "FNM." None of the documents cited in support of the Petition's discussion of these programs uses the phrase "full net metering" or the acronym FNM.[10]

14. It thus appears to me that FNM, as defined in the Brown Report and used throughout the Petition, is a fiction. In reality, each state, and each utility in each state, has implemented net energy metering with its own particular rates, terms, and conditions of service.

B. The Brown Report does not Support NERA's Position that Net Metering Service Includes Wholesale Sales

15. The Brown Report spends considerable time explaining that FNM results in "perverse effects," including subsidies (cross-subsidies),[11] inefficiency, socially-regressive and anti-competitive effects, "unfairness to competing technologies," and intermittency. Much of the Brown Report is irrelevant to the arguments made in the Petition. Fully a quarter of the Brown Report is devoted to dismissing the concept of the Value of Solar without citing a single study on the Value of Solar. The Petition does not even mention the term Value of Solar. The Brown Report should be entirely disregarded, for two reasons.

16. First, as illustrated above, it is not clear that FNM exists in the form that NERA and the Brown Report allege. Instead, most current programs appear closer in concept to NEM (as that term is used in the Brown Report and the Petition) than FNM. The Brown Report acknowledges that at least some of the alleged harms of FNM are mitigated by NEM.[12] In sum, because the

[10] The footnote supporting the Petition's discussion of the California program includes a reference to a document entitled "California Net Energy Metering (FNM) Draft Cost-Effectiveness, FNM Study." Petition at 2, fn. 4. However, that is not the title that appears on the underlying document. The actual title is "California Net Energy Metering Draft Cost-Effectiveness Evaluation, Study." *See* CPUC Energy Division, *California Net Energy Metering (NEM) Draft Cost Effectiveness Evaluation, NEM Study Introduction*, (Sept. 26, 2013), *available at* https://www.heartland.org/_template-assets/documents/publications/cpucnemdraftreport92613.pdf (accessed June 15, 2020). The Petition also misrepresents the content of this document. The Petition states that "99 percent of customers on FNM tariffs had installed solar photo voltaic (PV) …" equipment. *See* Petition at 2, fn. 4.

The Petition states that "under N.H. Rev. Stat. § 362-A:9 (2019) FNM customers receive a price …" However, the New Hampshire statute does not mention FNM or have any requirements for FNM customers. The Petition goes on to claim that "[o]ther New England States also require FNM." No New England state requires FNM.

[11] In order to support its position, the Brown Report has conflated the economic term subsidy with cost shift, even while his own reference goes to lengths to clarify the difference. *See* Scott P. Burger, "Rate Design for the 21st Century: Improving Economic Efficiency and Distributional Equity in Electricity Rate Design, Ph.D. Dissertation, MIT (Sept. 2019) at 89, *available at* https://dspace.mit.edu/handle/1721.1/123564 (accessed June 15, 2020).

[12] Brown Report at 28.

Brown Report ignores the nuances of the net metering programs it purports to analyze, the "perverse effects" described in the Brown Report are nothing more than unsubstantiated musings.

17. Second, and more importantly, none of the "perverse effects" alleged in the Brown Report constitutes a basis for federal jurisdiction over net metering. Instead, each is a consequence of a policy choice that states alone are empowered to make, or a factor that state legislatures and commissions can and have considered in making the policy choice to implement net metering, or both. For example, although I disagree with the Brown Report as to the extent of cross-subsidies and "socially regressive"[13] effects, if they do occur, they occur between retail customers, as a result of retail ratemaking choices. It is not this Commission's role to police retail ratemaking choices to correct those impacts.[14] Likewise, the "inefficiency" and intermittency effects described in the Report are factors that might be considered in shaping net metering policies – but again, it is not the role of this Commission to determine whether states have reached appropriate conclusions to balance the inefficiency and intermittency of small-scale renewable generation against the benefits states perceive. Finally, the alleged "anti-competitive effects"[15] and "unfairness to competing

[13] Many organizations are working to extend the benefits of net energy metering to low-income customers. A report for Clean Energy States Alliance ("CESA") lists 38 programs in 13 states plus the District of Columbia that provide methods for extending the benefits of solar energy to low-income consumers. As that report explains, service providers are creatively combining their states' net metering offerings with other opportunities presented by federal, state, and local low-income support programs to benefit low-income customers and many of the entities that provide services to low-income constituencies. Paulos, B., *Bringing the Benefits of Solar Energy to Low-Income Consumers – A Guide for States & Municipalities. Report for Clean Energy States Alliance* (May 15, 2017), *available at* https://www.cesa.org/resource-library/resource/bringing-the-benefits-of-solar-energy-to-low-income-consumers/ (accessed June 15, 2020). In the District of Columbia, the Solar for All Implementation Plan, has as its express aim "to reduce by at least 50% the electric bills of at least 100,000 of the District's low-income households with high energy burdens by December 31, 2032." That program is working with both rooftop and community solar installations. District of Columbia, Department of Energy and Environment, *Solar for All Implementation Plan,* (March 10, 2017) *available at* https://doee.dc.gov/node/1226501 (accessed June 15, 2020). Illinois is implementing a program through which "environmental justice communities" can be designated, which then helps to ensure that new solar projects will be developed in areas that were previously exposed to higher risks due to local pollution and socioeconomic factors. Illinois Solar for All, *Environmental Justice Communities* https://www.illinoissfa.com/environmental-justice-communities/ (accessed June 5, 2020). New Hampshire has also made energy efficiency and solar programs available to low-income customers. The programs integrate accessible financing, incentives for small solar installations, and net metering. https://www.energysage.com/local-data/solar-rebates-incentives/nh/ (accessed June 15, 2020).

[14] This was a fundamental issue in Order No. 745 when the pricing of demand response ("DR") programs was debated. *See generally Demand Response Compensation in Organized Wholesale Energy Markets*, 134 FERC ¶61,187 (March 15, 2011). The Commission rejected efforts to price DR in a manner that would have corrected for inefficiencies in retail ratemaking. Specifically, advocates for correcting "inefficiencies" in retail rates wanted to price DR at LMP-G where LMP is the locational marginal price and G measured the contribution to fixed cost recovery in the variable portion of the retail rate. The Commission rejected that argument and found that the just and reasonable rate was LMP.

[15] The basis for the Brown Report's contention that FNM leads to "anti-competitive effects" appears to be that sometimes solar providers pass on cost reductions to customers and at other times they do not. *See* Brown Report

technologies," if any could be demonstrated, are simply outgrowths of states' choices to incentivize particular forms of in-state generation resources. This Commission is not in the business of second-guessing those choices.

18. The Brown Report contains no support for the principle, alleged in the Petition, that components of net metering service are in fact wholesale sales in interstate commerce that would be subject to this Commission's jurisdiction. The Brown Report does not analyze what constitutes a wholesale sale, or demonstrate that net metering service occurs in interstate commerce.

III. ADOPTION OF NERA'S POSITION WOULD NEGATIVELY IMPACT RATEPAYERS

A. Clarifying the Impact of NERA's Position on Net Metered Customers

19. NERA asks the Commission to assert jurisdiction over one component of net metering service, while leaving other components to the states. Under NERA's theory, when the output of net-metered facilities exceeds customer load, this Commission will hold ratemaking authority; at all other times, state regulators will hold ratemaking authority. NERA recognizes that its proposal would cause a split in jurisdiction, noting that its Petition "asks the Commission to declare its jurisdiction over energy sales from rooftop solar facilities and other distributed generation located on the customer side of the retail meter (i) whenever the output of such generators exceeds the customer's demand or (ii) where the energy from such generators is designed to bypass the customer's load and therefore is not used to serve demand behind the customer's meter."[16]

20. Figure 1, below, illustrates where the jurisdictional lines would be drawn under NERA's proposal, as applied to an illustrative net metering customer with solar PV.

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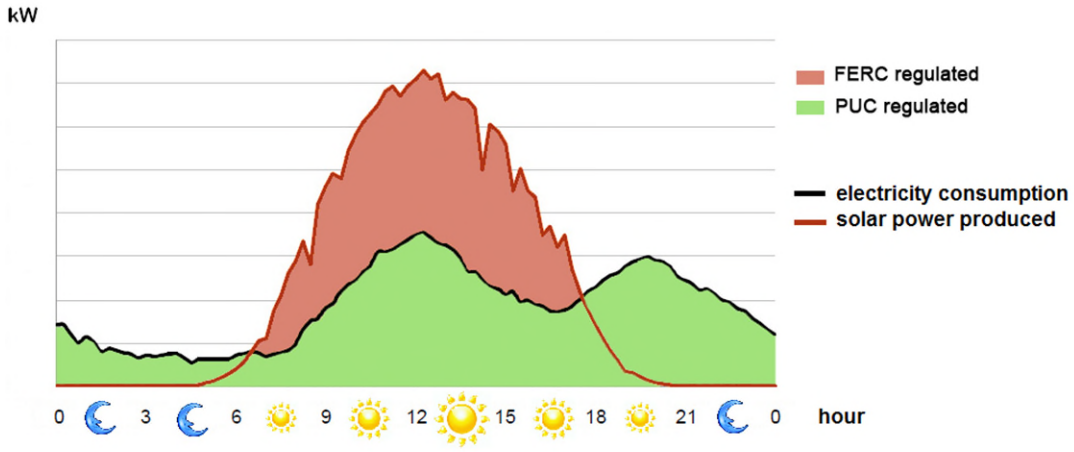
at 19-22. That is not anticompetitive behavior; it is simply a pricing strategy. True anti-competitive practices are those that "include activities like price-fixing, group boycotts, and exclusionary exclusive dealing contracts or trade association rules, and are generally grouped into two types: (i) agreements between competitors, also referred to as horizontal conduct; and (ii) monopolization, also referred to as single-firm conduct." Federal Trade Comm'n, "Anticompetitive Practices," https://www.ftc.gov/enforcement/anticompetitive-practices (accessed May 29, 2020). The Brown Report contains no information that either type of anti-competitive practice is occurring, or has occurred. Furthermore, it fails to explain how the price reductions in its primary source on this topic, the MIT Future of Energy Study, are indicative of market power. Massachusetts Institute of Technology, Energy Initiative, *The Future of Solar Energy: An Interdisciplinary MIT Study*, (2015) *available at* http://energy.mit.edu/wp-content/uploads/2015/05/MITEI-The-Future-of-Solar-Energy.pdf (accessed May 28, 2020).

[16] Petition at 5-6.

Figure 1. Jurisdictional Implications under NERA's Assumption[17]



As Figure 1 demonstrates, NERA appears to believe that the energy produced at certain times during the day should be subject to two different regulatory jurisdictions, each with its own pricing mechanism. During the hours when production from the net-metered facility exceeds the customer's consumption, the portion used to satisfy on-site consumption would be subject to state jurisdiction while the excess portion (shown in red) would be subject to federal jurisdiction.

B. Consequences if NERA's Position is Adopted in its Entirety

21. Neither NERA's Petition nor the Brown Report account for the continued ability of states to measure the quantity of retail service using netting, and credit customers for net output on their retail bills. Under this circumstance the NERA petition actually could create a windfall for NEM customers through double payment. Instead, NERA appears to assume that FERC's assertion of authority would prevent states from fully crediting customers' retail bills.[18] Although NERA provides no support for this premise, it is worth evaluating the consequences that would result from accepting that position.

[17] Figure is a modification of figure at https://heliopower.com/wp-content/uploads/2014/03/Daily_net_metering.png (accessed June 3, 2020).

1. Uncertainty and its Fallout

22. Acceptance of NERA's position would create tremendous price, contract, and regulatory uncertainty, which will in turn harm a wide variety of customers that have installed distributed generation resources, including homeowners, religious institutions, schools, hospitals, commercial and industrial establishments, and municipal and governmental entities. Indeed, disruption of the existing price, contract, and regulatory certainty may be a goal of the Petition.[19]

23. The net metering construct allows for an expectation of stable revenue streams that enable customer-investors to rationally evaluate whether to install distributed generation. For most customers, this is a significant investment.[20] To evaluate the economics of an on-site distributed generation facility, the customer would compare the installation and ongoing operating cost (or lease cost) of the facility versus their expected savings from avoided utility bills, over the life of the asset – typically twenty years. Customers are generally unwilling to undertake such significant, long-term capital investments unless they understand the financial implications, including the pay-back period. Net metering programs enable that understanding by ensuring that consistent technical requirements and economics are applicable to all such installations in a utility's territory. They smooth the learning-curve that would otherwise discourage many individual customers who have no independent understanding of energy pricing or grid functionality.

24. NERA's petition would disrupt the existing financial arrangements of the approximately two million net metering customers nationwide who have already made the monumental decision to invest in distributed generation, and would leave an indelible cloud of uncertainty over future decisions to invest. The potential for significant disruption, and the possible implications of such disruption, have been discussed in state regulatory proceedings at length. In response to those concerns states have made incremental changes to their net metering programs over time, and the vast majority have ensured that existing net-metering customers are "grandfathered-in" to the

[19] The Brown Report states that net metering "operates to make rooftop solar more attractive than other forms of renewable generation via subsidies from non-solar ratepayers, diverting resources (including capital) to the least efficient energy source and away from competing (and, arguably, superior), technologies." Brown Report at 30.

[20] In 2018, median prices for an installed residential solar array ranged from $3.0/W to $5.0/W (prior to incentives), with most below $4.0/W, and the median size of a residential solar array was 6.4 kW. Barbose, G. and Darghouth, N., *et al.*, "Tracking the Sun: Pricing and Design Trends for Distributed Photovoltaic Systems in the United States, 2019 Edition," Lawrence Berkeley National Laboratory (Oct. 2019), at 10, 30 *available at* https://eta-publications.lbl.gov/sites/default/files/tracking_the_sun_2019_report.pdf (accessed June 15, 2020). Thus, the median cost of a residential solar array in 2018 was approximately $25,000, prior to any applicable incentives.

ratemaking mechanism that applied when their facility became operational. Adoption of NERA's position would disrupt the financial terms that existing net metering customers relied upon in making their investment in distributed generation, and would undermine consumer and investor confidence in a stable regulatory environment, which is critical to the continued adoption of distributed generation.

25. The Petition and the Brown Report would have the Commission believe that the typical solar customer is "wealthy," and neither document discusses or describes any type of solar host other than affluent.[21] The logical conclusion would be that the only "harm" is to wealthy customers. This is not true. The Petition's remedy will harm a wide variety of customers that have installed distributed generation, including low income customers, religious institutions, schools, hospitals, commercial establishments, municipal and governmental buildings, and industrial concerns.

26. The Commission need only look outside its own windows to see the potential for damage to programs directed to low-income retail customers. Net metering forms the nucleus of the District of Columbia's Solar for All program. The goal of the District's program is "to reduce by at least 50% the electric bills of at least 100,000 of the District's low-income households with high energy burdens by December 31, 2032."[22] Low-income customer participation is generally predicated on either individual net metering (for rooftop solar installed on single family dwellings) or community net metering (for housing complexes, neighborhood, and community-based installations). The program offers each customer the opportunity to choose their own competitive electric service provider. In developing the initiative, the DC Department of Energy & Environment solicited vendor projects that would cut low-income customer utility bills at least in

[21] The Brown Report cites to a draft California Public Utilities Commission report in support of its characterization that net-metering customers have a median income 78% greater than the median California income. However, the final version of that report reflects that the median income of net metering customers in California is 68% greater than the median California household income. *See* Brown Report at 23, fn. 37, *citing* California Pub. Utils. Comm'n Energy Division, "California Net Energy Metering Ratepayer Impacts Evaluation," (Oct. 2013), *available at* https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=4292 (accessed June 15, 2020). Further, the Brown Report's characterization of the socially regressive impact of net metering is based upon a 2013 study (Brown Report at 23, fn. 37) and does not mention state regulatory actions to address the issue of cost shifts or low-income programs to encourage on-site solar.

[22] District of Columbia, Department of Energy and Environment, March 10, 2017, *Solar for All Implementation Plan*, https://doee.dc.gov/node/1226501 (accessed June 15, 2020). *See also* DC Department of Energy & Environment, *Solar for All*, https://doee.dc.gov/solarforall (accessed June 9, 2020).

half, if not more. By the end of 2019, about 5.3 MW of solar had been installed as part of multiple projects serving 9,000 low- and moderate-income customers. Urban Ingenuity, LLC, working collaboratively with the National Housing Trust, has already installed solar "on 24 affordable housing complexes across the district, with projected savings of $3.25 million over the next 15 years."[23] The Solar for All program "also includes a job training initiative, to prepare the city's low-income youth for careers in solar."[24]

27. In addition, the Petition may have an adverse impact on employment. There are now a quarter of million solar-related jobs in the United States. Of that, over 150,000 are related to installation. Importantly, the makeup of the solar installation work force is diverse, including 26% women, 7.7% African-American, 17.2 % Hispanic, and 8.5% Asian-American workers.[25]

28. This Petition, if approved, will reduce the progress toward electrification by creating regulatory chaos and establishing an incoherent regulatory system in which customer purchases are regulated by state regulators and injections into the grid are regulated by an overlapping regime of state and federal regulation. In addition, the Petition will adversely affect efforts to increase resilience. It does so by violating one of the principle tenets of making electric systems more resilient, which is to move generation closer to load. Both the Petition and the Brown Report have a clear preference for utility-scale solar distanced from load, rather than solar at the customers' premises.[26]

2. Technical Challenges

29. NERA's preferred outcome is technically infeasible to implement. NERA asserts that the output of net metered facilities is subject to FERC jurisdiction "whenever the output of such generators exceeds the customer's demand."[27] This is a real-time notion, and requires constant, real-time communication with the net-metered customer about changes in the applicable regulatory

[23] Kaufmann, K., "DC's Solar For All forges new pathways for solar in low-income communities" *PV Magazine* (June 3, 2020) *available at* https://pv-magazine-usa.com/2020/06/03/dcs-solar-for-all-forges-new-pathways-for-solar-in-low-income-communities/ (accessed June 9, 2020). *See also* Urban Ingenuity, *Solar Solutions*, https://urbaningenuity.com/solar-finance/ (accessed June 9, 2020).

[24] *Id*.

[25] Personal communication email from Shawn Rumery, Director of Research, SEIA, to Tom Stanton, NRRI, May 28, 2020.

[26] Petition at 40; Brown Report, at 20, 29, 30.

[27] Petition at 5.

scheme.[28] Failure to track and convey information to the net-metered customer about the instantaneous division in regulatory treatment of PV output would be economically inefficient and unjust, because customers would not have the information they need to make decisions about their own consumption relative to their production.

30. If communication did not occur in real-time, but over a longer period, such as a billing period, the meter would not be able to track the actual value of the power produced and consumed. Equity in pricing generator output is critical to the Commission's regime of just and reasonable market design in which the markets it regulates track production used as the basis for billing and payments on sub-hourly increments. No other generator has output that is only metered over a long billing period. As a consequence, the only way to implement NERA's preferred jurisdictional outcome in a just and reasonable manner is to do so based upon billing increments consistent with the organized wholesale markets that the Commission regulates.

31. Thus, the feasibility of the Petitioner's remedy is dependent on appropriate metering technology and accounting systems. Petitioner recognizes that metering plays a crucial role in the implementation of net metering.[29]

32. However, the metering equipment described in the Petition is not sufficient to implement its preferred outcome. The Petition states, "to the extent the customer does not already have appropriate metering, avoided cost pricing for FNM generation requires that the customer have a meter that is capable of measuring the net flow of energy between the customer and the utility on an hourly or shorter-term basis."[30] But in order to practically implement NERA's proposal, the meter will need to differentiate between power generated by net-metered facilities that is under FERC regulated prices and the power that is subject to the net metering practices of the state or

[28] The Brown Report misrepresents current capabilities to pass real-time prices on to all retail customers.: "in those parts of the country with organized markets, we now have transparent locational marginal cost pricing that provides real-time price data on energy prices and, in some places, deployment of time-sensitive retail pricing that would enable more efficient price signals for retail customers, including those deploying rooftop solar." Brown Report at 12. As the Commission well knows, the capability to pass on LMP price signals in all of the organized markets that it regulates, just does not exist.

[29] The Brown Report describes the metering technology and its effect on pricing the output of rooftop systems: "When rooftop solar systems were first connected to the grid in the 1980s and 1990s, most households had a single meter capable only of running forwards, backwards, and standing still. This characteristic left utilities and their ratemaking authorities with limited options for pricing the output of the rooftop systems." Brown Report at 7.

[30] Petition at 33.

utility. Each meter would need to reflect the appropriate pricing depending on which part of the customers' consumption and production it was reading. Neither the Petition nor the Brown Report explains whether the technology currently exists to implement a dual jurisdictional real-time pricing scheme.

33. These metering challenges are analogous to those faced by storage resources, which the Commission has acknowledged. In a Commission Order concerning PJM Interconnection's revisions to its Open Access Transmission Tariff in compliance with Order No. 841, the Commission noted that some utilities may be "unable—due to a lack of the necessary metering infrastructure and accounting practices—or unwilling to net out any energy purchases associated with an electric storage resource's wholesale charging activities from the host customer's retail bill, [and Order No. 841] found that [regional transmission organizations/independent system operators] would be prevented from charging that resource wholesale rates for the charging energy for which it is already paying retail rates."[31]

34. Moreover, neither the Petition nor the Brown Report acknowledges that approximately 2 million retail customers' meters would need to be replaced to support its proposed scheme. Neither document explains who would pay for those meters, or whether the associated costs would be recoverable in wholesale or retail rates. Finally, neither document describes whether meters capable of this complex metering are even available.[32]

IV. CONCLUSION

35. The Petition asks the Commission to institute the most significant change in the structure of regulation since its adoption of Order No. 888, but offers no cogent basis for that outcome, or any semblance of a plan for a transition to a new regulatory scheme. Adopting the proposal in the absence of a cogent basis or a plan will create uncertainty over existing contractual relations. The electric utility industry is progressing towards an environment of increasing electrification, which is based largely upon the "two-way" flow of energy. This Petition, if approved, will reduce the

[31] *PJM Interconnection, LLC*, Docket No. ER19-469-000, Order on Compliance Filing, Instituting Section 206 Proceeding, and Establishing Paper Hearing (Oct. 17, 2019).

[32] After the Petition was filed, President Trump issued "Executive Order on Securing the United States Bulk Power System Infrastructure & Technology," (May 1, 2020), which would impose new requirements that the FERC must consider with respect to the availability of adequate meters and the practical feasibility of Petitioner's proposed remedy. *See* https://www.whitehouse.gov/presidential-actions/executive-order-securing-united-states-bulk-power-system/ (accessed June 3, 2020).

progress toward electrification by creating regulatory chaos and establishing an incoherent regulatory system in which customer purchases are regulated by state commissions while energy banked by the distribution utility is regulated by an overlapping regime of state and federal regulation.

36. NERA's Petition and the Brown Report mischaracterize the net metering programs currently in existence, to imply that the problems they allege are both widespread and easily resolved. Neither is actually true. The Brown Report does not support the position taken in NERA's Petition that net metering service involves wholesale sales, and the "perverse effects" of net metering identified in the Brown Report do not support the exercise of federal ratemaking jurisdiction. Even if the Commission were to accept NERA's theory that excess energy produced by net metered facilities is entitled to a federally-regulated revenue stream, neither the Petition nor the Report demonstrates why states would be prevented from continuing to credit customers for that excess energy when calculating the quantity of retail service consumed. Finally if the Commission did find that such retail netting is preempted, it would significantly disrupt the expectations on which existing net metering customers relied in making substantial investments, and could cause ripple effects throughout the energy economy. For all these reasons, I conclude the Commission should not grant NERA's requested declaration.

37. This concludes my affidavit.

I declare under penalty of perjury that the foregoing is true and correct.

Carl Pechman

Carl Pechman, Ph.D.

15 June 2020

Date

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1999-2009	**President and Founder**, Power Economics, Inc., Santa Cruz, Ca.
1997-99	**Director,** LECG, Emeryville, Ca.
1979-97	**Supervisor of Energy and Environmental Economics**, New York Public Service Commission, Albany, NY.

EXPERIENCE AND ACCOMPLISHMENTS

Industry transformation

- Analyst/co-author of U.S. Department of Energy Quadrennial Energy Review (QER) – 1.1: *Transforming U.S. Energy Infrastructures in a Time of Rapid Change* and 1.2: *Transforming the Nation's Electricity System.*
- Analysis and papers on the future of the distribution utility and utility business model, including new planning paradigms, empowering customers and utilities' role on the customers' side of the meter.
- Developed concept of "integrated electricity security planning" proposed in QER 1.2.
- Developed concept of a "Smart City Audit" adopted for implementation by the New Orleans City Council.
- Author: *Regulating Power: The Economics of Electricity in the Information Age*, Kluwer Academic Publishers. 1993 – which included the first published analysis on the importance of locational based generation reserve requirements; analysis of information structures as impediments to industry transformation and promoted strategies for harmonizing state and federal regulation.
- Led multi-party technical process that resulted in the blueprint for the development of the New York Independent System Operator.
- Author of white paper on the adoption of affiliate codes of conduct for the Edison Electric Institute.
- Advisor to the City of Santa Cruz School System for Purchase Power Agreements to develop 1.5MW of solar photovoltaics. Designed a contract provision that limits power payments to what the school system would have paid had it not developed solar.
- Developed competitive power acquisition strategy for New York City's own load requirements.

- Initiated and managed early development of "Grid Architecture."
- Advice and counsel to the Puerto Rico Energy Bureau on restructuring the Commonwealth's bankrupt municipal utility (PREPA) and development of a resilient and resilient electric system.

California/Western Energy Crisis

- Advisor to Speaker Hertzberg and Speaker pro tempore Keeley of the California State Assembly regarding efforts to resolve the California electricity crisis. Developed regulatory strategy that allowed Southern California Edison to avoid bankruptcy.
- Expert witness for the California Parties and various public and investor-owned utilities in the West, in proceedings before the Federal Energy Regulatory Commission (FERC) related to refunds of charges in real-time markets and modification of long-term contracts, as related to the California energy crisis.
- Analysis, review and testimony on evidence of Enron's violation of its market-based rate authority, financial fraud, and power market manipulation, including supervision of review and testimony that made the Enron trader tapes public.
- Analysis and testimony providing evidence of market power abuse during the California Energy Crisis
- Author of white paper for the Public Policy Institute of California on the state's restructuring of utility regulation and resource acquisition in response to the "Energy Crisis."

Market Structures/Rates

- Developed method through negotiated and litigated proceedings, and supervised modeling of "Avoided Costs" pursuant to Public Utilities Regulatory Policies Act of 1978 (PURPA) in New York.
- Created "cost effectiveness test" for demand response, relied on by the Supreme Court in affirming FERC Order 745 in FERC v. EPSA.
- Design of market mechanisms for demand response, frequency regulation and renewable integration.
- Design of capacity markets for resource adequacy in New York, New England and California.
- Preparation of cost studies, rate design, incentive rate mechanisms.
- Testimony and analysis on unbundling utility rates.
- Expert witness on inter-relation of market design and market manipulation.
- Empirical analysis and oversight of projects to calculate the Value of Loss Load.
- Design of market mechanisms for maintaining resource adequacy in organized markets.

Grid modernization

- Initiated, managed development and promoted new paradigm of Grid Architecture.
- Member US DOE Grid Tech Team charting strategic direction of grid modernization,
- Evaluation of changing role of customers on grid and distribution design and operation.
- Analysis of reliability concepts for both operation and maintenance of resource adequacy.
- Policy development of interoperability and small generator interconnection standards.
- Developed concept of "Integrated Electric Security Planning," to coordinate planning between different jurisdictions responsible for cyber-security standards and protection.

Environmental Analysis

- Principal NYPSC staff witness on economics of the "need" for energy-related facilities, including coal-fired power plants, electric transmission lines and natural gas pipelines, as well as the re-conversion of coal capable oil-fired generating units to coal in order to reduce oil imports.
- Economics of multi-use resources, such as balancing interests of lake level regulation.
- Responsible for determination of "significance" of regulatory actions pursuant to the New York State Environmental Quality Review Act.
- Analysis of utility compliance of the Clean Air Act Amendments of 1990.
- GHG reduction strategies and their impact on organized electricity markets.

- Analysis of the social cost of carbon and implications for the future of existing nuclear reactors.
- Oversight of project to calculate the environmental costs of electricity.
- Member, President's Pollinator Health Task Force

Modeling

- Managed implementation and use of production cost modeling at the New York Public Service Commission for evaluating energy efficiency programs, capacity additions and price forecasts.
- Developed early financial models for evaluating nuclear finance and rate recovery.
- Led task force investigating alternative modeling methods for calculating the cost of transmission wheeling.
- Project manager for development of the CCMU – an annually recursive policy scenario analysis policy model that integrated power system operations, utility accounting and costs of meeting environmental objectives.
- Modeling for and review of Integrated Resource Plans and generation expansion proposals and scenarios.
- Review of California Energy Commission load forecasting methods.

Training/Education

- On-site training programs for Public Utility Commissions
- Development of the Regulatory Training Initiative = a remote training platform on regulation that will be open to regulators, legislators and stakeholders.
- Various courses taught at Cornell University, Adjunct, University of California at Santa Cruz, Skidmore College and Rensselaer Polytechnic Institute.

Study Groups

- Participant, Aspen Energy Roundtable.
- Agency Representative, New York State Energy Master Plan working group.
- Agency Representative, New York State Governor's Office of Regulatory Reform. Task force on development of a cost-benefit handbook.
- Member, Keystone Dialog on Environmental Externalities.
- Member. Part of a project team sent by the United States Environmental Protection Agency to work with Mosenergo (the Moscow electric utility), and other academics and government officials on developing a strategy for transformation to a market economy.

Stakeholder Relations

- Consultant to a diverse group of industry stakeholders including: utilities, Independent System Operators, state and federal regulatory agencies, municipalities, attorneys general, environmental groups, and representatives of low-income, commercial building owners and industrial customers.
- Managed modeling efforts based upon stakeholder input.
- Mediated numerous multi-party negotiations.

International

- Member of USEPA team that worked with Mosenergo (the Moscow electric utility) in preparation for the transition from a planned to a market economy.
- Numerous outreach meetings with international contingents.

BOOKS

Regulating Power: The Economics of Electricity in the Information Age. Kluwer Academic Publishers, 1993.

SELECT PUBLICATIONS AND REPORTS

"Determining the Scope of the Electric Distribution Utility of the Future," Paper published as part of the Smart Electric Power Alliance 51st State Initiative, 2017. https://sepapower.org/resource/51st-state-ideas-determining-scope-electric-distribution-utility-future/.

"Modernizing the Electric Distribution Utility to Support the Clean Energy Economy." U.S. Department of Energy White Paper. 2016 https://www.energy.gov/epsa/downloads/modernizing-electric-distribution-utility-support-clean-energy-economy.

"Investing in Solar Photovoltaics: A School District's Story." Electricity Journal, with Peter Brown. 2008.

"California's Electricity Market: A Post-Crisis Progress Report." California Economic Policy California Economic Policy, Public Policy Institute of California. 2007. http://www.ppic.org/main/publication.asp?i=731

"A Review of the Economic Analysis of the Demand Curve Proposal." Prepared for Multiple Interveners, presented to the New York Independent System Operator. 2003

"Designing an Alternative Form of Regulation for Wyoming." Private report prepared for PacifiCorp. 2003.

"The California Electricity Crisis: A Report to the Building Owners and Managers Association (BOMA) of California." With Miles Bidwell, prepared for Building Owners and Managers Association of California. 2001.

"A Demand Response Will Lower Peak Prices." With Miles Bidwell, prepared for Multiple Interveners for submission to the New York Independent System Operator.

"Retail Competition in New York: A Status Report." Prepared for Utility.com. 2000.

"Developing Codes of Conduct: An Analysis of Parties and Positions." With Robert G. Harris, Edison Electric Institute. 1999.

"Cost-Benefit Handbook: A Guide for New York State's Agencies." Co-author. 1997.

"Exporting Integrated Resource Planning to Less-Developed and Post-Communist Countries." With Marc Ledbetter, David Wolcott and Mark Cherniack, Proceedings ACEEE Study on Energy Efficiency in Buildings, Integrated Resource Planning Volume. 1992.

"Determining the Value of Electricity from Waste-to-Energy Facilities: A Comparison of Pricing Based Upon Avoided Costs and Bidding." Proceedings: Fifth Annual Conference on Solid Waste Management and Materials Policy, 1989.

"The Regulator as Mediator/Negotiator." Proceedings: National Association of Regulatory Utility Commissioners (NARUC) Sixth Biennial Regulatory Information Conference. 1988.

"Equity, Efficiency, and Sulfur Emission Reductions." Public Utility Fortnightly, (paper originally presented at the 1984 Air Pollution Control Association Annual Meeting, San Francisco, California). 1985.

"The Role of Public Utility Commissions in Evaluating Sulfur Emission Reduction Strategies." With William Deehan, Proceedings: NARUC Fourth Biennial Regulatory Information Conference, 1984.

"REVREQCON: A Model for Evaluating the Revenue Requirement of Coal Conversion Expenditures." With Charles Dickson, Electric Ratemaking, vol. 1, no. 3. 1982.

"Converting Oil Fired Generating Units to Coal in New York State." With Jack Lebowitz, Northeastern Environmental Science, vol. 1, no. 2. 1982.

SELECT PRESENTATIONS

"The Smart City Audit as a Building Block for Developing Smart Cities," City Council of New Orleans Smart and Sustainable Cities Committee, December 2018.

"Administration Activities to subsidize coal and nuclear," NARUC Electricity Committee. 2018.

"Overview of the History and Practice of Electric Regulation," Blue Ribbon Task Force
Strategizing an Electric Energy Policy and Regulatory Framework in Puerto Ric, 2018.

"QER: Status Report," Presented to EPRI Power Delivery & Utilization Sector Council. 2015.

"The Agile Utility: Aligning Consumer Demand with Distributed Generation," Georgia Tech Enterprise Innovation Institute. 2014.

"Realizing the Value of Transactive Energy," Plenary Speaker, 2014 Transactive Energy Conference. 2014.

"A New Paradigm for Electricity Distribution: The Forces for Change" presented at Joint EPRI and EEI workshop "Role of the Electric Distribution System in an Integrated Grid." 2014.

"FERC innovations in market design and the future of solar." Plenary talk at SolarTech 2012 4th Annual Solar Leadership Summit. San Jose, Ca. 2012.

"Transformational Changes and Resource Planning – looking "back to the future" – or forward to "where no one has gone before?" Keynote address - EUCI, Integrated Resource Planning Conference. 2010.

"Enron in the West" Presented at the 21st Annual Western Conference of the Advanced Workshop in Regulation and Public Utility Economics, sponsored by Rutgers University, 2008.

"Market Structure and Design Issues Affecting California Electric Sector" Power Association of Northern California. April, 2008.

"Lessons on Deregulation: the US Experience" Allahabad University Department of Economics seminar. February, 2008.

Wrap-up speaker at "Forming Expectations: the Emerging Capacity Markets of the Northeast and Mid-Atlantic" sponsored by the Northeast Energy and Commerce Association. 2007.

"Territoriality of Electricity" Presented at the American Association of Geographers, Annual Meeting, San Francisco, Ca. Association of American Geographers. 2007.

"The Policy Response to the California Energy Crisis – Is it Adequate?" Presented at the 19th Annual Western Conference of the Advanced Workshop in Regulation and Public Utility Economics, sponsored by Rutgers University, Graduate School of Management Center for Research in Regulated. 2006.

"Regulatory Implications of the California Energy Crisis." Invited Presentation to the Public Policy Institute of California. 2005.

"Is FERC's Plan for National Electric Transmission Grid Equitable? Should State Regulatory Oversight be Strengthened?" Presented at National Black Caucus of State Regulators. 2003.

"Managing Regulatory Risk." Presented at EUCI Enterprise-Wide Risk Management Conference. 2002.

"The Regulatory Treatment of Power Costs and Customer Vulnerability to Market Power." Presented at the 15th Annual Western Conference of the Advanced Workshop in Regulation and Public Utility Economics, sponsored by Rutgers University, Graduate School of Management Center for Research in Regulated Industries. 2002.

"The Energy Crisis & Commercial Real Estate: Winning Lower Prices and Increased Reliability." Building Owners and Managers Association's National Advisory Council Spring Conference. 2001.

"The Changing Role of Regulation in Competitive Electric Markets." Presented at the Independent Power Producers of New York, 13th Annual Spring Legislative Conference. Albany, New York. 1999.

"Retail Competition in New York's Electric Power Market." Presented at Competitive Power Sourcing for Industrial Customers, sponsored by InfoCast. Chicago, Illinois. 1995.

"Environmental Implications of Electric Market Transformation." Presented at New York State Network for Economic Research, Research-in-Progress Conference. 1994.

"State Regulatory Perspectives on Emissions Trading." Presented at SO2 Emissions Trading in the Electric Utility Sector, sponsored by, The Wharton School and Philadelphia Electric Company. 1993.

"The Evolution of Integrated Resource Planning: Incorporating Environmental Externalities." Invited paper presented at the Third USSR/US Bilateral Conference on the Use of Economic Instruments in Environmental Protection. Moscow, USSR. 1991.

"The Economics of Environmental Dispatch." Presented at the conference DSM and the Global Environment, sponsored by the US Environmental Protection Agency, The Edison Electric Institute, and the New York State Energy Research and Development Authority. 1991.

"Model Access and Administratively Determined Prices." Presented at the Eighth Annual Conference of the Rutgers University Advanced Workshop in Regulation and Public Utility Economics. 1989.

"Information Cartelization and the Control of Regulation." Presented at the Allied Social Science Association Annual Meeting. 1988.

"Electric Capacity Planning in New York: Model Limited Choice and Inefficient Investment in Reliability." Presented at the Sixth Annual Conference, Rutgers University Advanced Workshop in Regulation and Public Utility Economics. 1987.

"Using Production Costing Models to Estimate PURPA Buyback Rates: The New York Experience." National Association of Regulatory Utility Commissioners (NARUC) Fifth Biennial Regulatory Information Conference. 1986.

"Estimating Long Run Avoided Costs for New York State Electric Utilities." Fourth Annual Conference, Rutgers University Advanced Workshop in Public Utility Economics and Regulation. 1985.

"The Future of Energy Imports to the Northeastern United States." Presented at the Corpus Energy Group – Energy Pricing Conference. Toronto, Canada. 1983.

"An Estimate of the Capacity Cost of the Shoreham Nuclear Power Plant." Presented at the American Association for the Advancement of Science Annual Meeting. Detroit, Michigan. 1983.

TESTIMONY

Extensive testimony in federal court, bankruptcy court, state courts and before the FERC and various state PUCs on a wide variety of electricity issues including, market design, electric ratemaking (both determination of revenue requirements, cost studies and rate design), resource adequacy, prudence of utility power acquisition, the western electricity crisis, determination of avoided costs, power contracts and damages, investor confidence and finance and siting (generation, transmission and gas pipelines).

TESTIMONY AS INDEPENDENT EXPERT

Western energy crisis

Critique of Federal Energy Regulatory Commission market mitigation proposal

Affidavit prepared for the California Assembly before the Federal Energy Regulatory Commission (Dockets No. EL00-95-012, No. EL00-98-000, No. RT01-85-000, No. EL01-68-000) (2001).

Analysis of and remedies for Enron gaming behavior

Testimony presented on behalf of the Snohomish County Public Utilities District before the Federal Energy Regulatory Commission in Enron Power Marketing, Inc. and Enron Energy Services, Inc. (Docket No. EL03-180-000 et al.) (2004, 2005).

Demonstrations of market power abuse

Testimony on behalf of the City of Tacoma and the Port of Seattle before the Federal Energy Regulatory Commission in Puget Sound Energy, Inc., et al., v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale Into Electric Energy and/or Capacity Markets in the Pacific Northwest, Including Parties to the Western Systems Power Pool Agreement (Docket No. EL01-10-005) (2002).

Testimony presented on behalf of the California Parties before the Federal Energy Regulatory Commission in Puget Sound Energy, Inc. Complainant, v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest, Including Parties to the Western Systems Power Pool Agreement (Docket Nos. EL01-10-000, EL01-10-001) (2001).

Method for calculating Mitigated Market Clearing Prices (MMCPs)

Testimony presented on behalf of the California Parties before the Federal Energy Regulatory Commission in San Diego Gas & Electric Company, Complainant, v. Sellers of Energy and Ancillary Services into

Markets Operated by the California Independent System Operator Corporation and the California Power Exchange (Dockets EL00-95-045, EL00-98-042) (2002).

Effect of contract modification on investor confidence

Testimony presented on behalf of PacifiCorp before the Federal Regulatory Commission in PacifiCorp v. Reliant Energy Services, Inc., Morgan Stanley Capital Group, Inc., Williams Energy Marketing & Trading Company, El Paso Merchant Energy, L.P. (Docket Nos. EL02-80-000, EL02-81-000, EL02-82-000, EL02-83-000). (2003).

Interpretation and calculation of benchmark prices for long-term power contracts

Testimony presented on behalf of the California Public Utilities Commission and Electricity Oversight Board before the Federal Energy Regulatory Commission in Public Utilities Commission of The State of California v. Sellers of Long Term Contracts to the California Department of Water Resources and California Electricity Oversight Board, v. Sellers Of Energy And Capacity Under Long-Term Contracts With the California Department of Water Resources (Docket No. EL02-60-003 and Docket No. EL02-62-003) (2003).

Appropriate natural gas price to use for calculating power refunds

Declaration presented on behalf of the California Parties before the Federal Energy Regulatory Commission (Dockets EL00-95-004, EL00-95-005, EL00-95-019, EL00-95-031, EL00-98-004, EL00-98-005, EL00-98-018, EL00-98-030, EL01-10-000, EL01-10-001) (2001).

Damages associated with Enron's market manipulation and fraud

Affidavit presented on behalf of Snohomish County Public Utility District in Enron Corporation (Case No. 01-16034) before the United States Bankruptcy Court, Southern District of New York (2006).

Expert report on behalf of Snohomish County Public Utility District in Public Utility District No. 1 of Snohomish County, Washington v. Citigroup, Inc., et al., before the United States District Court, Southern District of Texas (2006).

Generation siting

Testimony on behalf of the Owners Committee on Electric Rates (OCER) before the New York State Board on Electric Generation Siting and the Environment - Application of TransGas Energy Systems LLC, for a Certificate of Environmental Compatibility and Public Need to Construct and Operate a 1,100 Megawatt Combined Cycle Cogeneration Facility in the Borough of Brooklyn, New York. (Case 01-F-1276) (2003).

Hydro-electric asset divestiture

Testimony on behalf of Humboldt County, California, before the California Public Utilities Commission -- Application of Pacific Gas and Electric Company to Market Value Hydroelectric Generating Plants and Related Assets Pursuant to Public Utilities Code Sections 367(b) and 851 (1999).

Market design

Testimony on behalf of the Connecticut Department of Public Utility Control, the Connecticut Office of Consumer Counsel, Richard Blumenthal, Attorney General the State of Connecticut and Southwestern Area Commerce and Industry Association of Connecticut, before the Federal Energy Regulatory Commission in the matter of Devon Power, LLC, et al. (Docket No. ER03-563-030) (2005).

Affidavit on behalf of the City of New York before the Federal Energy Regulatory Commission in the matter of New York Independent System Operator, Inc. (Docket No. ER03-647) (2003).

Determination of planning (installed) reserve margins

Affidavit on behalf of the Connecticut Office of Consumer Counsel; Richard Blumenthal, Connecticut Attorney General; the Vermont Department of Public Service; the Vermont Public Service Board; the Rhode Island Public Utilities Commission; the New Hampshire Public Utilities Commission, and the Connecticut Light and Power Company by its agent Northeast Utilities Service Company before the Federal Energy Regulatory Commission in the matter of ISO New England Inc. (Docket No. ER-5-715, 2005/2006 Power Year Installed Capacity Requirements) (Objective Capability Values) (2005).

Prudence of utility power acquisition

Testimony presented on behalf of the Nevada Attorney General's Bureau of Consumer Protection in the matter of the Application of Nevada Power pursuant to A.B. 369 as enacted by the 2001 Nevada Legislature for authority to establish a Deferred Energy Accounting Adjustment (DEAA) rate to clear purchased fuel and power costs of $922 million accumulated between March 1, 2001 through September 30, 2001 from its deferred energy account balance over three years, to recalculate its Base Tariff Energy Rate (BTER) to reflect anticipated ongoing purchased fuel and purchased power costs, and for other relief properly related thereto (2003).

Testimony presented on behalf of the Nevada Attorney General's Bureau of Consumer Protection in re Application of Sierra Pacific Power Corporation for authority to establish a Deferred Energy Accounting Adjustment (DEAA) rate to clear purchased fuel and power costs of $205 million accumulated between March 1, 2001 through November 30, 2001 from its deferred energy account balance to recalculate its Base Tariff Energy Rate to reflect anticipated ongoing purchased fuel and power costs, and for other relief properly related thereto (2003).

Cost analysis and rate design

Testimony on behalf of the Owners Committee on Electric Rates (OCER) before the New York Public Service Commission Case # 00-E-1208 - Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc.) For Electric Service (Case 04-E-0572) (2004).

Testimony on behalf of the Owners Committee on Electric Rates (OCER) before the New York Public Service Commission Case # 00-E-1208 - Proceeding on Motion of the Commission in the Matter of Consolidated Edison Company of New York, Inc.'s Plans for Electric Rate Restructuring with Respect to Service Provided in Westchester County (2000).

Testimony on behalf of the Owners Committee on Electric Rates (OCER) before the New York Public Service Commission Case 99-S-1621 - Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Steam Service (1999).

Testimony on behalf of Public Service Company of New Mexico before the New Mexico Public Utility Commission, in the matter of the application of and complaint by Residential Electric, Incorporated, vs. Public Service Company of New Mexico (Case No. 2867) and in the matter of the application of Residential Electric, Inc. for a Certificate of Public Convenience and Necessity (Case No. 2868) (1998).

Power contracts and damages

Testimony presented on behalf of North Star Steel Company before the United States Court of Claims – North Star Steel Company, v. the United States (No. 00 238C) (2005).

Testimony presented on behalf of Hydrocarbon Generation, Inc., before the Superior Court of the State of New York, Cattaraugus County in the matter of Hydrocarbon Generation, Inc., and Allegany Limited Partnership v. Niagara Mohawk Power Corporation (2001).

Testimony presented on behalf of the Norcon Power Partners before the United States District Court for the Southern District in the matter of Norcon Power Partners v. Niagara Mohawk Power Corporation (1999).

Testimony on behalf of Imperial Irrigation District before the Superior Court of the State of California, County of San Bernardino, in the matter of Coachella Valley Water District v. Imperial Irrigation District (1999).

Commercial contract litigation

Testimony (jury) presented on behalf of Corbin, Inc., before the Superior Court of the State of California in the County of Monterey. Doyle and Schmidt v. Corbin (2000).

TESTIMONY AS STAFF OF THE NEW YORK PUBLIC SERVICE COMMISSION

Power plant and transmission (electric and gas) siting

Case 80010 - Application of Halfmoon Cogeneration Project for a Certificate of Environmental Compatibility and Public Need pursuant to Article VIII of the Public Service Law.

Case 88-T-132 - Empire State Pipeline (May 1989).

Case 70126 - Power Authority of the State of New York - Marcy-South 345 KV Transmission Facility (August 1983).

Energy security: conversion of oil-fired generating units to coal

New York State Energy Master Plan and Long Range Electric & Gas Report.

Case 29083 - Central Hudson Gas & Electric Corporation - Danskammer Coal Conversion (August 1985).

Central Hudson Gas & Electric Corporation - Application No. UPA 2083-0544 - Danskammer Coal Conversion (August 1984).

Long Island Lighting Company - UPA #10-82-0350 - Port Jefferson Coal Conversion.

Consolidated Edison Company of NY, Inc. - UPA #20-81-0002 - Ravenswood Coal Conversion; UPA #20-81-0009 - Arthur Kill Coal Conversion.

Determination of Avoided Costs: used as basis for paying renewable generation and qualifying facilities under the Public Utilities Regulatory Policies Act of 1978

Case 92-E-0508 - Methods for Calculation and Payment of Avoided Generation (May and June 1993).

Case 29670 - Niagara Mohawk Power Corporation (April 1988).

Cases 29674-5-6 - Rochester Gas & Electric (December 1987).

Cases 29541-42 - New York State Electric & Gas Corporation (July 1987).

Case 29484 - Long Island Lighting Company (May 1987).

Case 29433 - Central Hudson Gas & Electric Corporation (January 1987).

Case 29426 - Rochester Gas & Electric Corporation (December 1986).

Case 29327 - Niagara Mohawk Power Corporation (August and September 1986).

Case 29195 - Central Hudson Gas & Electric Corporation (January 1986).

Cases 29069-70 - Niagara Mohawk Power Corporation (August 1985).

Case 29029 - Long Island Lighting Company (August 1985).

Electric ratemaking: utility regulation, cost of service studies, incentive regulation, prudence evaluations

Case 96-E-0891 - New York State Electric & Gas Corporation's Plans for Electric Rate/Restructuring Pursuant to Op. No. 96-12 (March and May 1997).

Cases 93-E-1075, 93-E-0912 - Generic FAC/Buyback Rates and Long-Run Avoided Costs (June 1995).

Case 94-E-0334 - Consolidated Edison Company of NY, Inc. (September 1994).

Cases 94-E-0098, 94-E-0099, 94-G-0100 - Niagara Mohawk Power Corporation (August 1994).

Cases 88-E-081 & 92-E-0814 - Petitions for Approval of Curtailment Petitions (March 1993).

Case 91-E-0462 - Consolidated Edison Company of New York, Inc. (Great whale) (September 1991).

Case 90-E-1185 - Long Island Lighting Company (May 1991).

Cases 29189-91 - Rochester Gas & Electric Corporation (December 1985).

Case 28824 - New York State Electric & Gas Corporation (September 1984).

Case 28798 - Niagara Mohawk Power Corporation (August 1984).

Case 28525 - Niagara Mohawk Power Corporation (August 1983).

Case 28211 - Consolidated Edison Company of NY, Inc. (August 1982).

Case 27741 - Fuel Adjustment Clause (July 1982).

Case 28252 - Shoreham Ratemaking Principles.

Water rates: methods of reflecting salt water intrusion and VOC contamination in rates

Case 89-W-062 - Jamaica Water Supply Company (August 1989)

Case 29268 - Jamaica Water Supply (September 1986)

SERVICE

2006-2007	Volunteer, Advisor and negotiator for the City of Santa Cruz School System for contracting and acquisition of solar photovoltaics
2001-2004	Sponsor, Journal of Regulatory Economics.
2001	Assistant Den Leader, Cub Scouts.
2001-2005	Team Sponsor, Santa Cruz Youth Soccer.
1999-2001	Board Member, Chair of Finance Committee, Temple Beth El, Santa Cruz, California.
1992-1995	Board Member, Temple Berith Shalom, Troy, New York.
1988-2005	Member, Organizing Committee, Center for Research on Regulated Industries, Rutgers University.
1969-71	Secretary, Rockville Center Environmental Committee, Committee reporting to Village Council. Developed one of the first post WWII municipal recycling programs in Metropolitan New York.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New England Ratepayers Association	)	No. EL20-42

AFFIDAVIT OF SAM WHEELER, IN SUPPORT OF THE PROTEST OF THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

I, Sam Wheeler, declare:

1. I am Sam Wheeler. I am an electrical engineer and an energy consultant with extensive experience in commercial, industrial, and utility electric power.

2. I have been an independent energy consultant since 2003. I have worked in nearly every utility, industrial, and commercial setting, on projects on the utility and customer side of the meter. As a consultant, I have completed power system equipment, technology, and methodology evaluations for the U.S. Department of Energy, the National Renewable Energy Laboratory, the World Bank, Xcel Energy, WEL Energy (New Zealand) and United Energy (Australia). I have designed and reviewed the grid-interconnection portions of energy projects in Illinois, New Jersey, Hawaii, Puerto Rico, El Salvador, and China. My work has supported engineering design, specifications, power system protection, code reviews, technical and safety training related to the interconnection of renewable energy facilities with the grid in Hawaii, Wisconsin, and Texas. Prior to 2003, I worked as an engineer for several investor-owned and municipal utilities in Colorado.

3. I earned a B.S. in Electrical Engineering from the University of Colorado in 1980. I obtained the Association of Energy Engineers designation of Certified Power Quality Engineer in 1999. My curriculum vitae is attached as Attachment 1.

I. PURPOSE OF AFFIDAVIT, SUMMARY OF CONCLUSIONS, AND RECOMMENDATIONS

4. I have been asked by counsel for the National Association of Regulatory Utility Commissioners ("NARUC") to explain how distributed energy resources ("DER") owned or operated by retail customers participating in net metering programs actually interact with the local

distribution system and under what conditions, if at all, the output of that DER flows onto the interstate transmission system.

5. The Petition for a declaratory order filed by the New England Ratepayers Association ("NERA") addresses those issues only in generalities and with little if any recognition of how the grid is designed and operated. NERA assumes that the output of net-metered DER flows in interstate commerce – that any outflow moves across state lines or at least flows onto the interstate transmission system. However, as I explain, that is not typically the case and, for most net metered installations, will likely never be the case. Net metering programs vary across the states, and many different types of customers participate. But, only rarely, under unusual circumstances or atypical conditions, will energy generated by DER participating in net metering programs flow onto the transmission system. The output will not in general exceed the energy required to serve the load of the participating customer, the load of other customers on the same local distribution feeder, and other load supplied by the same local distribution substation or intermediate voltage local distribution facilities. Further, most net metering programs, the tariffs that implement them, and the design and operation of the distribution interconnections and networks make it difficult or impossible for the outflow from net-metered DER to reach the bulk power system.

II. DISCUSSION

6. As a general rule, the design of the distribution system makes it difficult for energy produced by DER participating in net metering programs to reach the transmission system. Most such DER is installed behind retail customers' meters and interconnected with distribution feeders. Distribution networks are designed so that outflow from net-metered DER will not normally reach the bulk power system. For energy produced by such DER to reach the transmission system, the output would have to exceed not only the customer's own load (which is all NERA appears to assume is required), but also exceed the other load being served by the feeder to which the DER is connected, as well as the loads being served by other feeders supplied by the same local distribution substation. Electricity follows physical and scientific laws, and outflow from a DER to its distribution feeder will flow to points of usage along the distribution feeder at customer taps; it will only flow to the nearest distribution substation in the event of oversupply from DER. Normally, any such oversupply is detected and restricted by the utility's relaying system. In cases

where the utility distribution substation accepts additional supply from a DER, the normal path would be out to any of the many other distribution feeders connected with the distribution substation, not further upstream to the facilities that supplies the substation, as long as the feeders and substation have net load.

7. For purposes of explanation, let us examine the case of a single residential customer who installs net metered DER. The customer is interconnected with the local distribution utility and is served by a feeder. That feeder is supplied by a distribution substation, which is interconnected to a network of other distribution substations and feeders serving other customers. Some of these distribution facilities are connected to higher-voltage facilities, which run further "upstream" to eventually connect with a transmission-distribution substation, and the bulk power system.

8. Assume that this particular customer's net metered DER produces more power than the customer is simultaneously consuming for several hours during the afternoon. The excess power will flow through the customer's meter, and onto the distribution feeder that serves the customer. But, distribution feeders typically serve entire neighborhoods as single-phase loads – it would be highly unusual for a feeder to serve just a single customer. When the net-metered customer's DER is producing more power than the customer is consuming, other individual customers on that same feeder will use that excess power. The excess power from the net-metered DER will flow first to the other customers on the local feeder. For the excess power from the net-metered DER to flow beyond that neighborhood feeder, there would need to be a sufficient quantity of power injected to offset the simultaneous consumption of all other customers on the feeder.

9. Typically, local distribution feeders are supplied by other distribution substations and, sometimes, by higher voltage distribution or sub-transmission substations that also supply other feeders but do not feed onto the transmission system. Distribution substations normally connect with many distribution feeders routed to customer loads. It is unlikely that a feeder is supplied directly from the transmission system. If any of the excess energy produced by the net-metered customer's DER did ultimately flow "upstream" past the feeder serving that individual customer, it would then flow "downstream" along other feeders serving other end-use customers. Excess power generated by the net-metered customer's DER would flow further "upstream"

beyond the local distribution substation only if it more than offset all of the consumption of all of the other customers interconnected to that distribution substation. Again, this is unusual not only because of the topology of the grid, but also because the utility and DER relaying and metering systems are intentionally designed to limit DER output to avoid or limit over-production based on the distribution system's needs. Finally, the industry is increasingly considering DER as a potential solution for issues of "transmission constraint," meaning where the transmission grid is inadequate to supply the needs of the customer base at a particular location. One solution is to add DER inside the local distribution system, using the output to displace or defer transmission need by displacing the power that would otherwise have been routed through the transmission system. In these situations, the intent is to prevent DER output from ever reaching the transmission grid.

10. The underlying engineering concepts discussed above in the context of a single customer are applicable to every distribution system. Even if multiple net-metered customers are interconnected to the same feeder, all of their facilities are producing excess energy at the same time, and that cumulative excess energy more than offsets all of the load of other, non-net-metered customers on the same feeder, the cumulative excess would flow first to neighboring distribution feeders.

11. In addition to the inherent implausibility of the assumption that outflows from net-metered DER reach the transmission system, the design of net metering programs, of the implementing tariffs and regulations, and of interconnections, relay protection schemes, and advanced inverter control devices and Smart Metering make it even less likely. Partly as one of the important outcomes of the extensive effort by this Commission and interested parties invested in designing and implementing the FERC Small Generator Interconnection Procedures ("SGIP"), but also as a result of state-jurisdictional rules and operator standards, interconnection procedures all over the country for net-metered systems include steps intended to make sure that unintended backflow is not likely to happen. This further attenuates the potential for the energy produced by small DER at any particular point on the grid to flow onto the bulk power system. In addition, net metering programs typically include limits on the size of individual net metered facilities and/or aggregated limits, and those limits are often set at levels that ensure that the primary purpose of the generation is to offset the individual customer's load, not to produce excess energy in a quantity

that is likely to offset the load of every other customer served by that feeder, let alone upstream distribution facilities.

12. Most, if not all, net metering programs include an interconnection application or review process. Distribution utilities are obligated to evaluate these applications, almost always under the requirements of the IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems, which was initially approved by the IEEE Standards Board in June 2003 and most recently amended in 2018,[1] and is being amended and updated on an ongoing basis. That standard calls on the utility to determine whether the addition of the individual net metered facility could potentially cause power to flow "upstream" through the transformer. If so, the utility is obligated to notify the entity responsible for the facilities on the high-side of the transformer (either the transmission department of a vertically-integrated utility, or the independent transmission owner). Utilities can and do also take affirmative operational steps to limit the potential for backflow of energy from the local distribution system to the bulk power system. These steps may include voltage supervised reclosing on the distribution feeder, or modifications of other relays on the transformer. In more and more cases, smart metering and advanced inverters are being used to accomplish load and load flow control on distribution feeders. Note that, if the backflow were to ever affect any transmission system components, the transmission owners and operators would be notified and have their own opportunities to model, address, and mitigate those possibilities.

13. For all these reasons, I conclude that while excess power could theoretically flow onto the transmission system from a DER, it is not a usual or desired effect, and the overall grid would automatically countermand such an occurrence to maintain grid reliability and performance. As a result, it is highly unlikely that excess power generated by a net metered DER can or will travel "upstream" far enough to enter the bulk power system. For the same reasons, it is not accurate to claim that a general characteristic of net metering programs is that power generated by participating DER flows onto the transmission system.

14. I note three other important implications of the facts I have explained. First, since energy from net metered DER does not generally flow onto bulk power facilities, the transmission

[1] On February 12, 2020, the Board of Directors of NARUC unanimously approved a resolution recommending that state commissions nationwide review and adopt the newly revised IEEE 1547-2018 distributed energy resource interconnection standard.

system will physically "see" net metered DER as local load reduction regardless of how it is billed. Just as the output of a particular customer's DER results in a reduction in the retail load of that customer, when the output of the DER connected to a feeder or other distribution system element does not exceed its total connected load, the result will be a reduction in the flow from the transmission system to supply those distribution facilities. Put another way, flows on the interstate transmission system will be the same when it supplies (i) a feeder with 10 MW of load and 500 kW injection from net metered DER, or (ii) when it supplies a feeder with a 9.5MW of load and no DER.

15. Second, because outflows onto the transmission system from DER participating in net metering programs occur only in atypical circumstances, and because program rules and grid operating practices also in general discourage those flows, net metering customers cannot in general expect that the output of their DER will reach the transmission system.

16. Third, and somewhat obviously, most DER output is intermittent and only available on a limited basis relative to the overall generation supplying the grid. For example, wind power is only available during windy days and solar power is only available during certain hours of the day when cloud cover or other obstructions are minimal. Thus, the amount of power actually released onto the distribution system is a fraction of the actual nameplate rating of any given DER. Utilities can and do react to this. For example, during the morning hours in non-winter months solar can add to the load flow during a peak use time when customers and businesses are starting up for the day. Solar can continue to contribute during the day, and utilities reduce baseload power accordingly to reduce their fuel and operations costs during this time. During most of the year, a second peak in the residential sector occurs when customers come home prepare dinner. This is counteracted by commercial and industrial facilities shutting down for the day, all of which is understood and accounted for by utilites' long experience at performing load flow adjustments, based on well understood usage patterns by their customer bases. Utility power flow is a dynamic procedure that is constantly occurring around the clock, and as DERs are added and removed from the overall load profile, utilities must compensate actively. This process tends too reduce baseload power generation during times when DERs are the most active, reducing the likelihood of DER generation being exported to the transmission grid, confirming that Solar-based DER in particular is essentially used up by local utility customer need.

III. CONCLUSION

17. NERA's Petition assumes energy produced by net metered DER in excess of the host customer's load, in general and across the nation, is sold in interstate commerce. To the extent that this conclusion rests on the premise that such flows generally or routinely reach the interstate transmission system, that assumption is unsupported and incorrect.

18. This concludes my affidavit.

I declare under penalty of perjury that the foregoing is true and correct.

Sam Wheeler

6/13/20
Date

Sam Wheeler
Electrical Engineer, Energy Consultant
Relevant Experience

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Overview

Sam Wheeler is a degreed Electrical Engineer (University of Colorado, 1980) with extensive experience with commercial, industrial and utility electric power. His experience includes:

- Building Commercial, Industrial and Utility electrical design with experience in nearly every utility, industrial and commercial setting, on both sides of the electric meter
- Extensive familiarity with the NEC & NFPA 70E, NESC, API and IEEE Codes and Standards
- Power system cost estimating
- Power quality, ARC Flash, Hazardous locations
- Creating complete drawing packages, written specifications and equipment evaluations
- Troubleshooting electrical system problems

He has specific experience working in nearly every utility, commercial and industrial environment including:

- Oil and gas fields, production, gathering, refineries
- Light and heavy manufacturing – food, automotive, aircraft, injection molding, clean rooms, laboratories
- Data Centers
- Healthcare - hospitals, clinics
- Renewables - wind, PV, energy storage, interconnections
- Utilities – distribution, substations, interconnections

Work History

- 2003 – Present: Sam Wheeler, Energy Consultant, Thornton, CO
- 2000 – 2003: Johnson Controls, Denver, CO
- 1997 – 2000: PSCO/Xcel Energies, Denver, CO
- 1994 – 1997: UtiliCorp United, Pueblo, CO & Kansas City, MO
- 1989 – 1994: The City of Longmont Electric Department, Longmont, CO
- 1984 – 1989: National Center for Atmospheric Research, Boulder, CO
- 1980 – 1984: Rockwell International, Golden, CO (2 time periods)

Related Project Experience – Broad Summary Related to Affidavit
The following is a representative list of Sam Wheeler's engineering experience. It is not a comprehensive list.

- Minnesota Department of Commerce – Independent Engineer – Acted as an Independent reviewer of Solar Energy Farm installations that were being disputed between Solar Farm Companies and Utility in Minnesota. Reviewed Tariffs, Codes, Standards, and best practices and ruled on finding under Minnesota DOC & PUC Guidelines.

- Altairnano Inc., Indianapolis, IN – Consultant - supported large-scale energy storage battery manufacturer, with engineering design, specifications, power system protection, code reviews, technical and safety training, etc., for work on Wind Farm and PV projects, working with utilities HELCO, HECO, and MECO in Hawaii with Hawaiian Natural Energy Institute (HNEI). Also designed grid-interconnection portion of system interconnections and protective relaying, for sites in Illinois, New Jersey, Hawaii, Puerto Rico, El Salvador, China.

- City of Pueblo, Pueblo, CO – Evaluated the Transmission and Distribution systems of the Aquila (formerly West Plains Energy) power system in Southern Colorado for possible sale to the City of Pueblo, Colorado. Part of a team that evaluated the entire assets of Aquila in Colorado, Sam's role concentrated on the transmission, distribution and substation assets of this 12.47 kV to 230 kV system.

- Microgy Inc., Golden, CO – Consultant - designed and supported construction efforts on five (5) utility grid interconnected biogas powered generator sites using manure powered engine-generators to supply power to three different rural utility distribution grids in the States of Wisconsin and Texas.

- Public Service of Colorado/Xcel Energy, CO – Denver CO - Product Development Engineer, direct employee. Developed utility and customer solutions for power quality and system interconnections with industrial customers.

- UtiliCorp-United – International/CO/KS/MS – Senior Engineer – Distribution and Substation design engineer, designed and supported all aspects df distribution, sub-transmission and generation systems across US and foreign asset. Power Quality expert for international utility.

- City of Longmont Electric Department, CO – Senior Engineer - direct employee, Senior Distribution Engineer for municipal utility City's 12.47 kV distribution system, including all aspects of power system design, cost estimating, construction supervision, both overhead and underground

construction. Developed budgets, schedules, equipment specifications and evaluated vendor and contractor bids.

- Sam Wheeler has also done power system equipment, methodology and technology evaluations for DOE, NREL, The World Bank, Xcel Energy, WEL Energy (New Zealand), United Energy (Australia).

Education

- University of Colorado – B.S. Electrical Engineering, 1980
- Certified Power Quality Engineer – Association of Energy Engineers, 1999
- Certified SafeLand Operator – Oil, gas and chemical site safety training – Petroleum Energy Council 2013

Associations

- Member – National Fire Protection Association (NFPA) – Related to National Electric Code – NFPA 70 - NEC and NFPA 70E

Publications

- *Wheeler, Sam*, Etal, Studies for Grid Connection of Variable Renewable Energy Generation Plants, ESMAP Division of the World Bank, July 2019. World Bank technical guidebook covering the studies needed to build and support DER assets internationally.

- *Wheeler, Sam*, Power Quality Monitors, NEC Digest, Vol. 1, pp 50-55, November 2002. Article covering the range of currently available portable power quality and energy monitors.

- *Wheeler, Sam*, Looking Abroad – Retail Utility Services in New Zealand, Power*Value*, Vol. 3, No.8, pp 21-23, March-April 2000. Article on utility approaches to providing services to high tech customers in New Zealand.

- *Wheeler, Sam*, Power Factor - An Old Issue Becomes a New Opportunity, E SOURCE Tech Update, TU-98-1, January 1998.

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