BEFORE THE WASHINGTON

UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION Complainant, v. PACIFICORP dba PACIFIC POWER & LIGHT COMPANY Respondent.	DOCKET NOS. UE-230172 AND UE-210852 *(Consolidated)*

EXHIBIT LM-3

RALPH CAVANAGH, *ENERGY EFFICIENCY AND DECARBONIZATION: PRIORITIES FOR REGULATED UTILITIES*

ON BEHALF OF

NW ENERGY COALITION

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Energy Efficiency and Decarbonization: Priorities for Regulated Utilities
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This essay continues a conversation with electric utilities' leadership about clean energy prospects, which extends over more than four decades. It reflects a shared conviction that America's electric utilities should be essential clean energy partners, and that utilities can thrive if they help ensure the acceleration of a now longstanding transition to a decarbonized economy.

But two essential elements of decarbonization pose particular challenges for traditional utility business models: massive economy-wide acceleration of energy efficiency and demand response for all customer classes, and a diverse portfolio of utility grid enhancements and zero-carbon resource additions requiring long-term investment and cost recovery. To be sure, utilities have always needed a solution to the conflict of interest that cost-effective demand reductions can create between shareholders and customers, along with reasonable assurances of cost recovery for new infrastructure. But the decarbonization imperative raises the stakes massively and exposes worsening inadequacies of the status quo. Regulatory frameworks that work tolerably well under contemporary levels of energy-efficiency and demand flexibility will be increasingly untenable in the decades ahead.

The discussion that follows highlights two overriding priorities:

- Advancing a utility business model that, while fully consistent with traditional regulatory principles, better accommodates cost-effective energy efficiency/demand flexibility EE/DF and other critical parts of the clean energy transition to which most utilities have committed; and

- Reconciling regulators' increasingly dysfunctional EE/DF "cost-effectiveness tests" with more appropriate and accurate measures of life-cycle resource cost-effectiveness in a decarbonizing utility system.

Core assumptions include:

- Despite intermittent claims to the contrary since at least the 1980s, management of electricity grids incorporates key "natural monopoly" features that call for single managers with defined service territories, operating under price regulation.

- Affordable, equitable, and reliable electricity service in a decarbonizing economy depends vitally on harnessing the full capacity of cost-effective energy efficiency and demand response (likely half or more of the total solution in aggregate).

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- AND YET traditional state utility regulation typically has treated utilities as commodity providers whose financial health is tied directly to sustained growth in retail kilowatt-hour sales.

- Well established regulatory principles accommodate a solution to this business model dilemma, which replaces rate caps with revenue caps and allows for multi-year adjustments in those caps between rate cases.

- Attempts to address the business model dilemma with rate caps and/or periodic lost revenue adjustments are not sustainable if energy efficiency and demand flexibility initiatives scale up to the extent required by an affordable clean energy transition.

- Extensive experience demonstrates that regulatory reform is possible through coalition-based advocacy involving diverse interests sharing a stake in an equitable and affordable clean energy future for electricity customers.

I. DECARBONIZATION IMPERATIVES FOR UTILITIES' BUSINESS MODEL

By establishing goals to reduce and eliminate greenhouse gas emissions, America's utilities are aiming to stake out national leadership positions on decarbonization. To cite just one of many examples, Duke Energy in 2019 established a 2030 target of 50% reductions, leading by 2050 to "net zero" emissions. CEO Lynn Good said at the time that "A diverse mix of renewables, nuclear, natural gas, hydro and energy efficiency are all part of this vision, and we'll take advantage of economical solutions to continue that progress."

Of the resource categories on her list, one stands out both in magnitude and cost-effectiveness. In a retrospective look at energy resource contributions to meeting the needs of a growing US economy since 1970, the Bipartisan Policy Center determined that energy efficiency had surpassed all other resources *combined*, including fossil fuels, nuclear power and renewable energy.[2] And forward-looking assessments are united in concluding that this progress, impressive by any measure, can and must accelerate dramatically to achieve decarbonization. For example:

- *IEA, Energy Efficiency 2018* (https://www.iea.org/reports/energy-efficiency-2018): According to the International Energy Agency (IEA), significant investments in energy efficiency could cut global climate pollution by 7.1 Gt CO2-eq annually by 2040, delivering over 40% of the abatement required to be in line with the Paris Agreement. These energy savings would also reduce energy bills for consumers by more than $500 billion dollars per year and cut other hazardous air pollution. Achieving this would require global efficiency spending to double from today's levels by 2025 – and then double again by 2040 – which would result in transportation energy demand remaining flat despite a doubling of miles driven, shipped, or flown by 2040; keep building energy

[2] Bipartisan Policy Center, America's Energy Resurgence (2013), p. VIII ("[O]ver the last four decades, energy savings achieved through improvements in energy productivity have exceeded the contribution from all new supply resources in meeting America's growing energy needs.")

demand flat despite a 60 percent growth in building space; and help industry halve the energy intensity of all goods produced compared to today.

- *The American Council for an Energy Efficiency Economy's* recent findings:

  Energy efficiency can slash US energy use and greenhouse gas emissions by about 50% by 2050, getting us halfway to our national climate goals. We can achieve almost all these savings, worth more than $700 billion in 2050, by dramatically scaling up government policies and [utility] programs.

- *Evolved Energy, 350 ppm Pathway Report for the U.S.*:

  Achieving decarbonization in line with 1.5-degree warming rests on four key strategies or "pillars", including energy efficiency, with the energy intensity of the entire economy dropping to 60% below today's level by 2050.

Decarbonization also requires extensive electrification, but it would be a wrong to assume that somehow this removes the need to shift utilities from a business model linked to commodity sales, or that the value of end-use efficiency is somehow diminished as electrification increases.[3] For example, Amory Lovins's assessment of untapped energy efficiency potential in electric vehicles demonstrates the cost-effective potential to more than triple fleet average miles/kWh.[4] Utilities' financial planning must anticipate the likelihood and need for rapid acceleration of energy efficiency gains in buildings, equipment, industrial processes and transportation. This will further reinforce the case for regulatory reform.

II. BUSINESS MODEL SOLUTIONS

Utilities need a business model optimized for a clean energy transition based in part on exploiting all cost-effective EE/DF, electrifying transportation and buildings efficiently, and taking advantage of flexible demand opportunities in newly electrified end uses. I recommend an approach that makes recovery of multi-year authorized revenue requirements independent of fluctuations in commodity sales.

For more than two decades, advocates of "formula rates" (sometimes called "multi-year rates") and "revenue decoupling" have talked past each other without recognizing that they are

[3] For an extensive NRDC rebuttal to such contentions, see https://www.nrdc.org/experts/max-baumhefner/are-efficiency-and-electrification-policies-conflict.

[4] See AB Lovins, Reframing Automotive Fuel Efficiency, SAE Mobilius (April 16, 2020) [https://saemobilus.sae.org/content/13-01-01-0004], concluding that "efficiency gains achievable by integrative design of whole light-duty vehicles can be severalfold larger, yet cheaper, than those predicted by canonical incremental technology-by-technology analyses. This means that US and international efficiency standards rest on overly conservative analyses; electrification can be cheaper and faster than conventionally assumed; and the efficiency potential predicted by groups like the US National Research Council and assumed in climate-mitigation assessments need major revision, aided by evaluation processes that better assess whole-vehicle design and early signals from concept vehicles."

emphasizing different parts of the same thing. The Regulatory Assistance Project deftly captured the overlap in a classic treatise entitled REVENUE REGULATION AND DECOUPLING (2011). In a "Revenue Functions" chapter (p. 14), the treatise notes that decoupling almost invariably comes with "one or more revenue functions to set allowed revenues between rate cases," allowing annual revenue requirements to change based on indices tied to systemwide service needs and cost trends (as opposed to commodity sales levels), reducing the need for frequent rate cases. That goes to the heart of what "formula rates" aim to achieve, ousting the myopic tyranny of "test years" incapable of looking beyond the last or next twelve months. Decoupling shifts regulatory emphasis from utility rates to utility revenues, and formula rates create a predictable multi-year trajectory for all or part of a utility's revenue requirement.

To cite one of many illustrative cases: in 2013 Puget Sound Energy (PSE) broke through two decades of regulatory paralysis and secured approval of a PSE/NRDC proposal that was equally about formula rates and revenue decoupling, with tailored accommodations for low-income customers (including significant increases in dedicated funding for their energy efficiency and bill assistance programs).[5] The formula rates locked in three percent annual increases in the authorized per-customer electric distribution system revenue requirement for at least three years. The revenue decoupling mechanism covered both residential and non-residential classes (and both electricity and gas revenues).

The PSE decision set the stage for nationwide progress. As of this writing, 18 states and Washington D.C. have at least one investor-owned electric utility with an active revenue decoupling/formula rates mechanism. Most recently, Northwestern Energy, in Montana, received approval to implement a mechanism in December of 2019.[6] A coalition including NRDC, Commonwealth Edison and Ameren achieved wide-ranging clean energy reforms in Illinois, including a revenue decoupling/formula rates package that had languished at the Illinois Commerce Commission for years, along with performance-based energy efficiency incentives for the utilities.[7] Commission action on decoupling/formula rates proposals is pending in New Hampshire, New Mexico, and New Jersey.

In total, 43 investor-owned electric utilities are now decoupled, accounting for about 36% of total revenues for the sector. They serve 41% of all IOU customers, up from a little less than 25% at the end of 2013. These decoupled electric utilities serve 42.3 million electric customers (i.e., accounts) and represent some $84.3 billion in annual revenue and 815 terawatt hours of annual demand. Over 30 publicly-owned utilities are also decoupled, including the Los Angeles Department of Water and Power and Long Island Power Authority, representing about 19% of public power customers and revenues.[8]

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[5] See Washington Utility and Transportation Commission, Dockets UE-121697 & UG-121705 (consolidated), Order 07. Interests of low-income customers are addressed at pp. 75-78, and also figure prominently in a dialogue that I coauthored with consumer advocate John Howat on the equity dimensions of revenue decoupling. R. Cavanagh & J. Howat, Finding Common Ground between Consumer and Environmental Advocates, ElectricityPolicy.com (May 2012).

[6] Montana Public Service Commission, Order No. 7604u, Docket No. 2018.02.012 (Dec. 20, 2019).

[7] For particulars, see https://www.nrdc.org/experts/nick-magrisso/future-energy-jobs-bill-path-illinois-bright-clean-energy-economy.

[8] These data are compiled regularly by my colleague Amanda Levin, NRDC's principal expert witness on revenue decoupling, and the cited totals are current as of December 1, 2020.

But too many utilities still labor under an outmoded commodity-based business model, with strained (if any) energy efficiency accommodations that cannot scale to accommodate significantly expanded EE/DF portfolios. A prominent example is lost revenue adjustment mechanisms (LRAMs), which aim to restore to utilities part or all of the net revenues lost as a result of the savings attributed to their energy efficiency initiatives.

When I work with utilities to assess the LRAM option, I begin with rate impacts. For a typical regulated utility, LRAM compensation for savings averaging just one percent of retail sales per year means double digit annual rate increases within a decade, even though the initial year's impacts are trivial.[9] This reflects the compounding effect of cumulative savings as they build up over time (a typical diversified energy efficiency portfolio yields average savings lifetimes exceeding ten years).

These impacts can be reduced (and usually are) by constraining the quantity and duration of savings for which utilities receive compensation. Frequent rate cases can also help, and some utilities have adroitly navigated LRAM mechanisms without creating destabilizing rate pressures. But the savings involved (typically averaging less than one percent of annual retail sales systemwide) are far below than those needed for aggressive decarbonization.

Meeting utilities' decarbonization goals at affordable costs will require annual electricity savings significantly exceeding one percent of retail sales. Manageable lost revenue adjustments will conspicuously fail to hold utilities harmless for lost sales of that magnitude. And the adjustments will miss altogether savings for which utilities are unable to claim substantial credit, like those associated with government standards and rooftop solar installations. By contrast, full revenue decoupling would eliminate utilities' financial risks from commodity sales fluctuations, whatever the source, while staying within reasonable annual rate impact limits (typically two percent or less historically, with rate adjustments going in both directions).[10] And decoupling would simultaneously remove revenue risks associated with the innovative rate designs that an evolving electricity system needs.

Unlike LRAMs, decoupling puts no automatic upward pressure on utilities' approved revenue requirement. It simply ensures that approved revenues are recovered annually (no more and no less), even if sales volumes diverge from regulators' expectations at the time the revenue

[9] A typical case in the public record involves Puget Sound Energy's (PSE) 2011 General Rate Case. Of PSE's $2.1 billion annual revenue requirement, $500 million/year represented fixed costs of distribution and transmission recovered through volumetric energy and demand charges. NRDC testimony (uncontested by PSE) showed that the "lost revenues" of $5 million/year for the first year's-worth of 1% savings would have ballooned to $140 million/year by year 7 and $225 million/year by year 10, compared to an annual revenue requirement of $2.1 billion. The mathematics are straightforward: $5m + 10m +15m +20m +25m +30m +35m [$140 m/year in year 7] + 40m + 45m + 50 m [$225m/year and growing by year 10].

[10] The definitive empirical assessment of rate impacts of revenue decoupling is Pamela Morgan's multi-year study, covering a decade of nationwide experience involving 49 utilities in 24 states, which can be found on the website of the Regulatory Assistance Project.

requirement is established.[11] And it ensures that any windfall gains from unexpectedly rapid electrification are returned to utility customers in the form of rate reductions, whereas LRAM represents a virtually automatic annual rate increase with no such customer protection feature.

Another approach to revenue decoupling is what Lon Huber calls "Energy Service Subscription Pricing;" one variant offers customers certainty about their monthly utility bills in exchange for installation of energy efficiency and demand flexibility measures, leaving the utility with a strong ongoing incentive to help participating customers minimize and shape consumption (since utility costs increase with no offsetting revenue gains if energy is wasted or used when grids are stressed).[12]

Utilities need to redouble their efforts to secure regulatory reforms across all the states they serve, including but not limited to formula rates and revenue decoupling. But success requires an energized and diverse coalition in each of those states. As noted earlier, recent history provides encouraging examples of regulatory and legislative reforms that united utilities and others with a stake in an equitable, affordable and reliable clean energy transition.

III. COST-EFFECTIVENESS TESTS FOR EE/DF IN A DECARBONIZING UTILITY SYSTEM

Four decades ago, my work with utilities on energy efficiency investments engaged early and often with "cost effectiveness tests" devised by regulators. A common approach was the so-called "no losers test," which required utilities to demonstrate that allowing them cost recovery for an efficiency measure or program would not raise rates for those who chose not to participate. Even savings costing *nothing* routinely failed this test, since the resulting reduction in commodity sales would have required miniscule rate increases to recover fixed costs over a smaller sales base, even as systemwide revenue requirements dropped.

Happily, the "no losers test" (rebranded as the "RIM test") reigns today only in Florida. Other new obstacles have surfaced, however, as regulators wrangle with utilities over how to accommodate a trend toward lower wholesale spot market costs, how and whether to withdraw credit for utility-delivered savings that "might have occurred regardless" (the infamous "net-to-gross" debate), and how to assign economic value to greenhouse gas reductions associated with efficiency measures.

Decades of experience across the nation point to best practices for evaluating the cost-effectiveness of energy efficiency measures and programs. These cost-effectiveness tests should

[11] Unlike lost revenue adjustments, revenue decoupling adds nothing to revenue requirements and puts significantly less sustained upward pressure on electricity costs; indeed, if sales forecasts adopted in conjunction with rate cases prove reasonably accurate, trivial or no rate adjustments are needed to achieve decoupling.

[12] See Lon Huber, Innovations in Pricing: Energy Service Subscription Pricing, NRECA Business and Technology Advisory (February 2019). An obvious question, worthy of rigorous empirical assessment, is whether the efficiency and flexibility gains from such a tradeoff are enough to offset the loss of volumetric pricing in monthly bills to participating customers (although that could be restored to some extent with periodic adjustments in the monthly subscription price, reflecting metered consumption during the fixed billing period).

be designed to help minimize the life-cycle cost to utility customers of the clean energy/decarbonization transition. Wholesale spot market prices are useful for purposes of guiding economic dispatch but should be largely irrelevant to EE/DF resource cost-effectiveness. Short-term energy purchases avoided at wholesale prices are only a portion of the total benefits to utility systems of EE/DF. Emphasis instead should be on the life-cycle cost and resource value of EE/DF compared to alternative long-term generation and other resource acquisitions.

In the "net to gross" debate, the focus should be on verifying savings (and associated carbon pollution reductions) rather than unresolvable causation disputes. Of the various standardized tests that are widely used to assess cost-effectiveness, the Utility Cost Test captures the interest of customers in minimizing system costs associated with utilities' resource portfolios,[13] and the RIM test should be retired once and for all.[14] Cost-effectiveness should be judged at the EE/DF portfolio level, as opposed to individual programs or measures. Programs targeting low-income communities need special treatment. All these issues can be (and are) the subject of whole treatises,[15] but here the key question is how best to go about substituting these widely supported policies for an inconsistent and inadequate patchwork of cost-effectiveness standards. Advocacy for reforms should be fully integrated with systemwide decarbonization plans, which will be an increasingly important vehicle for demonstrating both the value of EE/DF investment and the costs of curtailing it inappropriately.

A good illustration of a successful initiative to secure regional coherence on EE/DF evaluation issues comes from the Pacific Northwest (defined for this purpose as the states of Idaho, Montana, Oregon and Washington, which share a common hydropower system). With strong support from utilities and other stakeholders across the region, a Regional Technical Forum and a Northwest Energy Efficiency Alliance (NEEA) were created to generate a durable consensus on how to design and evaluate cost-effective EE/DF programs. The Forum is a panel of experts who convene regularly to establish and update evaluation criteria under the auspices of a public agency (the Northwest Power and Conservation Council); it is effectively the region's independent bureau of energy efficiency standards. NEEA helps harness the combined purchasing power and experience of a large region's utilities to drive down savings costs and accelerate innovation.

A recent joint NRDC/Dominion Energy effort in Virginia, another long-time outlier on cost-effectiveness, gives hope for progress in defanging even Florida's infamous RIM test. Early in 2018, the Virginia legislature paired Dominion's multi-year grid modernization plan with a ten-year energy efficiency investment commitment of at least $870 million and an explicit acknowledgment that programs need not pass the RIM test in order to secure regulatory approval (indeed, the statute provides that programs must be approved if they pass the other three tests). The State Corporation Commission has rejected no Dominion EE/DF program proposals in the period since the statute's enactment, and the newly approved programs have significantly

[13] The Idaho PUC agreed, for all the right reasons, in a recent order (see pp. 8-9).
[14] Most states long ago abandoned RIM and use either the TRC Test, the Utility Cost Test, or the Societal Cost Test as the primary means to determine cost-effectiveness; each of these tests compares the levelized cost of saved kilowatt-hours with those of displaced generation. Only the RIM test treats reduced utility revenues from lower electricity sales as a "cost" of energy efficiency measures for purposes of determining cost-effectiveness.
[15] See, e.g., The National Standard Practice Manual (NSPM).

augmented electricity savings. Indeed, a Residential Efficient Products Marketplace program approved in May 2019 ended up providing over 50 percent of the net annualized savings for the Company's entire EE portfolio in Virginia during that year.[16]

CONCLUSION

The issues addressed in this chapter go to the heart of reaching utilities' decarbonization goals without compromising affordability or reliability. The result would be in the very best tradition of "regulation in the public interest."[17]

[16] See Dominion's Company's 2020 EE EM&V Report. available at https://scc.virginia.gov/docketsearch/DOCS/4mxt01!.PDF.

[17] For an excellent review of the history and contemporary context of this term, which figures prominently in the legal foundations of state utility regulation, see Scott Hempling's September 2017 essay: https://www.scotthemplinglaw.com/essays/the-public-interest-who-has-a-definition.