American Council for an Energy-Efficient Economy
529 14th Street, N. W., Suite 600 Washington, D.C. 20045 202.507.4000 202.429.2248 www.aceee.org

October 22, 2018

Chairman Brown
Vice Chairman Place
Commissioner Coleman
Commissioner Kennard
Commissioner Sweet
Pennsylvania Public Utilities Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Alternative Ratemaking Methodologies, Docket No. M-2015-2518883.

Dear Chairman Brown and fellow Commissioners:

The American Council for an Energy-Efficient Economy (ACEEE) welcomes the opportunity to provide further comments on the proceeding on alterative ratemaking methodologies within Docket No. M-2015-2518883. ACEEE appreciates the Commission's interest in exploring issues associated with alternative ratemaking and the Commission's leadership in implementation and support of the Act 129 energy efficiency programs. Given recent legislative activity, and in response to the Commission's Proposed Policy Statement Order issued on May 23, 2018, we would like to reiterate and expand upon comments we previously submitted to the Commission focused on the important link between alternative ratemaking approaches and energy efficiency.

Act 58, enacted into law in June 2018, confirms authority of the Public Utility Commission to approve full revenue decoupling and utility performance incentives. The law notes that "the commission may approve an application by a utility in a base rate proceeding to establish alternative rates and rate mechanisms including, but not limited to… decoupling mechanisms, performance-based rates… or rates based on a combination of more than one of the mechanisms... or other ratemaking mechanisms."[1] With the passage of this new law, the Commission should take steps to align ratemaking with "the efficient consumption of utility service."[2]

Our comments focus on issues related to alternative ratemaking and the Commonwealth's energy efficiency goals. Research demonstrates energy efficiency programs are on average the least cost resource available to electric utilities nationally,[3] and are consistent with the Commonwealth's stated

[1] Title 66 § 1330

[2] *Ibid.*

[3] LBNL June 2018: *The Cost of Saving Electricity Through Energy Efficiency Programs Funded by Utility Customers: 2009–2015*.

priorities of security, reliability, and availability of utility infrastructure as well as efficient consumption of utility service. Research also demonstrates the substantial value of energy efficiency to reduce system costs and defer the need to invest in costly distribution and transmission infrastructure.[4] As we have discussed in previous comments to the Commission, well-designed electric rates and utility business model approaches can be a useful complementary policy tool to encourage energy efficiency. Meanwhile, poorly designed utility business models can discourage utility investments in energy efficiency in favor of more costly investments in distribution and transmission infrastructure and generation assets.

Based on many years of research, ACEEE has identified three regulatory tools that work best together to drive utility energy efficiency performance and to achieve statutory energy savings targets such as those in Act 129.[5] These mechanisms help to align the utility business model with the achievement of energy efficiency savings targets. The three components are program cost recovery, revenue decoupling, and performance incentives that provide meaningful earnings opportunities for achieving energy savings.[6] These regulatory policies combine to address three primary financial concerns utilities face regarding customer energy efficiency programs: (1) recovery of program expenses, (2) removal of the throughput incentive (revenues and profits increase with higher energy sales), and (3) provision of earnings opportunities for shareholders, similar to electric supply-side investments. ACEEE recently prepared a technical memo for the PA PUC on these topics and attach that as Appendix A for further background on national trends for these energy efficiency policies including performance data.

In our May 31 comments to the PUC, we included several recommendations focused on the three regulatory tools to drive efficiency and considerations for rate structures that can influence efficiency.[7] Below, we make five recommendations to the Commission as it finalizes and implements its Policy Statement Order, and in light of Act 58's passage. We recommend the PUC:

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[3] Molina, M. and G. Relf 2018. *Does Efficiency Still Deliver the Biggest Bang for Our Buck? A Review of Cost of Saved Energy for US Electric Utilities.* American Council for an Energy-Efficient Economy. Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings.

[4] Neme, C. and J. Grevatt. 2016. *Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments.* Energy Futures Group, prepared for the Northeast Energy Efficiency Partnerships. neep.org/sites/default/files/products/EMV-Forum-Geo-Targeting_Final_2015-01-20.pdf.

[5] We have at times referred to these as the "3-legged stool" for supporting utility energy efficiency programs, such as in York, D., and M. Kushler. 2011. *The Old Model Isn't Working: Creating the Energy Utility for the 21st Century*. Washington, DC: ACEEE. http://aceee.org/white-paper/the-old-model-isnt-working.

[6] Additional resources documenting ACEEE research findings and policy recommendations regarding utility business models that encourage energy efficiency include Kushler, M. and M. Molina. 2015. *Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future*. White paper. Washington, DC: American Council for an Energy-Efficient Economy. http://aceee.org/policies-matter-creating-foundation-energy ; ACEEE policy brief. 2014. *Utility Initiatives: Alternative Business Models and Incentive Mechanisms.* http://aceee.org/policy-brief/utility-initiatives-alternative-business-models-and-incen ; York, D., M. Kushler, S. Hayes, S. Sienkowski, and C. Bell, ACEEE and S. Kihm, Energy Center of Wisconsin. 2013. *Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation*. Washington, DC: ACEEE. http://aceee.org/sites/default/files/publications/researchreports/u133.pdf

[7] http://www.puc.state.pa.us/pcdocs/1523033.pdf

1. Provide guidance and invite proposals from utilities, within the timeframe specified by Act 58, for full revenue decoupling for gas and electric utilities in Pennsylvania. This policy balances the interests of utilities and customers by ensuring cost recovery while still promoting customer investment in cost effective energy efficiency. The PUC should approve full revenue decoupling for utilities that follow the commission's guidelines.

2. Provide guidance and invite proposals from utilities in Pennsylvania, within the timeframe specified by Act 58, for performance incentive mechanisms that are aligned with energy efficiency savings performance within Act 129 proceedings, as well as for gas utilities that commit to and achieve energy savings goals. The PUC should approve performance incentive mechanisms for utilities that follow the commission's guidance.

3. Carefully consider the impact of alternative rate designs on the implementation of other state policy goals, such as the energy efficiency targets and low-income savings goals outlined in Act 129.

4. Reject increases to customer charges beyond those determined using the basic customer method. The basic customer method is cost based, equitable to all customers, and provides price signals to customers to use energy efficiently.

5. Consider proposals for critical peak pricing and reject demand charges on residential customers.

I. FULL REVENUE DECOUPLING

In section § 69.3303. Illustration of possible distribution ratemaking and rate design options for the energy industry, the Proposed Order includes an example of a natural gas distribution company proposal for a weather normalization adjustment and/or revenue per customer ratemaking proposal, and offers guidelines for addressing consumer protections and rate classes included in the proposal.

ACEEE supports full revenue decoupling for both electric and gas utilities. Adoption of full revenue decoupling has increased in recent years, and currently electric utilities in 15 states and the District of Columbia and gas utilities in 23 states are fully decoupled.[8] ACEEE supports the use of full revenue decoupling to ensure utilities are able to recover authorized costs. We define full revenue decoupling as a decoupling mechanism which adjusts utility revenues on a periodic basis to ensure a utility does not over or under recover commission authorized revenues. We do not include lost revenue, weather, or other partial decoupling mechanisms in this definition. [9] This is consistent with the definition laid out in Act 58, which defines decoupling as "a rate mechanism that reconciles authorized distribution rates or revenues for differences between the projected sales used to set rates and actual sales, which may include, but not be limited to, adjustments resulting from fluctuations in the number of customers

[8] Berg, W. et al. 2018. "The 2018 State Energy Efficiency Scorecard." ACEEE. https://aceee.org/research-report/u1808.

[9] ACEEE research has found that lost revenue adjustment mechanisms, which are not symmetrical and allow a utility to recover revenues that are reduced specifically as a result of energy efficiency programs, are less effective than full decoupling as they do not remove the throughput incentive. We detail these findings in Gilleo, A. et al. 2015. *Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms.* https://aceee.org/research-report/u1503.

served and other adjustments deemed appropriate by the commission." As we reported in our technical memo to the Commission (Appendix A), we see a strong correlation between states achieving high savings results and those employing full revenue decoupling. States with both electricity savings targets and decoupling achieved energy savings averaging 1.6% of MWh sales in 2016. Pennsylvania and other states with electricity savings targets but no decoupling saved only half as much, 0.8% of sales.

Full revenue decoupling also effectively balances risk between a utility and its customers. Utilities are protected from under recovery of revenues while customers are protected from over recovery. Revenue decoupling is a mechanism that alleviates utility concerns of revenue erosion and cost recovery. Included in our May 31 comments is a comprehensive national evaluation of the rate and bill impacts for decoupling mechanisms, which shows that bill impacts have been minimal (typically resulting in surcharges or credits within 2% of the retail rate).

The second paper included in our May comments is from the Regulatory Assistance Project and lays out how to best design a full revenue decoupling mechanism that meets a specific state's policy goals. This paper outlines key decision points that regulators face when designing a decoupling mechanism. With the passage of Act 58, we recommend that the commission proactively address these framework questions before inviting proposals from electric and gas utilities. While we agree that the Commission need not be prescriptive, we do suggest that the Commission provide timely guidance on key elements, including the maximum number of years allowable between rate cases and expectations for the frequency of true-ups. Laying out specific elements included in a decoupling regime will ensure that proposals are comprehensive and effectively address Commission priorities.

Recommendation: Within the timeframe specified in Act 58, provide guidance and invite proposals from utilities for full revenue decoupling for gas and electric utilities in Pennsylvania. This policy balances the interests of utilities and customers by ensuring cost recovery while still promoting customer investment in cost effective energy efficiency. The PUC should approve full revenue decoupling for utilities that follow the Commission's guidelines.

II. UTILITY PERFORMANCE INCENTIVES ALIGNED WITH ENERGY EFFICIENCY

In section § 69.3303. Illustration of possible distribution ratemaking and rate design options for the energy industry, the Proposed Order offers examples of alternative rate design methodologies and instructs utilities to include these proposals in base rate case proceedings.

While including these proposals in base rate case proceedings will make sense for rate design proposals, the inclusion of other kinds of alternative ratemaking methodologies may be challenging for the Commission's efforts to coordinate between Act 129 filings and the electric distribution companies' base rate cases. We propose that the final Order recognize this timing challenge, and allow for the proposal of incentives related to Act 129 in the Act 129 proceeding.

We note that financial incentives for energy efficiency need not be limited to electric utilities, however. Gas utilities in 17 states also have performance incentives.[10] While gas utilities operate outside of the

[10] Berg, W. et al. 2018.

Act 129 framework, we recommend that the Commission consider how performance incentives can effectively drive energy efficiency programs for gas customers across the Commonwealth by pairing performance incentives with energy savings targets.

ACEEE strongly supports the use of financial incentives to drive utility performance in energy efficiency programs. Performance incentives are a useful policy instrument that allow the PUC an opportunity to use financial rewards to meet specific policy goals, such as higher energy savings or seasonal peak demand reduction. We recommend a careful approach to developing a performance incentive. Performance incentives should be linked to verified energy savings, not spending. Performance incentives should be set in conjunction with specific energy savings targets and based on tiers of performance, awarding utilities that surpass targets. Finally, performance incentives should be capped at a reasonable amount to secure management attention and drive efficiency savings for customers.

Recommendation: Within the timeframe specified in Act 58, provide guidance and invite proposals from utilities for performance incentive mechanisms that are aligned with energy efficiency savings performance within Act 129 proceedings as well as for gas utilities that wish to adopt energy savings goals. The PUC should approve performance incentive mechanisms for utilities that follow the commission's guidance.

III. ALIGNING RATE DESIGN APPROACHES WITH GOALS OF ACT 129 AND ACT 58

Section § 69.3302. Distribution rate considerations of the proposed policy statement offers a useful set of factors for the Commission to consider when determining just and reasonable rates. Rate design changes should always be based on sound, comprehensive, and transparent analysis, which begins with a clear articulation of the policy principles regulators intend to use to assess new rate proposals.

ACEEE specifically applauds the inclusion of three factors for the Commission to consider in determining just and reasonable distribution rates:

" (5) How the rates limit or eliminate disincentives for the promotion of efficiency programs.
(6) How the rates impact customer incentives to employ efficiency measures and distributed energy resources.
(7) How the rates impact low-income customers and support consumer assistance programs."

Energy efficiency generates significant benefits for individual customers, the utility system, and the broader society affected by the utility sector. As we noted in our May 31 comments, rate design approaches that rely on high fixed charges are in direct conflict with the energy efficiency and conservation goals in Act 129. They are also in conflict with Act 58's stated goal of efficient use of utility services. This is due to the fact that establishing higher fixed charges results in lower per-unit energy charges, which reduces the "price signal" to customers to be energy efficient. Because energy efficiency is in the public interest, principles of rate design should encourage efficient use of energy through usage-based price signals.

In addition, energy efficiency can support energy affordability and reduce the energy burden of low income customers, a key goal of Act 129. Research shows that low-income, African American, Latino,

and renters pay up to three times more than the average household on home energy costs.[11] Energy efficiency programs for low-income households help address energy affordability by providing building upgrades that can reduce household energy burden over the long term. Given the importance of addressing energy affordability for low-income Pennsylvanians in cities and rural counties, assessment of rate designs should consider their impact on low income customers.

Recommendation: Carefully consider the impact of alternative rate designs on the implementation of other state policy goals, such as the energy efficiency targets outlined in Act 129 and the focus on innovation and the efficient use of utility services laid out in Act 58. We recommend the Commission pay particular attention to the potential impacts of alternative rate designs on low-income customers.

IV. HIGHER CUSTOMER CHARGES

The Proposed Order notes that the examples are purely illustrative. ACEEE's review of the example for an electric distribution company reveals important principles that we recommend the Commission consider in the final Policy Statement Order.

First, the proposal restricts the fixed customer charge to "metering, final line transformer, and service drop cost recovery." ACEEE recommends limiting customer charges to include only costs associated with billing, customer service, meters, and service drops, excluding any distribution system costs such the final line transformer.[12] This approach simplifies calculation of the customer charge, ensures equity, and provides a stronger price signal to conserve. Our analysis demonstrates that increased customer charges often adversely impact payback periods for energy efficiency measures.[13] There are two mechanisms that produce this result. If a higher portion of a customer's utility bill is fixed, any actions taken to use energy more efficiently will have less impact on the total bill. Increasing fixed charges will limit customer control over energy costs and therefore discourage energy efficiency. In addition, high customer charges raise equity concerns by penalizing those who have already successfully invested in energy efficiency and those customers who use less electricity in the first place, including many low-income customers.

Recommendation: The Pennsylvania Public Utilities Commission should reject utility proposals for higher customer charges and implement a policy of only accepting the basic customer method to determine this charge. This method is tested, cost based, equitable, and aligns with other state policy goals of promoting energy efficiency.

V. CRITICAL PEAK PRICING VERSUS RESIDENTIAL DEMAND CHARGES

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[11] Drehobl, A. et al. 2016. "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities." ACEEE. https://aceee.org/research-report/u1602

[12] Whited, M. et. al. 2017. *The Ratemaking Process.* Synapse Energy Economics. http://www.synapse-energy.com/sites/default/files/Ratemaking-Fundamentals-FactSheet.pdf

[13] Baatz, B. 2017. *Rate Design Matters: The Intersection of Residential Rate Design and Energy Efficiency*. ACEEE. https://aceee.org/research-report/u1703

We also note the example's focus on demand or critical peak volumetric price components that reflect "usage over the local or nodal substations, feeders, and other related distribution system components during localized peak usage periods." The Proposed Order offers this example for illustrative purposes. However, we highlight the existing body of evidence on time-varying rates (including critical peak pricing) and demand charges that finds critical peak pricing is a more appropriate option for alignment with energy efficiency, particularly for residential customers.

Critical peak pricing is one of a class of time-varying rates, which more accurately reflect cost by varying time of day. Critical peak pricing mechanisms charge customers higher prices for a limited number of days a year when system costs are highest. They address capacity costs by making the usage rate customers pay for electricity lower during times of low demand, such as in the middle of the night, and higher when there is more demand on the system. There is a strong body of evidence that demonstrates that these price signals can motivate customers to alter usage patterns in a way that reduces both demand and overall energy usage.[14] However, customer enrollment for critical peak periods can be a challenge if the number of periods is too frequent.

In contrast, customers with demand charges pay a fee based on their usage during a pre-defined peak period or their period of highest consumption. There is less evidence on how a mandatory or default residential demand charge rate affects overall consumption, peak demand reductions, or customer enrollment. A 2016 review of alternative rate designs found that "limited empirical evidence is available to provide insight on the efficacy or impact of demand charges on any desired outcome beyond cost recovery,"[15] Further, our research demonstrates some risk to customer incentives to employ efficiency measures from demand charges; they produce the longest payback periods among all the energy efficiency measures we reviewed.[16]

Research supports how critical peak prices may be more effective at reducing demand than demand charges, and are also less likely to risk significant disincentives for energy efficiency.

Recommendation: The PUC should reject any proposals for mandatory residential demand charges. We recommend the Commission consider critical peak pricing, which may achieve the same goals while minimizing the risk to customers.

Sincerely,

Annie Gilleo
Senior Manager, State Policy
ACEEE

Rachel Gold
Senior Utilities Program Manager
ACEEE

[14] Our analysis reviewed 13 critical peak pricing studies, where the average and median peak demand reduction was 23%.

[15] Chitkara et al. 2016. *A Review of Alternative Rate Designs.* RMI. https://rmi.org/wp-content/uploads/2017/04/A-Review-of-Alternative-Rate-Designs-2016.pdf

[16] *Baatz 2017.*

Appendix A

TO: Chairman Brown, Vice Chairman Place, Commissioner Coleman, Commissioner Kennard, and Commissioner Sweet, Pennsylvania Public Utility Commission

FROM: American Council for an Energy-Efficient Economy

DATE: April 23, 2018

SUBJECT: Assessment of Pennsylvania Electric Utility Business Models

The American Council for an Energy-Efficient Economy (ACEEE) welcomes the opportunity to provide this assessment of Pennsylvania electric utility business models as they relate to energy efficiency. ACEEE developed this technical brief in response to the Pennsylvania Public Utilities Commission's (PUC) request for comparison of the Pennsylvania models and practices with those used in other states.

The Commission is reviewing business models used by Pennsylvania utilities to determine if there are better and more cost-effective best practices that should be recommended for consideration in subsequent phases of the Act 129 program. One purpose of this comparison and assessment is to support and augment the Commission staff's capability to analyze these issues. A second purpose is to provide a framework to consider how future phases of Act 129 might best be implemented.

Based on many years of research, ACEEE has identified three regulatory tools that work best together to drive utility energy efficiency performance and to achieve statutory energy savings targets such as those in Act 129.[1] These mechanisms help to align the utility business model with the achievement of energy efficiency savings targets. The three components are program cost recovery, revenue decoupling, and performance incentives that provide meaningful earnings opportunities for achieving energy savings.[2] These regulatory policies combine to address three primary financial concerns utilities face regarding customer energy efficiency programs; (1) recovery of program expenses, (2) removal of the throughput incentive (revenues and profits increase with higher energy sales), and (3) provision of earnings opportunities for shareholders, similar to electric supply-side investments.[3]

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[1] We have at times referred to these as the "3-legged stool" for supporting utility energy efficiency programs, such as in York, D., and M. Kushler. 2011. *The Old Model Isn't Working: Creating the Energy Utility for the 21st Century*. Washington, DC: ACEEE. http://aceee.org/white-paper/the-old-model-isnt-working.

[2] Additional resources documenting ACEEE research findings and policy recommendations regarding utility business models that encourage energy efficiency include Kushler, M. and M. Molina. 2015. *Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future*. White paper. Washington, DC: American Council for an Energy-Efficient Economy. http://aceee.org/policies-matter-creating-foundation-energy; ACEEE policy brief. 2014. *Utility Initiatives: Alternative Business Models and Incentive Mechanisms*. http://aceee.org/policy-brief/utility-initiatives-alternative-business-models-and-incen; York, D., M. Kushler, S. Hayes, S. Sienkowski, and C. Bell, ACEEE and S. Kihm, Energy Center of Wisconsin. 2013. *Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation*. Washington, DC: American Council for an Energy-Efficient Economy. http://aceee.org/sites/default/files/publications/researchreports/u133.pdf

[3] Kushler, M. and M. Molina. *Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future*. White paper. Washington, DC: American Council for an Energy-Efficient Economy. http://aceee.org/policies-matter-creating-foundation-energy

The remainder of this document is organized as follows. First, we provide a summary description of our understanding of the policy framework for utility energy efficiency programs in Pennsylvania (i.e., Act 129 and associated regulations). In the second section, we compare Pennsylvania's policy framework and electric utility energy efficiency performance results to other states'. In that section, we show how Pennsylvania compares to other states regarding the existence and nature of the key policy features (i.e., energy efficiency resource standards (EERS), program cost recovery mechanisms, revenue decoupling, and performance incentives) and in terms of utility energy efficiency savings results. In the third section, we discuss the results of our analysis and offer suggestions for possible improvements for future phases of Act 129.

THE CURRENT PENNSYLVANIA ENERGY EFFICIENCY POLICY FRAMEWORK

Pennsylvania Act 129

Act 129 provides the basic policy framework for utility energy efficiency programs in Pennsylvania. Act 129 meets ACEEE's definition of an energy efficiency resource standard (EERS): it requires utilities to obtain specific, long-term (three years or more) energy savings levels through customer energy efficiency programs.

With regard to the three basic components of the "3-legged stool" for energy efficiency program support, Act 129 contains the following:

- *Cost recovery*: Act 129 directs the Commission to establish cost recovery mechanisms for each electric distribution company (EDC) that recover all energy efficiency program costs. The mechanisms are similar to other states with EERS. However the statute sets a cap on energy efficiency program spending:

  "Limitation on costs.--the total cost of any plan required under this section shall not exceed 2% of the electric distribution company's total annual revenue as of December 31, 2006." [Section 2 (G)]

- *Decoupling*: Act 129 appears to preclude a utility from utilizing decoupling:

  "*Except as set forth in paragraph (3) [i.e., a rate case], decreased revenues of an electric distribution company due to reduced energy consumption or changes in energy demand shall not be a recoverable cost under a reconcilable automatic adjustment clause." [Section 2 (K) (2)]*

  Some parties have argued that there may be some flexibility for PUC discretion regarding decoupling-type approaches under current statutes.[4]

- *Performance Incentives*: We were unable to find any reference to utility company incentives for energy efficiency performance in the energy efficiency section of Act 129.[5] Various parties

[4] E.g., see Comments of the Keystone Energy Efficiency Alliance (et.al.), in the En Banc hearings, Docket No. M-2015-251883 March 16, 2016.

[5] It should be noted that Act 129 does contain provisions for a financial penalty to be assessed on a utility for failing to achieve the required energy savings. States with EERS policies have generally not utilized penalties. While penalties can encourage utilities to avoid failure, they do not reward excellent performance above the minimum. Moreover they can cause utilities to seek to minimize risk by advocating for lower energy-savings targets or for having no EERS targets at all.

have argued that the PUC has authority to establish incentives for utility energy efficiency performance under current statutes.[6]

Policy Framework Summary

Pennsylvania has an energy efficiency resource standard specifying energy savings targets for electric utilities. It also has a designated cost-recovery mechanism, albeit with a spending cap. Pennsylvania does not currently use two of the primary regulatory tools for aligning utility business models with achievement of energy savings targets: revenue decoupling and performance incentives for EDCs.

Pennsylvania Policy Framework and Energy Efficiency Performance Compared to Other States

In this section we compare Pennsylvania's policy framework to other states, on four key policy criteria: (1) presence of an energy efficiency resource standard (EERS); (2) presence and nature of cost recovery provisions; (3) revenue decoupling; and (4) incentives for utility energy efficiency performance. We also compare Pennsylvania to other states on energy efficiency performance, using 2016 electricity savings as a percent of retail sales as a metric.

The Importance of a Policy Framework

Absent specific policy provisions to support and/or require utility energy efficiency programs, the default condition under traditional cost-of-service regulation is to support a utility business model that rewards utilities for increasing sales and revenues. That approach foregoes the cost-effective energy savings and the economic and other benefits of increased energy efficiency.[7] The core objective of policy provisions to encourage utility energy efficiency action is to counteract the effects of those disincentives for promoting customer energy efficiency that are inherent in traditional regulation.

Energy Efficiency Resource Standards

The most effective policy instrument to facilitate substantial utility energy efficiency efforts and achievements is an energy efficiency resource standard.[8] An EERS is a binding energy savings target for utilities or third-party program administrators of at least three years, with savings to be achieved through energy efficiency programs for customers.[9] Twenty-six states currently have an EERS in place.[10]

Pennsylvania is one of these states, with Act 129 requiring the seven major EDCs to develop energy efficiency and conservation plans and administer cost-effective energy efficiency programs to achieve

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[6] E.g., see Comments of the Keystone Energy Efficiency Alliance (et.al.), in the En Banc hearings, March 16, 2016; and Legal Comments of NRDC in Docket No. M-2015-251883, May 25, 2017.

[7] E.g., reduced environmental emissions, increased local employment, and improved business productivity.

[8] Kushler, M. 2014. "IRP vs. EERS: There's one clear winner among state energy efficiency policies." Blog post. December 16, 2014. http://aceee.org/blog/2014/12/irp-vs-eers-there%E2%80%99s-one-clear-winner-

[9] ACEEE policy brief. "State Energy Efficiency Resource Standards (EERS)." January 2017. http://aceee.org/sites/default/files/state-eers-0117.pdf

[10] It is noteworthy that states tend to be successful at achieving their EERS savings targets. In 2011, 24 of 26 states saved 80% or more of target. In 2012, 25 of 26 states saved 80% or more of that year's energy savings target. In aggregate across the nation, states with an EERS hit 110% of the total MWh savings target. (See: Downs, A. and C. Cui. 2014. *Energy Efficiency Resource Standards: A New Progress Report on State Experience*. Washington, DC: ACEEE. http://aceee.org/research-report/u1403)

the required minimum savings levels. Phase III implementation of Act 129 includes targets for each EDC over a five-year period. Pennsylvania energy savings targets are lower than those of most other states with an EERS. Averaging targets across the Pennsylvania EDCs, the total savings requirement is about 0.8% incremental electricity savings per year.[11] As shown in table 1, Pennsylvania ranks 21st in approximate average annual electric savings targets as a percentage of retails sales, for the years 2016-2020.

Table 1. Comparison of average annual incremental savings targets among states with EERS

Rank	State	Approx. annual electric savings target (2016-2020)	Approx. % electric retail sales covered by EERS
1	Massachusetts	2.9%	86%
2	Rhode Island	2.6%	99%
3	Arizona	2.5%	56%
4	Maine	2.4%	100%
5	Vermont	2.1%	100%
6	Maryland	2.0%	100%
7	Illinois	1.7%	89%
8	Connecticut	1.5%	93%
9	Minnesota	1.5%	86%
10	Washington	1.5%	79%
11	Hawaii	1.4%	100%
12	Colorado	1.3%	57%
13	Oregon	1.3%	69%
14	California	1.2%	78%
15	Iowa	1.2%	74%
16	Michigan	1.0%	100%
17	New Hampshire	1.0%	100%
18	Ohio	1.0%	89%
19	Arkansas	0.9%	53%
20	Wisconsin	0.8%	100%
21	**Pennsylvania**	0.8%	97%
22	New York	0.7%	100%
23	New Mexico	0.6%	68%
24	Nevada	0.4%	62%

[11] Pennsylvania Public Utility Commission. 2015. Energy Efficiency and Conservation Program Docket No. M 2014-2424864 Implementation Order. Table 6, p. 51. http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx

Rank	State	Approx. annual electric savings target (2016-2020)	Approx. % electric retail sales covered by EERS
25	North Carolina	0.4%	99%
26	Texas	0.1%	70%
	Average	**1.3%**	

Source: ACEEE State Scorecard 2017

Pennsylvania ranks in the bottom quartile of energy savings targets among states with an EERS. It should be noted that advancing on this savings metric would be difficult under the existing 2% cost cap, which restricts EDCs from expanding program offerings and increasing the funding of customer incentives for energy savings. We compare Pennsylvania 2016 program spending with other states in the next section of this document.

Program Cost Recovery

The function of program cost recovery is to ensure that utilities are made whole for energy efficiency program direct costs. All states that require regulated electric utilities to offer energy efficiency programs also have program cost-recovery mechanisms in place. While having these mechanisms is a prerequisite for energy efficiency in cost-of-service regulation, the type of cost-recovery mechanism is not a primary driver of increased energy savings. The Act 129 implementation orders require EDCs to include a proposed cost-recovery tariff mechanism in their Energy Efficiency and Conservation (EE&C) program plan filings. EDCs' energy efficiency program costs are recovered annually and trued-up to actual costs each year. The Act requires all EDCs to recover all costs incurred on a full and current basis from customers through a reconcilable adjustment clause.

Pennsylvania's energy efficiency program cost-recovery mechanisms are similar to those of other states. ACEEE collected 2017 data on 41 large regulated electric utilities in 30 states (not all utilities responded to each question in the data request). Twenty-seven of 34 utilities responding to the question have one-year collection periods, the same as Pennsylvania EDCs. Of the 38 utilities responding to the question, 25 use a rider, tracker, or public benefits charge on customer bills as the cost-recovery mechanism. The terminology and definitions of the fees and charges vary by state. Pennsylvania uses a reconcilable rider mechanism. The remaining 13 utilities recover costs though base rates or a combination of mechanisms.

Table 2 provides examples of utility cost-recovery mechanisms applicable to specific utilities in other states. In some cases, the collection mechanism funds not only program cost recovery but also performance incentives, lost revenue adjustments, annual adjustments to true-up collections with actual costs, or other costs.

Table 2. Examples of energy efficiency cost recovery mechanisms

Utility State Type of cost-recovery mechanism	Description of cost-recovery mechanism
Ameren Missouri Missouri Rider	Program costs are recovered in the year they occur through the Energy Efficiency Investment Charge (Rider EEIC). The charge appears on customer bills as "Energy Efficiency Invest Chg." The 2016-18 EE Plan, approved in 2014, notes that the "rider will be based on annual collection of 100% of the forecasted program costs and 100% of the forecasted throughput disincentive collected contemporaneously with their incurrence, with true-ups to match billed revenues to the costs and throughput disincentive experienced." Since this mechanism also addresses the throughput disincentive, collections go beyond basic program cost recovery.
Arizona Public Service Arizona Combination of base rates and DSM adjustment charge	APS collects most program costs through the DSM Adjustment Charge (DSMAC). In addition, the utility collects $10 million annually through base rates. DSMAC is included in another charge on customer bills.
Centerpoint Texas Rider	Centerpoint recovers program costs as one component of charges called the Energy Efficiency Cost Recovery Factor (EECRF). The EECRF is calculated annually to equal, by rate class, the sum of forecasted energy efficiency costs, adjustment for past over- or under-recovery, performance incentives, any previous year's EECRF proceeding rate case expenses, and EM&V costs; divided by the forecasted billing units for each class.
ConEdison New York In base rates or in surcharges, varies by program	For programs recovering costs through rates, direct program costs are amortized over the collection period (~10 years). Labor and indirect program costs are recovered through base rates. For programs recovering costs through surcharges, the surcharge authorizes an annual collection amount that creates a liability on collection. When direct program costs are incurred, they are booked against the liability. Labor and indirect program costs are recovered through base rates.
Dominion Energy Virginia Rate adjustment clause including margin	The utility may petition for an adjustment clause up to once per year for the projected and actual costs to design, implement, and operate energy efficiency programs, including a margin to be recovered on operating expenses, equal to the general rate of return on common equity.
Eversource Connecticut Public benefits charges collected on customer bills	Ratepayer contributions to the EE fund are collected on the program year/period that the funds are expensed. However in the instances when the EE fund account has an unspent balance, the carryover amount is transferred to the following program year.

Utility State Type of cost-recovery mechanism	Description of cost-recovery mechanism
NIPSCO Indiana Tracker with annual true-up	Through a tracker mechanism, costs are recovered annually by including an estimate of costs for the upcoming 12 months and an adjustment for a reconciliation of previously estimated costs with the actual costs that occurred for the previous 12 months, including a true-up of lost revenues based on evaluation, measurement, and verification of program savings.
PPL Electric Utilities Pennsylvania Rider with annual true-up	Costs are recovered through a reconcilable rider mechanism that trues-up to actual expenses each year.
Public Service (Xcel Energy) Colorado In base rates and rider adjustments	Approximately $89 million of annual DSM costs are recovered through base rates, with any spending over or under this amount adjusted through the DSM Cost Adjustment rider. Any incentive and disincentive value is included in this cost recovery.
We Energies Wisconsin In base rates	The Public Service Commission of Wisconsin requires energy efficiency/conservation program costs to be trued-up through escrow accounting. Program charges are deferred into the escrow account as incurred and expensed based on current cost recovery authorized in the most recent base rate case. Any over- or under- recovery in the current year is carried forward to be included in future ratemaking.

The takeaway on the cost recovery issue is that there are many different technical approaches for facilitating cost recovery for utility spending on energy efficiency programs. Pennsylvania's current approach for cost recovery seems adequate for accomplishing that task. Of more concern is the spending cap that is incorporated in current policy.

Pennsylvania's Spending Cap on Cost Recovery

Act 129 imposes a spending limit of two percent of 2006 annual revenue for EDCs' energy efficiency program costs. Specifically, "the total cost of any plan must not exceed two percent of the EDC's total annual revenue as of December 31, 2006, excluding LIURP, established under 52 Pa. Code § 58 (relating to residential Low Income Usage Reduction Programs). 66 Pa. C.S. § 2806.1(g)."[12] Table 3 shows the percentage of electric utility revenues invested in energy efficiency program spending. Pennsylvania ranks 21st of the 26 states with electric EERS.

Because the spending cap is based on 2006 annual revenues, Pennsylvania EDC spending on energy efficiency as a percent of current-year revenues has declined over time as revenues have increased.

[12] Pennsylvania Public Utility Commission. 2015. Energy Efficiency and Conservation Program Docket No. M 2014-2424864 Implementation Order. http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx

This lack of indexing to current revenues lowers Pennsylvania's rank relative to other states that continue to increase energy efficiency investments. Note in table 3 that Pennsylvania's total energy efficiency spending as a percent of statewide electric revenues is 1.55% of 2016 revenues, not 2%.

Table 3. Electric energy efficiency program spending as percent of statewide electric revenues for EERS states

Rank	State	2016 Electric energy efficiency program spending ($million)	Percent of statewide electric revenues
1	Vermont	54.0	6.84%
2	Rhode Island	78.4	6.42%
3	Massachusetts	538.9	6.25%
4	Washington	291.2	4.29%
5	Connecticut	191.9	3.85%
6	Oregon	156.6	3.79%
7	California	1364.1	3.50%
8	Iowa	119.2	2.86%
9	Minnesota	161.9	2.50%
10	Maryland	186.8	2.49%
11	Maine	32.3	2.21%
12	Illinois	262.8	2.05%
13	New York	425.2	2.00%
14	Arkansas	68.7	1.86%
15	Hawaii	37.0	1.64%
16	Colorado	87.2	1.63%
17	New Mexico	34.3	1.62%
18	Nevada	49.0	1.62%
19	Michigan	182.1	1.58%
20	Arizona	126.7	1.56%
21	**Pennsylvania**	229.4	1.55%
22	New Hampshire	23.2	1.36%
23	North Carolina	144.6	1.17%
24	Ohio	141.0	0.98%
25	Wisconsin	74.1	0.98%
26	Texas	194.1	0.60%
	Median	**142.8**	**1.93%**
	Average		**2.59%**

Because the spending on energy efficiency programs is logically (and in actual experience) closely related to the amount of energy efficiency savings achieved, it is not surprising that Pennsylvania ranks 21st among states in both the percent of revenues spent on energy efficiency (table 3) and the projected target for savings achieved as a percentage of sales (table 1). Pennsylvania also ranks a very similar 19th in actual savings as a percentage of sales in 2016 (table 4 below.)

Revenue Decoupling

True symmetrical revenue decoupling (i.e., "full decoupling") adjusts for deviations (both upward and downward) of actual sales from the levels forecasted when rates were set.[13] The purpose of revenue decoupling is to address the basic throughput incentive that utilities face under traditional regulation, which creates an inherent disincentive regarding customer energy efficiency and an inherent incentive to pursue sales increases. By adjusting for any sales shortfall, decoupling ensures full recovery of the authorized revenue requirements independent of sales volume. This removes a key disincentive for utilities regarding the promotion of energy efficiency. At the same time, true symmetrical decoupling protects customers by requiring utilities to refund excess revenues when electricity sales exceed the forecast. This removes any incentive for the utility to encourage wasteful use of energy.

Decoupling changes the regulatory incentive structure under which the utility operates, altering its business model. Without revenue decoupling, the utility will have an economic incentive to increase sales rather than to pursue significant energy savings through customer energy efficiency programs. Without decoupling, a utility will also tend to resist policies requiring it to promote customer energy efficiency improvements. Decoupling alone is not sufficient to produce strong utility performance regarding customer energy efficiency, but it does remove one important obstacle to strong performance.

Consistent with these factors, we see a strong correlation between states achieving high savings results and those employing revenue decoupling. Among the top 14 states with electric EERS ranked by incremental annual savings, 11 have revenue decoupling. As a group these states averaged 1.75% annual incremental savings in 2016. As of July 2017, 15 states had an electric revenue decoupling policy in place and have implemented that policy by approving decoupling for at least one major utility.[14]

Table 4 ranks states with an EERS by 2016 energy savings as a percent of sales and indicates whether they had revenue decoupling in place for at least one electric utility at that time.

Table 4. Comparison of EERS states saving with and without decoupling

State	Net incremental 2016 electric savings as % of sales	Decoupling in effect 2016
Massachusetts	3.00%	Yes
Rhode Island	2.85%	Yes
Vermont	2.52%	Yes
Washington	1.54%	Yes

[13] RAP (Regulatory Assistance Project). 2016. *Revenue Regulation and Decoupling: A Guide to Theory and Application.* Montpelier, VT: Regulatory Assistance Project. http://www.raponline.org/wp-content/uploads/2016/11/rap-revenue-regulation-decoupling-guide-second-printing-2016-november.pdf

[14] ACEEE State Policy Database. https://database.aceee.org

State	Net incremental 2016 electric savings as % of sales	Decoupling in effect 2016
California	1.54%	Yes
Connecticut	1.53%	Yes
Arizona	1.42%	No
Maine	1.38%	Yes
Hawaii	1.32%	Yes
Minnesota	1.31%	Yes
Illinois	1.23%	No
Michigan	1.17%	No
Oregon	1.16%	Yes
New York	1.09%	Yes
Iowa	1.01%	No
Maryland	0.91%	Yes
Colorado	0.89%	Yes
Ohio	0.87%	Yes
Pennsylvania	0.73%	No
Arkansas	0.68%	No
Nevada	0.63%	No
Wisconsin	0.61%	No
New Mexico	0.59%	No
New Hampshire	0.58%	No
North Carolina	0.57%	No
Texas	0.19%	No
Average with decoupling	**1.6%**	
Average without decoupling	**0.8%**	

States with both EERS and decoupling achieved energy savings averaging 1.6% of MWh sales in 2016. Pennsylvania and other states with EERS but no decoupling saved only half as much, 0.8% of sales.

Performance Incentives

While decoupling and cost-recovery mechanisms are designed to reduce the disincentive to acquire energy savings, the function of performance incentives is to provide a positive incentive. Performance incentives, sometimes called shareholder incentives for investor-owned utilities, enable utilities to achieve some earnings from their energy efficiency activities. Because utilities have well-established mechanisms for earnings from supply side investments, this is important for persuading utility management to seriously pursue energy efficiency objectives.

Twenty-nine states have performance incentives in place for meeting electric savings targets, including 20 of the 26 states with EERS.[15] As with decoupling, there is a strong correlation between the presence of performance incentives in a state and the energy savings achieved by utilities in those states. States with performance incentives in place averaged more than twice the energy savings of states without performance incentives. The average 2016 net incremental savings (MWh) as a percent of retail sales for states with incentives was 0.97%, while those without performance incentive policies averaged only 0.43%.

There is also a strong correlation between the states with the highest savings targets and those with performance incentives. Ten of the top 14 states with EERS policies, ranked by average annual savings targets for 2016-2020, award financial incentives to utilities for hitting their targets. We have observed that the presence of performance incentives in the policy package may actually be helpful in facilitating a state's ability to establish a strong EERS, by encouraging utilities to cooperate rather than oppose the EERS policy. In that regard, it is noteworthy that utilities tend to be successful in earning their performance incentives. In 2015, ACEEE collected data on 19 states with incentive mechanisms in place and found that regulated utilities achieved sufficient savings to earn at least some incentive payment in each of those states.[16]

The specific performance incentive mechanisms used to facilitate achievement of those energy efficiency program savings vary from state to state. To facilitate comparisons, here we summarize the approaches based on the four primary ways to calculate incentives: 1) as a share of net benefits, 2) energy savings-based incentives, 3) multifactor, and 4) rate of return.[17] Most have a threshold savings level set as the achievement of a minimum amount of energy savings. Most states also have some type of upper limit to the amount of incentive that can be earned, so that the incentive level is "reasonable" and does not become a target for criticism. Each incentive calculation type is described below.

Shared net benefits. Shared net benefits mechanisms give utilities the opportunity to earn some portion of the benefits of a successful energy efficiency program that otherwise would all go to the ratepayers. The incentive payment amount is usually a percentage of the positive difference between the costs (efficiency program spending) and the benefits (the dollar valuation of energy savings achieved as a result the program). This approach also has a savings-based element, in that most have a threshold level set as the achievement of a minimum percentage of the energy savings performance goal for the utility. We call it shared net benefits because the incentive amounts are driven by net benefits; the greater the net benefits, the higher the incentive payment amount. In most cases, there is a cap or maximum incentive, although some of these limits are defined as a percentage of net benefits rather than a fixed dollar amount.

Energy savings-based incentives. Savings-based incentives reward utilities for achieving, and sometimes for exceeding, pre-established energy savings goals, measured in kWh. Often, these energy savings targets for utilities may be tied to or derived from statewide EERS policies. For example, if the

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[15] The remaining nine states award performance incentives for the achievement of savings targets that do not qualify as EERS under our definition.

[16] Nowak, S., B. Baatz, A. Gilleo, M. Kushler, M. Molina, and D. York. 2015. *Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency*. Washington, DC: ACEEE. http://aceee.org/beyond-carrots-utilities-national-review

[17] Nowak, S., B. Baatz, A. Gilleo, M. Kushler, M. Molina, and D. York. 2015. *Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency*. Washington, DC: ACEEE. http://aceee.org/beyond-carrots-utilities-national-review

utility energy efficiency programs save 100% of the target, they are eligible for some particular amount of an incentive payment. Five of the six states with savings-based incentives have EERS policies. The amount of the financial incentive the utility earns is often calculated as a percentage of total program spending or budget in a tiered structure (e.g., achieve 100% of the savings target, receive an amount equivalent to 6% of the program spending; achieve 110% and receive 8%; and so on), but driven by the program energy savings achieved.

Multifactor mechanisms are those in which the calculation of performance incentive amounts includes multiple metrics. Energy savings are just one of several metrics that are typically used to determine the amount of incentive earned. For example, financial incentives may also be tied to demand savings, job creation, or measures of customer service quality. This type of approach is found in a handful of states where the mechanism is used to forward the achievement of several regulatory and public policy goals at the same time.

Rate of return incentives are far less common. They allow utilities to earn a rate of return based on efficiency spending. This creates a correspondence between demand side (energy efficiency) spending and supply side (generation and transmission) investments. For example, a utility may earn a rate of return for efficiency investments equivalent to or comparable to the rate it earns for new energy supply capacity investments.[18] One aspect which make this approach less desirable is that it technically rewards spending rather than actual energy savings.

DISCUSSION AND OPTIONS FOR STRENGTHENING UTILITY ENERGY EFFICIENCY POLICY

The comparative results presented above demonstrate that there are four components of state energy efficiency policy frameworks consistently associated with high energy savings: robust energy savings targets in the form of EERS; program cost-recovery mechanisms with no cost cap; revenue decoupling; and performance incentives for achieving energy savings targets.

States with the strongest energy efficiency performance tend to share common policy features. For example, in 2016, all of the top 10 states in terms of savings as a percent of sales had an EERS, nine of the top 10 had decoupling, and eight awarded performance incentives. The top ten energy-saving states averaged 1.84% net savings and average energy efficiency spending was 3.9% of statewide electric revenues.

Looking beyond past energy savings to future potential, we also see that relatively high EERS savings targets are most commonly paired with the complementary policies examined in this report. Among the top 14 states with electric EERS ranked by average incremental annual targets for 2016-2020, 13 have revenue decoupling and 10 award performance incentives. In the top five, all with average annual targets above 2%, four have decoupling, four use performance incentives, and three have both.

Twenty-nine states have performance incentive policies in place for electric utilities, and 15 have implemented decoupling for electric utilities. Pennsylvania is among the 17 states using neither decoupling nor performance incentives. Pennsylvania is among only 3 of 26 states with an EERS, but not decoupling or performance incentives.

Considerations for Future Phases of Act 129 Implementation

[18] Amortizing the recovery by the utility of the cost of programs over multiple years may also be considered a rate of return incentive in some instances, if the utility earns a return on the balance after the first year.

If Pennsylvania would like to enhance the energy savings accomplishments of its electric utilities, our review of experience in other states leads us to recommend that the Commission, staff, and stakeholders explore the following initiatives. While these are not all within the power of the PUC to accomplish without new legislation, other states' experiences have consistently demonstrated that they are essential policy elements for high energy efficiency performance.

1) Drive greater energy savings by adopting higher savings targets for EDCs (i.e., a stronger EERS), either at the Commission level or the legislative level. Because Pennsylvania targets are well below average savings goals set by other states, it is reasonable to assume that more energy savings can be cost-effectively captured for consumers across the Commonwealth.

2) Eliminate artificial constraints to efficiency spending by removing the 2% spending cap on utility energy efficiency expenditures through legislative action. This is likely a necessary step to enable the achievement of higher savings targets.[19]

3) Continue to examine the Commission's ability to develop performance incentives that encourage EDCs to meet or exceed energy savings goals. Performance incentive structures that are based on verified energy savings and have reasonable caps can effectively encourage EDC achievement of energy savings while protecting consumers.

4) Consider the feasibility of adopting full revenue decoupling. Several stakeholders have presented arguments that Act 129 may permit some form of decoupling. However we acknowledge that it would be ideal to clarify that authority through legislation.

In summary, the national data are clear. Virtually all of the leading states on utility energy efficiency achievements have a set of policies that include a strong EERS, performance incentives for utilities, and true revenue decoupling.

Further Research

We appreciate this opportunity to present comparisons of the Pennsylvania energy efficiency models/practices with those used in other states. ACEEE is available to provide additional resources, research, and analysis of options for aligning utility business models for energy efficiency performance.

For more information on the information contained in this memo, please contact ACEEE Senior Fellow Martin Kushler (mgkushler@aceee.org) or Senior Analyst Seth Nowak (snowak@aceee.org). For more information on technical assistance opportunities, please contact Senior Manager for State Policy Annie Gilleo (agilleo@aceee.org).

[19] The requirement for cost-effectiveness is a de facto protection against imprudent excess expenditures of ratepayer dollars. It makes no sense to artificially limit the expenditures on a cost-effective resource.