

Prepared Testimony of
James H. Cawley
Commissioner
Pennsylvania Public Utility Commission

before the

Pennsylvania House of Representatives
Consumer Affairs Committee

Hearing on the Costs and Benefits
Associated with the Overall and Peak Load
Reductions Required by Act 129 of 2008

February 25, 2014



Pennsylvania Public Utility Commission
400 North Street
Harrisburg, Pennsylvania 17120
Telephone (717) 787-4301
<http://www.puc.pa.gov>

Good Morning, Chairman Godshall, Chairman Daley, and members of the Committee. On behalf of the Commissioners, I thank you for the opportunity to present testimony on the implementation status of the Energy Efficiency and Conservation (EE&C) program pursuant to the provisions of Act 129 of 2008. Specifically, we have been asked to provide information on:

1. The costs incurred to implement EE&C plans and to meet the required reductions in overall and peak demand contained in Act 129.
2. The benefits realized through these programs.
3. How the percentage incremental reduction required of each electric distribution company (EDC) for overall and peak load was determined for implementation purposes.
4. Suggestions for improvement of the EE&C and demand response provisions of Act 129.

Costs

The costs to implement the EE&C plans is limited by statute to not more than 2% of each EDC's total annual revenue as of December 31, 2006. The total budgeted costs of the EDCs to implement the EE&C plans for Phase I was \$978 million. For the entirety of Phase I, the total cost to the EDCs to successfully implement these plans was \$803.7 million. The total cost of implementation, including estimated participant costs,¹ was \$1.755 billion.

Benefits

The total avoided costs (or benefit) to consumers was \$4.2 billion. That is, the benefits of this program were more than double its costs. The Total Resource Cost (TRC) test provided in Act 129 in order to calculate the costs and benefits associated with the program compares the net present value of the avoided monetary cost of supplying electricity to the net present

¹ Implementation costs include EDC and contractor Act 129 administrative costs and customer investment costs on efficiency measures.

value of the monetary cost of energy efficiency conservation measures.² This TRC excludes environmental and societal costs and benefits³ unless such costs and benefits were already embedded in the wholesale cost for generation of electricity.

Year-end results for Phase I for all EDCs are contained in Appendix A.⁴ As can be seen from this table, all EDC plans were cost effective. EDCs achieved a statewide TRC ratio of 2.3, meaning the benefits exceeded the costs by a ratio of 2.39 to 1. Overall EDC program performances over the approximately 4 year program life were all very successful, with each utility exceeding its required program requirements at the end of the program by an average of 23% for energy efficiency programs, and 13% for demand response programs.

There were also quantifiable indirect benefits for our state and local economies.

- With the implementation of Act 129, the Commission instituted a Conservation Service Provider (CSP) registry program. CSPs provide services to assist EDCs to carry out the various conservation load programs throughout the Commonwealth. To date, 155 businesses have registered to perform such services.⁵
- Act 129 has benefitted all customer classes directly and indirectly through reduced energy consumption, decreases in peak prices, and therefore lower billed amounts. This is particularly true for Pennsylvania's low-income customers who typically receive various forms of public assistance. Low-income customers receive additional assistance and

² TRC test example: Calculate the cumulative electricity cost savings over the life of a Compact Fluorescent Light (CFL) bulb and reduce these savings by the incremental cost of a CFL relative to a standard light bulb, including any EDC administrative costs of the EDC light bulb program.

³ Examples of excluded benefits include carbon emission reductions, water, natural gas, and oil use savings, home and business comfort, sulfur dioxide (SO₂), nitrous gas (NO_x), and particulate emissions reductions which improve air quality.

⁴ The first table includes data from planning years 1-4, while the second table covers planning years 2-4. The first planning year was a partial year, starting in January 2010 and ending May 31, 2010.

⁵ CSPs are service providers that assist in program implementation, actual installment of energy efficiency equipment, customer outreach, assistance and marketing, or help with plan performance measurement. CSP participation in these plans provides local jobs and tax bases for local and state economies.

offerings under the EE&C plans.⁶ In total, energy reductions from Phase I of Act 129 have amounted to 201,072 MWh for low-income customers, equal to 3.7% of total Phase I savings.

- The electric grid benefits by shaving (lowering) peak loads, thereby helping to increase reliability and reducing the need to call on increased sources of generation, which typically are the dirtiest and most expensive sources of generation available and typically are needed during the worst air quality days. The associated emissions reductions from Act 129 include an estimated reduction of more than 2,500 tons of NO_x emissions, nearly 6,500 tons of SO₂ emissions and nearly 3.9 million tons of CO₂ emissions.⁷ Efficiency and conservation are the cheapest ways to control emissions—by not creating them in the first place.

Calculation of Required Energy and Demand Reductions

The reductions for Phase I were stipulated by the Act. The Act required a reduction in consumption of 1% by May 31, 2011, and of 3% by May 31, 2013, measured against the EDC's expected consumption as forecasted by the Commission for June 1, 2009, through May 31, 2010. Also, by May 31, 2013, peak demand was to be reduced by a minimum of 4.5% of the EDC's annual system peak demand in the 100 hours of highest demand, measured against the EDC's peak demand during the period of June 1, 2007 through May 31, 2008. By Commission order issued March 26, 2009, the consumption and demand reduction requirements pursuant to the Act were quantified as follows:

⁶ Act 129 programs provided additional funding above and beyond existing Low Income Usage Reduction Programs (LIURP).

⁷ NO_x is a generic term for mono-nitrogen oxides NO and NO₂ (nitric oxide and nitrogen dioxide). SO₂ refers to sulfur dioxide, an oxide of sulfur, and CO₂ refers to carbon dioxide, a common greenhouse gas.

Table 1. Energy Consumption Forecasts and Act 129 Mandated Consumption Reductions as Measured in Megawatt-Hours

EDC	Forecast	1% Reduction	3% Reduction
Duquesne	14,085,512	140,855	422,565
Met-Ed	14,865,036	148,650	445,951
Penelec	14,399,289	143,993	431,979
Penn Power	4,772,937	47,729	143,188
PPL	38,214,368	382,144	1,146,431
PECO	39,386,000	393,860	1,181,580
West Penn	20,938,650	209,387	628,160
Total	146,661,792	1,466,618	4,399,854

Table 2. Average Historical Peak Loads and Act 129 Mandated Peak Demand Reductions as Measured in Megawatts

EDC	Load	4.5% Reduction
Duquesne	2,518	113
Met-Ed	2,644	119
Penelec	2,395	108
Penn Power	980	44
PPL	6,592	297
PECO	7,899	355
West Penn	3,496	157
Total	26,524	1,193

The Act required the Commission to evaluate the cost and benefits of the program by November 30, 2013, and every five years thereafter. If the benefits exceed the costs using a TRC test or other cost-benefit analysis approved by the Commission in such an evaluation, the Commission must implement additional reductions in consumption (Phase II). On March 1, 2012, the Commission tasked the Statewide Evaluator⁸ (SWE) to conduct a market potential study regarding the energy savings potential remaining in the large EDCs' service territories. In addition, the Commission asked the SWE to conduct baseline studies. Together, the baseline studies present a thorough assessment of electricity usage and the electrical energy consuming equipment in Pennsylvania. The baseline studies formed the basis for a Market Potential Study,

⁸ The Statewide Evaluator (SWE) was selected through a RFP competitive bid process issued by the Commission for Phase I and Phase II. GDS Associates was the winning bidder for both solicitations. Its contract extends through March 2017.

the purpose of which was to determine the remaining opportunities for cost-effective electricity savings in the EDCs' service territories.

Based on the spending cap of 2% of 2006 annual revenues for annual program spending and using the previously established load forecasts and an acquisition cost⁹ adder of 25% (average statewide acquisition cost of \$221.39 per MWh), the SWE concluded that instituting a second phase of Act 129 electric energy efficiency programs will be cost-effective for Pennsylvania ratepayers. The SWE determined that the statewide estimated program potential electricity savings would be 3,313,247 megawatt-hours (MWh) on a cumulative annual basis from June 1, 2013 to May 31, 2016 (a 2.3% reduction in projected 2010 baseline MWh sales). Required energy use reductions varied for each EDC, based on the SWE's detailed analysis of savings potential in each service area. The requirements varied for each EDC based on the SWE's analysis, which considered the specific mix of program potential, acquisition costs, and available funding for each EDC. These reduction requirements are as follows:

Table 3: Act 129 Phase II Three-Year Energy Efficiency Reduction Compliance Targets

EDC	Three-Year Program Acquisition Cost (\$/MWh)	Three-Year % of 2009/10 Forecast Reductions	Three-Year MWh Amount of 2009/10 Forecast Reductions
Duquesne	\$211.90	2.0	276,722
Met-Ed	\$220.87	2.3	337,753
Penelec	\$216.19	2.2	318,813
Penn Power	\$209.20	2.0	95,502
PPL	\$224.71	2.1	821,072
PECO	\$227.55	2.9	1,125,851
West Penn	\$209.42	1.6	337,533

⁹ Acquisition costs include customer incentive payments and EDC administrative costs of the energy efficiency and conservation programs. Acquisition cost projections were increased to reflect the impacts of federal legislation, changing baseline conditions, and increasing saturation of energy efficiency equipment.

In establishing these new reduction requirements, the Commission determined that it is in the public interest for EDCs to adopt more comprehensive measures, including whole house treatments.¹⁰ The Commission therefore required EDCs to develop EE&C plans containing at least one comprehensive measure for residential and small commercial rate classes in EE&C Plans going forward. Other design features of Phase II include:

- The Commission required EDCs to submit EE&C plans designed to achieve at least 25 percent of the target amount in each program year in order to promote consistent program savings over the 3-year period and to avoid a boom and bust cycle of spending.
- The 10% carve-out target for the government/educational/nonprofit sector was extended to Phase II.
- The Commission encouraged the EDCs to give special emphasis and consideration to multifamily housing within the government/educational/nonprofit sector and to reach out to the Pennsylvania Housing Finance Agency (PHFA) for assistance and coordination of efforts.
- The Commission directed its Bureau of Consumer Services and Bureau of Technical Utility Services to initiate a working group to investigate best practices from other states and identify working models of on-bill financing and on-bill repayment that address the concerns of the EDCs, consumer interest groups, and other interested stakeholders.
- The Commission required a 4.5% reduction in consumption goal from the low-income sector.
- The Commission allowed EDCs that achieved their Phase I three percent target before the end of Phase I to continue their programs and credit all savings above the three percent Phase I target towards Phase II requirements, so long as those EDCs still have Phase I funds available. This enabled continuous operation of these Act 129 programs.

By November 30, 2013, Act 129 also required the Commission to compare the total costs of the EDCs' EE&C plans to the total savings in energy and capacity costs to retail customers or other costs as determined by the Commission for demand response programs. If

¹⁰ Whole home approaches to energy efficiency start with a home energy audit, followed by a report of recommended energy efficiency measures, combined with offers by one or more service providers to complete the recommended measures.

the Commission determined that the benefits of the plans exceeded the costs, the Commission was required to set additional incremental requirements for reduction in peak demand for the annual 100 hours of greatest demand, or an alternative reduction approved by the Commission.

Since the demand response programs were only fully implemented during the summer of 2012, the results of these programs could not be measured until late 2012. Furthermore, evaluation of these programs could not be completed until well after the need to file and commence Phase II energy efficiency plans. Given this late implementation of demand response programs during Phase I, the Commission determined that only energy efficiency plans could be implemented effectively in Phase II. Implementation of any cost effective demand response programs would have to await a more rigorous analysis of demand response potential and cost effectiveness. In the interim, the Commission ruled that EDCs seeking to establish new, or to continue existing, load management programs that are prudent and cost-effective were free to file a petition with the Commission for approval of such programs under 66 Pa.C.S. § 1505(b).

Suggested Improvements to Act 129

Appendix B provides a detailed discussion of suggested edits to Act 129 previously shared with members of the legislature. Included in these suggestions are various clarifications to the Act to (1) provide a more sound, legal, quantitative basis and criteria for establishing future demand response targets, (2) delay the period necessary to implement future demand response targets, (3) provide more direction as to the continuation of various customer “carve out” requirements implemented subsequent to Phase I, (4) provide the Commission with additional time to review plan submissions, and (5) provide the Commission with greater flexibility in imposing penalties for non-performance (the Commission is required to impose a minimum \$1 million penalty on an EDC if requirements are missed, even by 1 MWH).

The Commission also suggests that the Commission not be the default provider of energy efficiency programs if the utility fails in its responsibilities under the Act.

It may also be appropriate to include some amendments to the revenue provisions of the Act, including allowance for an inflation adjustment to the cost caps of Act 129, and clarification that the 2% cost cap is applied annually to the plans and that revenues include generation and transmission charges to customers of EGSs serving customers in the specific EDC's service territory.

We also suggest that the TRC test not be limited to 15 years, because that limitation may have the unintended consequence of discouraging more long term, comprehensive energy efficiency measures.

I would be happy to answer your questions.

Appendix A:

EDC	Costs and Savings				Energy Reduction Performance			Demand Reduction Performance		
	Budget	Phase I Spending	TRC Cost	Avoided Cost	3% MWh Reduction Requirement	TRM Verified MWh Reduction Achieved	TRM Verified % of Target Achieved	4.5% Peak Demand (MW) Reductions Required	TRM Verified Peak Demand (MW) Reductions Achieved	TRM Verified % of Target Achieved
Duquesne	\$78,183,806	\$67,049,000	\$110,617,000	\$345,847,000	422,565	556,282	132%	113	139	123%
PECO	\$341,580,634	\$221,106,000	\$448,186,000	\$1,287,541,000	1,181,580	1,399,242	118%	355	399	112%
PPL	\$246,005,504	\$240,926,000	\$597,221,000	\$1,304,636,000	1,146,431	1,642,067	143%	297	341	115%
Met-Ed	\$99,467,568	\$90,656,000	\$235,084,000	\$374,502,000	445,951	493,138	111%	119	125	105%
Penelec	\$91,898,976	\$76,380,000	\$140,894,000	\$341,200,000	431,979	458,784	106%	108	114	106%
Penn Power	\$26,639,136	\$21,869,000	\$40,668,000	\$122,724,000	143,188	165,768	116%	44	46	105%
West Penn Power	\$94,249,873	\$85,740,000	\$182,714,000	\$415,939,000	628,160	688,089	110%	157	186	119%
Total	\$978,025,497	\$803,726,000	\$1,755,384,000	\$4,192,389,000	4,399,854	5,403,370	123%	1,193	1,350	113%

Peak Demand requirement is defined as the Top 100 hours in 2012. TRM refers to the Commission's Technical Reference Model, which provides the rules for determining energy and capacity reduction estimates for plan measures. **Note that the TRC is 2.39 (total avoided cost ÷ total TRC cost).**

Cumulative TRC, Costs, Avoided Costs

Program Type	Avoided Cost	TRC Cost	TRC
<i>Commercial & Industrial EE</i>	<i>\$1,731,537,964.00</i>	<i>\$822,333,971.00</i>	<i>2.11</i>
<i>Government & Non-Profit EE</i>	<i>\$324,121,855.00</i>	<i>\$203,796,603.00</i>	<i>1.59</i>
<i>Residential EE</i>	<i>\$1,015,465,049.00</i>	<i>\$281,437,870.00</i>	<i>3.61</i>
<i>Appliance Recycling</i>	<i>\$143,101,732.00</i>	<i>\$26,219,934.00</i>	<i>5.46</i>
<i>Low-Income</i>	<i>\$115,188,204.00</i>	<i>\$65,252,913.00</i>	<i>1.77</i>
<i>New Construction</i>	<i>\$19,414,000.00</i>	<i>\$10,678,000.00</i>	<i>1.82</i>
<i>Renewables</i>	<i>\$19,271,479.00</i>	<i>\$68,821,636.00</i>	<i>0.28</i>
<i>Behavioral Modification</i>	<i>\$12,733,584.00</i>	<i>\$6,052,194.00</i>	<i>2.10</i>
<i>Multiple Family</i>	<i>\$666,000.00</i>	<i>\$86,000.00</i>	<i>7.74</i>
<i>Streetlighting</i>	<i>\$1,863,000.00</i>	<i>\$903,000.00</i>	<i>2.06</i>
<i>Demand Response</i>	<i>\$32,144,926.00</i>	<i>\$145,971,331.00</i>	<i>0.22</i>
<i>Voltage Reduction</i>	<i>\$447,061,831.00</i>	<i>\$3,193,843.00</i>	<i>139.98</i>
<i>Cumulative Total</i>	<i>\$3,862,569,624.00</i>	<i>\$1,634,747,295.00</i>	<i>2.36</i>

The first table in Appendix A includes Planning years 1-4 of Phase I. The second table immediately above only includes Planning Years 2-4.

Appendix B

Proposed Legislative Changes to the Energy Efficiency and Conservation Program

66 Pa.C.S. § 2806.1

a) Program

- The term “peak demand” should be added after the term “consumption” whenever subsections (c) and (d) are referenced to make the language consistent with the requirements of both subsections (c) and (d).
- Add a provision requiring procedures for determining cost-effective additional required incremental reductions in consumption, peak demand or both consistent with subsections (c) and (d).
- Add a provision requiring procedures to establish requirements for plans submitted under subsection (b).

b) Duties of electric distribution companies

- Under (b)(1)(i) the term “peak demand” should be added after the term “consumption” whenever subsections (c) and (d) are referenced to make the language consistent with the requirements of both subsections (c) and (d). For example, (b)(1)(i)(A) should read that the plan shall include specific proposals to implement energy efficiency and conservation measures to achieve or exceed the required reductions in consumption and peak demand under subsections (c) and (d).
- Under (b)(1)(ii), add a provision giving the Commission discretion to change the plan requirements under (b)(1)(i)(A)-(K) based on cost-effectiveness, market potential and public interest. This provision will make it clear that the Commission has the discretion to increase or decrease the percent of savings to come from government, educational and nonprofit institutions, based on the cost-effectiveness and market potential for such energy savings. In addition, the provision will make it clear that the Commission can modify the requirements related to low income customers and other underserved customers based on cost-effectiveness, market potential and public interest.
- Under (b)(1)(ii), the term “peak demand” should be added to make it clear that the plans shall set forth the manner in which the company will meet the required reductions in consumption and peak demand as adopted by the Commission under subsections (c) and (d).

c) Reductions in consumption

- Under (3) the language should explicitly require that the determination by the Commission must demonstrate that the benefits of the program will continue to exceed the costs, prior to the Commission adopting additional incremental reductions in consumption. The determination should be forward looking based on costs, benefits and potential for energy savings during the period for which the Commission is setting the additional required incremental reductions in consumption.

d) Peak demand

- Under (2), in the last sentence, the term “consumption” should be replaced with the term “peak demand” to make it consistent with the requirement that the plans shall reduce peak demand.
- Also, under (2), in the last sentence, the date that the reductions are to be accomplished should be moved from no later than May 31, 2017, to no later than May 31, 2018. This change would provide more time for the Commission to set a more rigorous peak demand reduction requirement and the EDCs more time to obtain the resources to meet that more rigorous requirement. We note that with the date change to May 31, 2018, the peak demand reductions will still occur during the summer of 2017. This is due to the fact that the PJM system peak demand occurs in the summer months of June through September, thus, a peak demand reduction requirement that is to be accomplished no later than May 31, 2018, will actually occur from June 1, 2017 through September 30, 2017.

e) Commission approval

- Under (1) the term “peak demand” should be added after the term “consumption” whenever to make the language consistent with the requirements of both subsections (c) and (d).
- Under (2) extend the time period given to the Commission to approve a plan from 120 days of plan submission to 180 days of plan submission. This will give the Commission and all interested parties time to more fully review and propose changes to improve each plan.

f) Penalties

- Under (2) and (2)(i) add the term “peak demand” after the term “consumption” such that it explicitly provides for penalties for an EDC that fails to achieve the reductions in

consumption or peak demand under subsections (c) or (d), so that it is consistent with the requirements of (c) and (d).

- Under (2)(i) give the Commission more discretion to impose penalties that are commensurate with an EDC's failure to meet the required reductions. Under the current language, an EDC is subject to at least a \$1,000,000 whether they fail to achieve the reductions by one megawatt-hour or 5,000 megawatt-hours. In addition, the current language is silent on the imposition of penalties for an EDC's failure to achieve 10% of its reductions from government, school districts, institutions of higher learning and nonprofit entities. Finally, the term "peak demand" should be added to make the language consistent with the requirements of subsection (d). The language should be changed such that the EDCs may be subject to a civil penalty not greater than \$20,000,000 for a failure to achieve the required reductions in consumption or peak demand under subsections (c) or (d) in a manner prescribed by the Commission.
- Subsection (f)(2)(ii) should be eliminated. Transferring the responsibility to achieve the reductions in consumption under subsections (c) or (d) to the Commission absolves the EDCs of any responsibility for future reductions and the associated penalties for a failure to meet those reductions. It may also cause the implementation of competing programs where the Commission is responsible for the peak demand reductions and the EDC remains responsible for the consumption reduction program in a scenario where an EDC meets the consumption reduction target but fails to meet the peak demand reduction target. The transfer of responsibility will increase the costs associated with running such programs as it will add another layer of administration on top of such programs. These added costs will be borne by the ratepayers. We note that under such a scenario EDCs will still be involved as they have the requisite information about their customers' electricity usage and system capabilities to determine how to best target conservation and demand response measures.

g) Limitation on costs

- The Commission should be given discretion to increase the limitation on plan costs above the current 2% of the EDC's total annual revenue as of December 31, 2006. Such discretion could allow for an increase in plan costs every five years based on the Consumer Price Index or some other benchmark. We note that costs associated with implementing the plans as well as the energy efficiency measures incented by the plans

are likely to increase over time due to inflation, technology advancement and market penetration of energy efficiency measures, among other factors. Having a fixed budget indefinitely will likely decrease the impact and effectiveness of the program over time.

- In addition, the language should be revised to clarify that the total annual average cost of a plan cannot exceed the cap. Again, in order to fully implement the intent of the legislation, the Commission interpreted this cost limitation as an average annual cost over the life of a plan, which can run up to five years. A strict reading of the current language could limit the total cost of a five year plan to the 2% cap amount, resulting in one-fifth of the funds currently funding the plans. Such a result would severely restrict funding of the program which in turn would severely limit the impact and effectiveness of the program.

h) Costs

- No proposed changes.

i) Report

- Under (2) change the requirement for an annual report to the Consumer Protection and Professional Licensure Committee or the Senate and the Consumer Affairs Committee of the House of Representatives to a requirement for a report every five years, consistent with the requirements under subsections (c) and (d) for the Commission to determine the cost-effectiveness of the program.

j) Existing funding sources

- No proposed changes.

k) Recovery

- No proposed changes.

l) Application

- No proposed changes.

m) Definitions

- Change the definition of “electric distribution company total annual revenue” to amounts collected by the electric distribution company for generation, transmission, distribution and surcharges by retail customers. We note that in 2006, some of the EDCs were out from under rate caps and had customers obtaining generation from electric generation suppliers. A strict reading of the current definition could exclude the amounts collected by the EDC for generation and transmission which the EDC forwarded

to the EGS serving the customers. This would result in a significant reduction in the funds available for the program, frustrating the purpose of the program and limiting its impact and effectiveness.

- Revise the definition of “peak demand” to “The period when the load served by an electric distribution company is at or near the highest level expected to occur or capable of occurring during a period.” This definition more accurately reflects the technical meaning of the term, “peak demand.”
- Revise the definition of “total resource cost test” by eliminating the phrase “over the effective life of each plan not to exceed 15 years” and replace it with the phrase “over the effective life of the energy efficiency and conservation measure.” This would allow for a more accurate cost-benefit analysis of measures that have a useful life of greater than 15 years.