

Act 129 of 2008 Phases IV & V

Summary: This work plan identifies potential carbon dioxide emission reductions associated with future megawatt-hour (MWh) reductions of electricity consumption from continued participation in Act 129 energy conservation and energy efficiency programs and the associated implementation orders from the PA Public Utility Commission (PUC).

Background:

Phase I of Act 129 required electricity reductions from June 1, 2009 through May 31, 2013. Phase II began when Phase I ended and runs through May 31, 2016. The PUC's proposed Phase III will operate from June 1, 2016 through May 31 2021. Implementation of Phase I and Phase II have shown net customer benefits.

Pennsylvania has already demonstrated overall success at achieving cost effective energy efficiency outcomes through energy efficiency and conservation measures implemented via its energy efficiency standard, Act 129 of 2008. The Statewide Evaluations report for Phase 1 achieved pursuant to Act 129 is summarized below in Table 1.

Table 1: Summary of Statewide Technical Reference Manual Verified Savings:

	CPITD Reported Gross Impact	CPITD TRM Verified Gross Impact	Savings Achieved as % of 2013 Targets
Total Energy Savings (MWh/yr)	5,567,257	5,403,370	123%
Top 100 hours Demand Reduction (MW)	1,405.12	1,349.92	113%
Total Demand Reduction	1,608.64	1,540.61	N/A
TRC Benefits (\$1,000)	N/A	\$4,192,389	N/A
TRC Costs (\$1,000)	N/A	\$1,755,384	N/A
TRC Costs-Benefits Ratio	N/A	2.4	N/A
CO2 Emissions Reduction (Tons)	3,535,208	3,431,140	N/A

Based upon the success of these energy conservation and efficiency programs, a continuation of the Act 129 program beyond the Phase III end date is recommended. Potential Phase IV (running from June 1, 2021 through May 31, 2026) and Phase V (running from June 1, 2026 through May 31, 2031) schedules are provided in this work plan analysis.

Note, however, that the imposition of Act 129 requirements covers the vast majority of Pennsylvania but does not include electricity consumption from electric distribution companies (EDCs) with fewer than 100,000 customers, municipalities that are service providers and customers of rural electric cooperatives.

The potential electricity reduction targets and associated benefits for Act 129 Phases IV and V are:

Phase IV

- An average reduction in electricity consumption of 0.75% per year for the five-year period from June 1, 2021, through May 31, 2026. Based on projected growth rates of the respective EDCs, this will result in savings of 6,227,960 MWh or an approximate average of 1,245,592 MWh per year. Program savings potential estimates are based on maintaining the 2% funding level caps or a NPV in EDC expenditures of roughly \$1.3 billion dollars. This analysis results in a net \$2.2 billion dollars of consumer benefits through energy savings.

Phase V

- An average reduction in electricity consumption of 0.75% per year for the five-year period from June 1, 2026, through May 31, 2031. Based on projected growth rates of the respective EDCs, this will result in savings of 6,502,316 MWh or an approximate average of 1,300,463 MWh per year. Program savings potential estimates are based on maintaining the 2% funding level caps or a NPV in EDC expenditures of roughly \$1.6 billion dollars. This analysis shows net \$2.6 billion dollars of consumer benefits from energy savings.

Costs and Greenhouse Gas (GHG) Reductions:

Tables 2 and 3 depict the anticipated last year annual and cumulative benefits of Act 129 through the two prescribed five-year periods of implementation for a fourth and fifth phase to extend through 2030.

Table 2. Work Plan Cost and GHG Results Phase IV

Annual Results (2025)			Cumulative Results (2021-2025)		
GHG Reductions (MMtCO _{2e})	Net Costs (Million \$)	Cost-Effectiveness (\$/tCO _{2e})	GHG Reductions (MMtCO _{2e})	Net Costs (NPV, Million \$)	Cost-Effectiveness (\$/tCO _{2e})
3.0	(223)	(74.6)	9.0	(891)	(99.6)

Table 3. Work Plan Cost and GHG Results Phase V

Annual Results (2030)			Cumulative Results (2026-2030)		
GHG Reductions (MMtCO _{2e})	Net Costs (Million \$)	Cost-Effectiveness (\$/tCO _{2e})	GHG Reductions (MMtCO _{2e})	Net Costs (NPV, Million \$)	Cost-Effectiveness (\$/tCO _{2e})
3.0	(271)	(89.2)	9.1	(1,083)	(119)

The net present value (NPV) of the cost savings resulting from implementation of Act 129 from 2013 through 2020 is estimated at approximately \$2.0 billion. Some of this will be due to peak load reductions that result in lower wholesale energy and capacity charges, but not less energy used. Peak demand reductions are not quantified in this analysis, as discussed later in this document. There is an assumption that lower wholesale charges will be passed through to customers. Other savings will result through reducing energy consumption.

Quantification Approach and Assumptions:

- A 2014 report prepared by the PJM Resource Adequacy Planning Department (PJM) provides the energy supply data for the analysis of this work plan.¹
- The Pennsylvania Public Utility Commission (PUC) has implementation responsibility for Act 129, determination of annual MWh reductions, peak load reductions and approval of each EDC's individual implementation.
- Efficiency investments installed under Act 129 are reasonably expected to have lifetimes as long as or longer than the 5-year periods of analysis (2021-2025 & 2026-2030).
- Efficient equipment is cost-effective to install and it is assumed that it will be replaced in-kind at the end of its life. Act 129 does not specify how these reductions are to be achieved. Responses will be market-driven and will be identified in the implementation plans provided by the EDCs to the PUC. Actual savings will likely vary throughout the EDC territories, within the various rate classes and economic sectors and also based on socioeconomic factors for residential consumers.
- The efficiency percentage targets are applied to residential, commercial, and industrial loads but this assessment does not try to identify the specific percentage of load reductions that will be met by each EDC for each of the three sectors. Instead, this assessment applies a weighted average cost for energy efficiency measures, which is held constant throughout the period of analysis. This value is determined by the sector costs as identified in the Act 129 Statewide Evaluator (SWE) Energy Efficiency Potential for Pennsylvania - Final Report².
- This work plan assumes that energy conservation and energy efficiency measures will continue to be cost-effective and that the existing Act 129 implementation structure, including budget caps, will remain in effect. The cost of energy efficiency measures includes program and participant costs as is typically used in a Total Resource Cost (TRC) test. Based on SWE assessment of Phase I and Phase II flat average TRC Benefit to Cost ratio of 1.7 is used for this analysis.
- Projected GHG Emissions in Electricity assumes a 0.5% annual reduction from EIA's 2013 Pennsylvania value (1112 lb/MWh). One metric ton = 2,204.63 lbs.

Implementation Steps:

This work plan recommends a continuation of Act 129 activities beyond the currently proposed 2021 Phase III implementation plan. Based upon the SWE's Energy Efficiency Potential Study for Pennsylvania² there remains sufficient additional market potential for conservation and efficiency measures in electricity consumption to meet the Phase IV and Phase V targets in this workplan.

Act 129 requires the PUC to submit 5-year plans assessing the potential of further energy efficiency requirements deemed cost-effective according to a Total Resource Cost Test that also considers the annual EDC budgets for these reductions not to exceed two percent of annual revenues. The Act further stipulates that the PUC must continue this planning process every 5 years thereafter. It is recommended that Act 129 be continued through at least two additional 5-

¹ Source: PJM Resource Adequacy Planning Department (2014). PJM Load Forecast Report. <http://www.pjm.com/~media/documents/reports/2014-load-forecast-report.ashx>

² Source: [Act 129 Statewide Evaluator Energy Efficiency Potential for Pennsylvania - Final Report](#) – Dated February 2015. Released via Secretarial Letter, at Docket No. M-2014-2424864, on February 27, 2015. <http://www.puc.pa.gov/pcdocs/1345079.pdf>

year implementation cycles (through 2030) or until such time that electricity conservation and efficiency measures are no longer cost effective.

Potential Future Considerations

Other related items for potential future evaluation and/or consideration include: increasing the reach of the Act to include smaller electricity providers, increasing the budget cap, and creating a commonwealth-wide systems benefit fund administered by a central authority (similar to New York State's NYSERDA).

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