

**PENNSYLVANIA  
PUBLIC UTILITY COMMISSION  
Harrisburg, PA 17105-3265**

Public Meeting held November 7, 2024

Commissioners Present:

Stephen M. DeFrank, Chairman

Kimberly Barrow, Vice Chair

Kathryn L. Zerfuss

John F. Coleman, Jr.

Ralph V. Yanora

2026 Total Resource Cost (TRC) Test

M-2024-3048998

**FINAL ORDER**

**BY THE COMMISSION:**

Act 129 of 2008, 66 Pa.C.S. § 2806.1, directs the Pennsylvania Public Utility Commission (Commission) to analyze the benefits and costs of the energy efficiency and conservation (EE&C) plans that certain electric distribution companies (EDCs) are required to file. Our 2026 TRC Test Tentative Order entered August 1, 2024, at this docket proposed methodology and requested comments on a 2026 TRC Test for use in planning for and during a potential Phase V of Act 129. This Order finalizes the specific refinements to the 2026 TRC Test for use in Phase V of Act 129, that, if approved, would begin June 1, 2026.<sup>1</sup>

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<sup>1</sup> The currently assigned docket for matters relating to the Commission's consideration of a potential Phase V is *Release of the Act 129 Statewide Evaluator Energy Efficiency Baseline Studies* at Docket No. M-2023-3044490. The 2026 Technical Reference Manual (TRM) is at Docket No. M-2023-3044491.

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## BACKGROUND AND HISTORY

Act 129 of 2008, P.L. 1592, requires electric distribution companies (EDCs)<sup>2</sup> with 100,000 or more customers to adopt an energy efficiency and conservation (EE&C) plan, subject to approval by the Commission, to reduce electric consumption. The initial EE&C plans, effective from June 1, 2009, to May 31, 2013, were designated Phase I of Act 129 (Phase I). For Phase I, Act 129 required that an analysis of the benefits and costs of each EDC's EE&C plan, in accordance with a TRC Test, be approved by the Commission. Act 129 required each EDC to demonstrate that its plan was cost-effective using the TRC Test and required that the EDC provide a diverse cross-section of alternatives for customers of all rate classes. 66 Pa.C.S. § 2806.1(b)(1)(i)(I).

Similarly, for subsequent phases, the Commission is charged with determining whether to establish conservation and peak demand reduction requirements and, if so established, to determine if EDCs have met the requirements.<sup>3</sup> Act 129 also addresses energy efficiency (EE) and demand reduction targets from June 1, 2013, forward. 66 Pa.C.S. §§ 2806.1(c)(3) and 2806.1(d)(2).<sup>4</sup>

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<sup>2</sup> The four EDCs affected by Act 129 are: Duquesne Light Company (Duquesne Light), FirstEnergy Pennsylvania Electric Company (FirstEnergy), PPL Electric Utilities Corporation (PPL), and PECO Energy Company (PECO). FirstEnergy was granted approval for consolidation by the PUC, at the December 7, 2023 public meeting, of the four independent Pennsylvania EDCs it owned: Metropolitan Edison Company (Met-Ed), Pennsylvania Electric Company (Penelec), Pennsylvania Power Company (Penn Power), and West Penn Power Company (West Penn). These former four EDCs are now Rate Districts that comprise the FirstEnergy EDC. Due to timing issues, studies performed to inform this Order, and discussed herein, were conducted as if the Rate Districts were still independent EDCs.

<sup>3</sup> After 2013, the Commission has had the option to determine what test to use. 66 Pa.C.S. § 2806.1(m).

<sup>4</sup> Section 2806.1(c)(3) states that, based on a review to be concluded by November 30, 2013, if “the Commission determines that the benefits of the program exceed the costs, the Commission shall adopt additional incremental reductions in consumption.”

For Phase II of Act 129 (Phase II), which covered the period from June 1, 2013, to May 31, 2016, the Commission adopted three-year consumption reduction requirements, as recommended by the Phase I Statewide Evaluator (SWE),<sup>5</sup> that varied by EDC based on the specific mix of program potential, acquisition costs, and funding available under the 2% limitation stipulated by Act 129.<sup>6</sup> The SWE produced an *Energy Efficiency Market Potential Study*<sup>7</sup> to document the methodology, assumptions, inputs, and analytical methods used to arrive at the recommended consumption reduction goals for each EDC.

The Commission directed the Phase I SWE to study the cost-effectiveness of current and potential future demand response (DR)<sup>8</sup> programs. On November 1, 2013, the Phase I SWE's *Act 129 Demand Response Study* was released.<sup>9</sup> For Phase II, there were no DR requirements, however, the Commission also directed the Phase II SWE<sup>10</sup> to study the cost-effectiveness of potential future DR programs. On February 27, 2015, the Phase II SWE's *Demand Response Potential Study*<sup>11</sup> was released. In both studies, the SWE collected data and documentation from EDCs to aid in performing an analysis of the cost-effectiveness of compliance with the current legislative DR requirements and of potential improvements to the DR program design.

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<sup>5</sup> The SWE is a team of technical consultants. They are engaged by the Commission under contract pursuant to a request for proposal process.

<sup>6</sup> Act 129 sets a limit on the cost of an EDC's EE&C plan at 2% of the EDC's annual revenue as of December 31, 2006. See 66 Pa.C.S. § 2806.1(g).

<sup>7</sup> See [http://www.puc.pa.gov/electric/pdf/Act129/Act129-PA\\_Market\\_Potential\\_Study051012.pdf](http://www.puc.pa.gov/electric/pdf/Act129/Act129-PA_Market_Potential_Study051012.pdf). The *EE Market Potential Study* is dated May 10, 2012, and was released May 11, 2012.

<sup>8</sup> Demand Response is a change in electric usage by end-use customers from their normal consumption patterns in response to a signal. Usually, incentive payments are offered to customers to induce lower electric consumption at times of high wholesale market prices or when system reliability is jeopardized. Examples include turning up the temperature on the thermostat to reduce air conditioning loads or slowing down/stopping production at an industrial facility temporarily.

<sup>9</sup> See GDS Associates, Inc. (Phase I SWE), *Act 129 Demand Response Study* (dated May 13, 2013). <http://www.puc.pa.gov/pcdocs/1256728.docx>.

<sup>10</sup> The SWE for Phase II consisted of GDS Associates, Inc., and its subcontractors.

<sup>11</sup> The *DR Potential Study*, dated February 25, 2015, was released February 27, 2015. See <https://www.puc.pa.gov/pcdocs/1345077.docx>.

Act 129 also required that the Commission determine if EE and DR goals should be established beyond the Phase II goals. 66 Pa.C.S. §§ 2806.1(c)(3) and 2806.1(d)(2). Phase III goals were determined in the Phase III Implementation Order at Docket No. M-2014-2424864.<sup>12</sup> To support implementation and the benefit/cost (B/C) analyses for Phase III of Act 129, the Commission adopted the *2016 TRC Test Order* at Docket No. M-2015-2468992 on June 22, 2015.<sup>13</sup> Phase III covered June 1, 2016, to May 31, 2021.

During planning for Phase IV of Act 129 the Commission determined that EE goals would remain in place but dispatchable DR goals would be removed from consideration in favor of peak demand reduction goals, which could be met with coincident demand reductions from EE measures. The goal of this change was to allow more focus on long-lasting everyday reductions from energy efficiency measures rather than have funds be split between EE programs and dispatchable DR programs.<sup>14</sup> Phase IV goals were determined in the Phase IV Implementation Order at Docket No. M-2020-3015228.<sup>15</sup> To support implementation and the B/C analyses for Phase IV of Act 129, the Commission adopted the *2021 TRC Test Order* at Docket No. M-2019-3006868 on December 19, 2019.<sup>16</sup> Phase IV covers June 1, 2021, to May 31, 2026.

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<sup>12</sup> See <https://www.puc.pa.gov/pcdocs/1367313.doc>.

<sup>13</sup> See <https://www.puc.pa.gov/pcdocs/1367195.docx>.

<sup>14</sup> See <https://www.puc.pa.gov/pcdocs/1666981.docx> at page 68.

<sup>15</sup> See <https://www.puc.pa.gov/pcdocs/1666981.docx>.

<sup>16</sup> See <https://www.puc.pa.gov/pcdocs/1648126.docx>.

If the Commission decides to proceed with Phase V of Act 129, it will be necessary to address the B/C measurements for Phase V. To allow for adequate planning, the Commission put forth a Tentative Order regarding a 2026 TRC Test, building on the five previous Pennsylvania TRC Test Orders and industry documents such as the *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*<sup>17</sup> (*California Manual*), for the B/C analysis of EE&C plans for a potential Phase V. The Commission also adopted a 2026 Technical Reference Manual (TRM) at Docket No. M-2023-3044491 (Final Order entered September 12, 2024), for use if we decide to proceed with a Phase V.

Pennsylvania conducts the requisite B/C analyses using a TRC Test. The TRC Test for Phase I of Act 129 was adopted by Commission Order at Docket No. M-2009-2108601 on June 23, 2009 (*2009 TRC Test Order*). The TRC Test was refined at the same docket on August 2, 2011 (*2011 TRC Test Order*), and on August 30, 2012, at Docket No. M-2012-2300653 (*2013 TRC Test Order*). The TRC Test was updated for use during Phase III of Act 129 on June 22, 2015, at Docket No. M-2015-2468992 (*2016 TRC Test Order*). The TRC Test was most recently updated for Phase IV of Act 129 on December 19, 2019, at Docket No. M-2019-3006868 (*2021 TRC Test Order*).

### **2026 Technical Reference Manual**

The 2026 Technical Reference Manual (TRM) is the guide to measure and verify applicable EE and Demand Side Management (DSM) measures used by EDCs to meet the Act 129 consumption and peak demand targets. While its use will continue to provide the necessary information that establishes the evaluation process to monitor and verify data collection, quality assurance, and the results of each EDC's EE&C plan, it also provides information that will assist EDCs in their TRC calculations.

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<sup>17</sup> The *California Standard Practice Manual – Economic Analysis of Demand-Side Programs and Projects*, July 2002, p. 18. See [http://www.calmac.org/events/SPM\\_9\\_20\\_02.pdf](http://www.calmac.org/events/SPM_9_20_02.pdf).

The Commission proposed an updated 2026 TRM on May 9, 2024 at Docket No. M-2023-3044491 for use during a potential Phase V, and the final version was adopted on September 12, 2024.<sup>18</sup>

## **TRC TEST EXPLAINED**

Act 129 defines a TRC Test as “a standard test that is met if, over the effective life of each plan not to exceed 15 years, the net present value (NPV) of the avoided monetary cost of supplying electricity is greater than the NPV of the monetary cost of energy efficiency conservation measures.” 66 Pa.C.S. § 2806.1(m). Thus, the TRC Test is a critical measuring tool in determining the cost-effectiveness of an EDC’s EE&C plan. Historically, the TRC Test has been a regulatory test. It is not a static, one-size-fits-all tool. It can incorporate different factors and evaluate variables in different ways, as determined by the jurisdictional entity using it. Pennsylvania has tailored its TRC Test over time to evaluate EDC progress in meeting the requirements of Act 129, consistent with the policy objectives of the Commonwealth within the statutory directives of Act 129.

The purpose of using a TRC Test to evaluate EE&C programs is to track the relationship between the benefits to the Commonwealth and the costs incurred to obtain those benefits. Sections 2806.1(c)(3) and 2806.1(d)(2), as well as the definition of the TRC Test in Section 2806.1(m) of Act 129, provide that a TRC Test be used to determine whether ratepayers received more benefits (in reduced electric energy, capacity, and non-electric resources) than the total costs of the EE&C plans.

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<sup>18</sup> See <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/technical-reference-manual/>.

In Pennsylvania, the TRC Test considers the combined effects of EE&C plans on both participating and non-participating customers based on the costs incurred by the EDC and participating customers. In addition, the benefits calculated for use in the TRC Test include the avoided supply costs, such as the reduction in energy production valued at marginal cost for the periods when there is a consumption reduction, and the avoided cost of generation, transmission, and distribution capacity for measures that reduce peak demand. In addition to the avoided cost of supplying electricity, the avoided cost of supplying fossil fuel and water are included in the algorithms for calculating TRC benefits. These avoided costs apply to EE&C measures that impact consumption of those resources. Avoided supply costs, depending on the mandate in each jurisdiction, can be calculated using either gross or net program savings. In Pennsylvania, we have primarily looked at avoided supply costs from the perspective of gross program savings, which is how Act 129 compliance targets are measured.

Further, the costs used in the TRC Test include the costs of the various programs paid by an EDC or its Conservation Service Provider (CSP) and the participating customers<sup>19</sup> and reflect any net change in supply costs for the periods in which consumption is increased in the event of load-shifting. Equipment, installation, operation and maintenance (O&M) costs, cost of removal (less salvage value), and administrative costs, are included – regardless of who pays for them.

The results of the TRC Test are expressed as both a present value of net benefits (PVNB) and a B/C ratio. The PVNB is the present value of the net benefits (benefits minus costs) of this test over a specified period (*i.e.*, the expected useful life of the EE&C measure or program). The PVNB is a measure of the change in the total resource costs due to the program. A PVNB above zero indicates that the program is a less expensive

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<sup>19</sup> In this regard, we note that the 2026 TRC Test will continue to use the incremental measure costs of services and equipment. This matter is discussed in more detail below, in the segment addressing incentive payments from an EDC.

resource than the supply options upon which the marginal cost forecast is based. A discount rate must be established to calculate the NPV. In the first three phases of Act 129, the discount rate for the Pennsylvania TRC Test was the EDC's weighted average cost of capital. In Phase IV of Act 129, the Commission updated its discount guidance to reflect a 3% real discount rate for all EDCs. *See 2021 TRC Test Order* at 17 - 21.

The B/C ratio (or TRC ratio) is the ratio of the discounted total benefits of the program to the discounted total costs over the expected useful life (up to a maximum of 15 years) of the energy efficiency measure, program, or portfolio. The B/C ratio gives an indication of the rate of return of this program to the utility and its ratepayers. A B/C ratio greater than one indicates that the program is beneficial to the utility and its ratepayers on a TRC basis.<sup>20</sup> The explicit formulae for use in Pennsylvania are set forth in Appendix A of this order.

As discussed in prior TRC Test Orders, the *California Manual* was the starting point for the Pennsylvania TRC Test but does not address all issues specific to Pennsylvania. For this reason, the Commission will continue to explore how best to structure and apply the TRC Test for Pennsylvania.<sup>21</sup> In preparation of this Order, the Commission and the SWE<sup>22</sup> have reviewed industry literature on benefit-cost analysis to refine the TRC Test to meet Pennsylvania policy objectives. The TRC Test for Phase V, if implemented, would be applicable throughout the course of Phase V, potentially concluding May 31, 2031. However, many issues involved in EE&C plans,

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<sup>20</sup> See *Appendix A – TRC Definitions and Formulae* of this Order for detailed methodology to calculate the PVNB and B/C ratio of the 2026 TRC Test.

<sup>21</sup> After November 30, 2013, and every five years thereafter, the Commission is to evaluate the costs and benefits of the EE&C program established under Section 2806.1(a) and of the approved EE&C plans using a TRC Test or a benefit/cost analysis of the Commission's determination. 66 Pa.C.S. § 2806.1(c)(3).

<sup>22</sup> The SWE for Phase IV is NMR Group, Inc. and its subcontractors. The SWE for Phase V has not been determined at the time of this Order.

program implementation, and operation of the TRC Test are ongoing in nature, and future updates may be proposed by stakeholders, or the Commission as needed. This Final Order regarding the 2026 TRC Test sets forth constraints that the Phase IV SWE will need to finalize the Phase V Market Potential Study.

On August 1, 2024, the 2026 TRC Test Tentative Order was entered and provided to stakeholders for comment. It set forth a proposed 2026 TRC Test for Phase V of Act 129. Notice of the 2026 TRC Test Tentative Order and the comment/reply comment periods was published in the *Pennsylvania Bulletin* on August 17, 2024, at 54 *Pa.B.* 5313. Stakeholders were encouraged to provide input on the proposed 2026 TRC Test through the formal comment and reply comment process. This Final Order summarizes stakeholder comments and issues final dispositions on all aspects of the 2026 TRC Test for Phase V.

Comments in response to the 2026 TRC Test Tentative Order were due September 6, 2024. The following parties filed comments: Duquesne Light Company (Duquesne Light); Coalition for Affordable Utility Service and Energy Efficiency in Pennsylvania (CAUSE-PA); PPL Electric Utilities Corporation (PPL); PECO Energy Company (PECO); Northeast Energy Efficiency Partnerships (NEEP); Keystone Energy Efficiency Alliance (KEEA); Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company and West Penn Power Company (collectively, FirstEnergy); and Center for Coalfield Justice, Ceres, Community Legal Services of Philadelphia, Conservation Voters of PA, Green Building United, Housing Alliance of Pennsylvania, Keystone Energy Efficiency Alliance, National Housing Trust, PA Jewish Earth Alliance, PennFuture, Pennsylvania Utility Law Project, Pennsylvania Solar & Storage Industries Association, Philadelphia Solar Energy Association, POWER Interfaith, and Vote Solar (collectively, the Joint Energy Advocates).

Reply Comments were due September 16, 2024. One party, FirstEnergy, filed reply comments by the due date.

## **A. General Issues**

### **1. TRC Test Assumptions In Other Matters**

The TRC Test requires EDCs to make numerous financial and technical assumptions about the costs of operating an electric power system, future market structures, and the time-value of money. Consistent with our determination in prior TRC Test Orders, the Commission proposed in the 2026 TRC Test Tentative Order to maintain the provision that TRC Test assumptions are used exclusively for Act 129 related matters. TRC Test assumptions are not presumed to be binding in other regulatory matters such as prudence, cost-of-service, or other inquiries. Stakeholder comments on the 2021 TRC Test Tentative Order encouraged the Commission to synchronize the methodologies used for the avoided costs of natural gas with the calculation of these benefit streams in the EE&C plans filed by natural gas distribution companies (NGDCs). The Commission agreed that consistency across EE&C plans filed by different utilities that serve Pennsylvania customers is desirable, but the differing statutory requirements and goals of NGDCs ultimately make this synchronization infeasible. *See 2021 TRC Test Order* at 9-11. If there are significant differences between the assumptions used in the TRC Test and the assumptions or facts at issue in such other proceedings, parties may inquire into the validity and underlying rationale of the differences in EE&C plan proceedings.

#### **a. Comments**

The Commission received no comments on this topic.

## **b. Disposition**

For Phase V, the Commission maintains the provision that EDCs and other parties are not bound by the TRC Test assumptions in prudence, cost-of-service, or other inquiries.

### **2. Frequency Of Review Of The TRC Test**

Consistent with our determination in past TRC Test Orders, the Commission proposed in the 2026 TRC Test Tentative Order to maintain the provision that the 2026 TRC Test apply for the entirety of Phase V. This would promote consistency across the Market Potential Studies, EE&C plan development, and annual benefit-cost reporting during the entire phase. The Commission recognized that this 2026 TRC Test was developed almost two years prior to the beginning of a potential Phase V, and it is possible that new issues will arise that were not considered in this Order. Consequently, we proposed to reserve the right to update or modify the 2026 TRC Test during a potential Phase V or to direct the Phase V SWE to develop guidance memos on such topics to promote consistency across EDCs and TRC Test results that are in line with Act 129 and the policy objectives of the Commonwealth.

In the 2021 TRC Test Order, the Commission directed the Phase IV SWE to include in its Final Annual Reports a comparison of forecast avoided costs of supplying electricity to actual market conditions. *See 2021 TRC Test Order* at 30-31. During PY13 of Phase IV, actual avoided costs deviated substantially from the Phase IV forecasted values. The major cause of the deviations from the expected values were from increases in the prices of natural gas due to ongoing global conflicts. The Phase IV SWE team cautioned the Commission against updating its long-term avoided cost forecast based on this volatility and recommended the Commission wait to see if market conditions returned to more normal levels.<sup>23</sup> This forbearance turned out well as

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<sup>23</sup> See [https://www.puc.pa.gov/media/2152/py13\\_swe\\_annual\\_report120522final.pdf](https://www.puc.pa.gov/media/2152/py13_swe_annual_report120522final.pdf) at page 106.

PY14 market conditions returned to levels that were closely aligned with the Phase IV avoided cost forecast.<sup>24</sup> As was the case in Phase IV of Act 129, the Commission continues to see value in annual comparisons between avoided cost projections and actual market prices for informational purposes, but cautions against any over reactions to short-term market volatility from year to year.

**a. Comments**

FirstEnergy, PECO, and PPL comment that the 2026 TRC Test assumptions should be fixed and not change during Phase V to ensure that any comparisons made with filed EE&C plans are done using consistent assumptions. FirstEnergy Comments at 2, PECO Comments at 1, PPL Comments at 3.

PECO also comments that any changes to the TRC assumptions during the phase could necessitate development of new EE&C plans. PECO Comments at 1.

**b. Disposition**

The Commission agrees with the comments made by FirstEnergy, PECO, and PPL that it is desirable for 2026 TRC Test assumptions and methodologies to remain fixed during Phase V to ensure that any comparisons made with EE&C plans are done using consistent assumptions. The Commission also agrees with PECO that any changes made to the assumptions of the 2026 TRC Test could necessitate development of new EE&C plans during the phase.

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<sup>24</sup> See [https://www.puc.pa.gov/media/2688/swe\\_py14\\_final\\_annual\\_report120123.pdf](https://www.puc.pa.gov/media/2688/swe_py14_final_annual_report120123.pdf) at page 101.

The Commission has considered the parties' positions and concludes that the methodologies set forth in the 2026 TRC Test shall apply for the entirety of Phase V. However, the Commission continues to see value in comparing the forecasted avoided costs with actual market conditions throughout Phase V and therefore reserves the right to update or modify the 2026 TRC Test assumptions during a potential Phase V or to direct the Phase V SWE to develop guidance memos on such topics to promote consistency across EDCs and TRC Test results that are in line with Act 129 and the policy objectives of the Commonwealth. The Commission will not make any decision to update assumptions of the 2026 TRC Test Order lightly as demonstrated by the decision to hold the Phase IV avoided cost forecast constant despite early deviations in market conditions during Phase IV.

### **3. Level At Which To Calculate And Report TRC Test Results**

Prior TRC Test Orders provided that “compliance will be measured separately going forward in any phase for which there will be DR or EE goals.” The Commission proposed in the 2026 TRC Test Tentative Order to maintain this requirement for Phase V if separate goals are established for dispatchable DR programs. However, the Phase V Tentative Implementation Order may include a more integrated EE/DR program design that includes “daily load-shifting” rather than an event-based DR program design. Peak demand impacts from a daily load-shifting style of DR are much like coincident demand reductions from energy efficiency, and it may be possible to have a single peak demand reduction goal that could be satisfied by either coincident demand reductions from EE or daily load-shifting DR programs (see Section G.2). If Phase V goals follow this more integrated structure, the Commission proposed to determine cost-effectiveness at the EE&C plan level rather than separately for EE and DR.

EDCs are required to develop and implement a portfolio of programs wherein the benefits of the portfolio are greater than the cost. Conducting TRC testing at the plan level gives new programs and technologies an adequate opportunity to establish whether they can contribute to the EE and DR goals of Act 129. Comments on past TRC Test Orders suggested conducting TRC Tests at the measure level but were rejected. Screening cost-effectiveness at the measure level could lead to adverse outcomes where EDCs are forced to limit the scope of efficiency projects within homes and businesses based on assumptions about avoided costs and incremental measure costs (IMCs) that each carry a degree of uncertainty.

As in prior phases, the Commission proposed in the 2026 TRC Test Tentative Order to continue applying the TRC Test at the plan level and to continue to reserve the right to reject any program with a low TRC ratio. EDCs are required to estimate and report program-level TRC ratios in their EE&C plans and in each final annual report. TRC ratios should also be reported for the EE and dispatchable DR portfolios, if applicable, as well as the entire EE&C plan (including both EE and DR).

**a. Comments**

PECO, PPL, CAUSE-PA, and Duquesne Light agree with the Commission's proposal to continue applying the TRC Test at the EE&C plan level. PECO Comments at 2, PPL Comments at 3, CAUSE-PA Comments at 4, Duquesne Light Comments at 2.

PPL also recommends that the Commission provide additional examples of qualifying "daily load-shifting" measures, programs, or both. PPL Comments at 3.

Duquesne Light requests that the Commission consider the additional costs associated with separate compliance goals if the Commission elects to establish a separate, dispatchable demand response program. Duquesne Light Comments at 2.

## **b. Disposition**

The Commission agrees with PECO, PPL, CAUSE-PA, and Duquesne Light's comments that the TRC Test should continue to be applied at the EE&C plan level.

The Commission also agrees with PPL that further examples of "daily load-shifting" measures would be helpful context. Examples of daily load-shifting programs the Phase IV SWE plans to investigate include electric vehicle managed charging, daily water heater control, thermostat optimization, behind-the-meter battery storage, and select commercial auto-DR options.

The Commission agrees with Duquesne Light that the additional costs associated with establishing a separate goal for dispatchable DR programs should be considered.

The Commission concludes that the determination of cost effectiveness for Phase V of Act 129 will remain at the EE&C plan level if no separate dispatchable DR goals are set for Phase V. If separate goals for EE and DR portfolios are set in the Implementation Order for Phase V, then cost effectiveness will be calculated at the EE portfolio level and the DR portfolio level, respectively. The Commission continues to reserve the right to reject any program with a low TRC ratio.

## **4. Discount Rate**

A discount rate is the percentage used to calculate the present value of future costs and benefits. Discounting reflects the reality that, all else equal, people prefer benefits now rather than later, and vice versa for costs. When choosing a discount rate, it is important to consider whose preferences are reflected by the discount rate. In the case of energy efficiency programs and other public policy initiatives, the discount rate is typically selected to reflect the preferences of the public at large. Because Act 129 is

an energy efficiency and conservation program, we proposed in the 2026 TRC Test Tentative Order to continue using a discount rate that reflects the preferences of the public at large. Act 129 did not set discount rates, but the 2021 TRC Test Order set a discount rate of 3% in real terms or 5% in nominal terms.

The Commission proposed to continue using a discount rate of 3% in real terms or 5% in nominal terms for Pennsylvania’s EE&C programs in Phase V, the same discount rates as Phase IV. The difference between the real discount rate and nominal discount rate is the assumed rate of inflation. We further proposed a standard 2% inflation assumption be used by all EDCs for Phase V, based on the projections of the United States (US) Congressional Budget Office’s 2024 to 2034 Budget and Economic Outlook.<sup>25</sup> A 3% real discount rate for the 2026 TRC Test is supported by economic theory of benefit-cost analysis that indicates that long-term gross domestic product (GDP) growth rates can be used as a rough proxy for the public’s preference for tradeoffs over time. In the US, real GDP growth has averaged 3.15% since 1948, according to the US Bureau of Economic Analysis.<sup>26</sup>

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

The Commission directs all EDCs subject to Act 129 to apply a common discount rate of 3% in real terms or 5% in nominal terms for Phase V EE&C programs. This guidance is consistent with the discount rates from Phase IV. The nominal discount rate of 5% includes a standard 2.0% inflation assumption discussed further in Section B.3.

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<sup>25</sup> See <https://www.cbo.gov/system/files/2024-02/59710-Outlook-2024.pdf> at page 5.

<sup>26</sup> See <https://tradingeconomics.com/united-states/gdp-growth>.

## **5. Effective Useful Life**

As established in Act 129 and as discussed in prior TRC Test Orders, any given measure is limited to a maximum of 15 years of savings benefits. 66 Pa.C.S.

§ 2806.1(m). Measures that require recurring expenditures, such as increased natural gas consumption for combined heat and power (CHP) projects, are also limited to 15 years of negative benefits. Typically, the costs of energy efficiency are front-loaded, and the benefits accrue over many years. This can result in a situation where benefits for a subset of the measure's technical life are compared to its full lifetime costs, since costs are incurred up front. In previous TRC Test Orders stakeholders have suggested various methodologies whereby costs are reduced proportionately to truncated lifetime benefits. The position of the Commission is unchanged on this issue. The Tentative Order proposed that such end effects adjustments are not acceptable for use in a potential Phase V. While certain technologies may have an expected useful life (EUL) greater than 15 years, Act 129 is clear about the 15-year limit, and any adjustment to the cost ledger would circumvent the legislative directive.

For some EE&C measures, a single baseline may not be appropriate for the duration of the mechanical life of the equipment. Although compliance with Act 129 goals has historically been based on "first-year" savings, lifetime savings are required for the calculation of TRC benefits. Dual baselines are appropriate when a known change in codes and standards lowers the savings opportunity in future years or the equipment that served as the baseline initially reaches the end of its useful life and a code-minimum baseline needs to be assumed for the remainder of the measure life. The latter situation is often appropriate for early replacement measures where it is not reasonable to assume the replaced equipment would continue to operate for the full EUL of the program-supported efficient equipment. In this situation, the remaining useful life (RUL) of the baseline equipment should be less than the EUL of the efficient equipment.

For the 2026 TRC Test, the Commission proposed that EDCs and their evaluation contractors continue to use dual baselines where appropriate and practical. Specifically, when an early replacement measure characterization is used to estimate first-year savings or a known change to codes and standards calls for a second savings level during the EUL. There are multiple ways to implement a dual baseline calculation within a benefit-cost model. The EDCs and their evaluation contractors should use professional judgment when selecting an implementation method based on the structure of their program tracking data, impact evaluation results, and TRC models.

**a. Comments**

PECO maintains that capping EULs at 15 years results in an asymmetric application of cost and benefits streams for long-life measures such as solar PV. If a 15-year cap on measure life is maintained, PECO suggests either (1) recognizing a measure's residual system value at 15 years or (2) prorating measure costs to reflect only those costs occurring in the first 15 years of the measure. PECO Comments at 2.

PPL maintains that there is still no adequate methodology to address the artificially reduced cost-effectiveness created by the 15-year EUL limit and recommends that the Commission reconsider proportionally reducing costs to align with benefits in these cases. PPL Comments at 3-4.

**b. Disposition**

The Commission does not disagree with PECO and PPL that the legislative 15-year EUL limit disadvantages technologies with a mechanical life of more than 15 years. However, the Commission's position on the topic is unchanged from prior TRC Test Orders or the 2026 TRC Test Tentative Order. Deliberate adjustment of equipment cost assumptions designed to balance out truncated TRC benefits violates the legislative intent of the Act and cannot be changed via a TRC Test Order.

## **6. Low-Income Programs**

The Commission proposed a modification to the avoided costs for low-income programs by incorporating into Phase V avoided cost forecasts of the benefit of EDC's financial savings from their Act 129 low-income EE programs (see Section B.12). The Commission did not propose any special B/C reporting requirements for low-income programs. Like any other EE&C program, low-income programs are not required to have a TRC ratio greater than 1.0. If an EDC has multiple low-income programs, there is no need to aggregate the cost effectiveness results across low-income programs for reporting purposes.

### **a. Comments**

KEEA, NEEP, PPL, CAUSE-PA, and the Joint Energy Advocates are all supportive of the inclusion of the benefit of EDC's financial savings from their Act 129 low-income EE programs into Phase V avoided cost forecasts. KEEA Comments at 2, NEEP Comments at 2, PPL Comments at 4, CAUSE-PA Comments at 4-5, Joint Energy Advocates Comments at 2.

KEEA recommends considering broadening the application of cost-effectiveness testing by incorporating elements of other cost test models across all EE programs, with a particular emphasis on low-income programs. For example, KEEA recommends including additional benefits such as customer satisfaction. KEEA Comments at 2.

CAUSE-PA recommends including reduced energy usage and resulting energy bills of Customer Assistance Program (CAP) participants as a reduced cost as these savings result in a direct reduction in the cost of providing rate assistance to CAP participants. CAUSE-PA urges the Commission and SWE to evaluate reductions in universal service program costs in future TRC Test studies. CAUSE-PA Comments at 4-5.

NEEP suggests including an adder for low-income non-energy impacts (NEIs) of at least 10% to capture the potential benefits of reducing hardship, improving health, lowering air emissions, and increasing comfort in the home, arguing that a 10% adder is in line with what other states have included in their cost-effectiveness testing. NEEP Comments at 2.

#### **b. Disposition**

The Commission recognizes the concerns of parties who highlight the exclusion of potential health, safety, and comfort benefits in the TRC Test. However, in reviewing the information provided in comments, our own research, and research performed by the SWE, we are not persuaded to allow the inclusion of adders for these potential benefits in the TRC benefits, especially given the large variance in the size of benefits among states that do quantify health, safety, and comfort benefits.

The Commission determined that CAUSE-PA's comments regarding EDC low-income programs, reduced energy usage and resulting energy bills of CAP participants and the subsequent reduction in the cost of providing rate assistance to CAP participants warrant further investigation. We will direct TUS staff to further investigate the validity of the potentially reduced costs of providing rate assistance to CAP participants attributable to EDC low-income programs. Based on the outcome of

that initial investigation, we will make recommendations regarding further study to quantify these potential impacts for use in a potential Phase VI.

## **7. Basis Of TRC Test Impacts**

In the 2026 TRC Test Tentative Order, the Commission proposed no changes and to continue the process established in Phases III and IV, under which EDCs are required to report verified gross savings, verified net savings, and actual costs in their final annual reports. *See 2016 TRC Test Order* at 46 and *2021 TRC Test Order* at 26-27. Compliance would continue to be based on verified gross kWh and kW electric savings, and costs would continue to be based on actual costs. Because EDCs use net savings for planning purposes, they would continue to report net savings for each program and the total portfolio of programs as well as describe how such net savings are calculated.

In addition, EDCs would continue to report TRC ratios in EE&C plans in two ways: (1) based on projected gross savings and (2) based on projected net savings. Actual costs are not known at the time of EE&C plan submission, so all cost values would also be projected.

### **a. Comments**

The Commission received no comments on this topic.

### **b. Disposition**

For Phase V of Act 129, EDCs will continue to report verified gross savings, verified net savings, and actual costs in their final annual reports. Compliance will continue to be based on verified gross kWh and kW electric savings, and costs will continue to be based on actual costs.

## **8. Measures Supported By Both Act 129 Programs And Other Funding Streams**

The Commission did not propose any changes regarding this issue from its position established in prior TRC Test Orders. Outside incentives, whether they are rebates from other program administrators or tax credits, reduce the participating customers' costs; therefore, the reduction must be reflected in lower IMCs and be factored into the EDCs' TRC Test calculations. The Commission recognizes that tracking non-Act 129 incentives paid to EDC customers may be difficult as some customers may not be inclined to provide the requested information or may not have access to it. Consistent with prior TRC Test Orders, the Commission proposed in the 2026 TRC Test Tentative Order that EDCs only need to factor in, as reductions to cost, the non-Act 129 incentives that are reasonably quantifiable by the EDC at the time the Act 129 transaction is recorded. Examples of reasonably quantifiable non-Act 129 incentives include energy efficiency rebate programs administered by the Pennsylvania Department of Environmental Protection (DEP) and grants from the Alternative and Clean Energy Program jointly administered by the Pennsylvania Department of Community and Economic Development (DCED) and DEP. EDCs can continue to include the full benefits determined by the gross verified calculations of the TRC Test for measures that include incentives from non-Act 129 funding sources if any portion of the measure is attributable to Act 129. The availability of non-Act 129 funding streams for a measure may increase the estimates of free-ridership, which would reduce benefits in the net verified calculations for the measure. *See 2013 TRC Test Order* at 21.

**a. Comments**

PECO and PPL request that the Commission clarify how incentives, benefits, or both from Federal funding mechanisms such as the Inflation Reduction Act (IRA)<sup>27</sup> or the Infrastructure Investment and Jobs Act (IIJA)<sup>28</sup> as well as Reducing Industrial Sector Emissions in Pennsylvania program (RISE PA)<sup>29</sup>, will be treated from a TRC Test perspective. PECO Comments at 2, PPL Comments at 4. PPL comments that the plan for incentive stacking, attribution, and other issues remains unresolved by the 2026 TRC Test Tentative Order. PPL Comments at 4.

CAUSE-PA and the Joint Energy Advocates support the Commission’s proposal to continue the current policy allowing EDCs to factor in non-Act 129 incentives and funding that is “reasonably quantifiable by the EDC” to reduce the cost of the measure used in the TRC calculation. However, CAUSE-PA and the Joint Energy Advocates oppose allowing EDCs to count the full savings for measures that receive non-Act 129 funding unless the Act 129 savings targets incorporate savings potential from non-Act 129 funding. CAUSE-PA and the Joint Energy Advocates support adopting a negotiated attribution framework for Phase V to determine what portion of savings from measures that receive outside funding can count toward the Act 129 savings targets. CAUSE-PA Comments at 5, Joint Energy Advocates Comments at 2.

CAUSE-PA, the Joint Energy Advocates, and NEEP recommend the Commission meet with stakeholders or open a proceeding to develop an attribution framework for projects that receive non-Act 129 funding. CAUSE-PA Comments at 5, Joint Energy Advocates Comments at 2, NEEP Comments at 5.

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<sup>27</sup> Pub. L. 117-169, 136 Stat. 1818.

<sup>28</sup> Pub. L. 117-58, 135 Stat. 429.

<sup>29</sup> [https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/Pages/RISE\\_PA.aspx](https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/Pages/RISE_PA.aspx).

In Reply Comments, FirstEnergy agrees with commenters that the Commission should continue its current policy allowing EDCs to factor in non-Act 129 incentives and funding streams that are “reasonably quantifiable by the EDC” to reduce the cost of the measure used in the TRC calculation. FirstEnergy, however, disagrees with commenters that the non-Act 129 funding should be considered when attributing energy savings to Act 129 programs. Instead, the full savings of a project or measure that is installed with Act 129 funding should count towards the EDC’s targets. FirstEnergy also opposes incorporating non-Act 129 funds when setting the energy savings targets for Phase V. FirstEnergy notes that increasing EDC targets to reflect potential additional funding effectively circumvents the Act 129 maximum allowable budgets upon which the EDC targets are based. FirstEnergy also opposes the recommendation for the Commission to conduct a technical workshop, proceeding, and/or stakeholder process, commenting that this separate process is unnecessary given the established Act 129 processes. FirstEnergy Reply Comments at 2.

**b. Disposition**

The Commission agrees with commenters and agrees with FirstEnergy’s reply comment that reasonably quantifiable outside incentives, including Federal funding mechanisms such as the Inflation Reduction Act, reduce the participating customers’ costs and therefore, the reduction will be treated as a reduction in incremental cost for Phase V of Act 129.

The Commission, however, disagrees with commenters that the non-Act 129 funding should be considered when attributing energy savings to Act 129 programs. Instead, the full savings of a project or measure that is installed with Act 129 funding should count towards the EDC’s targets. Regarding the proposal to incorporate non-Act 129 funds when setting the energy savings targets for Phase V, we note that the SWE plans to consider the availability of non-Act 129 funds when estimating incremental

measure costs and adoption rates in the Market Potential Study (MPS). Finally, the Commission disagrees with commenters who proposed conducting a separate technical workshop, proceeding, and/or stakeholder process for considering non-Act 129 funding for attribution of energy savings. The Commission rejects the commenters' proposal for a separate proceeding and agrees with FirstEnergy that a separate process is unnecessary given the established Act 129 processes.

## **B. Avoided Costs Of Supplying Electricity**

The Commission proposed to continue using the *status quo* Act 129 methodology to develop forecasted avoided costs of electricity for use in the 2026 TRC Test. In the 2021 TRC Test Order, the Commission proposed the use of a statewide Avoided Cost Calculator<sup>30</sup> (2021 ACC), developed by the Phase III SWE, that implemented the methodologies outlined within the 2021 TRC Test Order. The intention was that more detailed instructions would improve consistency across EDCs and lead to better alignment with market conditions. The Commission proposed in the 2026 TRC Test Tentative Order the use of an updated ACC (2026 ACC), developed by the Phase IV SWE, for use in Phase V and that EDCs must utilize this standard tool when developing avoided costs for Phase V.

The 2026 ACC is Exhibit 1 of this Order and is located on the Commission's website at:  
[http://www.puc.pa.gov/filing\\_resources/issues\\_laws\\_regulations/act\\_129\\_information/total\\_resource\\_cost\\_test.aspx](http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/total_resource_cost_test.aspx).

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<sup>30</sup> See <https://www.puc.pa.gov/pcdocs/1648144.xlsx>.

The following paragraphs are the topics of changes and continuation from prior TRC Test Orders as they relate to avoided costs of supplying electricity.

**1. Vintage Of Avoided Cost Forecasts**

The Commission proposed in the 2026 TRC Test Tentative Order that EDCs continue to develop a single forecast of avoided costs for use in Phase V EE&C plans and in all cost-effectiveness reporting in Phase V annual reports. For simplicity and consistency with EE&C plans, EDCs are not expected to update avoided costs mid-phase. However, the Commission plans to direct the Phase V SWE to include in its annual reports a comparison of forecasted avoided costs of supplying electricity to actual market conditions for each EDC service area. The Commission reserved the right to require a mid-phase update and noted that the EDCs may request updating depending on market changes.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

As previously stated in section A.2.b., Frequency of Review of the TRC Test, the Commission maintains its position that a single forecast of avoided costs should be the foundation of Phase V EE&C plans and annual reports. However, we see value in periodically assessing the accuracy of the forecast to understand the alignment of forecast with market conditions. The Commission directs the Phase V SWE to include in its final annual reports a comparison of forecasted avoided costs of electricity to load weighted real time locational marginal prices (LMPs) and a comparison of forecasted avoided cost generation capacity costs to Base Residual Auction (BRA) clearing prices for each EDC service area. Should significant differences between the Phase V avoided cost forecast and actual experienced market prices be found, the Commission may reconsider

the appropriateness of a static forecast of avoided costs. The Commission reserves the right to require a mid-phase update of avoided cost forecasts should the variance between EE&C plan projections and current market conditions become large enough to fundamentally alter the B/C results at the portfolio level.

## **2. Avoided Cost Of Electric Energy**

The proposed methodology entailed the use of a 20-year period for calculating avoided electricity energy costs and is dissected into three segments. Forecasted avoided energy costs should be calculated in a time-differentiated format with a minimum of six distinct seasonal periods per annum, as defined by the 2026 TRM, Volume 1, Table 1-3.<sup>31</sup>

**The first segment, years one through four:** The proposed methodology for segment one (calendar years 2026 through 2029) utilizes New York Mercantile Exchange (NYMEX) PJM electricity futures prices for on-peak and off-peak periods as a basis. It is the Commission's preference to utilize market-based electricity prices whenever possible. NYMEX futures prices should be obtained at the PJM Interconnection Western Hub location with an EDC/Rate District zonal basis adjustment based on the *2024 PJM State of the Market Report, Chapter 11*. The zonal adjustment factor shall be defined as the ratio of zone-specific real-time load-weighted average locational marginal price (LMP) against the Western Hub real-time load-weighted average LMP for the prior 5-years (2020 through 2024). The same zonal adjustment shall be used for both on-peak and off-peak price periods. The prompt month for NYMEX PJM electricity futures is established three months prior to the EE&C plan filing date.<sup>32</sup>

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<sup>31</sup> On-peak is defined as 7am to 11pm on weekdays. Off-peak is defined as 11pm to 7am on weekdays and all weekend and holiday hours. Summer includes May-September. Winter includes December-February. The shoulder period includes March, April, October, and November.

<sup>32</sup> For instance, if the EDC EE&C plan is due in November 2025, the prompt month will be August 2025.

**The second segment, years five through ten:** The methodology for segment two (calendar years 2030 through 2035) should be based on NYMEX natural gas futures converted into electricity costs. Medium-term NYMEX natural gas futures shall be blended with the longer-term US Energy Information Administration Annual Energy Outlook (EIA AEO) projected natural gas costs across the second segment period to shift from market-based conditions to a more stable model that is public and transparent. Natural gas costs shall be converted into an electric energy price, with an additional spark price spread<sup>33</sup> using the following calculation steps:

- i. Collect monthly NYMEX natural gas futures at Henry Hub for years one through ten. The prompt month for NYMEX futures is established as three months prior to the EE&C plan filing date.
- ii. Use the differential between the Henry Hub as the source and TETCO M-3 as the destination for the locational basis adjustment to the natural gas prices for EDCs/Rate Districts west of the Susquehanna River. The locational basis adjustment to the natural gas prices for EDCs/Rate Districts east of the Susquehanna River is the basis differential between the Henry Hub as the source and Transco Zone 6 non-New York as the destination. For EDCs that have service territory on both sides of the river, such as PPL and FirstEnergy, the location should be based where most of the electric load is present. Adjustments shall be based on the average of adjustment prices in years one and two and applied to NYMEX natural gas futures at Henry Hub for years one through ten.

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<sup>33</sup> “Spark price spread” refers to the difference between the price of electricity sold by a generator and the price of the fuel used to generate it, adjusted for equivalent units. *See* [https://en.wikipedia.org/wiki/Spark\\_spread](https://en.wikipedia.org/wiki/Spark_spread).

- iii. Gather annual forecasted natural gas costs from the 2025 U.S. Energy Information Administration Annual Energy Outlook (EIA AEO) projected costs for Electric Power Users in the Mid-Atlantic region using nominal dollars. Annual AEO natural gas costs shall be converted into monthly or seasonal periods that align with the TRM utilizing adjustment factors derived from zone location adjusted NYMEX natural gas futures prices from years one and two.
- iv. Derive final natural gas costs by blending NYMEX natural gas futures and EIA AEO projected natural gas costs over the segment two horizon. This shall be executed by adding one-seventh of the differential between EIA AEO natural gas costs and locational adjusted NYMEX natural gas futures for each segment year starting in year five to the zone location adjusted NYMEX natural gas futures.
- v. Convert final natural gas costs into electricity costs utilizing assumed heat rates for the average existing natural gas generating station. The heat rates of a gas turbine shall be utilized for on-peak periods and the heat rate of a combined cycle unit shall be utilized for off-peak periods. The proposed heat rate for on-peak shall be 11,030 BTU/kWh, and off-peak shall be 7,596 BTU/kWh.<sup>34</sup>
- vi. Add a spark spread cost to the avoided energy costs for segment two. The spark spread shall be determined as the average difference between the zone location adjusted NYMEX PJM electricity futures and zone locational adjusted electricity costs based on NYMEX natural gas futures for years one through three.

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<sup>34</sup> 2023 EIA AEO source for the average existing natural gas prime mover in the US.

**The third segment, years eleven through twenty:** The methodology for segment three (calendar years 2036 through 2045) shall be a similar methodology as for the second segment but based solely on long-term EIA AEO projected natural gas costs. Natural gas projected costs shall be converted into an electric energy price using a spark price spread calculation, with the following calculation steps:

- i. Gather annual forecasted natural gas costs from the 2025 US EIA AEO projected costs for Electric Power Users in the Mid-Atlantic region using nominal dollars. Annual AEO natural gas costs shall be converted into monthly or seasonal periods that align with the TRM utilizing adjustment factors derived from zone location adjusted NYMEX natural gas futures prices for years one and two.
- ii. Convert final natural gas costs into electricity costs utilizing the same heat rates for on-peak and off-peak periods as the second segment.
- iii. Add the spark spread cost to the avoided energy costs for segment three. The spark spread shall be the same as determined in the second segment.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

Given the absence of stakeholder comments or alternative proposals, the Commission directs the EDCs to forecast the avoided cost of electric energy as proposed in Section B.2. of this Order. The 2026 ACC (Exhibit 1) codifies each step of this process in a transparent Microsoft Excel workbook. Since the formulas and assumptions of the 2026 ACC are consistent with this Order, forecasts developed using

the 2026 ACC are considered to be aligned with the guidance of the 2026 TRC Test Order.

### **3. Nominal Vs. Real Dollars**

The Commission proposed in the 2026 TRC Test Tentative Order that for Phase V, EDC avoided cost forecasts should continue to be developed in nominal dollars (e.g., the avoided cost of supplying electricity in 2040 should be expressed in 2040 dollars). A nominal discount rate is used to calculate the NPV of benefits in the base year (2026). The Commission proposed an inflation rate of 2.0%, consistent with the US Congressional Budget Office assumptions.<sup>35</sup>

#### **a. Comments**

The Commission received no comments on this topic.

#### **b. Disposition**

For Phase V of Act 129, the Commission directs the EDCs to develop avoided costs in nominal dollars and calculate the NPV of benefits and costs using a 2026/2027 (Act 129 Program Year 18) base year, assuming an inflation rate of 2.0%.

### **4. Line Losses**

The algorithms and assumptions in the 2026 TRM calculate energy and demand savings at the customer meter. Similarly, EDC CSPs and evaluation contractors produce savings estimates for custom projects at the meter level. When calculating TRC benefits, these resource savings must be scaled to the system level to account for losses during transmission and distribution (T&D). Volume 1 of the 2026 TRM<sup>36</sup> provides line loss

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<sup>35</sup> See <https://www.cbo.gov/publication/60419>.

<sup>36</sup> See *2026 Technical Reference Manual, Volume 1* at Docket No. M-2023-3044491, entered September 12, 2024. Page 13. <https://www.puc.pa.gov/pcdocs/1848562.pdf>.

factors by EDC and customer class. The Commission proposed in the 2026 TRC Test Tentative Order that EDCs/Rate Districts continue to use these values to calculate system-level electric energy and peak demand impacts and to determine TRC benefits.

**a. Comments**

Duquesne Light supports the establishment of clear, agreed-upon line loss rates for each customer class for each EDC. Duquesne Light also requests that, should the TRC Test Order reference the 2026 TRM for published line losses, the 2026 TRM should be updated, consistent with Duquesne Light's comments in that proceeding. Duquesne Light Comments at 2.

**b. Disposition**

The Commission agrees with Duquesne Light's support for establishing clear, agreed upon line loss rates for each customer class at each EDC. The Commission notes that Volume 1 of the 2026 TRM contains the line loss factors requested by Duquesne Light in its comments on the proposed 2026 TRM. For Phase V of Act 129, EDCs are directed to use the line loss factors as codified in the 2026 TRM to calculate system-level electric energy and peak demand impacts prior to determining TRC benefits.

**5. Escalation Rate**

The Commission proposed in the 2026 TRC Test Tentative Order that any avoided electricity costs that require escalation from a given year shall utilize the Bureau of Labor Statistics' (BLS) Electric Power Generation Transmission Distribution (GTD) sector price index<sup>37</sup> (BLS factor: NAICS<sup>38</sup> 221110) as a proxy rate. The electric escalation statistic would be derived from the compound average growth rate (CAGR) of the average annual values of the prior five years with data for all twelve months.

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<sup>37</sup> See <https://data.bls.gov/timeseries/PCU221110221110>.

<sup>38</sup> North American Industry Classification System.

The Commission highlighted that the electric escalation rate should not be confused with the rate of inflation. The escalation rate deals with the rate of increase in costs in real dollars. The escalation rate plus the inflation rate captures the increase in cost projections in nominal dollars. Because the GTD BLS price index is inclusive of inflation, historical inflation across the same five-year period should be removed to isolate the electric escalation rate. Because of recent inflationary volatility, if in the event the calculated escalation rate is less than zero, the Commission proposed that the escalation rate should be set to zero percent.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

For Phase V of Act 129, we direct that the escalation rate be equal to the five-year CAGR of the BLS Electric Power GTD sector price index or zero, whichever is greater.

**6. Allocation Of Avoided Capacity Costs Between Summer And Winter Peak**

Act 129 reporting of peak demand impacts and the associated capacity benefits have historically relied exclusively on reductions in summer peak demand. In the 2026 TRM Final Order<sup>39</sup> the Commission chose to bifurcate the Act 129 peak demand definition to include both summer peak and winter peak. To support this transition, the 2026 TRM provides the algorithms and assumptions needed to estimate winter peak demand impacts as well as summer peak demand impacts. The transition to a seasonal

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<sup>39</sup> See *2026 TRM Final Order*, at Docket No. M-2023-3044491, entered September 12, 2024 (2026 TRM Final Order). Page 7-8. <https://www.puc.pa.gov/pcdocs/1848423.pdf>.

peak demand definition raised a critical question for the estimation of capacity benefits within the TRC Test. Specifically, how should annual capacity value (\$/kW-year) be prorated across the two seasons?

For the avoided cost of generation capacity, the Commission proposed in the 2026 TRC Test Tentative Order a 50/50 allocation between summer and winter demand. The same 50/50 allocation would apply to the generation capacity Demand Reduction Induced Price Effects (DRIPE) discussed in Section B.10 of this Order. If the avoided cost of generation capacity for an EDC zone in PY18 is \$60/kW-year, EDCs and their evaluation contractors would value each kW of summer peak demand reduction at \$30/kW-year and each kW of winter peak demand reduction at \$30/kW-year. Alternatively, the EDCs could average the summer and winter kW reductions from a program or measure and multiply the average by \$60/kW-year.

The proposed 50/50 allocation method is simple and avoids taking a strong position on long-term trajectories of load growth and generation mix in the region. Jurisdictions like New York with aggressive policies to electrify space heating and water heating end uses might consider the transition to a winter-peaking system a foregone conclusion. PJM's 2024 Load Forecast Report<sup>40</sup> projects winter peak demand to grow more rapidly than summer demand over the next 15 years, bringing the seasonal peaks closer together in magnitude, but the system is still forecast to be summer peaking in 2039. However, recent modeling by PJM shows a higher risk of unserved energy and loss of load in the winter season.<sup>41</sup> The extent to which PJM States adopt electrification policies, and the success of those initiatives, is still very uncertain. Thus, the Commission felt a neutral position on this issue was prudent. Additionally, current valuation procedures for energy efficiency resources recognized in the Forward Capacity

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<sup>40</sup> See <https://www.pjm.com/-/media/library/reports-notice/load-forecast/2024-load-report.ashx>.

<sup>41</sup> See <https://www.pjm.com/-/media/committees-groups/committees/pc/2024/20240216-special/elcc-education.ashx>.

Market require that resources deliver both summer and winter capacity or get “matched up” with a complementary resource. When resources match up, the value is split by days (\$/MW-day) with an effective 50/50 split between the summer and winter resource.

In comments<sup>42</sup> to FERC in response to PJM’s October 2023 *Capacity Market Reforms to Accommodate the Energy Transition While Maintaining Resource Adequacy* filing, the Commission expressed support for a seasonal capacity construct with separate accreditation and price signals for summer and winter capacity. The Commission recognized the administrative complexities of a seasonal design but encouraged PJM to move toward a seasonal structure. To date, PJM has not adopted a seasonal construct for its scheduled auctions. However, if PJM elects to formally bifurcate the capacity market, resulting in separate resource clearing prices for summer capacity resources and winter capacity resources, our proposed 50/50 allocation would be unnecessary. If market rules change, and separate resource clearing prices exist by season in time for EDCs to reflect those values in potential Phase V EE&C plans, we proposed in the 2026 TRC Test Tentative Order that the EDCs use those values rather than allocate the annual value across seasons using assumed shares.

For the avoided cost of transmission and distribution values (see Section B.8), the Commission proposed EDC-specific values split by season based on historic and projected peaking conditions. If the proposed specific allocations are utilized, a top-down allocation of annual value is not necessary for transmission capacity or distribution capacity.

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<sup>42</sup> See [https://www.puc.pa.gov/media/2655/ferc\\_comments-pjm\\_er24-99-110923.pdf](https://www.puc.pa.gov/media/2655/ferc_comments-pjm_er24-99-110923.pdf), Section A.

**a. Comments**

PPL recommends a graded escalation of demand for each program year of Phase V instead of a flat 50/50 split because the winter peak is increasing as heating demand shifts towards electric and the progressive approach also aligns with the 15-year load forecast. PPL supports the Commission’s statement that “if PJM elects to formally bifurcate the capacity market, resulting in separate resource clearing prices for summer capacity resources and winter capacity resources,” then the “proposed 50/50 allocation would be unnecessary.” PPL Comments at 5-6.

Duquesne Light recommends that the allocation of avoided cost of capacity be based on the annual system peak of each individual EDC. Given the low penetration of electric space and water heating within its territory, the mix of measures likely to be offered and incentivized during Phase V is expected to produce lower winter than summer peak demand reductions. Duquesne Light believes that a 50/50 allocation will understate avoided capacity costs and harm the cost-effectiveness of the Company’s portfolio of programs. Duquesne Light asserts that the avoided cost of capacity is driven by the annual system peak, not the average of summer and winter peaks. Duquesne Light’s system is overwhelmingly summer-peaking, with 97% of substations peaking in the summer, and “a strongly summer-peaking EDC, like Duquesne Light, sees minimal avoided T&D benefit from winter peak demand reductions.” Duquesne Light Comments at 3.

The Joint Energy Advocates support the addition of winter peak demand as this could help ease the transition to electrification of heat and hot water, creating a more cost-effective transition from deliverable fuel or other inefficient electric heat to installation of high-efficiency air source heat pumps. Joint Energy Advocates Comments at 5.

**b. Disposition**

PPL’s suggestion of a dynamic split over the horizon of Phase V and the EUL of measures installed in Phase V is an interesting concept. However, absent a specific suggestion of the changing ratio over time, this is not a comment the Commission can support without making significant assumptions about PPL’s intent. A forecast that begins with 60% allocation to summer and 40% allocation to winter in the 2026/2027 delivery year and ends with 40% allocation to summer and 60% allocation to winter in the 2045/2046 delivery year is a “graded escalation.” Alternatively, a forecast that starts at 100% summer and ends with 100% winter is also a graded escalation. Duquesne Light’s suggestion also has potential merit but lacks the specificity needed for the Commission to approve and incorporate into this Final Order and the 2026 ACC.

Since no stakeholder put forth a clear alternative proposal, the avoided cost of generation capacity and generation capacity DRIPE will follow a 50/50 allocation between the summer and winter seasons for Phase V of Act 129. If PJM elects to formally bifurcate the capacity market, the 50/50 allocation will be unnecessary. If market rules change, and separate resource clearing prices exist by season in time for EDCs to reflect those values in potential Phase V EE&C plans, EDCs are directed to use those values rather than allocate the annual value evenly across seasons.

## 7. Avoided Cost Of Generation Capacity

Generation capacity for the region is procured through PJM's forward capacity auction process – the Reliability Pricing Model. The BRAs happen approximately three years prior to the beginning of the delivery year, so the actual generation capacity values for the first years of the forecast horizon are known.<sup>43</sup>

When available, the actual zonal BRA clearing price should be used as the value for the avoided cost of generation capacity. When projecting further into the future than the known values, the Commission proposed in the 2026 TRC Test Tentative Order the following methodology:

- i. Take a simple average of the five most recent BRA clearing prices for the zone. The Commission's position is that taking a five-year average is prudent because clearing prices vary from year-to-year, and an average will dampen this volatility. For Phase V EE&C plans, EDC/Rate Districts are expected to have actual BRA clearing price values for the 2026/2027 and 2027/2028 delivery years (Act 129 PY18 and PY19).
- ii. Use the averaged value as the avoided cost of capacity for the first year that BRA clearing pricing prices are not available.

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<sup>43</sup> Due primarily to litigation before FERC in recent years, PJM postponed a number of BRAs. To return to the normal BRA schedule, PJM truncated the ordinary practice of holding the BRA three years in advance of the delivery year for the 2025/2026 and 2026/2027 delivery years. Accordingly, the BRA for the 2025/2026 delivery year was held in July 2024, with the BRA for the 2026/2027 delivery year currently scheduled for December 2024. On October 15, 2024, PJM filed a motion seeking permission from FERC to implement a 6-month delay of BRAs through the 2029/2030 delivery year in *Sierra Club, et al. v PJM Interconnection, L.L.C.*, Docket No. EL24-148-000.

- iii. Escalate using a compound annual growth rate of the BLS index for the power sector to calculate the avoided cost of generation capacity in real dollars for the remainder of the forecast horizon.
- iv. Apply the electric escalation and inflation rates to convert real dollars to nominal dollars.

**a. Comments**

PECO disagrees with the proposed use of a five-year average from the PJM BRA clearing prices and instead recommends the use of a fixed three-year average of actual auction results for the entire phase. PECO Comments at 3.

PPL notes the recent 2025/2026 PJM BRA clearing prices were extremely high (\$269.92/MW-day) based on a combination of market factors. PPL questions how potential future volatility in the PJM BRA clearing prices will affect the avoided cost of generation capacity. PPL Comments at 6.

**b. Disposition**

While PJM's Base Residual Auction schedule continues to face delays, it is expected that there will be at least one additional BRA auction (2026/2027) completed prior to the development of EDC EE&C plans for Phase V. While the 2025/2026 BRA clearing price is a notable difference from recent auctions, there is uncertainty regarding whether these high prices are the new normal or a temporary spike. EDC inclusion of the upcoming auction results within the Phase V avoided cost of generation capacity calculation will be an important mechanism to capture any market shifts.

Regarding the three-year versus five-year average, the Commission prefers a consistent time horizon of five years for any TRC parameters that are based on historical data. A five-year period is an appropriate horizon to balance variability caused by unique events such as the COVID-19 pandemic. Therefore, the Commission directs the EDCs to use the average of the five most recent PJM BRA clearing prices to calculate the avoided capacity for the first year that BRA clearing pricing prices are not available.

## **8. Avoided Cost Of Transmission And Distribution Capacity**

Starting in Phase III of Act 129, the avoided cost of transmission and distribution capacity has been valued on a \$/kW-year rather than a \$/kWh basis. *See 2016 TRC Test Order at 34-35.* The Commission maintains that investments in T&D infrastructure are driven by the need to accommodate peak demand rather than the volume of energy sales and proposed that EDCs continue to calculate the avoided T&D benefits of Act 129 EE&C plans using the gross and net verified peak demand reductions.

As discussed in previous TRC Test Orders, the Commission proposed in the 2026 TRC Test Tentative Order that no avoided cost of distribution capacity be calculated for EE or DR peak demand reductions from participants in the Large Commercial and Industrial (C&I) class that receive service at high voltage. Peak demand reductions achieved by these facilities are presumed unlikely to avoid or defer load growth-related investments in an EDC distribution system because these accounts take service directly from the sub-transmission network. The Commission recognized that EDC tariffs vary, so Large C&I customers will possibly map more cleanly to the rate codes of some EDCs than to the rate codes of other EDCs. As a rule, we proposed EDCs apply the avoided cost of distribution capacity to residential customers and non-residential customers who take service at secondary voltage and omit the distribution capacity benefit stream for Large C&I customers that take service at primary voltage (13 kV and above).

The methodology used to estimate avoided T&D costs has been the subject of much discussion in comments and reply comments to prior TRC Test Orders. For Phases III and IV of Act 129, the Commission proposed a simplified system wide value wherein the cost of growth-related capital investments is divided by system-level load growth. Challenges were identified with this approach in the face of flat or declining load growth. *See 2021 TRC Test Order* at 46. We also agreed with stakeholder comments that expressed concerns regarding the amount of variation in avoided distribution capacity costs and directed the Phase IV SWE, in collaboration with EDC system planners, to develop a more granular alternative methodology that is not predicated on load growth at the zonal level. *See 2021 TRC Test Order* at 49.

Listed in Section H, Exhibit 4, is the SWE's Avoided Cost of Transmission and Distribution Capacity Study. The Commission recognized the efforts of the EDC's planners to assemble the large volume of data required for this study and the collaborative work to help the SWE understand the nuances of their distribution systems. The Commission asserts that the SWE's T&D study represents a methodological improvement over the status quo approach and proposed the EDCs use the avoided T&D values presented in Table 1 of Exhibit 4 to calculate avoided T&D benefits for a potential Phase V of Act 129. The proposed 2026 ACC (Exhibit 1 to the Tentative Order) contained a full 20-year forecast with adjustments for inflation and escalation by EDC/Rate District and season. As described in Section B.6. of this Order, the SWE study recommends separate values for summer and winter demand impacts, so no assumed split is required.

In addition to presenting forecasts of avoided T&D benefits by EDC, the SWE T&D study raises several methodological topics that could potentially influence the application of avoided T&D costs and Phase V planning. Specifically, the Commission invited comments on the following observations by the SWE:

- The heat maps of deferral value for each EDC clearly show that avoided T&D benefits are concentrated in specific locations that are highly loaded and or expected to grow. Other locations have little or no deferral value. Taking a load-weighted average across an EDC territory simplifies the accounting but may mute important price signals regarding where load relief would be most beneficial. In the Conclusions and Recommendations section of its report, the SWE describes a low-medium-high value location taxonomy that could preserve some of the locational value. This suggestion would add a spatial component to EE&C program tracking or require EDCs to map participants to distribution circuit after the fact.
- Similarly, the SWE study notes that individual locations tend to be summer-peaking or winter-peaking, but rarely both. A load-weighted average at the EDC/Rate District territory level assigns a mix of summer and winter value to all demand reductions. Like the low-medium-high suggestion above, a seasonal classification scheme would help match EE&C plan measures with system need. A seasonal classification could justify more aggressive marketing or incentives on cooling equipment in summer-peaking areas and focus outreach for electric heating conservation or load-shifting measures in winter-peaking areas.

- The SWE also raises the possibility of a non-wires alternative (NWA) demonstration project for the EDCs. We see this as a logical conclusion based on the concentration of deferral value in certain pockets of a territory. The goal of an NWA would be to assess if EE&C resources, in combination with other resources, can be used to modify the load shapes, bend the growth, and avoid or defer likely upgrades.

**a. Comments**

Each of the four EDCs subject to Act 129 provided comments on this topic and presented similar positions. FirstEnergy expressed concern over the differential between the proposed Phase V values and the approved Phase IV values. FirstEnergy opposes variation (seasonal and sub-locational granularity) in avoided T&D costs due to uncertainty in where and how peak loads will grow, and the capital investments needed to support that load growth. FirstEnergy suggests that attempts to be more precise could introduce greater error. In addition, FirstEnergy comments that the increased administrative costs associated with tracking locational T&D benefits would reduce the available customer incentives under allowable Act 129 budgets. Lastly, FirstEnergy requests a single set of avoided cost values for the FirstEnergy EDC rather than separate values for Met-Ed, Penelec, Penn Power, and West Penn Power. FirstEnergy Comments at 2-4.

PECO opposes the addition of more granular inputs (e.g., spatial, seasonal) into the methodology for determining the avoided cost of transmission and distribution capacity because the additions will impose substantial new costs with uncertain energy reduction benefits. PECO notes that it would have to change its data collection and other processes to support more granular calculations and suggests that these new costs would reduce funding for customer incentives. PECO recommends adopting a flexible approach

that allows EDCs to voluntarily pursue NWA projects. If NWA projects become a mandated element of Phase V, PECO urges the Commission to consider the associated expenses in the target-setting process. PECO Comments at 3-4.

PPL agrees with the inclusion of the SWE T&D Study (Exhibit 4) results provided the Commission adopts the load-weighted average values from Table 1 of Exhibit 4 to simplify accounting and reporting. PPL prefers not to map Act 129 participants to distribution circuits. PPL does not recommend seasonal classification due to perceived customer incentive equity issues across the service territory. Lastly, PPL recommends that any NWA demonstration project be optional for Phase V. PPL Comments at 7-8.

Duquesne Light recommends not incorporating spatial or seasonal differentiation into avoided T&D benefits as more work is needed to evaluate the feasibility and impacts. Some EDCs, including Duquesne Light, might struggle with technology issues and high costs for implementing this proposal in Phase V due to the need for extensive mapping and system integration. Additionally, EDCs may lack information on where some measures are installed, like those from upstream programs. Duquesne Light believes the costs and administrative burden of using locational values outweigh the benefits currently. Achieving Phase V goals may also be harder as easier measures are no longer available. Duquesne Light supports encouraging EDCs to explore non-wires alternatives or limited locational avoided cost pilots but requests that this be optional and that the Commission allow each EDC to design projects as needed. Duquesne Light Comments at 3-4.

## **b. Disposition**

The EDCs' perspectives on the three observations raised by the SWE in its T&D study report were valuable as the Commission weighed its final disposition on this topic. For Phase V of Act 129, the avoided cost of T&D capacity will be the load-weighted seasonal values from Table 1 of the SWE's T&D study as shown in the 2026 ACC. Avoided distribution capacity benefits will not be applied to savings by participants taking primary service (13 kV and above).

The Commission recognizes that FirstEnergy will need to calculate weighted averages across the Met-Ed, Penelec, Penn Power, and West Penn Power service areas. Section I.1 of this Final Order provides instructions on how to calculate weighted average values across the four legacy EDCs for avoided T&D benefits and other TRC Test input values. The Commission has made no determination regarding the inclusion of the NWA projects in Phase V but the EDC preference for optionality and flexibility is noted.

## **9. Compliance with Alternative Energy Portfolio Standards Act (AEPS)**

In Phases I and II, the Commission required that the costs of compliance with the AEPS Act<sup>44</sup> that are known and knowable be included in the TRC Test calculation. The cost was applicable to all the power "avoided." Further, for Phase II, it was noted that a reduction in electric consumption would reduce an EDC's costs of complying with the AEPS Act requirements. *See 2013 TRC Test Order* at 44-45.

Because no EDCs had included AEPS Act costs through Phase III, beginning in Phase IV, the Commission provided the EDCs with Alternative Energy Credit (AEC) pricing to ensure uniform valuation of AECs (and hence avoided cost estimates) by EDCs in their EE&C plans and their cost-effectiveness calculations. The Commission has access to several subscription-based services that forecast AEC pricing, including

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<sup>44</sup> *See* 73 P.S. §§ 1648.1–1648.8 and 66 Pa.C.S. § 2814. *See also* 52 Pa. Code §§ 75.1–75.72.

Marex.<sup>45</sup> Using forecast data from May 1, 2024, for the year 2026, the Commission proposed that the AEPS Act avoided costs be \$6.88 per MWh for the first year of Phase V and escalated by the BLS escalation factor and the 2% inflation rate every year thereafter.<sup>46</sup>

In addition, the Commission plans to direct the Phase V SWE to include a summary of the AEPS costs with its Phase V annual reports for comparison purposes. If this comparison reveals significant differences between the assumed forecasted AEPS costs and the actual future AEPS costs, the Commission reserves the right to require a mid-phase update to avoided cost forecasts should the variance become large enough to fundamentally alter the benefit/cost results at the portfolio level.

#### **a. Comments**

KEEA recommends encouraging Act 129 EE programs and program participants to seek AEPS certification. KEEA proposes integrating energy efficiency into AEPS compliance to provide a revenue stream for energy efficiency programs. KEEA Comments at 4.

Duquesne Light notes that the monetary value of compliance with the AEPS is stated as \$6.88 MWh on page 28 of the Tentative Order but is stated as “\$6.88 cents per MWh” in Appendix C: Summary of Proposed Continuations/Changes/Clarifications/New Items. Duquesne Light requests clarification of the cost assigned to compliance with AEPS. Duquesne Light Comments at 4.

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<sup>45</sup> Marex is a United Kingdom-based broker of financial instruments and provider of market data services across the metals, agricultural and energy markets. See <https://www.marex.com/about-us/>.

<sup>46</sup> The AEPS Act avoided cost is established using a price of \$37.25 for solar photovoltaic sources at 0.5% of retail sales; \$34.20 for Tier I sources at 8% of retail sales; and \$39.63 for Tier II sources at 10% of retail sales. Obligations are set in <https://www.pabulletin.com/secure/data/vol38/38-51/2286.html>.

In reply comments, FirstEnergy opposes KEEA's recommendation to encourage Act 129 and other energy efficiency programs to seek AEPS certification as a potential revenue stream. FirstEnergy argues that the recommendation is misplaced and should instead be considered as part of the Commission's Tentative Phase V Implementation Order to have the benefit of input by all interested stakeholders. FirstEnergy further comments that this should be carefully considered and understood in recognition of the competitive market to avoid unnecessary costs and competition and to avoid any unintended consequences. FirstEnergy Reply Comments at 4.

### **b. Disposition**

While the Commission agrees that Act 129 programs and program participants should be encouraged to seek AEPS certification for Act 129 projects, the Commission agrees with FirstEnergy that the issue of providing a potential revenue stream should be carefully considered as part of the Commission's Tentative Phase V Implementation Order to have the benefit of input by all interested stakeholders.

Regarding Duquesne Light's comment about the monetary value of compliance with the AEPS, the Commission clarifies that the value is \$6.88 (six dollars and eighty-eight cents) per MWh.

## **10. Price Suppression Effects**

In organized markets, such as the capacity, energy, and ancillary services markets operated by PJM, reductions in demand tend to place downward pressure on the supply side of the market and can potentially lower the market equilibrium price. These wholesale price suppression effects are also known as demand reduction induced price effects (DRIPE). The Commission directed the Phase IV SWE to conduct an updated study to quantify the value of DRIPE under current market conditions. The SWE used

methodologies of nearby jurisdictions such as Maryland and New England.<sup>47</sup> Evidence of price suppression effects were found for both avoided electric energy and avoided generation capacity.

This issue has been investigated previously by the SWE and discussed in prior Commission Orders. In a Secretarial Letter, dated May 17, 2013, the Commission released the *Act 129 Demand Response Study – Final Report* at Docket No. M-2012-2289411.<sup>48</sup> The Commission held a DR Study Stakeholder Meeting on Tuesday, June 11, 2013. At the suggestion of stakeholders, the Commission directed the Phase II SWE to conduct a Preliminary Wholesale Price Suppression and Prospective TRC Test Analysis of the DR program. The Phase II SWE's *Act 129 Demand Response Study – Final Report; Amended November 1, 2013*<sup>49</sup> was released for comment on November 14, 2013.<sup>50</sup> Following a review of comments, the Commission issued its *Peak Demand Reduction Cost Effectiveness Determination* Final Order, which directed the Phase II SWE to perform a DR Potential Study.<sup>51</sup> In the *Peak Demand Reduction Cost Effectiveness Determination* Final Order, the Commission was persuaded by stakeholder comments opposing further price suppression research and directed the Phase II SWE to perform a DR Potential Study for Phase III without inclusion of price suppression benefits. Therefore, no price suppression benefits were included in the 2016 TRC Test Order for energy efficiency or DR.

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<sup>47</sup> <https://www.synapse-energy.com/sites/default/files/AESC%202024.pdf>. See page 227.

<sup>48</sup> See *Release of the Act 129 Demand Response Study – Final Report and Stakeholder Meeting Announcement*, at <https://www.puc.pa.gov/pdocs/1230514.docx>.

<sup>49</sup> The May 2013 and November 2013 versions of the SWE's *Act 129 Demand Response Study – Final Report* are available on the Commission's website at [http://www.puc.pa.gov/filing\\_resources/issues\\_laws\\_regulations/act\\_129\\_information/act\\_129\\_statewide\\_evaluator\\_swe.aspx](http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/act_129_statewide_evaluator_swe.aspx).

<sup>50</sup> See *Energy Efficiency and Conservation Program* Tentative Order, Docket Nos. M-2012-2289411 and M-2008-2069887 (entered November 14, 2013).

<sup>51</sup> See *Energy Efficiency and Conservation Program* Final Order, Docket Nos. M-2012-2289411 and M-2008-2069887 (entered Feb. 20, 2014) (PDR Cost Effectiveness Determination Final Order).

The 2021 TRC Test Order stated that avoided costs for Phase IV of Act 129 would not include any DRIPE but directed the Phase IV SWE to monitor the issue and provide recommendations regarding a study to re-examine capacity and/or energy DRIPE in the Commonwealth. *See 2021 TRC Test Order* at 55. In preparation for the 2026 TRC Test Tentative Order and Phase V planning, the SWE completed an analysis of price suppression effects and developed a recommended set of DRIPE values. The SWE's Pennsylvania Demand Reduction Induced Price Effects Study is included in Section H, Exhibit 3.

Based on review of the SWE's DRIPE study, the Commission proposed in the 2026 TRC Test Tentative Order to include price suppression effects in the TRC benefit calculations for Phase V of Act 129. The SWE's analysis showed that these benefits exist in the wholesale capacity and energy markets operated by PJM and are a real avoided cost of supplying electricity. While there is uncertainty in the DRIPE benefits estimated by the SWE, every component of the avoided cost forecast is based on estimates that contain uncertainty. The NGDCs of Pennsylvania include the value of DRIPE in their set of avoided costs used in benefit cost analysis.<sup>52</sup> Inclusion of DRIPE in the avoided cost of supplying electricity will promote alignment between electric and natural gas conservation programs.

As discussed in Exhibit 3, the Commission directed the SWE to only include price suppression benefits that accrue to Pennsylvania ratepayers and exclude effects on neighboring states. The 2026 ACC (Exhibit 1) reflects the specific price suppression effects values recommended in Chapter 4 of the SWE's DRIPE study. Consistent with the directions for generation capacity in Section B.6. of this Order, the Commission directed the SWE to split the annual generation capacity DRIPE value from its study

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<sup>52</sup> *See* Philadelphia Gas Works (PGW) ENERGYSense DSM Portfolio Implementation Plan FY 2024-2026 at Docket No. 2014-2459362 (Entered June 16, 2023) <https://www.puc.pa.gov/pcdocs/1790192.pdf>. Page 13.

evenly between summer and winter. The Commission proposed that these values be used by each EDC for TRC Benefit calculations in Phase V of Act 129.

**a. Comments**

PPL supports the inclusion of DRIPE into the avoided costs for Phase V.  
PPL Comments at 13.

**b. Disposition**

As proposed in the 2026 TRC Test Tentative Order, the Commission directs the EDCs to use the values in the 2026 ACC, which reflect the specific price suppression effect values recommended in Chapter 4 of the SWE’s DRIPE study.

**11. End-Use Adjustments**

In Section B.2., the Commission laid out a time-differentiated approach to valuing the avoided cost of electric energy. That valuation approach aligned with Table 1-3 (Periods for Energy Savings) in the 2026 TRM in defining six mutually exclusive costing periods.<sup>53</sup> The six periods are summer on-peak, summer off-peak, winter on-peak, winter off-peak, shoulder on-peak, and shoulder off-peak. The Commission proposed in the 2026 TRC Test Tentative Order continued use of end-use profiles, when available, for EE&C technologies or programs using a time-differentiated format consistent with the avoided energy costs. EDCs and their evaluation CSPs can use end-use profiles to partition the annual kWh savings from EE&C measures into the six energy savings periods. EDCs can then apply period-specific avoided energy cost projections or compute a weighted average avoided cost of energy specific to the measure type when estimating TRC benefits.

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<sup>53</sup> See the 2026 Technical Reference Manual, Volume 1, Docket No. M-2023-3044491 (Entered September 12, 2024) <https://www.puc.pa.gov/pdocs/1848562.pdf>. Page 10.

To support the EDCs and their CSPs in applying end-use profiles, the proposed 2026 ACC included a tab named “Six Period Load Shapes” containing profiles organized by sector, building type, and end use. Each profile contains six values that sum to 100%. Profiles for the lighting end use came from the Act 129 SWE Commercial and Residential Light Metering Study.<sup>54</sup> Other end use profiles were developed using load shape data produced by the National Renewable Energy Laboratory (NREL) and organized in its ResStock and ComStock datasets.<sup>55</sup> The Commission leveraged the NREL load shapes in development of summer and winter demand savings assumptions for the 2026 TRM so the application of end-use profiles in the TRC Test promotes consistency between the TRM and TRC Test.

The NREL ComStock dataset has a slightly different roster of commercial building types from the 2026 TRM. For ease of use, the SWE mapped the NREL building types to the business types in the TRM. The Commission proposed to include a “Composite Commercial” building type that is a floorspace-weighted average of all commercial building types for use when building type is unknown or for planning purposes when the distribution of business types is unknown. Similarly, the NREL ResStock dataset includes load shapes for five distinct residential building types. The Commission proposed in the 2026 TRC Test Tentative Order to simplify this in the 2026 ACC and include profiles for Single Family, Multi Family, and a “Composite Residential” building type that is a floorspace-weighted average of the five underlying residential building types.

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<sup>54</sup> See *Act 129 SWE Commercial and Residential Light Metering Study*, at Docket M-2014-2424864, entered February 4, 2015. [Appendix A](#) and [Appendix B](#) display 8760 load shapes for the residential and commercial sectors, respectively.

<sup>55</sup> See <https://www.nrel.gov/buildings/end-use-load-profiles.html>.

In addition, the Commission proposed the end-use load shapes in the 2026 ACC be considered optional resources for the EDCs and their evaluation CSPs. EDCs and their CSPs should exercise professional judgment in cases where they believe alternative end-use profiles are more relevant or accurate. Where primary data collection from impact evaluations returns project or measure-specific profiles, that data is clearly preferred. When end-use profiles are not available, or the EE&C measure savings are not expected to follow an end-use profile, the use of class average premise loads will continue to be acceptable.

**a. Comments**

PPL agrees with the Commission's proposal to make the end-use load shapes in the 2026 ACC optional resources for EDCs and evaluation CSPs. PPL Comments at 8.

**b. Disposition**

As proposed in the 2026 TRC Test Tentative Order, the Commission directs the EDCs to use end-use profiles to time-differentiate annual energy savings into the six energy costing periods in the 2026 ACC when estimating electric energy benefits in the TRC Test. The end-use load shapes in the 2026 ACC will be considered as optional resources for Phase V. EDCs and their CSPs should exercise professional judgment in cases where they believe alternative end-use profiles are more relevant or accurate.

## 12. Reductions In Arrearages And Collection Costs

In the 2021 TRC Test Order, stakeholders pointed out that the arrearages and uncollected debt were a cost of supplying electricity and suggested the Commission quantify potential reductions of these costs as benefits in the TRC Test for low-income programs. In its disposition, the Commission stated:

*Therefore, we determined that PA-EEFA's comments regarding reduced arrearages and uncollected debt merit further investigation, particularly for programs offered to the low-income sector, and will direct the Phase IV SWE to study the impacts of EDC low-income programs on collections. We will make, at a later time, recommendations regarding the appropriateness and magnitude of such a benefit for consideration in future TRC Test Orders.*<sup>56</sup>

Utilities can realize financial savings from their low-income EE programs. The efficient technologies installed by EE programs often result in reduced energy bills for participants, which can decrease the likelihood that customers will experience difficulties paying their utility bills. In turn, utilities may realize reduced costs associated with arrearages and late payments, uncollectible bills and bad debt write-offs, service terminations and reconnections, bill-related customer calls, and the bill collections process.

The SWE conducted a study to quantify and monetize EDCs' financial savings through an analysis of EDC data on customer arrearages, shutoffs, and collections actions for Act 129 low-income program participants. The Commission proposed in the 2026 TRC Test Tentative Order to incorporate the benefit of EDCs' financial savings

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<sup>56</sup> See 2021 TRC Test Final Order, at Docket No. M-2019-3006868, entered December 19, 2019. Page 73.

from their Act 129 low-income EE programs, quantified in the SWE’s study, into Phase V avoided cost forecasts. The SWE recommended adopting EDC-specific results for PECO, PPL, and Duquesne Light and the statewide average values for FirstEnergy. The benefits apply for the EUL of the installed measures.

The SWE’s recommendation, shown in Table 1, presents the per MWh values in 2026 dollars, adjusted for line losses and inflation, for each EDC/Rate District.

**Table 1: EDC/Rate District Financial Savings from Their Low-Income EE Programs**

<b>EDC / Rate District</b>	<b>Total Annual Benefit Per MWh, \$2026</b>
<b>PECO</b>	\$58.14
<b>PPL</b>	\$44.87
<b>Duquesne Light</b>	\$18.67
<b>FE: Met-Ed</b>	\$18.10
<b>FE: Penelec</b>	\$18.10
<b>FE: Penn Power</b>	\$18.10
<b>FE: West Penn Power</b>	\$18.10

**a. Comments**

KEEA, CAUSE-PA, PPL, and the Joint Energy Advocates express support for including an EDC’s financial savings from reduced customer arrearages, shutoffs, and collections actions attributable to the EDC’s Act 129 low-income programs. KEEA Comments at 2, CAUSE-PA Comments at 7-10, Joint Energy Advocates Comments at 2, PPL Comments at 8 and 12.

CAUSE-PA comments that including these benefits in TRC calculations will help to improve the variety of measures available through Act 129 low-income programs. CAUSE-PA supports a follow-up study to evaluate the avoided cost impact of Act 129 low-income EE&C programs on universal service program costs. Specifically,

CAUSE-PA suggests the SWE should quantify the reduction in CAP costs attributable to reductions in energy usage by Act 129 low-income program participants who are enrolled in CAP. CAUSE-PA also supports a follow-up study of reduced customer arrearages, shutoffs, and collections actions for the FirstEnergy Rate Districts. CAUSE-PA Comments at 7-10.

PECO encourages including health and safety improvements as a recognized benefit stream for low-income EE programs. PECO notes that its Phase IV Health and Safety Pilot resulted in significant benefits to participating customers. Due to the cost of health and safety measures, PECO recommends budgetary allocations to undertake health and safety measures that would enable utilities to implement more comprehensive energy-efficiency measures. PECO Comments at 4.

PPL comments that the SWE did not analyze the change in the number of reconnections because the EDCs would not realize any financial savings from reduced reconnections. However, PPL recommends calculating those savings for the Final TRC Order because those customer benefits from the EE&C programs should be considered. PPL Comments at 12.

In reply comments, FirstEnergy opposes the further study of reduced customer arrearages, shutoffs, and collections actions for FirstEnergy proposed by CAUSE-PA and instead recommends the Commission adopt the SWE's recommendation of using the statewide average values for FirstEnergy. FirstEnergy Reply Comments at 4.

**b. Disposition**

The Commission adopts the SWE’s recommended EDC financial savings from reduced customer arrearages, shutoffs, and collections actions attributable to the EDC’s Act 129 low-income programs as shown in Table 2. The values are presented as dollars per MWh using 2026 dollars, adjusted for line losses and inflation, for each EDC. The Commission has included a value for FirstEnergy, which is simply the statewide average value and identical to the individual FirstEnergy EDCs / Rate District values in Table 1.

**Table 2: EDC Financial Savings from Their Low-Income EE Programs**

<b>EDC</b>	<b>Total Annual Benefit Per MWh, \$2026</b>
<b>PECO</b>	\$58.14
<b>PPL</b>	\$44.87
<b>Duquesne Light</b>	\$18.67
<b>FirstEnergy</b>	\$18.10

As noted previously in Section A.6., the Commission will direct TUS staff to further investigate the validity of the potential reduced costs of providing rate assistance to CAP participants attributable to EDC low-income programs and report back to the Commission.

As also noted in Section A.6. above, the Commission recognizes PECO’s concerns of the exclusion of potential health and safety benefits in the TRC Test. However, in reviewing information provided in comments, our own research, and research performed by the SWE, we are not persuaded to allow inclusion of these potential benefits in the TRC benefits at this time. The Commission declines PPL’s suggestion to calculate the potential customer benefits from changes in the number of reconnections attributable to Act 129 programs, however, the Commission will direct TUS staff to further investigate the validity of this potential customer benefit.

## **C. Other TRC Benefits**

While the focus of Act 129 programming is the reduction of electric consumption and peak demand, EE&C measures often impact homes and businesses in other ways, such as fossil fuels or water usage. Fossil fuel and water impacts can be both positive and negative. For example, attic insulation upgrades to a home with central air conditioning and a natural gas furnace will conserve natural gas during the winter heating season in addition to the reduced electric consumption during the summer cooling season. Conversely, a combined heat and power project will reduce consumption of electricity from the grid, but it will increase the amount of fossil fuel consumed on-site by a business. EE&C measures can also reduce or increase the operation and maintenance costs for a participating customer. Lastly, EE&C measures can create societal benefits such as reduced greenhouse gas (GHG) emissions.

This section addresses each category of potential non-electric TRC benefits. Previous Act 129 TRC Test Orders limited inclusion of non-electric benefits to reasonably quantifiable impacts. Guidance and clarification regarding impacts that are reasonably quantifiable or not are provided below. In each area, the Commission proposed in the 2026 TRC Test Tentative Order symmetric handling of increases and decreases in other resource types.

### **1. Quantifying Water Impacts**

Several common EE&C measures achieve reductions in electricity consumption from domestic hot water end use by reducing the volume of hot water used for various tasks. For a potential Phase V TRC Test, the Commission proposed in the 2026 TRC Test Tentative Order that any measure whose TRM algorithm relies on a calculated change in gallons has reasonably quantifiable water savings that EDCs should include in their calculation of TRC benefits. The algorithms for measures 2.3.6 (Low-Flow Faucet Aerators), 2.3.7 (Low-Flow Showerheads), and 2.3.8 (Thermostatic Shower Restriction

Valves) of the 2026 TRM include estimation of water volume savings as an intermediate step in the energy savings calculations. Other TRM measures that provide enough information for an EDC or its evaluation contractor to estimate annual water savings with some basic secondary assumptions include 2.4.8 (ENERGY STAR Clothes Washers), 2.4.10 (ENERGY STAR Dishwashers), and 3.4.2 (Low-Flow Pre-Rinse Sprayers for Retrofit Programs and Time of Sale Programs). If a custom project scope includes annual water impacts developed by the participant or contractor, the Commission proposed that it is reasonable for EDCs to include those estimates in the calculation of TRC benefits.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

As proposed in the 2026 TRC Test Tentative Order, for Phase V of Act 129, the EDCs are directed to quantify water impacts and estimate the TRC benefits with those water impacts for measures that the 2026 TRM provides all or most of the necessary inputs and assumptions to calculate them. If a custom project scope includes annual water impacts developed by the participant or contractor, the EDCs are to include those estimates in the calculation of TRC benefits.

## 2. Monetizing Water Impacts

In the first two years of Phase IV (PY13 and PY14), water benefits accounted for approximately \$80 million of the \$972 million (8.2%) in TRC benefits statewide.<sup>57,58</sup> Based on the relative importance of water savings in the Phase IV TRC Test results, it is important that EDCs continue to monetize changes in water consumption in the TRC Test for a potential Phase V of Act 129.

In the 2021 TRC Test Final Order, the Commission directed EDCs to monetize water impacts at a rate of \$0.01 per gallon (2021 dollars) with a loss factor of 24.5% (1.32 multiplier). The value of \$0.01 per gallon was based on an estimated marginal cost to treat and pump an extra gallon of water. Adjusted for inflation, this translates to approximately \$0.011 per gallon (2026 dollars).

In preparation for this Order, Commission staff conducted an analysis of the retail rates of the Class A water utilities over which the PUC has jurisdiction. These include Aqua PA, Pennsylvania American Water, Audubon Water, Columbia Water, Community Utilities, Newtown Artesian, York Water Company and Pittsburgh Water and Sewer Authority. The analysis also included some water utilities that the PUC does not have jurisdiction over, specifically Philadelphia Water Department, Lancaster City Water Authority, and Lehigh County Authority.

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<sup>57</sup> See *Act 129 SWE Phase IV Program Year 13 Final Annual Report*. Submitted to the Commission on December 5, 2022, [https://www.puc.pa.gov/media/2152/py13\\_swe\\_annual\\_report120522final.pdf](https://www.puc.pa.gov/media/2152/py13_swe_annual_report120522final.pdf), Table 21 on page 48.

<sup>58</sup> See *Act 129 SWE Phase IV Program Year 14 Final Annual Report*. Submitted to the Commission on December 1, 2023, [https://www.puc.pa.gov/media/2688/swe\\_py14\\_final\\_annual\\_report120123.pdf](https://www.puc.pa.gov/media/2688/swe_py14_final_annual_report120123.pdf), Table 21 on page 46.

Many of the water utilities included in the analysis offer declining block rates where the cost per gallon is lower for billing cycles that exceed a specific volume. The Commission's analysis uses the second block in such cases, assuming that it better approximates the marginal cost of an additional gallon to the system. Once compiled, the price per gallon was averaged across the residential, commercial, and industrial classes for each water utility. After assigning an approximate number of customers to each utility, Commission staff computed a weighted average for the Commonwealth of 1.057 cents per gallon. Adjusted for inflation, this exercise also returns an estimate of \$0.011 per gallon in 2026 dollars.

Based on the consistency of these results with prior orders and Phase IV TRC testing, the Commission proposed in the 2026 TRC Test Tentative Order that the EDCs monetize water savings at a rate of 1.1 cents per gallon for Phase V of Act 129. Under the proposal, this rate would be increased yearly with the same inflation rate assumed throughout the TRC model and adjusted by a loss factor of 24.5% (1.32 multiplier).

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

For Phase V of Act 129, the EDCs and their evaluation contractors are directed to monetize annualized water savings at a rate of 1.1 cents per gallon (\$2026). This rate increases yearly with the same inflation rate assumed throughout the TRC model and adjusted by a loss factor of 24.5% (1.32 multiplier).

### 3. Quantifying Fossil Fuel Impacts

In the 2021 TRC Test Order, the Commission directed the EDCs to quantify the fossil fuel impacts of EE&C measures for inclusion in the calculation of TRC benefits. This was consistent with the 2016 TRC Test Order and a 2018 SWE guidance memo. The Commission noted that specific instructions regarding fossil fuel impact calculations for all Act 129 EE&C measures are not practical given the diversity of measures, program delivery models, and data collection practices. Accordingly, the EDC evaluation contractors are expected to use professional judgment when developing estimates. Considering this, the Commission proposed the following general guidance be used in a potential Phase V for certain measure categories.

- For building shell, whole home, or heating, ventilation, and air conditioning (HVAC) measures that reduce space heating consumption in homes with fossil fuel heat, the 2026 TRM generally provides adequate information to estimate fossil fuel savings for homes with non-electric space heating. EDCs should assume a natural gas furnace with a thermal efficiency of 88% and capacity of 78,000 BTU/hour in the calculations based on the results of the 2023 Residential Baseline Study.<sup>59</sup>
- Faucet aerators, low-flow showerheads, and thermostatic shower restriction valves reduce fossil fuel use when they are implemented in homes with non-electric water heating. The 2026 TRM assumes 47% of homes have electric water heat, indicating the remaining 53% have natural gas, propane, or fuel oil. Consistent with prior

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<sup>59</sup> See NMR Group for the Pennsylvania Public Utility Commission. *2023 Pennsylvania Statewide Act 129 Residential Baseline Study*. Submitted March 25, 2024, at Docket No: M-2023-304490. [https://www.puc.pa.gov/media/2883/2023\\_pa\\_residential\\_baseline\\_study.pdf](https://www.puc.pa.gov/media/2883/2023_pa_residential_baseline_study.pdf).

TRC Test Orders, the Commission proposed a simplified assumption that all non-electric domestic hot water savings be monetized using natural gas avoided costs for a potential Phase V at an assumed 80% recovery efficiency.

**a. Comments**

NEEP recommends that avoided costs for delivered fuels, such as fuel oil and propane, be accounted for separately from natural gas. NEEP cites an EPA determination that heating oil emits 40% more CO<sub>2</sub> than natural gas and thus suggests that the two fuels need to be assessed separately for accuracy. NEEP Comments at 4.

In its reply comments, FirstEnergy disagrees with NEEP's suggestion to separate fuel oil and propane savings from natural gas. It states that natural gas accounts for the majority of fossil fuel space heating in Pennsylvania, and suggests the administrative burden required to separate the different fuel types would be high. FirstEnergy supports the Commission's proposal to use natural gas as a proxy for all fuels in the Phase V TRC Test. FirstEnergy Reply Comments at 5-6.

**b. Disposition**

The Commission rejects NEEP's suggestion to require separate avoided cost forecasts for delivered fuels and natural gas. Act 129 programs are focused on electricity savings and are funded by cost recovery on electric bills. While this does not mean fossil fuel impacts should be ignored in the TRC Test, the Commission does not agree that the additional tracking and reporting complexity required to differentiate fossil fuel types is justified for electric EE&C plans. Further, the 2026 TRM does not provide default assumptions by fossil fuel type, which would be needed to implement NEEP's proposal at scale. NEEP's point about the additional emissions intensity of delivered fuels versus natural gas is well-taken, but in a TRC Test, which does not monetize emissions benefits,

this granularity would not impact the B/C results of the programs. While the Commission will not require fossil fuel differentiation by the EDCs for Phase V or to incorporate separate avoided cost forecasts for delivered fuels in the 2026 ACC, the EDCs should have the flexibility to adopt differential tracking and benefit calculations in their Phase V EE&C plans if the perceived benefits to program design and delivery outweigh the increased administrative costs.

#### **4. Interactive Effects**

Lighting interactive effects are a specific form of fossil fuel impacts that the TRC Test must consider. Installation of light emitting diode (LED) lighting reduces the amount of waste heat produced by the lighting end-use. TRM protocols quantify the impacts on electric HVAC systems, so the electric interactive effects are reflected in the calculation of TRC benefits. In the case of homes or businesses with fossil fuel heating systems, the increased heating fuel consumption should continue to be treated as a negative benefit in the TRC Test.

As part of the 2026 TRM, the SWE developed residential and non-residential lighting interactive effects calculators. The outputs of these Microsoft Excel tools were the basis of the proposed electric interactive effects in the *2026 TRM Tentative Order*.<sup>60</sup> That modeling effort also included estimates of fossil fuel heating penalties on a MMBtu per kWh of lighting savings basis. Table 3 shows the Commission's proposed default residential lighting interactive effects by EDC/Rate District, considering the weather patterns of each service territory and the heating fuel saturations from the 2023 Residential Baseline Study.

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<sup>60</sup> See *2026 TRM Tentative Order*, Docket No. M-2023-304491 (entered May 9, 2024), Page 15, <https://www.puc.pa.gov/pcdocs/1828766.pdf>.

**Table 3: Residential Interactive Effects By EDC/Rate District**

<b>EDC / Rate District</b>	<b>IF<sub>fossil fuel</sub></b>
<b>PECO</b>	-0.0009
<b>PPL</b>	-0.0006
<b>Duquesne Light</b>	-0.0012
<b>FE: Met-Ed</b>	-0.0007
<b>FE: Penelec</b>	-0.0009
<b>FE: Penn Power</b>	-0.0010
<b>FE: West Penn Power</b>	-0.0007

The Act 129 Lighting Audit & Design Tool for Commercial and Industrial Projects (2026 TRM Appendix C) collects HVAC configuration so heating fuel is known for most retrofit lighting projects. Table 4 shows the Commission’s proposed default non-residential lighting interactive effects by HVAC configuration based on the SWE’s modeling efforts.

**Table 4: Non-Residential Interactive Effects By HVAC Configuration**

<b>HVAC Scenario</b>	<b>IF<sub>fossil fuel</sub></b>
<b>AC with Fossil Fuel Heat</b>	-0.0010
<b>AC with Electric Heat</b>	0.0000
<b>Fossil Fuel Heat Only</b>	-0.0010
<b>Electric Heat Only</b>	0.0000
<b>Unknown - Use Market Average</b>	-0.0008

The Commission proposed in the 2026 TRC Test Tentative Order to simplify the approach of monetizing all fossil fuel impacts. As discussed in the following section and consistent with prior TRC Test Orders, the Commission proposed using the avoided cost of natural gas rather than requiring a separate avoided cost forecast for fuel oil and propane and tracking heating fuel distributions among EE&C plan participants with fossil fuel heat.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

For Phase V of Act 129, the EDCs and their evaluation contractors are directed to quantify and report both electric and non-electric interactive effects associated with installation of high-efficiency lighting in homes, businesses, and agricultural applications. The 2026 TRM provides default assumptions for electric interactive effects. Table 3 and Table 4 of this Order provide default assumptions for fossil fuel interactive effects on a MMBtu per kWh saved basis. The EDCs and their evaluation contractors are encouraged to utilize site-specific interactive effect calculations where practical if the necessary data is available.

**5. Monetizing Fossil Fuel Impacts**

The Commission proposed in the 2026 TRC Test Tentative Order that all resources be monetized using a marginal cost to reflect what is reduced (or increased) by an EE&C measure. Other fixed costs embedded in retail rates will still be recovered. The marginal cost of natural gas is used as an input to the avoided cost of electricity forecast, as described in Section B.2. of this Order. The Commission proposed that the EDCs use natural gas values in this forecast, collapsed to a single annual value, to monetize changes in fossil fuel consumption due to installation of EE&C measures. The proposed methodology entails the use of a 20-year period for calculating avoided natural gas costs and is dissected into three segments.

**The first segment, years one through four:** The methodology for segment one should utilize short-term market-based NYMEX natural gas futures prices.

- i. Use NYMEX natural gas futures prices at Henry Hub for years one through four. The prompt month for NYMEX futures is established as three months prior to the filing date.
- ii. Use the differential between Henry Hub as the source and TETCO M-3 as the destination for the locational basis adjustment to the natural gas prices for EDC\Rate Districts west of the Susquehanna River. The locational basis adjustment to the natural gas prices for EDC\Rate Districts east of the Susquehanna River uses the basis differential between Henry Hub as the source and Transco Zone 6 non-New York as the destination.
- iii. Average monthly NYMEX natural gas prices to create a single annual value.

**The second segment, years five through ten:** The methodology for segment two should be based on NYMEX natural gas futures. Medium-term NYMEX natural gas futures should be blended with the longer-term EIA AEO projected natural gas costs across the segment two period to shift from market-based conditions to a more stable model that is public and transparent.

- i. Gather NYMEX natural gas futures at Henry Hub for years five through ten. The prompt month for NYMEX futures is established as three months prior to the filing date. Monthly NYMEX natural gas prices shall be averaged to create a single annual value.

- ii. Use the differential between the Henry Hub as the source and TETCO M-3 as the destination for the locational basis adjustment to the natural gas prices for EDC\Rate Districts west of the Susquehanna River. The locational basis adjustment to the natural gas prices for EDC\Rate Districts east of the Susquehanna River uses the differential between the Henry Hub as the source and Transco Zone 6 non-New York as the destination. For EDCs that have service territory on both sides of the river, such as PPL and FirstEnergy, the location shall be based where most of the electric load is present.
- iii. Gather annual forecasted natural gas costs from the 2025 EIA AEO projected costs for Electric Power Users in the Mid-Atlantic region using real dollars.
- iv. Derive final natural gas costs by blending NYMEX natural gas futures and EIA AEO projected natural costs over the segment two horizon. The Commission proposed that this shall be calculated by adding one-seventh of the differential between EIA AEO natural gas costs and locational adjusted NYMEX natural gas futures for each segment year starting in year five to the zone location adjusted NYMEX natural gas futures.

**The third segment, years eleven through twenty:** The methodology for segment three should utilize long-term market-based EIA AEO projected natural gas costs.

The 2026 TRM does not include loss rates for natural gas; however, natural gas companies also experience losses in their distribution networks. The Commission proposed EDCs use a natural gas loss factor of 4% (1.04167) based on the SWE's calculations from data provided by the Pipeline and Hazardous Materials Safety Administration.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

The Commission directs the EDCs to calculate the avoided cost of fossil fuels as described above. The 2026 ACC (Exhibit 1) codifies each step of this process in a Microsoft Excel workbook. Since the formulas and assumptions of the 2026 ACC are consistent with this Order, the Commission views avoided cost of fossil fuels forecasts developed using the 2026 ACC as aligned with the guidance of the 2026 TRC Test Order.

**6. O&M Benefits**

The Commission's position on operation and maintenance (O&M) benefits has been largely unchanged since Phase I. O&M benefits, including avoided future replacement costs and labor, should be included as TRC benefits where such benefits are quantifiable and material. In cases where such costs were challenging to quantify, or unquantifiable, the Commission permitted the EDCs to omit such costs from TRC calculations.

O&M benefits can be positive or negative. CHP and solar photovoltaic (PV) systems, for example, will often have negative O&M benefits. If a project has ongoing maintenance costs relative to the baseline equipment, those costs should continue to be included as negative O&M benefits. For some measures, the SWE provides default O&M assumptions in its latest version of the incremental measure cost database (hereafter, 2026 IMCD, Exhibit 5 to this Order). In previous versions of the IMCD, the SWE proposed default O&M assumptions for LED lighting measures to reflect the longer rated lifetime of LED products compared to inefficient lighting equipment. Based on the rapid transformation of lighting markets and uncertainty in the availability of

non-LED products for certain equipment categories, the SWE did not provide default O&M values for LED lighting measures in the proposed 2026 IMCD. The EDCs may still assign O&M benefits to LED lighting measures if market conditions suggest that avoided future replacement costs are appropriate to include in the TRC benefits ledger.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

For Phase V of Act 129, the Commission directs the EDCs to continue to include O&M benefits in the TRC Test. O&M savings are expressed as positive TRC benefits and increased O&M costs are considered negative TRC benefits. EDCs and their evaluation contractors should attempt to quantify O&M benefits where the impacts are quantifiable and material.

**7. Societal Benefits**

In the 2021 TRC Test Order, the Commission concluded, consistent with prior TRC Test Orders, that the TRC Test would not include societal benefits such as greenhouse gas emissions reductions, other environmental benefits, or any other non-energy impacts (NEIs) beyond the quantifiable fossil fuel, water, and O&M impacts detailed elsewhere in this section.

Pennsylvania’s participation in the Regional Greenhouse Gas Initiative (RGGI) is currently on hold. The Commonwealth Court declared Pennsylvania’s involvement in RGGI to be unconstitutional in a decision issued on November 1, 2023.<sup>61</sup> While there are still ongoing appeals in the state judicial system on the matter, it is not likely that the Commonwealth will become involved with the initiative absent new legislation. If, in the future, the state legislature moves towards enacting legislation that would allow for involvement in RGGI or a similar initiative focused on greenhouse gas emissions reductions, or other environmental goals, the Commission reserves the right to revisit the position of societal benefits and their inclusion in B/C testing in Phase V of Act 129.

The TRC Test, traditionally, does not include explicit accounting of general societal benefits. Where societal benefits are embedded in the cost of supplying energy, such as compliance with the AEPS Act or reduced arrearages and collection costs, those benefits are included in the TRC calculations. The Commission proposed in the 2026 TRC Test Tentative Order to continue to omit the explicit accounting of additional societal benefits in the TRC Test in Phase V of Act 129.

**a. Comments**

NEEP, CAUSE-PA, and the Joint Energy Advocates comment that societal benefits, including the cost of carbon, should be included in cost-effectiveness testing. NEEP Comments at 2 and 4, CAUSE-PA Comments at 11, The Joint Energy Advocates Comments at 4.

KEEA notes that inclusion of societal benefits would make the TRC Test more holistic, especially with respect to low-income communities. KEEA Comments at 4.

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<sup>61</sup> See [https://www.pacourts.us/assets/opinions/Commonwealth/out/247MD22\\_11-1-23.pdf?cb=1](https://www.pacourts.us/assets/opinions/Commonwealth/out/247MD22_11-1-23.pdf?cb=1), Page 2-10.

NEEP recommends the Commission reverse its decision to exclude non-energy impacts such as health, economic development, comfort, and additional non-energy impacts. NEEP recommends the inclusion of a 5-10% non-energy benefit adder. NEEP Comments at 2 and 4.

PPL comments that societal benefits should be included in cost effectiveness testing. PPL also comments that potential alternative legislation, such as RGGI, should not directly impact decisions related to Act 129. PPL comments at 9.

CAUSE-PA comments that the inclusion of societal benefits will help support an equitable energy transition – allowing greater inclusion of comprehensive efficiency for low-income families. CAUSE-PA Comments at 11.

The Joint Energy Advocates comment that GHG emissions reductions in low-income and environmental justice areas should be factored into the 2026 TRC Test to help foster targeted distribution of program funds to areas most in need of comprehensive efficiency services. The Joint Energy Advocates Comments at 4.

Duquesne Light supports the Commission's decision to exclude societal benefits from the 2026 TRC Test. Duquesne Light also comments that the Commission should avoid any mid-phase changes related to societal benefits. Duquesne Light Comments at 5.

**b. Disposition**

The Commission disagrees with the commenters that the social cost of carbon should be included in the 2026 TRC Test. Act 129, as written, directs parties to only consider the costs of supplying electricity when considering cost effectiveness. The social cost of carbon or other greenhouse gas emissions is not currently valued in the cost of supplying electricity in PJM, which is the electricity market that all Pennsylvania EDCs participate in. If, in the future, this pricing position changes in the PJM marketplace then it would be appropriate to revisit the position of societal benefits and their inclusion in cost effectiveness testing in Phase V of Act 129.

The Commission disagrees with comments that argue for the inclusion of health and safety and economic development benefits in the 2026 TRC Test. In reviewing the information provided in comments, our own research, and research performed by the SWE, the most common approach other jurisdictions use to monetize these benefits is through “adders” that increase TRC benefits by some amount. We are not persuaded to allow inclusion of adders in the TRC benefits, especially given the large variance in the size of benefits among states that do quantify health benefits.

The Commission maintains its position and directs the EDCs to continue to omit the explicit accounting of additional societal benefits in the TRC Test in Phase V of Act 129.

## **D. TRC Costs**

As shown in Appendix A of this Order, there are fewer categories of TRC costs than TRC benefits. Almost all TRC costs can be classified as either program administration and overhead or IMCs. However, complications arise with respect to classifying different cost components based on the EE&C program delivery mechanism and which party incurs the costs. In this section, guidance is provided for calculating and reporting TRC costs during a potential Phase V of Act 129.

### **1. Program Administration And Overhead**

The administration and overhead costs of delivering an EE&C plan are costs in the TRC Test, on both a net and gross basis, as the costs would not occur absent the program. These costs should be carefully tracked for cost recovery purposes and straightforward to report. The Commission proposed in the 2026 TRC Test Tentative Order that all program administration and overhead costs continue to be treated as TRC costs regardless of whether they are incurred by EDCs, CSPs, or the evaluation contractor. Common categories of administration costs are program design, management, technical assistance, marketing, program delivery, and evaluation. The SWE audit costs should also be classified as program administration and overhead costs. CSP contracts and EDC cost tracking should be structured in a way that provides maximum stakeholder visibility into non-incentive cost elements.

Some administrative costs, like a program tracking system or legal counsel, are challenging to allocate to specific programs. EDCs will continue to have the flexibility to incorporate these cross-cutting costs at the portfolio level or allocate them across programs using energy savings, budget, or some other logical allocation method. The treatment of cross-cutting costs, as well as a breakdown of cross-cutting cost components, will continue to be included in the EDC EE&C plans and final annual reports.

In the 2021 TRC Test Order, the Commission reconsidered its perspective on the categorization of equipment costs for direct installation programs relative to previous phases. The Commission directly addressed the handling of kit measures in the 2021 TRC Test Order. While the treatment of kit and directly installed equipment costs do not affect the TRC calculation because the incremental cost is unaffected, the Commission recognized that the categorization of costs is a common area of interest for stakeholders. The share of costs used for administration rather than incentives was so important that the Commission required at least 50% of Phase IV EE&C plan spending to come from incentives and less than 50% to be attributed to non-incentive cost categories. *See Phase IV Implementation Order* at 126-127. For Phase IV of Act 129, kit and directly installed equipment costs were to be treated as IMCs and incentives rather than program administration costs. *See 2021 TRC Test Order* at 75. To maintain the requested visibility into the share of program expenses devoted to administration versus incentives, the Commission proposed to continue this handling of kit and directly installed equipment costs for a potential Phase V of Act 129. The shipping cost of the kits would still be treated as a non-incentive program delivery cost. The labor cost to directly install equipment would be included in the IMC and categorized as a participant incentive.

**a. Comments**

Duquesne Light supports the continued treatment of kit measures, directly installed equipment, and direct installation labor cost as an incentive to the participant. Duquesne Light Comments at 5. PPL recommends that the Commission categorize the delivery costs for kits as a participant incentive since kits often contain important educational materials and instructions associated with the shipped products that would normally be conveyed via ICSP labor. PPL Comments at 10.

## **b. Disposition**

The Commission recognizes PPL's assertion that shipping costs for kits displace CSP labor to transport efficient equipment to participating homes and businesses and provide guidance on installation and efficient operation. For Phase V of Act 129, both the cost of the kit itself and the shipping cost to deliver the kit to the participating home or business will be categorized as a participant incentive. As proposed, both the cost of directly installed equipment and the labor to perform the direct installation will be categorized as participant incentives.

## **2. Incremental Costs**

The IMC of an EE&C plan measure varies by measure type, and the assumptions about the baseline – or what costs the participant would have incurred absent program participation. Table 5 is adapted from the Pennsylvania Evaluation Framework<sup>62</sup> and provides a useful summary of common measure types. It is important that the methodology EDCs use to compute incremental costs continues to be aligned with the methodology used to calculate energy savings.

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<sup>62</sup> See [https://www.puc.pa.gov/media/1584/swe-phaseiv\\_evaluation\\_framework071621.pdf](https://www.puc.pa.gov/media/1584/swe-phaseiv_evaluation_framework071621.pdf) at page 86.

Table 5: Incremental Cost by Measure Type

Type of Measure	IMC (\$/Unit)	Impact Measurement (kWh/yr/Unit)
New Construction	Cost of efficient device minus cost of baseline device.	Consumption of baseline device minus consumption of efficient device.
Replace on Burnout (ROB)	Cost of efficient device minus cost of baseline device.	Consumption of baseline device minus consumption of efficient device.
Retrofit: An additional piece of equipment or process is <i>retrofit</i> to an existing system. (e.g., additional insulation or duct sealing)	Cost of efficient device plus installation costs.	Consumption of old device minus consumption of efficient device.
*Early Replacement: Replacement of existing functional equipment with new efficient equipment	Present value of efficient device (plus installation costs). If a dual baseline is used, subtract the present value of the baseline device assumed to be installed at the end of the remaining useful life of the existing equipment (plus installation costs).	<i>During remaining life of old device:</i> Consumption of old device minus consumption of efficient device.  <i>After remaining life of old device:</i> Consumption of baseline device minus consumption of efficient device.
Early Retirement (No Replacement)	Cost of removing old device.	Consumption of old device
*The early replacement case is essentially a combination of the simple retrofit treatment (for the time period during which the existing measure would have otherwise remained in service) and the failure replacement treatment for the years after the existing device would have been replaced.		

In preparation for Phase II, the Commission directed the Phase I SWE to complete an IMCD by December 31, 2012, to support EE&C plan development and uniform calculation of TRC costs across EDCs. *See 2013 TRC Test Order at 25.* The Commission also recognized that EDC EE&C plans may include measures that are not adequately addressed by the SWE IMCD or other industry resources. Since the initial development of the SWE’s IMCD, the SWE has conducted research to update cost assumptions for various measures.

The Phase IV SWE is currently working on the EE MPS for a potential Phase V of Act 129. IMC assumptions for EE&C measures are a key part of the economic screening step of the EE MPS. Since the timing of the 2026 TRC Test Tentative Order fell at approximately the same time that the SWE began economic screening, the Commission directed the SWE to complete its updates to the IMCD for inclusion as an exhibit. As listed in Section H, Exhibit 5, is version 5.1 of the IMCD. Measure information is organized to align with the 2026 TRM. The Commission invited stakeholders to present recommendations for alternative measure cost assumptions via comments if they have better data on equipment and labor costs in the Commonwealth.

As in prior phases, the Commission proposed in the 2026 TRC Test Tentative Order that the SWE IMCD remains an optional resource for EDCs and their evaluation contractors. EDCs may elect to use the cost assumptions in the IMCD or other reputable industry sources in their EE&C plans and annual TRC reporting. The source of all IMC assumptions should be documented. EDCs should use actual project costs where available and practical (*e.g.*, retrofit projects).

**a. Comments**

Duquesne Light supports the descriptions of incremental costs by measure type presented in Table 5 but suggests the Commission adopt industry-standard language for these types of measures. Specifically, Duquesne Light states that the “Replace on Burnout” measure type is more widely known as “Normal Replacement.” Duquesne Light reiterates its concerns from the 2026 TRM Final Order<sup>63</sup> about establishing any measure type other than “Replace on Burnout” or Normal Replacement as the default for a given delivery channel. Duquesne Light Comments at 5.

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<sup>63</sup> See *2026 Technical Reference Manual Final Order* at Docket No. M-2023-3044491, entered September 12, 2024. Page 25. <https://www.puc.pa.gov/pcdocs/1848423.pdf>.

Duquesne Light questions the appropriateness of using a single entry based on fixture wattage in the Incremental Measure Cost Database for all LED lighting under TRM sections 3.1.1 and 3.1.7. Duquesne Light comments that additional factors affect price, such as form factor (e.g., high-bay versus troffer) and intended use (e.g., standard versus explosion-proof). Duquesne Light Comments at 6.

**b. Disposition**

Consistent with our determination in the 2026 TRM Final Order, the Commission declines to rename the “Replace on Burnout” measure type “Normal Replacement”. The Commission finds the term “Replace on Burnout” is more descriptive and intuitive than “Normal Replacement” and disagrees with Duquesne Lights’s suggestion that there is an industry standard terminology with which Pennsylvania is misaligned. For Phase V of Act 129, the Commission adopts the SWE 2026 IMCD (Exhibit H.5) as an optional resource for EDCs and their evaluation contractors. EDCs may elect to use the 2026 IMCD or other reputable industry sources in their EE&C plans and annual TRC reporting. When actual project costs are available for retrofit projects, EDCs should use those costs in lieu of assumptions from the 2026 IMCD.

The Commission reminds Duquesne Light that the SWE-developed IMCD is an optional resource for EDCs and their evaluation contractors. EDCs may elect to use the cost assumptions in the 2026 IMCD or other reputable industry sources in their EE&C plans and annual TRC reporting. Duquesne Light is encouraged to develop and utilize more granular IMC assumptions for commercial lighting measures if it feels the weighted average values in the SWE 2026 IMCD could bias Phase V B/C results. The source of all IMC assumptions should be documented. EDCs should use actual project costs where available and practical (e.g., retrofit projects).

### 3. Act 129 Incentives

Incentives to program participants are transfer payments intended to offset the IMC of efficient equipment. They are a cost to the EDC and a benefit to the participant, so they are neither a cost nor a benefit in the TRC Test. An exception to this rule occurs when the incentive amount is greater than the IMC. If the incentive amount is greater than the IMC, the incentive amount should be used as the TRC cost instead of the IMC. Incentives may be greater than the IMC when an EDC elects to make the efficient option the lowest cost option for participants. Incentives can also exceed incremental cost when there is no clear measure cost, such as for Appliance Recycling programs.

Consistent with the 2021 TRC Test Order, the Commission proposed in the 2026 TRC Test Tentative Order to categorize the cost of kits and directly installed equipment as an incentive to program participants. The labor cost to directly install equipment in homes and businesses should also be categorized as an incentive. Prior to the 2021 TRC Test Order, the Commission defined an incentive as “a payment made to a program participant by an EDC to encourage the customer to participate in an energy efficiency program and to help offset some, or all, of the participant’s costs to purchase and install an energy efficiency measure.” *See 2013 TRC Test Order* at 16. It is the Commission’s position that kits and directly installed equipment encourage customers to participate in programs and offset some or all the cost of installing energy efficient equipment. Kits and direct install programs do not require the participant to pay the upfront cost and then recover a portion of that cost via a second financial transaction with the EDC. This does not affect the underlying program mechanism whereby an EDC program reduces the participant cost for measure installation.

In summary, the Commission proposed that the EDCs continue to treat incentive costs as neither a cost nor a benefit in the TRC Test, except when the incentive amount is greater than the IMC, in which case the incentive amount should be used as the TRC cost instead of the IMC. In addition, the Commission proposed that EDCs continue to categorize the cost of kits and directly installed equipment as an incentive to program participants.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

As proposed, the Commission directs the EDCs to continue to treat incentive costs as neither a cost nor a benefit in the TRC Test, unless the incentive amount is greater than the IMC, in which case the incentive amount should be used as the TRC cost instead of the IMC. EDCs will also continue to categorize the cost of kits and directly installed equipment as incentives to program participants.

**4. Incentives From Outside Of Act 129**

In the TRC Test formulae for Phases I, II, and III, outside incentives appeared as the factor “ $TC_t$ ” or tax credits in year  $t$ . This term was counted towards the program benefits. In Phase IV, the Commission proposed treating incentives from outside of Act 129 as a reduction in costs, not as a benefit of the program, and proposed using the term “ $OI_t$ ” or outside incentives in year  $t$  in the formulae. The Commission proposed to continue to treat incentives from outside of Act 129 as a reduction in costs.

As noted in Section A.8 above, EDCs only needed to factor in, as reductions to cost, the non-Act 129 incentives that are reasonably quantifiable by the EDC. The Commission interprets “reasonably quantifiable” to include any non-Act 129 incentive, such as a rebate, tax credit, or grant, where the EDC has direct data on the amount of the incentive and the fact that the customer made use of the funds. For example, if a participant completes a \$500,000 retrofit project and receives a \$100,000 grant from outside funding sources, the EDC should include the \$100,000 as a cost reduction and use \$400,000 as the IMC. Another example of reasonably quantifiable non-Act 129 incentives is energy efficiency rebates from programs administered by DEP. Federal tax credits to individuals for energy-efficient equipment, also supported by Act 129 incentives, would be an example of an incentive that the Commission would consider not reasonably quantifiable. The EDC would not have a way of knowing if a customer claimed the credit or what the actual impact was on their ultimate tax liability.

**a. Comments**

As noted in Section A.8. above, PECO and PPL request that the Commission clarify how incentives from federal funding mechanisms such as the IRA and IJJA, or RISE PA, will be treated from a TRC Test perspective. PPL comments that the plan for incentive stacking, attribution, and other issues remains unresolved by the Tentative TRC Order. PECO Comments at 2, PPL Comments at 4 and 10.

PECO disagrees with the Commission’s proposal that tax credits are not reasonably quantifiable. PECO argues that it would be reasonable and justifiable to recognize some level of impact from these federal tax incentives when assessing the cost-effectiveness and affordability of EE measures, including the newly added solar measure in Phase V. PECO Comments at 5.

**b. Disposition**

As discussed in the disposition of Section A.8., Measures Supported by Both Act 129 Programs and Other Funding Streams, reasonably quantifiable outside incentives, including Federal funding mechanisms such as the IRA, reduce the participating customers' costs and therefore, the reduction will be treated as a reduction in incremental cost for Phase V of Act 129. Regarding PECO's comment about assuming zero impact of tax credits, the Commission clarifies that its interpretation of "reasonably quantifiable non-Act 129 incentives" does not preclude an EDC from quantifying tax incentives. The Commission agrees with PECO that it is reasonable and justifiable to recognize some level of impact from these federal tax incentives when assessing the cost-effectiveness and affordability of EE measures such as solar photovoltaics. The Commission encourages the EDCs to quantify customer-claimed tax credits, particularly for solar measures.

In response to PPL's request for additional clarity regarding incentive stacking and attribution, the Commission wishes to make clear that EDCs may claim the full gross verified savings for any EE&C project they support. Projects supported by other entities are an important consideration for net savings as the free ridership rate could likely be higher for offerings where the EDC is not the only project sponsor. EDC evaluation contractors are expected to explore this issue as part of net-to-gross research in Phase V, but gross verified compliance savings are not affected by attribution results in the net savings analysis.

## **E. Fuel Switching**

### **1. ENERGY STAR Requirement**

In Phases I, II, III, and IV EDCs were allowed to support fuel switching measures that convert equipment from electricity to fossil fuel, but the fossil fuel equipment must meet or exceed the current US Environmental Protection Agency (EPA) minimum ENERGY STAR performance standard. The ENERGY STAR status of some fossil fuel equipment, such as gas furnaces, is in a state of uncertainty as they were being considered for removal from the ENERGY STAR specification. However, the EPA recently announced a proposal to update rather than sunset the ENERGY STAR specification for furnaces. The proposed new specifications are still in development.<sup>64</sup>

If an EDC wishes to incentivize a fuel switching measure in Phase V, the Commission proposed that the EE&C plan should state a proposed minimum standard and provide justification for the threshold. For example, if an EE&C plan includes CHP systems as a measure, the EE&C plan should specify the minimum system efficiency to receive program support.

#### **a. Comments**

KEEA, NEEP, CAUSE-PA and the Joint Energy Advocates all oppose continuing to allow incentives for electric-to-gas fuel switching within the Act 129 program. They argue that fuel-switching is counter to state and federal policies that support a shift towards decarbonization and reducing greenhouse gas emissions. KEEA Comments at 5. NEEP Comments at 4, CAUSE-PA Comments at 11, Joint Energy Advocates Comments at 5.

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<sup>64</sup> US EPA. (2023, May 18). ENERGY STAR Furnaces and Central Air Conditioners: Sunset Proposal Memo, [Weblink](#) US EPA (2024, April 16), [ENERGY STAR Version 5.0 Furnaces Draft 1 Cover Letter](#). [Weblink](#).

The Joint Energy Advocates note that Pennsylvania’s climate goals call for reductions of GHG emissions by 26% by 2025 and 80% by 2050 from 2005 levels and that other states with similar climate goals have eliminated fuel switching from their energy efficiency programs to better align efficiency investments with climate goals. Joint Energy Advocates Comments at 5. CAUSE-PA adds that switching a home from an electric to gas furnace will increase emissions and will work at a cross purpose to other goals to improve health and safety of individuals, families, and communities. CAUSE-PA recommends that, should fuel switching still be included, the EDC must prove that such a switch will be cost effective for the household and will improve energy savings. CAUSE-PA Comments at 11.

**b. Disposition**

The Commission is aware of the state climate goals and policies that support a shift towards decarbonization and reducing greenhouse gas emissions, and we note that fuel-switching measures have been removed from the 2026 TRM. However, the Commission declines to issue a general statement in this proceeding that fuel-switching measures should be discontinued within Act 129. The purpose of the TRC Test Order is to provide technical guidance on B/C testing so it is important that this Order specifies how to calculate TRC costs and benefits from fuel switching in case an approved Phase V EE&C plan includes fuel switching measures. If an EDC wishes to incentivize a fuel switching measure in Phase V, the Commission directs the EDCs to include in their EE&C plan a proposed minimum standard and provide justification for the threshold to receive program support.

## **2. Increased Fuel Consumption**

For Phase IV of Act 129, the Commission directed the EDCs to treat increased fuel consumption from fuel switching as a negative TRC benefit. *See 2021 TRC Test Order* at 82. In previous phases increased fuel consumption from fuel switching was considered a TRC cost. Positive costs and negative benefits lead to identical PVNB results, but different TRC ratios. Since the increased fuel consumption is an output of program efforts, the Commission believes the benefits ledger is more appropriate. Monetizing increased fuel consumption from fuel switching measures as TRC benefits alongside reductions in fossil fuel consumption from measures that conserve fossil fuel promotes symmetry in TRC Tests and allows EDCs to report overall impacts on fuel consumption. For a potential Phase V of Act 129, the Commission proposed in the 2026 TRC Test Tentative Order that EDCs treat any increased fuel consumption from fuel switching measures as a negative TRC benefit.

CHP projects both increase fuel consumption to power the electricity generation equipment and offset fuel consumption by recovering useful heat from the generation process. The fuel consumption offset by CHP should be estimated to calculate the net change in fuel consumption from fuel switching.

The Commission proposed in the 2026 TRC Test Tentative Order to continue using the marginal system cost of the fuel to monetize the projected fuel consumption over time if the fuel consumed is natural gas. The forecast methodology for natural gas is outlined above in Section C.5. A forecast of projected retail costs from the EIA AEO, or similar reputable industry source, should be used for delivered fuels such as gasoline or propane. For on-site fuels, such as biogas, the Commission proposed that EDCs use the estimated production cost over the EUL of the measure.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

For Phase V of Act 129, the EDCs and their evaluation contractors are directed to treat any increased fuel consumption from fuel switching measures as a negative TRC benefit. If an EE&C plan includes CHP, the fuel consumption offset from heat recovery should be netted out of the fuel consumption required to power the CHP system to calculate and report the net change in fuel consumption. In addition, the EDCs are to continue to use the marginal system cost of natural gas outlined in Section C.5. to monetize the projected fuel consumption over time if the fuel consumed is natural gas. A forecast of projected retail costs from the US EIA, or similar reputable industry source, should be used for any fuel switching to delivered fuels such as gasoline or propane. For on-site fuels, such as biogas, the EDCs are directed to use the estimated production cost over the EUL of the measure.

**F. Net-To-Gross (NTG) Issues**

**1. Use Of NTG Research**

In the 2016 TRC Test Order, the Commission required that EDCs report TRC ratios in EE&C plans in two ways: (1) based on projected gross savings and (2) based on projected net savings. *See 2016 TRC Test Order* at 46-47. The Commission proposed no changes to this requirement for Phase IV, and the Commission proposed no changes to this requirement for Phase V. EDC evaluation contractors shall continue to conduct NTG research, use the results for program planning purposes, report net verified savings, and calculate the TRC Test results on a net basis.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

The EDCs and their evaluation contractors are directed to continue to conduct NTG research in Phase V and to use the results for program planning purposes. EE&C plans and annual reports are to include estimates of net verified savings and present TRC Test results on both a net and gross basis. NTG research shall be applied to the TRC Test only for the purposes of program planning.

**2. Treatment Of Incentives To Free-Riders**

The Commission proposed in the 2026 TRC Test Tentative Order to maintain the current Phase IV position on the treatment of incentives for free-riders for Phase V, which is that free-rider incentives shall not be included as an additional program cost when considering a net TRC Test perspective. Free-rider participant costs would have occurred even in the absence of a program and are not part of net program costs. Spillover, the opposite of the free-rider effect, occurs when customers adopt measures because they are influenced by program-related information and marketing efforts, but they do not actually participate in the program. Consequently, the participant costs shall be reduced by the NTG value.

The Commission is aware that the inclusion of costs for incentives to free-riders in the calculation of a TRC Test was addressed by the California Public Utilities Commission in the 2007 Clarification Memo. However, in prior TRC Test Orders, this clarification to include free-rider incentives as a program cost was rejected as it was determined to overstate TRC costs and contradict the underlying rationale of the TRC Test perspective, which ignores incentive payments as they are a transfer between the program administrator and participant.

**a. Comments**

The Commission received no comments on this topic.

**b. Disposition**

As proposed in the 2026 TRC Test Tentative Order, incentives to free-riders are not to be included as an additional program cost when calculating and reporting TRC Test from the net perspective. EDCs and their evaluation contractors should continue to reduce participant costs by the NTG ratio to reflect only those incremental measure costs that would not have been incurred absent program efforts.

**3. Treatment Of NTG For TRC Benefits**

The Commission proposed in the 2026 TRC Test Tentative Order no changes to the treatment of NTG ratios for TRC benefits for a potential Phase V, but reminded EDCs that NTG ratios shall be applied to all benefits in the TRC Test. The benefits include, but are not limited to, avoided energy and capacity costs, O&M, interactive effects, and secondary resource impacts such as fossil fuel and water. NTG research shall only be applied to the TRC Test for the purposes of reporting and program planning. EE&C plans are not required to be cost-effective on a net basis.

**a. Comments**

The Commission received no comments on this topic.

## **b. Disposition**

The Commission's proposed treatment of NTG ratios for the calculation of TRC Benefits will continue for Phase V. NTG ratios will be applied to all benefits in the net TRC Test and NTG research will only be applied to the 2026 TRC Test for the purposes of reporting and program planning.

## **G. Demand Response**

### **1. DR Testing If DR Is Included In Phase V**

The Commission has not yet determined DR (or EE) targets for a potential Phase V of Act 129. Currently, the Commission expects to release the Phase IV SWE's DR MPS in early 2025. The results of that analysis will inform the decision relative to a potential Phase V. If it is determined to proceed with Phase V, the Commission anticipates a Phase V Implementation Tentative Order in Spring 2025 and a Final Phase V Implementation Order in summer 2025. Additionally, the Commission has made no determination regarding the frequency, duration, or notification time of DR events. The Commission expects the SWE's DR MPS to include a recommendation on these issues as these parameters have significant impacts on the amount of DR potential in an EDC service territory and the cost to acquire it.

This docket does not address issues related to whether DR should be included in or excluded from a potential Phase V. Stakeholders were invited to comment on the proposed cost-effectiveness methodology for DR in this proceeding. Our discussion and guidance herein, as well as any stakeholder comments in this docket, merely presume for discussion and comment purposes that a potential Phase V will include DR.

The Commission proposed in the 2026 TRC Test Tentative Order guidance on how to calculate the TRC costs and benefits for DR if Phase V EE&C plans include DR programming.

**a. Comments**

PPL recommends either a coincident peak demand target or dispatchable DR programs, but not both, for Phase V. PPL recalled the Commission's stated preference in the Phase IV Implementation Order for the long-term benefits of EE over DR and expressed concern about the lack of consistency related to coincident peak demand versus dispatchable DR from phase to phase of Act 129. PPL Comments at 11-12.

**b. Disposition**

As noted in the 2026 TRC Test Tentative Order, the purpose of the TRC Test Order is to provide the EDCs with clear instructions on how to compute benefits and costs in the TRC Test for a potential Phase V. The Commission has made no determination regarding whether there will be a Phase V and if so whether the Phase V programs will include DR (or EE) targets is outside the scope of this Order. PPL's suggestion to limit the focus of a potential Phase V to one type of demand reduction is noted.

**2. Calculation Of TRC Benefits**

DR programs are designed to reduce peak demand, so the dominant benefit streams are the avoided cost of generation, transmission, and distribution capacity on a \$/kW-year basis. For the 2026 TRC Test, the Commission proposed that EDCs average the gross verified demand reductions over each hour of performance and apply a line loss adjustment factor to estimate the magnitude of the peak demand reduction. The calculation should be performed separately for summer and winter peaks given the proposed transition to seasonal capacity values described in Sections B.7. and B.8. of this Order. The seasonal demand reduction value(s) would be multiplied by either two or three avoided cost of capacity values, depending on the participating customer sector. The notable exception, consistent with our guidance in Section B.8. of this Order, is that

no avoided distribution capacity benefits should be calculated for peak demand reductions at facilities that take electric service directly from the transmission or sub-transmission system (generally, Large C&I accounts that take service at primary voltage). These sites are not served by the EDCs' distribution systems so reductions in their peak loads should not avoid or defer investments to distribution system infrastructure. *See 2016 TRC Test Order* at 53.

In Phase III, peak demand reductions from dispatchable DR programs were monetized in the TRC Test using the full avoided cost of capacity. For Phase IV of Act 129, the Commission revisited the assumption that dispatchable DR programs create a 1:1 reduction in generation capacity requirements and directed the EDCs to use a set of derate factors when calculating TRC benefits. *See 2021 TRC Test Order* at 96-97. The Commission based the derate factors on modeling results from PJM for a hypothetical program design that the Phase III SWE expected to result in approximately 24 event hours per summer. *See 2021 TRC Test Order* at 94-95. The average derate factor statewide was approximately 60% so the Commission directed the EDCs to use a 60% derate factor for T&D benefits along with the EDC-specific derate values for avoided generation capacity. Ultimately, the Commission set no dispatchable DR targets for Phase IV or Act 129, and no EDC EE&C plans included dispatchable DR programs so the guidance in the 2021 TRC Test Order has been unused to date in Phase IV TRC modeling.

The Commission maintains its position from the 2021 TRC Test Order that dispatchable DR programs that are only activated on a limited number of days merit a derate factor unless they are formally recognized as capacity resources at the wholesale level. The Phase V DR MPS is currently underway, and the Commission expects any event-based DR programs identified by the SWE will have a derate factor based on the expected frequency and duration of calls associated with the event trigger. If the Commission chooses to propose dispatchable DR targets based on one or more program designs identified by the SWE in the Phase V DR MPS, the Commission will specify the associated derate factor(s) in the Phase V Tentative Implementation Order.

In its work plan for the Phase V DR MPS, the SWE presented a “daily load-shifting” DR program design (rather than event-based) that the Commission believes has promise for Act 129. One of the historic policy challenges with Act 129 DR is the interaction with DR options at PJM and concerns about dual enrollment or “double-dipping.” A daily load-shifting program that is active each weekday during the summer and/or winter peak season is fundamentally different from the event-based DR options at PJM. This type of DR program design could complement existing PJM DR offerings rather than compete with them by targeting solutions capable of more frequent but likely less aggressive curtailment methods. The SWE plans to model electric vehicle managed charging, daily water heater control, thermostat optimization, behind-the-meter battery storage, and select commercial auto-DR options under a daily load-shifting design.

Peak demand impacts from a daily load-shifting program are much like coincident demand reductions from energy efficiency because they are in place each day of the Act 129 peak demand definition. In fact, it may be possible to have a single peak demand reduction goal that could be satisfied by either coincident demand reductions from EE or daily load-shifting DR programs. Given the similarity of a daily load-shifting program to coincident demand reductions from EE, the Commission proposed no derate

factor be applied to peak demand reductions from daily load-shifting programs. Rather, the guidance presented in Sections B.6. through B.8. for the calculation of capacity benefits from coincident demand reductions from EE applies to any daily load-shifting programs offered by the EDCs in a potential Phase V of Act 129. The verified demand reduction scaled for losses from the daily load-shifting program during the summer season would be applied to summer avoided capacity costs and the verified demand reduction scaled for losses from the daily load-shifting program during the winter season would be applied to winter avoided capacity costs.

**a. Comments**

FirstEnergy opposes the decision not to apply a derate factor to daily load-shifting DR program reductions. FirstEnergy points out that programs typically allow participants to “opt-out” of load-shifting and rely on internet connectivity, which may be intermittent, and posits that these factors create uncertainty that daily load-shifting measures will generate demand reductions. FirstEnergy recommends applying a derate factor to these types of measures as not all connected customer devices will always be available and controllable. FirstEnergy Comments at 4-5.

**b. Disposition**

The Commission agrees with FirstEnergy that device connectivity and operability are key considerations for many daily load-shifting program options. However, these factors should be embedded in the gross verified demand reductions measured by the EM&V contractor. Since the observed kW reductions achieved by the program will be derated based on these factors, it would be inappropriate to further derate the capacity benefits. The Commission likens this issue to the “in-service rate” parameter in the TRM for many EE measures where the kWh and kW savings are derated to reflect the fact that less than 100% of program participants install the measure. Because the underlying

resource savings are adjusted downwards, EE measures with in-service rates of less than 100% are not treated any differently in the calculation of TRC benefits.

For Phase V of Act 129, no derate factor shall be applied to peak demand reductions from daily load-shifting programs. The guidance presented in Sections B.6. through B.8. for the calculation of capacity benefits from coincident demand reductions from EE applies to any daily load-shifting programs offered by the EDCs in a potential Phase V of Act 129. The verified demand reduction scaled for losses from the daily load-shifting program during the summer season would be applied to summer avoided capacity costs and the verified demand reduction scaled for losses from the daily load-shifting program during the winter season would be applied to winter avoided capacity costs. If the Commission chooses to propose dispatchable DR targets based on one or more program designs identified by the SWE in the Phase V DR MPS, the Commission will specify the associated derate factor(s) in the Phase V Tentative Implementation Order. No avoided distribution capacity benefits will be assigned to peak demand reductions at Large C&I facilities that take electric service directly from the transmission or sub-transmission system.

### **3. Participant Cost Assumption**

As established in Phase I, customer incentives in a DR program are intended to compensate participants for the sacrifices they make to consume less electricity during peak periods. Such sacrifices can take the form of being less comfortable in the case of a residential Direct Load Control (DLC) program or a disruption in production for a business that shuts down a manufacturing process. In recognition of these sacrifices, the Commission directed EDCs in Phase I to include the full incentive payment amount as a cost to the participant as a monetary proxy for participant costs. *See 2011 TRC Test Order* at 13-14. There were no DR requirements in Phase II.

In the 2016 TRC Test Order, the Commission revisited the participant cost issue. Setting the participant cost equal to the incentive amount implies a break-even arrangement for the participant, where the benefits are identical to the costs. The Commission rejected the break-even assumption, instead adopting the perspective that customers are generally rational and would likely only participate in a DR program if they felt the benefits of participation outweighed the costs. As a result, for Phase III, the Commission adopted the 75% participant cost assumption set forth in California’s 2016 DR Cost-Effectiveness Protocols<sup>65</sup> as a solution. Under this protocol, 75% of the customer incentive payment is used as a proxy for the participant cost when calculating the TRC ratio for DR programs. The Commission recognizes that many EDCs would elect to use CSPs to implement DR programs and that the exact incentive payment from the CSP to the participant might, therefore, be unknown. The Commission, therefore, directed EDCs to use 75% of the payment amount to the CSPs as a cost in the 2016 TRC Test for Phase III.

The Commission proposed no changes in the 2021 TRC Test Tentative Order regarding the use of DR incentive amounts to estimate participant costs for Phase IV and received no stakeholder comments on the issue. Given the lack of dissenting perspectives or alternative suggestions in that docket, the Commission proposed in the 2026 TRC Test Tentative Order that EDCs continue to use the 75% participant cost assumption for any potential Phase V DR programming.

**a. Comments**

The Commission received no comments on this topic.

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<sup>65</sup> See <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/demand-response/cost-effectiveness/2016-dr-cost-effectiveness-protocols---clean.docx>. California refers to this component as the “value of service lost.”

## **b. Disposition**

For Phase V of Act 129, the EDCs are directed to include 75% of the customer incentive payment as a TRC Cost for all dispatchable DR or daily load-shifting programs. The 75% assumption acts as a proxy for the participant's cost of sacrificing electric consumption during performance hours. In a program design where an EDC pays a CSP to deliver peak demand reductions and the exact incentive arrangement between the CSP and program participant is unknown to the EDC, the EDC may use 75% of the CSP payment to approximate the TRC Cost of the program. The 75% rule only applies to participation incentives. If an EDC program design includes cost subsidization of DR-capable equipment such as batteries or connected thermostats, the TRC Test should consider the full cost of the equipment.

## **4. Measure Life**

DR is a broad category of programs and measures that may or may not involve equipment installed at the participating customer's location. For load curtailment programs, participation involves a financial incentive between the EDC, or its CSP, and the program participant. As specified in the 2026 TRM, the measure life for load curtailment programs is one year. The 2026 TRM provides that the measure life of behavioral DR programs, which include neither incentives nor equipment, will be assumed to be one year.

For DR programs where the utility pays some or all the cost of DR equipment, the 2026 TRM provides an 11-year default measure life.<sup>66</sup> Examples of DR equipment include a Wi-Fi-connected "smart" thermostat, a water heater or air conditioner cycling switch, an electric vehicle charger that the EDC can control, and other similar equipment that the EDC (or CSP) can control. For this class of DR programs, the Commission

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<sup>66</sup> See 2026 TRM Volume 2, Docket No. M-2023-304491 (entered September 12, 2024) <https://www.puc.pa.gov/pcdocs/1848563.pdf>, Page 231.

proposed in the 2026 TRC Test Tentative Order an adjusted measure life shorter than the mechanical life of the equipment equivalent to the remaining years of Phase V. This approach is consistent with our disposition on the issue in the 2021 TRC Test Order and recognizes that certain types of DR equipment typically won't generate load reductions without program incentives or administration and there is no guarantee the Commission will establish DR targets for future phases of Act 129.

When a multi-year measure life is assumed for DR, consistent with prior TRC Test requirements, the Commission proposed in the 2026 TRC Test Tentative Order that EDCs also account for expected incentive costs over the remainder of the phase. For example, in a traditional air conditioner cycling program, where the EDC (1) purchases and installs the DLC equipment and (2) pays the participant \$50 per summer in exchange for continued participation in the program, the recurring annual \$50 incentive cost must be factored in. To realize the multi-year benefits of the equipment, annual costs are incurred. If a measure life equal to the five-year phase length is applied to the load control equipment when calculating benefits, five years of assumed incentive costs should also be factored in.

The Commission reminds the EDCs that any DR equipment purchased in a previous phase cannot be included in the TRC Test for a potential Phase V. Those expenses were accounted for as costs in a previous TRC Test and to consider them as TRC costs again would be “double counting.”

**a. Comments**

FirstEnergy opposes setting the measure life for customer equipment (smart thermostats, etc.) equivalent to the remaining years of Phase V due to uncertainty about whether a measure will generate savings for the term because customers can opt-out. Therefore, FirstEnergy recommends that the measure life should be based on the program

design to avoid overcounting benefits. For programs that enroll customers every year, such as with annual participation incentives, the measure life should align and be set at one year. Whereas, for programs that enroll customers for a longer term, such as by contract for an extended period, the measure life should be set to the length of the contract, not to exceed the length of Phase V. FirstEnergy Comments at 5-6.

## **b. Disposition**

FirstEnergy's comment highlights an important consideration regarding the measure life of DR programs. While the measure life of a DR offering that relies on recurring participation incentives should not exceed the length of Phase V, it is not equal to the length of Phase V by default. The Commission agrees with FirstEnergy that the measure life for a DR offering should be governed by the program design. For Phase V of Act 129, the EDCs are directed to use a one-year measure life for behavioral DR programs and load curtailment or daily load-shifting programs in the C&I sector. For equipment-based DR programs, the measure life shall equal the agreed-upon participation term with the program participant.

## **H. Exhibits**

### **1. 2026 Avoided Cost Calculator (2026 ACC)**

The 2026 Avoided Cost Calculator is available at the Public Utility Commission's website at: <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>.

## **2. Arrearages**

The *Impact of Act 129 Low-income Programs on Arrearages and Collections Study* is available at the Public Utility Commission's website at:

<https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>.

## **3. DRIPE**

The *Pennsylvania Demand Reduction Induced Price Effects Study* is available at the Public Utility Commission's website at: [https://www.puc.pa.gov/filing-](https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/)

[resources/issues-laws-regulations/act-129/total-resource-cost-test/](https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/).

## **4. T&D Study**

The *Avoided Cost of Transmission and Distribution Capacity Study* is available at the Public Utility Commission's website at: [https://www.puc.pa.gov/filing-](https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/)

[resources/issues-laws-regulations/act-129/total-resource-cost-test/](https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/).

## **5. 2026 Incremental Measure Cost Database (2026 IMCD)**

The 2026 Incremental Measure Cost Database is available at the Public Utility Commission's website at: <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>.

## **I. Additional Matters**

Several parties raised issues that do not directly relate to sections of the 2026 TRC Test Tentative Order. We shall address each matter in turn. All parties had the opportunity to address these matters in their reply comments.

## 1. TRC Test Assumptions For The FirstEnergy EDC

FirstEnergy notes that the Commission approved FirstEnergy Corp.’s request to merge the Met-Ed, Penelec, Penn Power, and West Penn Power operating companies into a single EDC (FirstEnergy EDC) in a December 7, 2023, Order.<sup>67</sup> FirstEnergy then requests that the Commission use TRC Test component values for the single FirstEnergy EDC in planning for and during a potential Phase V of Act 129. Additionally, FirstEnergy requests that references to “Rate District” either be removed or replaced with “EDC” or a single FirstEnergy value in the 2026 TRC Test Order and associated exhibits. FirstEnergy Comments at 6-7.

**Resolution** – The Commission has not formally addressed the consolidation of the four legacy FirstEnergy operating companies within the context of Act 129. However, we agree with FirstEnergy that Phase V benefit-cost analysis, reporting, goal setting, and compliance determination should be conducted at the FirstEnergy EDC level. In a Tentative Implementation for Phase V, the Commission would present a single budget allocation and target(s) for FirstEnergy. Given the evolving nature of the merger, our direction to the Phase IV SWE has been to conduct all analyses in support of planning for a potential Phase V at the legacy EDC or Rate District level. This includes the 2026 TRM, 2026 TRC Test, and Phase V Market Potential Studies. This approach provides flexibility as parties can always aggregate results from the four legacy entities, while it would be far more difficult to disaggregate modeling results from the consolidated entity to the four legacy entities, if needed.

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<sup>67</sup> Joint Application of Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, West Penn Power Company, Keystone Appalachian Transmission Company, Mid-Atlantic Interstate Transmission, LLC, and FirstEnergy Pennsylvania Electric Company, Docket Nos. A-2023-3038771, *et al.* (Order entered December 7, 2023).

The Commission rejects FirstEnergy’s suggestion to modify the 2026 TRC Test Order Exhibits to remove all instances of the phrase “Rate District”. From the standpoint of Act 129 Phase IV when the studies were commissioned, it is appropriate to refer to Met-Ed, Penelec, Penn Power, and West Penn Power as Rate Districts. However, FirstEnergy’s comment highlights the need for the Commission to provide clarity regarding the aggregation of TRC inputs for FirstEnergy. For any TRC assumption where the provided values are at the legacy EDC (Rate District) level, FirstEnergy should compute a weighted average across the four companies using 2024 retail sales (bundled and unbundled) as the weighting parameter.

Table 6 illustrates the guidance using values from Exhibit 4 (T&D Study) for the summer season avoided cost of distribution capacity and hypothetical retail sales values for calendar year 2024. By the time FirstEnergy needs to develop its avoided costs and EE&C plan for a potential Phase V, actual retail sales for 2024 will be known. The percentage of sales associated with each legacy EDC will act as the weighting factor when averaging the values.

**Table 6: Example Calculation of FirstEnergy Composite TRC Assumption Value**

<b>Legacy EDC / Rate District</b>	<b>Summer Avoided Cost of Distribution Capacity (\$/kW-year)</b>	<b>2024 GWh Sales</b>	<b>Share of Sales</b>
FE: Met-Ed	\$52.46	14,000	27.72%
FE: Penelec	\$37.18	13,000	25.74%
FE: Penn Power	\$43.52	4,500	8.91%
FE: West Penn Power	\$41.25	19,000	37.62%
<b>FirstEnergy</b>	<b>\$43.51</b>	<b>50,500</b>	<b>100.00%</b>

## **2. Facilitating Data Sharing Between Utilities And State Agencies**

KEEA comments that enhanced data sharing between the EDCs, the DEP, and the DCED is essential for improving the implementation and oversight of energy efficiency programs. KEEA posits that New York offers a successful model of how mandated data sharing can lead to improved EE outcomes, transparency, and accountability. KEEA Comments at 3.

**Resolution** – The Commission generally agrees with KEEA that data-sharing and coordination among utilities and state agencies will be important as the Commonwealth seeks to leverage federal Inflation Reduction Act funding and stack benefits across program administrators. KEEA does not provide examples of the type of data that is not currently being shared or specify the types of data that would be most helpful to exchange in an enhanced sharing process. The Commission will discuss this matter with DEP and DCED as part of preparations for a potential Phase V and suggests that KEEA provide more specific recommendations for the type of data to share. Examples might include billing data, customer contact information, approved contractor lists, previous program participation histories, or planned outreach campaigns. Cyber security and protection of personally identifiable information will be a key element of any data-sharing process considered by the Commission.

## **3. Formula Error In Appendix A**

PPL notes that the formula in Appendix A for gross TRC benefits is missing the term for capacity benefits. PPL Comments at 13.

**Resolution** – The Commission agrees with PPL that the gross TRC benefits formula was missing a term for capacity benefits. We have updated the formula in Appendix A of this Order to reflect the corrected formula.

## CONCLUSION

With this Final Order, the Commission adopts the 2026 TRC Test for use in planning and evaluating the potential Phase V of Act 129. All stakeholder comments and reply comments have been duly considered. Any issues raised by stakeholders that have not been addressed herein are deemed denied.

This Final Order, the 2026 TRC Test Tentative Order, the associated Exhibits, and all filed comments and reply comments related to this Order will be available to the public on the Commission's Act 129 Information web page<sup>68</sup>; **THEREFORE,**

### **IT IS ORDERED:**

1. That the 2026 Pennsylvania Total Resource Cost Test be used for evaluating energy efficiency and conservation programs during Phase V of Act 129, if implemented, consistent with this Order.
2. That a copy of this Order be served on the Office of Consumer Advocate, the Office of Small Business Advocate, the Commission's Bureau of Investigation and Enforcement, all jurisdictional electric distribution companies subject to the Energy Efficiency and Conservation Program requirements, all parties who commented on the *2021 TRC Test Order* at Docket No. M-2019-3006868, and all parties who commented on the 2026 TRC Test Tentative Order at this docket.
3. That the Secretary shall deposit a notice of this Order with the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin*.

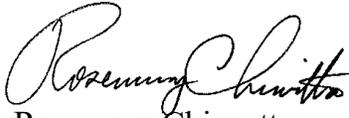
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<sup>68</sup> See <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>.

4. That this Order be published on the Commission's website at <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>.

5. That the contact person for technical issues related to this Order and the 2026 Total Resource Cost Test for the potential Phase V of Act 129 is David Edinger, Bureau of Technical Utility Services, 717-787-3512 or [dedinger@pa.gov](mailto:dedinger@pa.gov). The contact person for legal and process issues related to this Order and the 2026 Total Resource Cost Test for the potential Phase V of Act 129 is Tiffany Tran, Law Bureau, 717-783-5413 or [tiftran@pa.gov](mailto:tiftran@pa.gov).

**BY THE COMMISSION**

  
Rosemary Chiavetta  
Secretary

(SEAL)

ORDER ADOPTED: November 7, 2024

ORDER ENTERED: November 7, 2024

## **Appendix A**

The definitions and formulae to be used for the Pennsylvania-specific 2026 TRC Test, consistent with Act 129 of 2008, are set forth in this Appendix A.

## TRC Formulae, Calculations, and their Definitions

Table 7 below lists electricity supply avoided costs, other TRC benefits, TRC costs, and other assumptions, and it summarizes TRC guidance for each TRC element. Formulae are detailed for each TRC element in the algorithms section. These are split into primary and supporting algorithms, where the supporting algorithms assist with the calculation of input values required for implementing the primary algorithms.

**Table 7: Definition of Terms**

TRC Category	TRC Element	Units	Symbol	Guidance Summary
Avoided Costs of Supplying Electricity	Electric Line Loss Factor	Unitless	$LLF_{elec}$	Table 1-5 of the 2026 TRM Volume 1 provides line loss factors by EDC and customer class.
	Electric energy (quantity)	kWh/year	$E$	Gross verified annual kWh.
	Electric energy (price)	\$/kWh (nominal)	$MCE$	Twenty-year forecast divided into years 1-4, 5-10, 11-20. <i>See</i> supporting MS-Excel spreadsheet calculation model. Inclusive of 4 years of energy DRIPE.
	Compliance with RPS/AEPS	\$/kWh (nominal)	$AEPS$	Electricity cost adder to reflect avoided compliance costs.
	Reduction in Arrearages and Collection Costs	\$/kWh (nominal)	$RACC$	Electricity cost adder for low-income customers to reflect avoided arrearages and collection costs
	G, T, D capacity (quantity)	kW/year	$D$	Gross or net verified peak demand savings (kW). Calculated separately for summer and winter.
	Generation capacity (price)	\$/kW-year	$MCD$	Actual and escalated PJM BRA clearing prices. Apply a derate factor for dispatchable DR programs. Inclusive of 4 years of capacity DRIPE. Separate values for summer and winter.
	Transmission capacity (price)			<i>See</i> supporting MS-Excel spreadsheet calculation model. Apply a derate factor for DR programs. Separate values for summer and winter.
Distribution capacity (price)	<i>See</i> supporting MS-Excel spreadsheet calculation model. Apply a derate factor for DR programs. Does not apply to			

TRC Category	TRC Element	Units	Symbol	Guidance Summary
				Large C&I. Separate values for summer and winter.
Other TRC Benefits	Water impacts (quantity)	Gallons	$H2O$	Savings are positive. Increased water consumption is negative.
	Marginal cost of water (price)	\$/gallon (nominal)	$MCH2O$	\$0.011 / gal (2026 dollars), adjusted for inflation over forecast horizon.
	Fossil Fuel Impacts (quantity)	MMBTU/year	$F_{impact}$	Direct changes in fuel usage. Savings are positive, increases in fuel usage are negative.
	Marginal cost of fuel (price)	\$/MMBTU (nominal)	$MCF$	Twenty-year forecast divided into years 1-4, 5-10, 11-20. See supporting MS-Excel spreadsheet calculation model. Apply natural gas loss factor.
	Interactive Fuel Effects (Waste Heat)	MMBTU/year	$F_{waste}$	Secondary fuel impacts due to reduced waste heat from efficient lighting. Increased fuel usage recorded as a positive value.
	Societal Benefits			Do not include.
	O&M Benefits	\$ or \$/year (nominal)	$O\&M$	Incremental relative to baseline equipment. Note some measures (CHP) can produce negative O&M benefits.
TRC Costs	Program Admin & Overhead	\$(nominal)	$PA$	Allocated to specific programs where applicable. Common costs can be allocated to programs or incorporated at the portfolio level.
	Incremental costs	\$(nominal)	$IMC$	Maximum of IMC (relative to baseline) and incentive. IMC for DR programs assumed to be 75% of incentives.
	Incentives from Outside Act 129	\$(nominal)	$OI$	Incentives from outside of Act 129 considered as a reduction in costs, not as a benefit of the program.
Other Assumptions	Real discount rate	Unitless	$r$	3%
	Nominal discount rate	Unitless	$d$	5%
	Inflation rate	Unitless	$inf$	2%
	Escalation rate	Unitless		Growth in real dollars. Based on CAGR of BLS GTD sector price index (NAICS 221110).
	Gas Loss Factor	Unitless	$LLF_{gas}$	1.04167
	Water Loss Factor	Unitless	$LLF_{H2O}$	1.32
	Measure life	Years	$N$	Maximum 15 years. For DR programs, lifetime of hardware. One-year lifetime for behavioral DR and load curtailment.

TRC Category	TRC Element	Units	Symbol	Guidance Summary
	Free-ridership	Unitless	FR	Determined by evaluation contractor.
	Spillover	Unitless	SO	Determined by evaluation contractor.
	Market Effects (ME)	Unitless	ME	Determined by evaluation contractor.
	Low-Income Indicator	Unitless	LI	Indicator for low-income programs. Used to include the added value of reduction in arrearages and collection costs only for low-income program savings.
Calculated Inputs	NTG Ratio	Unitless	NTGR	See Table 9.
	Gross TRC benefits	\$	$TRC Benefits_{gross}$	See Table 9.
	Gross TRC costs		$TRC Costs_{gross}$	See Table 9.
	Net TRC benefits		$TRC Benefits_{net}$	See Table 9.
	Net TRC costs		$TRC Costs_{net}$	See Table 9.
	Electric energy benefits		$EB_t$	See Table 9.
	Capacity benefits		$DB_t$	See Table 9.
	Fuel benefits		$FB_t$	See Table 9.
Water benefits	$H2OB_t$		See Table 9.	

**Algorithms**

TRC ratios, net benefits, and levelized costs are detailed in Table 8. While some of the inputs are available in Table 7, other inputs must be calculated. These input formulae are provided in Table 9.

**Table 8: Primary Algorithms**

$TRC Ratio_{gross}$	$= \frac{TRC Benefits_{gross}}{TRC Costs_{gross}}$
$TRC Ratio_{net}$	$= \frac{TRC Benefits_{net}}{TRC Costs_{net}}$
$PV Net Benefits_{gross}$	$= TRC Benefits_{gross} - TRC Costs_{gross}$
$PV Net Benefits_{net}$	$= TRC Benefits_{net} - TRC Costs_{net}$
$Levelized Cost per kWh_{gross}$	$= \frac{TRC Costs_{gross}}{\left[ \sum_{t=1}^N \frac{\sum_{t=1}^n EB_t}{(1+d)^{t-1}} \right]}$

Levelized Cost per $kW_{gross}$	$= \frac{TRC\ Costs_{gross}}{\left[ \sum_{t=1}^N \frac{\sum_{t=1}^n DB_t}{(1+d)^{t-1}} \right]}$
Levelized Cost per $kWh_{net}$	$= \frac{TRC\ Costs_{net}}{\left[ \sum_{t=1}^N \frac{\sum_{t=1}^n EB_t * NTGR}{(1+d)^{t-1}} \right]}$
Levelized Cost per $kW_{net}$	$= \frac{TRC\ Costs_{net}}{\left[ \sum_{t=1}^N \frac{\sum_{t=1}^n DB_t * NTGR}{(1+d)^{t-1}} \right]}$

**Table 9: Supporting Algorithms**

$NTGR$	$= 1 - FR + SO + ME$
$TRC\ Benefits_{gross}$	$= \sum_{t=1}^N \frac{EB_t + DB_t + FB_t + H2OB_t + O\&M_t}{(1+d)^{t-1}}$
$TRC\ Costs_{gross}$	$= \sum_{t=1}^N \frac{PA_t + IMC_t - OI_t}{(1+d)^{t-1}}$
$TRC\ Benefits_{net}$	$= NTGR * (TRC\ Benefits_{gross})$
$TRC\ Costs_{net}$	$= \sum_{t=1}^N \frac{PA_t + (IMC_t - OI_t) * (NTGR)}{(1+d)^{t-1}}$
$EB_t$ (Electric energy benefits in year $t$ summed across $p$ costing periods)	$= E_{t,p} * LLF_{elec} * (MCE_{t,p} + AEPS + (RACC * LI))$
$DB_t$ (Capacity benefits in year $t$ )	$= D_t * LLF_{elec} * MCD_t$
$FB_t$ (Fuel benefits in year $t$ )	$= (F_{impact_t} - F_{waste_t}) * LLF_{gas} * MCF_t$
$H2OB_t$ (Water benefits in year $t$ )	$= H2O_t * LLF_{H2O} * MCH2O_t$

## **Appendix B**

### **List of Acronyms and Definitions**

ACC: Avoided Costs Calculator MS-Excel spreadsheet calculation model

AEC: Alternative Energy Credit

AEO: Annual Energy Outlook

AEPS: Alternative Energy Portfolio Standards

B/C: Benefit/Cost

BLS: Bureau of Labor Statistics

BRA: Base Residual Auction

BTU: British Thermal Unit

CAGR: Compound Annual Growth Rate

California Manual: 2002 California Standard Practice Manual

CAP: Customer Assistance Program

CHP: Combined Heat and Power

C&I: Commercial and Industrial

CSP: Conservation Service Provider

DLC: Direct Load Control

DR: Demand Response

DRIPLE: Demand Reduction Induced Price Effects

DSM: Demand Side Management

EDC: Electric Distribution Company

EE: Energy Efficiency

EE&C: Energy Efficiency and Conservation

EIA: Energy Information Administration

EPA: Environmental Protection Agency

EUL: Expected Useful Life

FR: Free-Ridership, Free Rider

GHG: Greenhouse Gas

GTD: Generation, Transmission, and Distribution

IE: Low-income  
IMC: Incremental Measure Cost  
IMCD: Incremental Measure Cost Database  
LED: Light Emitting Diode  
LMP: Locational Marginal Price  
MPS: Market Potential Study  
ME: Market Effects  
NAICS: North American Industry Classification System  
NEI: Non-Energy Impact  
NGDC: Natural Gas Distribution Company  
NPV: Net Present Value  
NREL: National Renewable Energy Laboratory  
NTG: Net-to-Gross  
NYMEX: New York Mercantile Exchange  
O&M: Operation and Maintenance  
Phase I: Act 129 requirements from June 1, 2009, through May 31, 2013  
Phase II: Act 129 requirements from June 1, 2013, through May 31, 2016  
Phase III: Act 129 requirements from June 1, 2016, through May 31, 2021  
Phase IV: Act 129 requirements from June 1, 2021, through May 31, 2026  
Phase V: Potential Act 129 requirements beginning June 1, 2026  
PV: Photovoltaic  
PJM: The regional transmission organization (RTO) covering, *inter alia*, Pennsylvania, New Jersey, and Maryland  
PUC: Public Utility Commission  
PVNB: Present value of net benefits  
RGGI: Regional Greenhouse Gas Initiative  
RPS: Renewable Portfolio Standard  
RTO: Regional Transmission Organization  
RUL: Remaining Useful Life

SO: Spillover

SWE: Statewide Evaluator

T&D: Transmission and Distribution

TRC: Total Resource Cost

TRM: Technical Reference Manual

US: United States

WACC: Weighted Average Cost of Capital

## Appendix C

### Summary of Continuations/Changes/Clarifications/New Items

Sub-section	Subsection Name	Summary of Proposed Continuation/Change/Clarification/New Item
<b>A - General Issues</b>		
1	TRC Test Assumptions in Other Matters	TRC Test assumptions are used exclusively for Act 129 related matters. TRC Test assumptions are not presumed binding in other regulatory matters such as prudence, cost-of-service, etc.
2	Frequency of Review of TRC Test	TRC Test applies for the entirety of Phase V. The Commission reserves the right to update or modify during Phase V. Commission continues to direct the Phase V SWE to review avoided cost forecast annually.
3	Level at Which to Calculate and Report TRC Test Results	Continue cost-effectiveness reporting at plan level, not program level. EDCs are required to estimate and report program level TRC ratios in each annual report.
4	Discount Rate	Continue to use discount rate of 5% nominal (3% in real terms).
5	Effective Useful Life	Continue using statutorily mandated 15-year maximum even if the mechanical life of the technology exceeds that. Continue to develop dual baselines for technologies where appropriate.
6	Low-Income Programs	Directs EDCs to include financial benefits from the Low-Income Act 129 programs, which are detailed in section B.12, in cost-effectiveness testing. Continue reporting low-income programs as previously done.
7	Basis of TRC Test Impacts	Continue reporting verified gross savings, verified net savings, and actual costs in their final annual reports. Compliance will continue to be based on verified gross kWh and kW electric savings, and costs will continue to be based on actual costs.
8	Measures Supported by Act 129 Programs and Other Funding Streams	Continue tracking non-Act 129 incentives that are reasonably quantifiable.

<b>B - Avoided Costs of Supplying Electricity</b>		
n/a		Use 2026 Avoided Cost Calculator (2026 ACC) to aid in implementation of proposed methodology.
1	Vintage of Avoided Costs Forecasts	Continue to develop a single forecast of avoided costs for use in Phase V EE&C plans and cost-effectiveness reporting in annual reports. The Commission continues to reserve the right to require a mid-phase update to the avoided cost forecasts should the variance between EE&C plan projections and current market conditions become large enough to fundamentally alter the benefit/cost results at the portfolio level.
2	Avoided Cost of Electric Energy	Continue to forecast avoided energy costs in a seasonal- and time-differentiated format.
3	Nominal vs. Real Dollars	Continue to develop avoided costs forecasts in nominal dollars. Nominal discount rate to be used to calculate NPV.
4	Line Losses	Align assumptions with 2026 TRM values.
5	Escalation Rate	Use BLS Electric Power GTD sector price index, compounded by average growth rate of average annual values of prior 5 years. If the escalation rate is calculated to be less than zero, it should be treated as if it were zero.
6	Allocation of Avoided Capacity Costs Between Summer and Winter Peak	Instead of allocating 100% of avoided capacity to summer, the Commission directs EDCs to allocate avoided capacity on Phase V 50/50 between summer and winter.
7	Avoided Cost of Generation Capacity	Use actual values from Base Residual Auctions (BRA) for the years that the auctions have been completed. For all future years, use a simple average of the five most recently completed BRAs escalated using the escalation rate. This is a change from the three-year average used in the prior TRC Test Orders.
8	Avoided Cost of Transmission and Distribution Capacity	The Commission directs EDC to use the avoided T&D values calculated by the Phase IV SWE's T&D study. The Commission clarifies avoided costs in distribution should not be applied to EE measures for Large C&I customers taking service at primary voltage.
9	Compliance with AEPS	Statewide value of \$6.88 per MWh for first year of Phase V and increase yearly by BLS escalation factor and inflation.
10	Price Suppression Effects	Commission directs the EDCs to include Price Suppression effects from the Phase IV SWE's Price Suppression Effects study for both energy and capacity in TRC calculations in Phase V.
11	End Use Adjustments	Continue to use of end-use profiles, when available.

12	Reductions in Arrearages and Collection Costs	The Commission adopts the SWE’s recommended EDC financial savings from reduced customer arrearages, shutoffs, and collections actions attributable to the EDC’s Act 129 low-income programs
<b>C - Other TRC Benefits</b>		
1	Quantifying Water Impacts	Continue to account for water impacts from EE&C measures where the impacts are reasonably quantifiable.
2	Monetizing Water Impacts	Continue to monetize water impacts from Phase V EE&C measures.
3	Quantifying Fossil Fuel Impacts	Continue to use the TRM to inform fossil fuel savings by EE&C measure, where available. Where the TRM does not provide guidance on fossil fuel savings, EDCs and their evaluation contractors should use professional judgement when estimating impacts.
4	Interactive Effects	Directs EDCs to quantify and report both electric and non-electric interactive effects associated with installation of high-efficiency lighting in homes, businesses, and agricultural applications. Assumptions are provided in the TRM, but site-specific effects should be used where practical.
5	Monetizing Fossil Fuel Impacts	Continue to use natural gas values in Section B.2. (Avoided Cost of Electric Energy), collapsed into a single value. Continue to use 20-year period but propose that period is broken into three segments. Directs EDCs to use natural gas loss factor of 4%.
6	O & M Benefits	Continue to include O&M benefits whether they are positive or negative. EDCs and their evaluation contractors should attempt to quantify O&M benefits where the impacts are quantifiable and material.
7	Societal Benefits	Continue to omit the explicit accounting of societal benefits from TRC.
<b>D - TRC Costs</b>		
1	Program Administration and Overhead	Continue to treat all program administration and overhead expenses as a TRC cost. Continue to exclude kit and direct install costs from administrative costs and classify as incentives and IMC.
2	Incremental Costs	Continue to use SWE-developed 2026 IMCD as an optional resource for EDCs and evaluation contractors when actual project costs are not available or appropriate. Incremental costs should be documented regardless of source.

3	Act 129 Incentives	Continue to treat incentive costs as neither a cost nor a benefit in the TRC Test, unless the incentive amount is greater than the IMC, in which case the incentive amount should be used as the TRC cost instead of the IMC. Continue to treat kits and directly installed equipment costs as an incentive to the customer.
4	Incentives from Outside of Act 129	Continue to treat incentives from outside Act 129 as reduction in costs, not as benefit to program.
<b>E - Fuel Switching</b>		
1	ENERGY STAR Requirement	EDCs must propose and justify the minimum efficiency standard for any fuel switching measure they wish to include in a Phase V EE&C plan given the uncertainty in ENERGY STAR specifications for fossil fuel equipment.
2	Increased Fuel Consumption	Continue to treat increased fuel consumption as a negative TRC benefit.
<b>F - Net-to-Gross (NTG) Issues</b>		
1	Use of NTG Research	Continue NTG research, use results for program planning purposes, and report TRC Test ratios based on gross and net savings.
2	Treatment of Incentives to Free-Riders	Continue excluding free-rider incentives as a TRC cost when considering the net TRC perspective.
3	Treatment of NTG for TRC Benefits	Continue to apply NTG ratios to <i>all</i> benefits in 2026 TRC Test.
<b>G - Demand Response (DR)</b>		
1	Testing if DR is Included in Phase V	DR has not yet been determined, but proposed guidance to calculate TRC benefits and costs for DR is included.
2	Calculation of TRC Benefits	The commission directs EDCs to average gross verified demand reductions over each hour of performance and apply line loss adjustment factor. Use separate calculations for summer and winter peak demand. EDCs should use a derate factor based on the frequency of dispatch to monetize DR impacts, if DR uses a daily dispatch, then there will be not derate factor.
3	Participant Cost Assumption	Continue to use 75% participant cost assumption.

4	Measure Life	EDCs shall use a one-year measure life for behavioral DR programs and load curtailment or daily load-shifting programs in the C&I sector. For equipment-based DR programs, the measure life shall equal the agreed-upon participation term with the program participant. Clarify that DR equipment purchased in prior phase should not be counted in Phase V.
<b>I – Additional Matters</b>		
1	TRC Test Assumptions for the FirstEnergy EDC	The Commission provides the FirstEnergy EDC guidance on calculating composite values for use during Phase V.
2	Facilitating Data Sharing Between Utilities and State Agencies	The Commission plans to investigate ways to facilitate data sharing between utilities and State Agencies as part of preparations for a potential Phase V and suggests stakeholders submit constructive ways of doing so.
3	Formula Error in Appendix A	An error in Appendix A of the Tentative Order was pointed out to the Commission during the comment period and was subsequently corrected.