**PENNSYLVANIA**

**PUBLIC UTILITY COMMISSION**

**Harrisburg, PA. 17105-3265**

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|  | Public Meeting held July 28, 2011 |
| Commissioners Present: |  |

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| Robert F. Powelson, Chairman |
| John F. Coleman, Jr., Vice Chairman |
| Wayne E. Gardner |
| James H. Cawley, StatementPamela A. Witmer |
|  |  |
| Implementation of Act 129 of 2008 – Total Resource Cost (TRC) Test2011 Revisions  | Docket No. M‑2009-2108601 |

**FINAL ORDER**

**2011 TOTAL RESOURCE COST TEST ORDER**

**BY THE COMMISSION:**

 Act 129 of 2008, 66 Pa.C.S. § 2806.1, directs the Commission to use a total resource cost (TRC) test 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. The Pennsylvania TRC Test was adopted by Commission order at this docket on June 23, 2009 (*2009 PA TRC Test Order*). Before us are the comments and reply comments to the May 6, 2011 TRC test tentative order (Tentative Order) relative to refinements to the 2009 PA TRC test for use through May 31, 2013, and to a lesser extent, on the use of the TRC test after June 1, 2013.

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**I. BACKGROUND**[[1]](#footnote-1)

Act 129 requires an EDC with more than 100,000 customers to adopt an energy efficiency and conservation (EE&C) plan, subject to Commission approval, to reduce electric consumption by at least 1% of the EDC’s expected load for the period from June 1, 2009, through May 31, 2010, adjusted for weather and extraordinary loads, by May 31, 2011. Further, by May 31, 2013, the EDC is required to reduce its total annual weather-normalized consumption by a minimum of 3%. Also by May 31, 2013, the EDC is expected to reduce its peak demand by a minimum of 4.5% of the EDC’s annual system peak demand, as measured against the EDC’s peak demand during the period from June 1, 2007, through May 31, 2008. 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).[[2]](#footnote-2) On January 16, 2009, the Commission’s Act 129 *EE&C Implementation Order* was entered.[[3]](#footnote-3)

Seven EDCs filed EE&C plans. Those plans are docketed as follows: *Petition of West Penn Power*, Docket No. M-2009-2093218 (October 23, 2009); *Petition of PPL Utilities*, Docket No. M-2009-2093216 (October 26, 2009); *Petition of Duquesne Light*, Docket No. M-2009‑2093217 (October 27, 2009); *Joint Petition of Met-Ed, Penelec, and Penn Power*, Docket No. M‑2009‑2092222, M-2009-2112952 and M-2009-2112956 (October 28, 2009); *Petition of PECO*, Docket No. M‑2009-2093215 (October 28, 2009).

**II. RECAP OF *2009 PA TRC TEST ORDER***

Act 129 requires an EDC to demonstrate that its plan is cost-effective using the TRC test. 66 Pa.C.S. § 2806.1(b)(1)(i)(I). The TRC test is “a standard test that is met if, over the effective life of each plan not to exceed 15 years, the net present value of the avoided monetary cost of supplying electricity is greater than the net present value of the monetary cost of energy efficiency conservation measures.” 66 Pa.C.S. § 2806.1(m). The *EE&C Implementation Order* directed that EDCs evaluate the cost-effectiveness of energy efficiency or demand reduction programs using a TRC test based on the California model. After a comment period, a final order relative to TRC testing on June 23, 2009, at Docket No. M‑2009-2108601 (*2009 PA TRC Test Order*).[[4]](#footnote-4)

The *2009 PA TRC Test Order* specified that the TRC test assumptions were generally not intended for use in prudence or cost-of-service inquiries but did not establish a blanket exclusion of such use. If there are significant differences between the TRC test assumptions and the assumptions or facts at issue in other proceedings, parties may inquire into the validity of such differences in those, or in the TRC test, proceedings. With TRC testing at the plan level, new technologies would have the opportunity to establish an ability to contribute to the EE and demand reduction goals of Act 129. Many issues involved in the EE&C plans, program implementation, and operation of the TRC test are ongoing in nature. Pennsylvania is not using the Societal Test as part of the TRC test.

The PA TRC test takes into account the combined effects of an EDC’s EE&C plan on both participating and non-participating customers based on the costs incurred by both the EDC and any participating customers. The benefits calculated in the TRC test include the avoided supply costs and capacity costs valued at marginal cost for the periods when there is a consumption reduction. The avoided supply costs are calculated using net program savings, *i.e.*, savings net of changes in energy use that would have happened in the absence of the program. The persistence of savings over time is considered in the net savings. The costs calculated in the TRC test include the costs of the various programs paid by an EDC or a default service provider (DSP) and the participating customers, and reflect any net change in supply costs for the periods in which consumption is increased in the event of load shifting. The PA TRC test uses the *incremental* costs of services and equipment. For example, equipment, installation, operation, and maintenance costs, cost of removal (less salvage value), and administrative costs, regardless of who pays for them, are included.

 TRC test results are expressed as both a net present value (NPV) and a benefit/cost ratio (B/C ratio). The NPV is the discounted value of the net benefits over a specified period of time, *i.e.*, the expected useful life of the EE measure, and is a measure of the change in the total resource costs due to the program. A NPV above zero indicates that the program is a less expensive resource than the supply option upon which the marginal costs are based. The B/C ratio is the ratio of the discounted total benefits of the program to the discounted total costs over the expected useful life of the EE measure. The B/C ratio gives an indication of the rate of return of a program. A B/C ratio above one indicates that the program is beneficial to the utility and its ratepayers on a TRC test basis. The *2009 PA TRC Test Order* provided that the PA TRC test could be amended based upon experience and/or input from stakeholders.

Pursuant to the Tentative Order, comments were filed by Duquesne Light Company (Duquesne); Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, and West Penn Power Company (collectively, First Energy); PECO Energy Company (PECO): PPL Electric Utilities Corporation (PPL); Energy Association of Pennsylvania (EAP); Comverge, Inc.; EnerNOC, Inc.; Sustainable energy Fund of Central Eastern Pennsylvania, (SEF); Office of Consumer Advocate (OSA); and Pennsylvania Department of Environmental Protection (DEP). Reply Comments were filed individually by First Energy and PECO.

**III. DISCUSSION**

The purpose of using the TRC test to evaluate EE&C programs is to track the relationship between the benefits to customers and the costs incurred to obtain those benefits. The TRC test has historically been a regulatory test. Sections 2806.1(c)(3) and 2806.1(d)(2), as well as the definition of the TRC test in Section 2806.1(m), provide that the TRC test be used to determine whether ratepayers, as a whole, received more benefits (in reduced capacity, energy, transmission, and distribution costs) than the implementation costs of the EE&C plans. As noted above, we recognized in our *2009 PA TRC Test Order* that many issues involved in the EE&C plans, program implementation, and operation of the TRC test would be ongoing in nature and that future updates may be proposed by stakeholders or the Commission as needed. This order makes further refinements to the PA TRC test for use through May 31, 2013, relative to demand response, net-to-gross issues, fuel switching, TRC calculation, and TRC reporting. To a lesser extent, it also addresses the use of the TRC test beginning June 1, 2013. As specified relative to the 2009 PA TRC test, future updates to the 2011 TRC test may also be proposed.

1. **Demand Response**
2. **Application of TRC Test Calculation To DR Programs**
3. Summary of Issue and Proposed Resolution

The *EE&C Implementation Order* directed the EDCs to evaluate the cost-effectiveness of each energy efficiency or demand reduction program using a TRC test. This provision was carried forward in the *2009 PA TRC Test Order*. The Tentative Order proposed that EDCs continue to evaluate demand response (DR) programs using the PA TRC test.

1. Discussion of Comments and Reply Comments

PPL and Duquesne agree with the proposal that EDCs continue to evaluate DR programs using the PA TRC test (PPL Comments at 4, Duquesne Comments at 2). There were no contrary comments.

1. Final Resolution

Accordingly, the TRC test shall continue to be applicable to DR programs.

1. **Treatment of DR Payments To CSPs And EDCs from PJM**
2. Summary of Issue and Proposed Resolution

The Tentative Order addressed whether payments from PJM, the regional transmission organization, should be included in the TRC as costs or as benefits in two different situations: When PJM payments are made to a curtailment service provider (CSP) and when PJM payments are made directly to an EDC. The Tentative Order proposed to allow PJM payments to EDCs to be recognized as benefits “to the extent that these payments represent benefits (costs avoided) that exceed those costs avoided which are calculated as set forth in the “*2009 PA TRC Test Order*.” The Tentative Order proposed the following:

*i*. PJM payments to CSPs for DR market participation in all PJM programs would be excluded from TRC test calculations.

*ii.* PJM payments to EDCs for DR market participation in economic programs would be allowed as benefits for the purpose of the TRC test to the extent that these payments represent benefits (costs avoided) that exceed those costs avoided which are calculated as set forth in the *2009 PA TRC Test Order*. As stated in the *2009 PA TRC Test Order*, these predicted avoided cost assumptions are to be developed over 15 years and include generation, transmission, distribution, and capacity costs.

*iii.* PJM payments for capacity would be excluded from TRC calculations as either benefits or costs relative to the TRC test.

Tentative Order at 9.

1. Discussion of Comments and Reply Comments

PPL and EAP disagree with the Commission’s first and second proposals regarding treatment of PJM payments to CSPs and EDCs for several reasons. PPL and EAP state that PJM’s economic and capacity DR programs are independent programs from Act 129. To the extent that participation in PJM DR programs would have occurred in the absence of Act 129 DR programs (*i.e.*, the PJM charges or payments are not directly related to incremental DR provided by Act 129), any charges, penalties, or payments from the PJM DR programs should be ignored for purposes of Act 129 regardless of whether the charges, penalties, or payments are to or from a CSP, a customer, or an EDC.

Further, according to PPL and EAP, if the PJM DR revenue is, however, directly related to Act 129 DR (*i.e.*, Act 129 DR is incremental to PJM DR programs, for example, demand response from a new Act 129 direct load control program that previously did not exist or additional load curtailment above and beyond what the customer would have achieved for PJM DR programs) and the Act 129 DR program has revenue, charges, or penalties from PJM DR programs, then it may be appropriate to include that PJM revenue, charge, or penalty as a cost or benefit for Act 129 TRC testing regardless of whether it is to/from a CSP, a customer or an EDC. The difficulty will be for the EDC or the EDC’s independent evaluator that performs the TRC calculations to know those PJM DR payments. PPL and EAP assert that since it will be nearly impossible to quantify or verify PJM DR payments in this case, EDCs should be permitted to ignore those benefits for the TRC. If these benefits are ignored, the reported benefit/cost ratio will be lower than it would have otherwise been if PJM DR payments were included (*i.e.,* EDCs would be understating the benefit/cost ratio).

PPL and EAP state that the TRC should not treat PJM DR payments differently based on whether the recipient of the payment is the EDC, the EDC’s CSP, or the customer because that would distort the cost-effectiveness. For example, if a PJM payment to the EDC is included as a benefit but the same PJM payment is ignored if it is paid to the EDC’s CSP, then the TRC will artificially look more favorable for EDC self-managed DR programs as compared to using a CSP (PPL Comments at 5-6; EAP Comments at 3-5).

PECO believes that all benefits and costs, including PJM payments for DR market participation, must be incorporated into the TRC test on a consistent basis regardless of whether they pass thorough a CSP or an EDC (PECO Comments at 2). PECO submits that it is not clear from the discussion in the Tentative Order why the entire PJM payment should not be included as a benefit. PECO believes that it is appropriate to include the entire PJM payment provided in connection with an Act 129 DR program because it represents an increment to any other avoided cost benefits (PECO Comments at 3). PECO also requests a clarification of the provision that payments by PJM for economic program participation represent benefits that are in excess of the retail rate, by definition (PECO Comments at 3).

Duquesne agrees with that proposal to exclude PJM payments to CSPs for DR market participation from TRC test calculations. Duquesne asserts that under the TRC test, payments to parties are not benefits, they are only costs, and, therefore, disagrees with the proposal to include PJM payments to EDCs for DR market participation as benefits for the purpose of the TRC test (Duquesne Comments at 2).

FirstEnergy disagrees with treating PJM payments to EDCs and PJM-CSPs[[5]](#footnote-5) differently. Rather, FirstEnergy believes that these payments, regardless of whether the payments are made to EDCs or PJM-CSPs, should be excluded from the TRC test calculations. FirstEnergy recommends that both PJM payments to PJM-CSPs and PJM payments to EDCs be uniformly considered a surrogate for customer cost

 (FirstEnergy Comments at 5-6).

Comverge urges the Commission to modify the proposed treatment of PJM payments to CSPs. Comverge believes that the benefits received from these energy payments are fundamentally equivalent regardless of who is performing the DR service. Comverge proposes that all PJM payments be treated identically, as benefits, regardless of whether the programs are performed by the EDC or by a third-party vendor for that EDC (Comverge Comments at 2).

EnerNOC’s comments are focused on the Commission’s tentative determination that payments from PJM for participation in its emergency DR programs be treated differently, depending on whether the payments come through an EDC or a CSP. EnerNOC believes that two programs, one run by an EDC and another by a CSP under contract to an EDC, both of which achieve the exact same peak load reductions, at the exact same costs, with the exact same revenues from PJM, should receive the exact same cost-effectiveness score (EnerNOC Comments at 5-6).

The Tentative Order also proposed that PJM payments for capacity should be excluded from TRC calculations as either benefits or costs relative to the TRC test. FirstEnergy supports excluding consideration of PJM payments for capacity or energy resources for the *current phase* of Act 129. However, FirstEnergy opposes excluding PJM payments for capacity for the *next phase* of Act 129. FirstEnergy states that for PJM capacity resources, the value of capacity is generally reflected in PJM payments to the PJM-CSP which generally settle through PJM settlement processes to the load serving entity, regardless of whether that entity is an EDC, default service provider or third-party supplier. To the extent capacity payments are monetized through PJM payments to the PJM-CSP, they are costs to the energy suppliers that customers ultimately pay, and these capacity payments should not be excluded particularly for existing capacity resources that have cleared the market in PJM RPM auctions (FirstEnergy Comments at 6-7).

Duquesne also agrees with the proposal to exclude PJM payments for capacity from the TRC test. Duquesne states that PJM payments are not applicable to incremental increases in available DR capacity resulting from Act 129 programs and should be excluded from Act 129 cost-effectiveness determination (Duquesne Comments at 2).

PPL agrees with the proposal that PJM payments for capacity would be excluded from TRC calculations as either benefits or costs relative to the TRC test. (PPL Comments at 5).

1. Final Resolution

While the Tentative Order proposed different treatments for PJM DR payments, the various commenters have persuaded us to reject that proposal. We agree with PPL, EAP, PECO, Duquesne, FirstEnergy, Comverge, and EnerNOC that the TRC test should not treat PJM DR payments differently based on whether the recipient of the payment is the EDC, the EDC’s CSP, or the customer. Different treatment of PJM DR payments would distort the cost-effectiveness scores.

We agree with the assertions of PPL, EAP, Duquesne, and FirstEnergy that PJM’s economic DR programs are independent programs from Act 129 and that any charges, penalties, or payments from the PJM DR programs should be ignored for purposes of Act 129, regardless of whether the charges, penalties, or payments are to/from a CSP, a customer, or an EDC.

We find equally compelling FirstEnergy’s recommendation that PJM DR payments to PJM-CSPs and EDCs be uniformly considered surrogates for customer cost. Thus, for the purposes of the TRC calculation, the payments from PJM are considered to offset customer costs and can be ignored.

Finally, we agree with PPL and EAP that since it would be difficult for an EDC or an EDC’s independent evaluator to quantify or verify PJM DR payments, EDCs should be permitted to ignore those benefits for purposes of the TRC test.

Accordingly, all DR payments from PJM will be handled in the same manner and be excluded from the TRC test on a going forward basis through May 31, 2013, consistent with the discussion above.

With respect to FirstEnergy’s proposal to include PJM DR payments for capacity for any next phase of Act 129, given the lack of comments from other parties of similar substance, the Commission will not direct a specific procedure or working group process to resolve FirstEnergy’s concern at this time. At its discretion, FirstEnergy may raise this issue at a future meeting of the Technical Working Group.

**3. Treatment of DR Payments To CSPs And Participants from EDCs**

1. Summary of Issue and Proposed Resolution

The Tentative Order addressed whether DR program payments from an EDC directly to participants or CSPs are cancelled out by an offsetting benefit to the participant or CSP and, therefore, should be excluded from the TRC test calculation. The Tentative Order proposed that all direct payments from EDCs to participants/customers or to CSPs in DR programs be treated as follows:

* For Program Years 1 to 4 [2009 to 2013], each EDC would treat such payments (made to CSPs or to DR program participants) in the TRC test in the same manner as each EDC treated such payments in its approved EE&C plan. These payments would be considered to be a proxy for participant transaction costs.
* After Program Year 4 ends on May 31, 2013, each EDC would include all such payments to CSPs or to DR program participants as transaction costs in the calculation of the TRC test. These payments would be considered to be a proxy for participant transaction costs.

Tentative Order at 11-12.

1. Discussion of Comments and Reply Comments

Duquesne and PPL agree with the Commission that payments made by EDCs directly to DR program participants or to DR CSPs should be included as a cost in the calculation of the PA TRC test (Duquesne Comments at 3; PPL Comments at 7).

PECO agrees that DR incentives can be a proxy for transaction costs but believes that 75% of incentive payments would be an appropriate proxy for transaction costs, instead of the 100% proposed by the Commission. Without further explanation, PECO asserts that the “base case” in the California Protocol[[6]](#footnote-6) DR reporting templates utilizes 75% of the sum of incentives and bill reductions in its transactional cost calculations (PECO Comments at 4).[[7]](#footnote-7)

FirstEnergy states that page 11 of the Tentative Order reads “…payments from an EDC directly to participants or [CSPs] are cancelled out by an offsetting benefit to the participant or CSP . . . .” FirstEnergy maintains that DR program payments from EDCs to CSPs or participants offset the *cost* (not the *benefit*) to the participant or CSP for participation in programs in a manner similar to the PJM payments to EDCs or PJM-CSPs discussed earlier (FirstEnergy Comments at 11).

1. Final Resolution

There was no disagreement with the proposal that payments made by EDCs directly to DR program participants or to DR CSPs should be included as a cost in the calculation of the PA TRC test. Accordingly, payments made by EDCs directly to DR program participants or to DR CSPs should be included as a cost in the calculation of the PA TRC test.

With respect to FirstEnergy’s clarification request, we agree that DR program payments by the EDCs to CSPs or participants offset the *cost* (not the *benefit*) to the participant or CSP.

**4. Treatment of American Reinvestment and Recovery Act of 2009 (ARRA) Funds**

 a) Summary of Issue and Proposed Resolution

The Tentative Order proposed that since Act 129 funding is capped, any additional funds such as ARRA funds should be used to supplement, not replace, funds from EDCs.

1. Discussion of Comments and Reply Comments

PPL and Duquesne agree with the proposal regarding ARRA funds (PPL Comments at 8; Duquesne Comments at 3). PPL, however, has concerns regarding the implementation of accounting for all ARRA funds in the TRC. PPL states that due to practical implementation concerns regarding quantification and/or verification of ARRA funding, EDCs should have the option of ignoring those benefits for the TRC. If these benefits are ignored, the reported benefit/cost ratio would be lower than it would have otherwise been if ARRA benefits were included. PPL submits that if the Commission decides that the inclusion of ARRA funds is required in the TRC, then the Commission should clarify that the benefits associated with ARRA funding take the form of a reduction to the costs, consistent with the California model (PPL Comments at 8).

DEP states that when the costs of EE&C plans are supported or supplanted by non-ratepayer funds, such as ARRA or other general population monies or tax-based programs, the process becomes analogous to taxation without representation. DEP recommends that ARRA funds and all other non-ratepayer based funds provided by, and intended to benefit, all of society and taxpayers on an equal basis, logically should not be used to support Act 129 program costs or to enhance individual and exclusive EDC EE&C plans (DEP Comments at 3).

FirstEnergy believes that if the benefits of ARRA funding are not considered benefits in the TRC testing, the cost-effectiveness of the program ignores the purpose of the ARRA funding and, as a result, will be lower. FirstEnergy argues that the Commission should reject DEP’s proposal regarding ARRA funding (FirstEnergy Reply Comments at 5-6).

PECO states that, while it is unclear how DEP would like the Commission to respond to its general statement, the issue of “co-funded” measures was addressed on several occasions, and the Commission has consistently concluded that the public interest will be best served by taking advantage of all incentives and rebates available. PECO states that the Commission has thoroughly reviewed and appropriately considered the various arguments related to co-funded EE&C measures and submits that DEP’s general comments do not warrant reconsideration of those issues (PECO Reply Comments at 1‑2).

1. Final Resolution

As both PECO and FirstEnergy point out, the issue of ARRA funding and its inclusion in the TRC test has been addressed on several occasions, and the Commission has consistently concluded that the public interest will be best served by taking advantage of all incentives and rebates available. As we have stated before, when EDCs receive ARRA funds that can be used for Act 129 implementation, such funds shall not count against the two percent revenue cap and shall be accounted for in the TRC test as a reduction in the EDC’s cost.

We agree with PPL’s concerns about the difficulty of tracking ARRA funding received by the customer directly. In instances where an accounting of customer received ARRA funding is not practical, we will grant the EDCs the option of not including those benefits in the TRC. In addition, we find it consistent with our previous orders that, when customer-received ARRA funding is included in the TRC, such funding shall be accounted for as a reduction of costs.

**5. Measure Life For DR Programs**

1. Summary of Issue and Proposed Resolution

The Tentative Order proposed to define “measure life” for use in calculating the TRC B/C ratio for DR measures as follows:

* For DR programs delivered by program administrators, “measure life” would include equipment life or program life and measure persistence (but not savings persistence).
* “Equipment life” would mean the number of years that a measure is installed and operates until failure.
* “Measure persistence” would take into account business turnover, early retirement of installed equipment, and other reasons measures might be removed or discontinued.
* “Program life” would be defined as the number of years that a DR program is projected to operate in an EDC’s approved EE&C plan or the EDC’s alternative plan for DR programs.
* . . . [F]or calculating the TRC B/C ratio, the measure life shall be the lesser of equipment life or program life, as appropriate.
* For retrofit/early retirement programs, measure life should take into account both the expected remaining life of the measure being replaced and the expected changes in baselines over time.

Tentative Order at 14. (bullets added).

1. Discussion of Comments and Reply Comments

OCA submits that direct load control programs have not been evaluated on a consistent basis by EDCs who are considering such programs. The different analyses have produced greatly varying results as to whether such programs are cost-effective, perhaps leading to incorrect information about the value of residential direct load control in the energy efficiency portfolio (OCA Comments at 2-3). OCA recommends that, for DR programs, the Commission define “measure life” in the TRC analysis to be the equipment life, *i.e.*, the number of years that a measure is installed and operated until failure. According to OCA, this approach would reflect the long term value of the DR resource and better ensure that beneficial programs are not left on the table due to an incomplete analysis (OCA Comments at 4).

PPL agrees with the proposal in the Tentative Order but requests clarification on the proposal, specifically the definition of “program life.” As currently structured in Act 129, the peak-load reduction compliance period is limited to one year, the summer of 2012 during Program Year 4.[[8]](#footnote-8) Since there are no Act 129 DR reduction targets beyond the summer of 2012 and no approved programs (DR or energy efficiency) beyond the current version of the approved EE&C Plans (*i.e.,* May 2013), PPL questions whether the program life is one year by default or whether the EDCs may assume that DR programs will extend beyond the summer of 2012 and, therefore, have a program life greater than one year (PPL Comments at 9-10).

FirstEnergy recommends that the Commission distinguish programs that are enabled by technology (*e.g.,* Direct Load Control/DLC or Smart Grid Modernization Initiative/ SGMI) and those that are non-technology enabled (*e.g.,* contracted incentive based callable load reductions). FirstEnergy believes that the measure life for technology-enabled programs should be based on the life of the equipment for the technology employed and that the measure life for non-technology enabled programs should be based on the contract term associated with customer participation in the program and not the number of years the program is projected to operate. FirstEnergy states that annual commitments for DR programs should be considered a one-year measure life and not assumed for the life of the program because: 1) these resources need to be contracted each year, and 2) it is speculative whether a contract will be renewed in any given year. Regarding the technology-enabled programs, FirstEnergy further recommends that stipulated measure lives be added to the TRM for the various technologies employed as they become known (FirstEnergy Comments at 7-8).

Duquesne agrees with the Commission’s proposed resolution on this topic (Duquesne Comments at 3).

DEP requests that the Commission increase the effective life used in calculating B/C ratio of building envelope measures from 15-years to 20-years, yielding significant improvements in 100 peak hour load reductions, energy consumption, air quality, ratepayer benefit and encouraging the development of more efficient structures (DEP Comments at 2).

1. Final Resolution

Many DR measures are implemented by supplying incentives that produce a one-time peak demand savings. It is possible that some of the equipment installed by the EDCs to achieve Act 129 DR compliance may not be utilized beyond the 2012 Act 129 DR compliance period. Because the implementation of a DR measure may not produce ongoing savings year after year like its energy efficiency counterpart, we believe the program life of a DR measure for Act 129 purposes is one year. The exception to this would be for DR measures where the EDC is committed to offer the measure to customers beyond 2012. Therefore, we adopt the FirstEnergy position that annual commitments for DR programs should be considered a one year measure life and not assumed to be for the life of the program.

We do not accept OCA’s recommendation that the Commission define “measure life” in the TRC analysis to be the equipment life. We also reject DEP’s request to increase the effective life used in calculating B/C ratio of building envelope measures from 15-years to 20-years. Effective lives were established by the Act 129 legislation and reinforced in our *Implementation Order*:

Act [129] defines “total resource cost 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 of the avoided monetary cost of supplying electricity is greater than the net present value of the monetary cost of energy efficiency conservation measures.” 66 Pa. C.S. § 2806.1(m). (*Implementation Order* at 14).

1. **Net-To-Gross (NTG)**
	1. **NTG Research And Applications**
2. Summary of Issue and Proposed Resolution

NTG research attempts to determine the actual savings from an EE program or measure and to ensure that the savings result only from the impact of that program or measure. In other words, the savings need to be “net” of what would have occurred in the absence of the program. Net savings refer to the portion of gross savings that is specifically or uniquely attributable to the program. NTG research and adjustments involve separating out the energy savings impacts that are a result of other influences. Three major factors that need to be addressed when considering NTG adjustments are “free riders,” “take-back effect,” and “spillover effect,” sometimes referred to as “free drivers.”[[9]](#footnote-9)

The Tentative Order proposed that EDCs develop and conduct NTG studies and that the NTG studies be funded out of the EDCs’ Act 129 2% program budgets. Pursuant to the RFP contract, the SWE would coordinate the development and approval of common methodologies for the EDCs’ NTG studies. The results of the studies should be reported to the SWE and utilized by the EDCs to determine when a measure or program should be removed from the EE&C portfolio because it is no longer cost-effective to offer incentives. We did not propose, for the period June 1, 2009 through May 31, 2013, that the NTG research be used to adjust the gross verified energy savings that are used for compliance purposes to determine whether an EDC has met its mandated Act 129 reduction targets.

1. Discussion of Comments and Reply Comments

SEF supports using NTG for the entire program period from June 1, 2009, through May 31, 2013, for adjusting gross verified savings that are used for compliance purposes to determine whether an EDC has met its mandated Act 129 reductions targets. SEF suggests that NTG is a key component of the TRC test (SEF Comments at 4, 5, and 7). SEF further states that the *Implementation Order* at p. 30 directs that economic change and weather must not skew the actual savings from Act 129. SEF also notes that the *2009 TRC Test Order* at p. 25-26 directed the EDCs to study the degree to which free-riders, take-back effects, spillover effects, or other factors are present. SEF further states that including savings that are not attributable to the plan violates the legislative intent of 66 Pa. C.S. §2806.1 (SEF Comments at 5, 6, and 7). Duquesne, FirstEnergy, PECO, and EAP disagree with the SEF request to use NTG to determine target compliance from June 1, 2009 to May 31, 2013 (Duquesne Comments at 3; EAP Comments at 7; FirstEnergy Comments at 8; First Energy Reply Comments at 4; PECO Reply Comments at 2, 3).

DEP states that NTG studies are costly, laden with potential inaccuracies, and difficult to undertake. DEP suggests using EPA’s Energy Star Portfolio Manager for commercial buildings and Home Energy Yardstick for residential buildings for NTG analysis. DEP submits that the EPA programs will give similar results as NTG analysis (DEP Comments at 3, 4). FirstEnergy disagrees with DEP on the application of EPA benchmarking programs as an alternative to NTG assessments. FirstEnergy notes that this approach has material shortcomings relative to its general application to EE&C programs in Pennsylvania (FirstEnergy Reply Comments at 5).

PPL and EAP state that net verified savings should be used to determine program design and effectiveness and not to determine savings target compliance. If NTG is to be used for determining savings compliance targets, PPL proposes that cost caps must be increased or targets decreased (PPL Comments at 11,12; EAP Comments at 7).

Duquesne, FirstEnergy, EAP, and PECO support NTG funding outside of the 2% ACT 129 budget. Duquesne and FirstEnergy suggest that some EDCs such as Duquesne, Penn Power, and West Penn have limited Act 129 funds and will need all 2% of the Act 129 funding cap for their programs. These EDCs do not have additional funds within the 2% funding cap for NTG studies. FirstEnergy notes that the EDCs designed Act 129 plans to achieve goals at the gross impact level and further suggested that including NTG study costs after their plans are approved could be considered a violation of the EDCs right to due process (Duquesne Comments at 3; FirstEnergy Comments at 8-10; EAP Comments at 6; PECO Reply Comments at 4).

EAP, FirstEnergy, and PPL comment that the Commission should not use NTG to determine target compliance for an Act 129 plan after 2013. EAP and PPL further note that only if program cost caps are raised or compliance targets reduced would NTG adjustments be acceptable (EAP Comments at 6; PPL Comments at 11; FirstEnergy Comments at 9; FirstEnergy Reply Comments at 5).

PPL seeks clarification of whether cost-effectiveness calculations should use gross verified savings from June 1, 2009 through May 31, 2013 (PPL Comments at 11).

1. Final Resolution

The Commission rejects DEP’s suggestion to use EPA’s Energy Star Portfolio Manager and Home Energy Yardstick in lieu of conducting NTG research. The EPA programs are benchmarking tools that do not provide insight into free-ridership or other issues necessary to determine NTG ratios.

The Commission rejects SEF’s suggestion to use NTG to determine compliance targets from June 1, 2009, to May 31, 2013. This would be a retrospective application of NTG. Implementing this requirement now would not afford EDCs an opportunity to have designed their programs with the knowledge that their savings would be determined on net verified savings. The Commission disagrees with SEF that a key component of the TRC test is the NTG component. In our opinion, NTG is not a key component of the TRC test. Neither Act 129 nor the *Implementation Order* directs that NTG be used as part of the TRC. In fact, the TRC test is a benefit/cost tool that can use either gross or net savings to determine a TRC ratio.

We believe that SEF is incorrectly interpreting and taking out of context the language in the *Implementation Order* that directs the EDCs to consider the net savings impacts of their programs. SEF asserts that “the Commission clearly agreed that after-the-fact measurement and verification remain critical to ensure that an EDC has properly implemented its EE&C plan . . . [and]. . . that non-controllable factors such as economic growth or contraction and weather have not skewed results, and the savings are a result of the EE&C plan” (SEF Comments at 5). SEF misinterprets page 30 of the *Implementation Order* as relating to energy efficiency programs on two bases: 1) “non-controllable factors such as economic growth or contraction and weather” relate to demand reduction and not NTG issues for energy efficiency, and 2) it is the paragraph before the paragraph containing questioned language that addresses demand reduction. NTG research measures mostly market/consumer behavior, not economic activity and weather.

Further, SEF incorrectly interprets 66 Pa. §2806.1 as requiring the Commission to consider NTG studies. When referencing savings goals, the legislation does not mention gross or net savings. *See* Section 2806.1(c)(1) and (2). There is no requirement in Act 129 that mandates that savings be determined on a net basis. SEF complains that the Commission did not convene a stakeholder process to examine the issues associated with development of NTG ratios. We note, in response, that we have discussed NTG in various working group meetings with the SWE and EDCs. Further, the stakeholders have had the opportunity to provide comments and reply comments in this proceeding on the subject.

The Commission agrees with Duquesne, EAP, FirstEnergy, PECO, and PPL that NTG research is appropriate for directing Act 129 program design and implementation. Accordingly, the Commission directs the EDCs to collect data necessary to determine the NTG ratio for their programs and to apply the ratio when determining the cost-effectiveness of future modifications of existing programs. For those EDCs that have collected sufficient NTG data to calculate NTG ratios, as determined by the SWE, they are to use those ratios immediately to calculate the TRC for future Act 129 program modifications or changes. For those EDCs that have not collected NTG data to date, they shall from the effective date of this order begin collecting NTG data and apply NTG ratios after 6 months from the effective date of this order for Act 129 program modifications or changes.

The EDCs make a persuasive argument in their comments that NTG funding should be outside of their Act 129 2% budget. The smaller EDCs have allocated most, if not all, of their 2% Act 129 budgets to programs or the administration of their programs and have no additional money to spend on NTG data collection and research. FirstEnergy notes that the EDCs designed their programs and developed their budgets before the Commission decided to require NTG research. As a result, requiring NTG research now could be considered a change of their approved plans without affording them, and other interested parties, the opportunity to be heard. Accordingly, the Commission directs that the NTG research necessary to develop NTG ratios shall be funded outside of the EDCs’ Act 129 program budgets.

Prior to undertaking the NTG studies, the EDCs shall submit a summary of their NTG study scope and methods, including estimated costs, for stakeholder comments and a prudency review. To the extent approved, implemented, and expended, the EDCs may recover these Act 129 NTG study research costs for the period June 2009 through May 31, 2013, pursuant to the Section 2806.1(k) recovery mechanism in the manner used to recover SWE costs through their Section 1307 riders. This would also apply for an EDC that has incurred NTG research costs to date within the 2% Act 129 program budget.

Act 129 requires the EDCs to evaluate the benefits and costs of the Act 129 programs using the TRC test or a benefit/cost analysis determined by the Commission at 66 Pa. §2806.1(c)(3) and submit the results to the Commission by November 30, 2013. The Commission directs all EDCs to use gross verified savings in their TRC test for calculating program cost-effectiveness for the period June 1, 2009 through May 31, 2013, and to submit the results to the Commission by November 30, 2013. The EDCs will conduct the TRC test analysis, and the SWE will audit the results. If any Act 129 programs are continued after May 31, 2013, all EDCs shall collect and use net verified savings to calculate the TRC ratio.

EAP and FirstEnergy request that the Commission decide that NTG would only be used for program design and implementation decisions and not for savings target compliance if there are Act 129 programs after 2013. The Commission will wait until further data and input is available before making such a decision and will not adopt at this time a position about the use of NTG ratios for determining compliance with savings targets after 2013.

NTG ratios will not be used to determine whether the EDCs met their energy and demand reduction targets for the June 1, 2009 to May 31, 2013 program period.

**C. Fuel Switching**

1. **TRC Inputs For Fuel Switching**
2. Summary of Issue and Proposed Resolution

The Tentative Order proposed adoption of the fuel switching provisions as set out in the Fuel Switching Working Group (FSWG) Staff Report. In addition, the 2002 CA SPM provides guidance on the benefits and costs that should be included in the TRC test for fuel switching programs. We proposed to use the 2002 CA SPM as a guide for defining the benefits and costs that should be included in the TRC test for fuel switching programs. We also proposed that other fuel source substitution programs should also use the 2002 SPM as a guide in the benefit/cost analysis of each proposed program.

1. Discussion of Comments and Reply Comments

PECO requests that the Commission provide explicit guidance on how to calculate increased supply costs for gas resulting from fuel switching. PECO believes it would be appropriate to use NYMEX gas costs for the first 10 years and U.S. Energy Information Association (“EIA”) projections thereafter. (PECO Reply Comments at 5)

PPL notes that the Commission does not define the calculation of gas avoided costs in the Tentative Order. Therefore, unless instructed otherwise by the Commission, PPL states it will use the gas avoided costs provided by the UGI Utilities, Inc. – Gas Division, UGI Penn Natural Gas, Inc. and UGI Central Penn Gas, Inc. in the Company’s cost-effectiveness calculations. Alternatively, to avoid confidentiality issues, PPL suggests that gas-avoided costs could be developed using an approach comparable to the calculation of electric costs, *i.e.*, using NYMEX and Energy Information Administration (EIA) published prices for natural gas (PPL Comments at 12).

FirstEnergy recommends that, where new extensions or installations are required to serve natural gas or other fuels such as oil or propane, the cost of any infrastructure upgrades or installations, regardless of who bears the cost, should be included as incremental costs for energy efficient measures associated with alternative fuels.   FirstEnergy believes that since the cost of infrastructure upgrades or installations such as connecting a customer to the local natural gas distribution system can be a costly endeavor, it is important that the TRC test for fuel switching recognize such costs (FirstEnergy Comments at 10-11). FirstEnergy also recommends that the Commission expand the TRC test to provide instruction on the fuel cost that should be used in the TRC test and that the Commission expand the TRM to provide deemed impacts and measure lives where appropriate, similar to the impacts and measure lives provided for electric measures (FirstEnergy Comments at 11).

1. Final Resolution

PECO, FirstEnergy, and PPL point out that the Tentative Order did not provide instruction on how to value the increased fuel costs due to fuel switching. We will adopt the suggestions of PECO and PPL to define the increased fuel costs as the NYMEX gas costs for the first 10 years and the EIA gas cost projections thereafter.

We agree with FirstEnergy’s recommendation that, where new extensions or installations are required to serve natural gas or other fuels such as oil or propane, the cost of any infrastructure upgrades or installations, regardless of who bears the cost, should be included as incremental costs for energy efficient measures associated with alternative fuels. However, only extensions or installations directly attributable to fuel switching due to Act 129 measures shall be included in the TRC calculation.

If a stakeholder wishes to expand the TRM to provide deemed impacts and measure lives where appropriate, similar to the impacts and measure lives provided for electric measures, the stakeholder should raise the issue at the TRM docket. We shall not revise or expand the TRM in this docket

1. **Fuel Switching Appliance Efficiency**
2. Summary of Issue and Proposed Resolution

The FSWG Staff Report, at pages 12 and 13, documents attempts to reach consensus on the minimum efficiency rating for new equipment involved in a fuel switching program. In the report, staff recommended that guidance be provided to determine efficiency standards for any equipment involved in a fuel switching program. The Tentative Order proposed that, where applicable, new equipment installed to replace electric equipment should be high efficiency equipment.

1. Discussion of Comments and Reply Comments

Duquesne agrees with the proposed resolution that, where applicable in a fuel switching program, new equipment installed to replace electric equipment should be high-efficiency equipment. Duquesne, however, believes that the Commission takes this proposed resolution a step further than necessary in terms of fuel switching: Duquesne believes that the Commission should not involve itself in either promoting or discouraging fuel switching. The only exception should be if a fuel switching program is offered by some joint electric and gas companies and approved by the Commission (Duquesne Comments at 4).

DEP concurs with the proposed resolution, allowing Fuel Switching, using the latest version of the CA SPM as a benefit/cost guide, and requiring replaced electrical appliances and equipment to be high efficiency. DEP submits that only equipment earning the EPA’s ENERGY STAR performance rating should be eligible for inclusion in EE&C plans (DEP Comments at 4).

1. Final Resolution

We agree with DEP’s submission that only equipment earning the EPA’s ENERGY STAR performance rating should be eligible for inclusion in EE&C fuel switching plans. However, we note this provision is only applicable to fuel switching proposals where there is EPA ENERGY STAR performance rated equipment available for installation.

Duquesne’s concerns that the Commission intends to promote or discourage fuel switching are unfounded. We did not intend to promote or discourage fuel switching with the language in the Tentative Order but simply to note that when fuel switching does occur, the Commission will encourage the switch to occur to the highest efficiency equipment available.

1. **TRC Calculations**
2. **Database For Deemed Customer Costs or Incremental Measure Costs As Applicable**
	* 1. Summary of Issue and Proposed Resolution

The Tentative Order recognized that the vast number of assumptions required to cover the incremental costs for a program could introduce the possibility of biased or misrepresented incremental costs (Tentative Order at 21). The Tentative Order proposed the development of an incremental costs database to assist EDCs in their development of TRC ratio calculations and to promote consistency in TRC calculations (Tentative Order at 22). The Tentative Order further proposed that such a database would only be developed if EDCs have future EE goal requirements. Incremental costs figures and assumptions used in EDC’s original EE&C plans would be retained through May 31, 2013 and would be used to construct the Act 129 incremental costs database. For measure variants not included in the EDC’s EE&C plans, the EDCs would use the California PUC’s Database for Energy Efficient Resources (DEER) as the primary source of cost data. The DEER database would also be used to construct cost figures for measure variants and new measures. EDCs would adjust DEER cost values for regional and local conditions using appropriate cost multipliers. Such multipliers would be clarified and included in the EDC’s annual reports.  Lastly, EDCs would be permitted to use cost data from local retailers and suppliers if the California DEER database does not provide appropriate values.

b) Discussion of Comments and Reply Comments

FirstEnergy states that it supports the proposed resolution, with the suggestions for one clarification and one modification. Concerning the clarification, FirstEnergy states that EDCs should use the database for either new measures added to the current phase of their EE&C Plans, or for measures offered under any next phases, and therefore asks that the Commission clarify this. Concerning the modification, FirstEnergy submits that the database will support assessing the cost-effectiveness of future programs that will ultimately guide EDCs in developing the next phase of their EE&C plans. FirstEnergy suggests that the Commission amend its recommendation to include the following language: “We further propose that an incremental cost database be developed *to support the assessment of* future EE goals and selection of future programs” (FirstEnergy Comments at 11).

PECO believes that the use of DEER data, which has been assembled over many years and is updated regularly, may represent, in some cases, an improvement over the previously filed incremental cost data. PECO, therefore, requests that the Commission allow EDCs to use DEER data, appropriately adjusted for regional and local conditions, for any measure (PECO Comments at 5).

DEP agrees with all the aspects of the Commission’s proposal but suggests that a party other than the EDC, such as the SWE or a separate third-party, be employed to determine appropriate multiplier values when EDCs use such to adjust DEER values (DEP Comments at 4).

PPL and Duquesne agree with the Commission’s proposal. (PPL Comments at 13; Duquesne Comments at 4).

c) Final Resolution

Concerning FirstEnergy’s first proposal, that the database be used for not only any measures under future EE&C plans but for any new measures added to the current EE&C plans, the Commission agrees with First Energy. Such a clarification is beneficial to EE&C plans as it allows the incremental cost database to offer immediate utility to EDCs. Therefore, the Commission clarifies that EDCs should use the database for either new measures added to the current phase of their EE&C plans, or for measures offered under any next phases of Act 129.

Concerning FirstEnergy’s second proposal, the Commission explicitly stated that the incremental cost database be used for assessing future EE goals and the selection of future EE programs, the Commission believes the main goal of the database is standardization. Any peripheral value that the database may provide for assessments or selection of EE programs can be asserted by the interested party within the context of such an assessment and/or selection. Therefore, the Commission will not explicitly direct that the database be used for such activities. This is not, however, to be construed as a prohibition regarding use of the database in such a capacity, only that the Commission will not explicitly endorse such usage at this time.

Concerning PECO’s request to use DEER data even when there is already previously filed incremental cost data; the Commission agrees that such flexibility could avail EDCs with the capability to use the most appropriate data possible. Therefore, the Commission will allow EDCs to use DEER data even where there is already previously filed incremental cost data.

Lastly, concerning DEP’s comments to have a third-party employed to create appropriate DEER multipliers, the Commission has already made it clear in the Tentative Order that the EDCs must clarify and include any multipliers within their annual reports. The SWE will then review the EDC annual reports and apprise the Commission on the appropriateness of any multipliers used. Consequently, the Commission rejects DEP’s request.

Accordingly, consistent with the procedures and recommendations outlined in the Tentative Order, with the summary provided above and with the dispositions for each substantive comment provided above, the Commission approves the development of an incremental costs database to assist EDCs with developing incremental costs for TRC ratio calculations and to standardize EDC assumptions. The SWE will be responsible for the coordination and compilation of the database. Costs the SWE incurs will be covered under the existing contract. The Commission believes that the incremental effort that may be required of the EDCs to compile this database is manageable within the EDCs’ existing Act 129 budgets. Accordingly, EDC database costs will be funded out of the EDCs’ existing 2% budgets for Act 129.

1. **Basis of TRC Benefits – Reported Savings or Verified Savings; And Basis of TRC Costs – Actual Costs or Committed Costs**
2. Summary of Issue and Proposed Resolution

 The Tentative Order proposed that the calculation of TRC benefits should be based upon “verified” kWh and kW savings and that costs should be based on “actual” costs, as opposed to “reported” kWh and kW savings and “committed” costs (2011 TRC Tentative Order at 23).

1. Discussion of Comments and Reply Comments

FirstEnergy supports the Commission’s proposed resolution, with the suggestion that the Commission amend the proposal to provide further clarification by defining actual costs as actual EDC program costs, as follows: “[T]he calculation of TRC benefits should be based upon “verified” kWh and kW savings and that costs should be based on “actual” costs, *as defined as actual EDC program cost*“” (FirstEnergy Comments at 12)*.*

 PPL states that it agrees with the Commission’s proposal regarding the calculation of TRC benefits. PPL requests, however, that the Commission revise two particular terms to ensure clarity and consistency with industry and PA SWE terminology. PPL requests that the Commission change “verified savings” to “verified gross savings” (so it is clearly differentiated from “verified net savings”). PPL also requests that the Commission change “reported savings” to “reported gross savings” (PPL Comments at 13).

1. Final Resolution

Concerning FirstEnergy’s recommendation to include the language “as defined as actual EDC program costs” to define “actual costs,” the Commission believes that such verbiage helps communicate the intended definition of “actual costs” and therefore accepts FirstEnergy’s recommendation.

Concerning PPL’s submission to modify “verified savings” to the term “verified gross savings,” the Commission believes that such language helps communicate the intended definition of “verified savings” and therefore accepts the modification. Accordingly, the Commission shall, consistent with its dispositions above, adopt the usage of “actual costs, as defined as EDC program costs” and “verified gross” kWh and kW savings for the basis of TRC benefits and costs. This definition of “verified gross savings” only applies to the pre-May 31, 2013 time period.

1. **Definition of Incentives In TRC for Energy Efficiency Measures**
2. Summary of Issue and Proposed Resolution

 EDCs requested clarification regarding the definition of incentives in the TRC calculation for EE measures. The tentative 0rder at 24 proposed that “incentive” be defined as a payment made to a program participant by an EDC to encourage the customer to participate in an EE program and to help offset some or all of the participant’s costs to purchase and install an EE measure.

1. Discussion of Comments and Reply Comments

FirstEnergy supports the proposed definition of incentives but recommends that the Commission expand the scope of the definition to clarify that the cost of direct installation programs (*e.g.,* low-income programs, direct load control programs involving thermostats) that do not involve a payment to the participant, but rather provide products and services on a low- or no-cost basis, are viewed as an incentive. Similarly, the scope of the definition should include the cost of incentives for such programs as appliance turn-in, or direct load control programs where the customer receives an incentive but does not otherwise pay a direct cost for participating in a program (FirstEnergy Comments at 12).

 PPL generally agrees with the proposal regarding the definition of “incentive.” PPL requests, however, clarification for cases where there is no incremental cost, *i.e.*, appliance recycling. In the case where the incentive paid to customers is a marketing cost or intended to offset participant costs that are difficult to quantify, PPL proposes including the incentive in the TRC calculations as either a direct cost (marketing) or as a proxy for the participant cost, consistent with the treatment of incentives paid to DR participants (PPL Comments at 14).

1. Final Resolution

The Commission does not agree with First Energy’s position that “incentive” should include the cost of direct installation programs that do not involve a payment to the participant. The Commission views such costs as direct costs and therefore rejects First Energy’s proposal.

Concerning PPL’s request for clarification in cases when there is no incremental costs, the Commission agrees with PPL’s proposed clarification, and therefore submits that in the case where funds paid to customers are a marketing cost or intended to offset participant costs that are difficult to quantify, EDCs may include the funds in the TRC calculations as either a direct cost or as a proxy for the participant cost, consistent with the treatment of incentives paid to DR participants.

Therefore, consistent with its discussion, the Commission retains the original definition of “incentive” proposed in the Tentative Order and adopts the clarification proposed by PPL.

1. **Avoided Cost Calculations And Forecasts**
2. Summary of Issue and Proposed Resolution

The Tentative Order proposed that EDCs use the historical average annual growth rate of the Bureau of Labor Statistics’ Electric Power GTD sector price index (BLS factor) as a proxy for the rate of escalation of transmission, distribution, capacity, and ancillary service costs between the end of the 2013 program year and the beginning of the Energy Information Administration (EIA) Annual Energy Outlook (AEO) in year 11. Further, the Tentative Order proposed that as transmission, distribution, capacity, and ancillary service cost data becomes known, it should be utilized in place of the BLS factor escalation.

1. Discussion of Comments and Reply Comments

EAP requests that the Commission confirm that use of the BLS factor would only apply to new programs (EAP Comments at 7). PECO requested confirmation that use of the BLS factor would apply only to new programs between now and May 31, 2013 (PECO Comments at 6).

1. Final Resolution

#### Concerning EAP’s and PECO’s comments for clarification, the Commission confirms that the BLS factor is to be used for new programs under current Act 129 plans, for any potential future Act 129 plans, and for any potential new programs under future Act 129 plans.

 Therefore, the Commission adopts the use of the BLS factor as proposed in the Tentative Order and consistent with the discussion provided in the summary and dispositions above.

1. **Inclusion or Exclusion of Customer Avoided Operating And Maintenance Costs In The TRC Calculation**
2. Summary of Issue and Proposed Resolution

EDCs have requested clarification from the Commission as to whether or not customer avoided operating and maintenance costs should be included in the TRC calculation. An example of a customer-avoided cost includes the reduced labor costs for street bulb maintenance that a municipality would realize from installing light-emitting diode (LED) street lights, given that the LED lights would last up to 5 times longer than conventional sodium bulbs.

The Tentative Order proposed that reduced costs for equipment and labor be treated as benefits that are quantifiable and measurable and proposed that customer avoided operating and maintenance costs should be included as benefits in the TRC calculation.

1. Discussion of Comments and Reply Comments

 PPL contends that it will be nearly impossible to obtain realistic operating and maintenance cost data for most programs or projects. PPL submits that for large custom projects, the EDC or its program implementation CSP work very closely with the customer and can attempt to reasonably estimate O&M benefits for the specific project. However, for standard, prescriptive type measures and projects, PPL submits that it will be nearly impossible to quantify operating and maintenance benefits, especially on a project by project basis. PPL states that EDCs should, therefore, be permitted to ignore operating and maintenance benefits for the TRC. PPL recognizes that such an omission will cause the reported benefit/cost ratio to be lower than it would have otherwise been if operating and maintenance benefits were included (*i.e.,* EDCs would be understating the B/C ratio) (PPL Comments at 15).

 DEP opines that avoided costs should only be included for TRC calculations in cases where pre-existing operations and maintenance contracts are in place and the costs for services are explicitly defined within such contracts (DEP Comments at 5).

1. Final Resolution

The Commission believes the concerns posed by PPL and DEP are valid. The ability to quantify such costs may very well present serious challenges. Therefore, the Commission will permit EDCs to include avoided operating and maintenance costs, to the extent quantifiable, in their TRC calculations. However, in cases where such costs may be challenging to quantify, or unquantifiable, the Commission will permit EDCs to omit such costs from TRC calculations. The Commission acknowledges, as PPL states, that omitting such costs will cause the benefit/cost ratio to be undervalued. However, the Commission believes providing such flexibility appropriately balances the concerns of the parties with the ability of the TRC to present program benefits.

1. **Avoided Costs In The Benefit/Cost Ratios In The Approved EE&C Plans And Avoided Costs Commencing June 1, 2013**
2. Summary of Issue and Proposed Resolution

The Tentative Order addressed the issue of what type of avoided cost data EDCs should use for determining the TRC of new programs and for determining the TRC of a portfolio of existing programs for both scenarios on whether or not EDCs should use the latest available forecast of avoided costs or previously filed vintage forecasts of avoided costs. In summary, the Tentative Order proposed that through May 31, 2013, EDCs would use the latest available or most current forecast of avoided cost when filing new programs and that the avoided costs figures included in TRC calculations of previously approved EE&C/DR program plans need not be updated for the period June 1, 2009, to May 31, 2013, by present or future avoided cost figure revisions or updates. When calculating and reporting the overall portfolio TRC test B/C ratio in EDC Act 129 annual reports, the EDCs would use the vintage of avoided cost forecasts applicable for each program at the time the program was approved.

1. Discussion of Comments and Reply Comments

 EAP and FirstEnergy contend that the use of multiple avoided costs within the same phase of Act 129 is extremely problematic, especially for EDCs who seek to continue to improve their plan and programs. EAP and FirstEnergy state that having multiple sets of avoided costs adds additional complexity to the plans by requiring additional modeling, reporting and tracking functionality to be able to assign different sets of avoided costs to different programs and measures. Further, EAP and FirstEnergy state that the proposal makes comparisons between the EDCs plans and programs difficult because EDCs may have the same programs evaluated using avoided costs that are based on different points in time. Lastly, EAP and FirstEnergy state that the proposal will create a situation where EDCs may benefit or be penalized solely by virtue of when the EDC proposed a program (EAP Comments at 8 through 10; FirstEnergy Comments at 13 and 14).

EAP and FirstEnergy recommend that the Commission accept the original (*i.e.,* as filed and approved) avoided costs for all programs and measures throughout the current phase of the plan regardless of when the programs or measures were proposed. Continuing, as an alternative, EAP and FirstEnergy suggest that, if the avoided costs are required to be updated during the current phase of the plan, current forecasts only be required if the addition of the new program(s) significantly contributes to or changes the source of energy savings of the EDC’s plan. Additionally, EAP and FirstEnergy recommend that any requirement to update avoided costs of the plan be limited to one time during the current phase in order to avoid adding unnecessary administrative burdens and costs (EAP Comments at 10; FirstEnergy Comments at 14).

1. Final Resolution

 Concerning EAP's and FirstEnergy’s position that the use of new avoided cost figures for new programs is burdensome and should not be required, the Commission believes that the use of out-dated cost information for newly implemented programs could result in TRC calculations that misrepresent the true value (or lack thereof) for potential programs or plans. When proposing new programs or plans, the use of current information outweighs any potential administrative hurdles. As stated in the Tentative Order, the Commission believes the proposed resolution strikes a balance between the usage of accurate and up-to-date avoided costs figures and the usage of avoided costs figures in effect at the time a program plan was approved. Therefore, the Commission rejects EAP’s and FirstEnergy’s proposals, and adopts the original resolution described in the Tentative Order and summary language above.

1. **TRC Reporting**
	1. **Baseline Study Research**
2. Summary of Issue and Proposed Resolution

In order to achieve accuracy as to where Pennsylvania’s baseline energy efficiency is in the marketplace, the baseline must be periodically updated with current research. Baseline research must be conducted so that an EE&C program gives accurate energy savings credit for the difference between baseline and high-efficiency measures. The determination of benefits is a major part of the equation for determining cost effectiveness using the TRC test. In order to maximize the efficiency of the Act 129 evaluation process, we have maintained and expanded the TRM to include a host of stipulated savings values for standard or deemed measures. The stipulated values often incorporate the difference between the energy savings of a high-efficiency measure and a standard-efficiency measure available in the marketplace. Baselines for standard-efficiency measures are typically gleaned from research in other states. Values for high-efficiency products typically come from manufacturer’s specifications and testing data. Over time, the baseline of what is standard-efficiency shifts toward more efficient products. At the same time, what constitutes a “high-efficiency” product will also shift toward a higher level of efficiency.

The Commission acknowledged the need for baseline research in the RFP for the SWE. In the RFP, when enumerating the roles of the EDCs and the SWE, the Commission noted that the EDCs or their evaluation consultants are responsible for coordinated Statewide Market Assessments and Characterizations (*i.e.*, baseline studies) (Work Statement, Table 1 at 36). The SWE, pursuant to the RFP, is responsible for reviewing and approving the common survey instruments, research methodologies, and sample sizes the EDCs are to use for baseline assessments and characterizations.

Baseline market research is necessary and should be conducted and reported by the EDCs so that the integrity of the TRM and its stipulated values are consistent with the EE marketplace. The SWE needs accurate baseline research from the EDCs to prepare recommendations to the Commission about the potential for energy efficiency gains after May 31, 2013. Without accurate and periodic baseline research and values review, the Commission is at risk of making compliance decisions and future target decisions based on over- or under-estimated energy savings.

The Tentative Order proposed that, consistent with the RFP contract, the EDCs conduct baseline studies in consultation with the SWE and that the SWE would coordinate, review, and approve such studies. The results of the studies would to be reported to the SWE by December 1, 2011, so that the SWE could make appropriate recommendations to the Commission on the potential for additional energy savings beyond May 31, 2013.

1. Discussion of Comments and Reply Comments

Most of the comments suggest that baseline study data is needed for future planning purposes and to supply information needed to prepare the Market Potential Assessment study to be conducted by the Statewide Evaluator (SWE). DEP noted the need for accurate baseline research but suggests that the Portfolio Manager and Home Energy Yardstick provided by the US EPA’s Energy Star program be used instead of conducting a Pennsylvania specific statewide baseline study (DEP Comments at 5).

EAP and PPL raise the question whether baseline data from published research data could be used for the Pennsylvania baseline study (EAP Comments at 17; PPL Comments at 18).

EAP, Duquesne, FirstEnergy, and PPL support a baseline study but EAP, Duquesne, and FirstEnergy suggest that it be funded outside of the 2% program budget cap contained in Act 129 (EAP Comments at 12; Duquesne Comments at 6; FirstEnergy Comments at 15). In reply comments, PECO notes that the baseline research costs should be recoverable outside of the existing 2% budget cap because the research obligations are new (PECO Reply Comments at 4). EAP notes that the need for a baseline study was not known when EDCs were designing and budgeting for their Act 129 programs (EAP Comments at 11).

FirstEnergy notes that a completion date of December 1, 2011, for the baseline study is quite ambitious. EAP and PPL further observe that without a scope of work it is not possible to determine an adequate timeline, but a December 1, 2011 completion date is not possible to meet when start-up time to hire a consultant, agree on a scope of work, etc., are considered (FirstEnergy Comments at 15; EAP Comments at 11; PPL Comments at 17-18).

PPL requests further clarification on the following issues: 1) statistical confidence level required, and 2) what parties are responsible for developing and maintaining data collection instruments and databases, and data analysis. PPL also recommends that a single data collection instrument be used by all EDCs to maintain consistency and that the SWE collect the raw data for the EDCs, maintain the database, and analyze the data provided by all EDCs. Duquesne suggests that the EDCs conduct the baseline study in consultation with the SWE (PPL Comments at 18; Duquesne Comments at 6).

1. Final Resolution

The Commission rejects DEP’s suggestion to use EPA’s Portfolio Manager and Home Energy Yardstick instead of conducting a Pennsylvania specific baseline study. Benchmarking programs like those cited by DEP are high-level tools which are not detailed enough to accurately capture the energy savings or potential at the energy conservation measure level. These tools by themselves also do not provide measurements of energy efficiency baselines for a state or a utility service area. They also do not have the ability to assess consumer behavior and discern motivations for participation in an Act 129 energy efficiency program. In addition, the EPA program will not be able to capture many of the data elements necessary for determining future program design and market potential in Pennsylvania.

In response to EAP’s request for clarification as to whether adequate published baseline studies are available as a surrogate for a specific Pennsylvania statewide baseline study, the Commission does not believe that there is sufficient baseline data available for designing EDC service territory specific Act 129 programs. The Act 129 programs were initiated without the benefit of baseline studies. However, it is important, at this juncture, that EDC specific baseline studies be conducted so that the Commission can make informed decisions about the potential for additional cost-effective energy savings beyond the first phase of Act 129 programs. The Commission is aware of only one study conducted recently in Pennsylvania to ascertain baseline data for determining energy efficiency and demand reduction potential. The study was conducted by PECO for its service territory and therefore, is not likely to be representative of all of the EDCs’ service territories. The Commission believes that PECO’s baseline study is acceptable and, therefore, PECO does not need to conduct additional baseline research at this time. However, the remaining six EDCs need to have baseline research conducted for each of their service territories.

The Commission also agrees with FirstEnergy, PPL, and EAP that a scope of study, statistical level of confidence, and a single data collection instrument need to be developed. This will be developed by the SWE as soon as possible after entry of this order.

The Commission agrees with EAP, Duquesne, FirstEnergy, and PECO that the baseline study should be funded outside of the 2% Act 129 program budget. The particulars of a baseline study were not available when the EDCs were originally developing their Act 129 budgets; therefore, the Act 129 budgets were devoted to program implementation.

The Commission agrees with the EAP, PPL, and FirstEnergy that the timeline for each of the EDCs to contract for and complete a baseline study by December 1, 2011, is ambitious. However, the Commission is also aware of the importance of the baseline research so that the SWE can have the data it needs to complete the Market Potential study. The Commission is also aware that a baseline study requires the development of a scope of work, hiring of a consultant, the development of a sampling technique, time to conduct the sample, and deliver and finalize a report to the SWE and the Commission.

Given the importance of having good baseline information available for Act 129 program planning and the short timeframe available to conduct the research, the Commission must consider an alternative way to conduct the baseline studies. A viable alternative is to have the SWE conduct the research instead of the EDCs. The SWE has conducted similar baseline studies in other states and has available survey instruments, qualified and trained survey staff, and data collection and analysis resources to quickly begin the baseline study and complete the study in time for the data to be used in the Market Potential Study. In addition to the SWE having the resources available to get a quick start on the baseline studies, there is likely to be significant cost savings for conducting the studies if the SWE were to do the research versus having the studies conducted under several different EDC contracts. Also, by having one contractor conduct the baseline studies, we are assured that uniform methods will be used across the service territories so that results are not influenced by method variances.

Therefore, the Commission directs the SWE to conduct baseline studies in the service territories of Duquesne, Met-Ed, Penelec, Penn Power, PPL and West Penn. Where available, the SWE should utilize other relevant information EDCs may have gathered from secondary sources. The Commission directs the SWE to work with CEEP and the EDCs in the development of a scope of work for the residential and commercial/industrial (C&I) baseline studies.

The Commission will allow the new EDC baseline study funding to be outside of the Act 129 2% program budget consistent with the comments offered by several parties. The justification for the baseline costs to be outside of the 2% program budget is that the baseline studies are clearly for the purposes of planning for a potential second round of Act 129 versus program implementation activities for the current round of Act 129. The Commission directs that the residential and commercial/industrial baseline studies shall be funded with a combination of $400,000 of funds from the current SWE contract as well as additional new funds from each of the six EDCs that the SWE will conduct baseline studies for. The Commission estimates that the additional funding needed from each of the six EDCs is a maximum of $100,000. This cost should be considered a one-time cost. To the extent that baseline study costs are approved up to $100,000 per EDC, implemented, and expended, an EDC may recover these Act 129 baseline study costs research costs for the period through May 31, 2013, pursuant to the Section 2806.1(k) recovery mechanism in the manner used by the EDCs to recover SWE costs through their Section 1307 riders.

Due to the significant differences between residential customers and commercial/industrial customers, two distinct baseline studies will be needed for each EDC service territory. Both the residential and combined commercial and industrial baseline studies will have their own distinct sampling and study methodologies.

The primary objectives of the residential baseline studies include the following:

* Select a representative random sample of residential electric customers for participation in the baseline study;
* Profile residential electric customers at the sector and end use level;
* Determine the current saturation of energy using equipment in residential households;
* Determine the current saturation of energy efficient HVAC and appliances, and energy efficiency measures and practices in the residential sector;
* Determine average baseline levels of energy use for space heating, space cooling, and water heating by end use; and
* Determine the percent of energy using equipment by end use that is already high efficiency equipment.

The Commission directs that each EDC service territory’s residential sample be statistically significant at a confidence level of 90% and a margin of error of 10% at the EDC service territory level. A sample size of 70 homes per EDC service territory is necessary to reach this level of confidence. The Commission directs the SWE to incorporate PECO’s residential baseline study results into the baseline studies conducted by the SWE when aggregating results across Pennsylvania.

The primary objectives of the commercial/industrial baseline studies include the following:

* Profile commercial electric customers at the sector and end use level;
* Determine the current saturation of energy using equipment in C&I facilities;
* Determine the current saturation of energy efficiency measures in the C&I sectors;
* Determine average baseline levels of energy use for lighting, space cooling, plug loads, HVAC, and water heating by end use; and
* Determine the percent of energy using equipment by end use that is already high efficiency equipment.

The Commission directs that the commercial/industrial sample be statistically significant at a confidence level of 90% with a margin of error of 10% at the EDC service territory level. A sample size of 70 commercial/industrial customers per EDC service territory is needed to reach this level of confidence. The Commission directs the SWE to incorporate PECO’s commercial/industrial baseline study into the baseline studies conducted by the SWE when aggregating results across Pennsylvania.

In order for the SWE to conduct baseline studies, the Commission directs the six EDCs to provide the SWE with access to EDC customer records or a data dump of customer records so that the SWE can draw samples for the baseline studies. The SWE will abide by the Nondisclosure Agreement contained in the SWE contract when using customer records for sampling purposes. The new provisions for the SWE to conduct the baseline studies will be incorporated into the SWE contract subject to Commission approval.

 If an EDC wishes to do a more extensive baseline study which would incur more costs, the EDC may petition for the authority to expend the extra costs. The petition will have its own docket but be referenced to the EDC’s EEC plan docket. Stakeholders will be able to comment on the prudency and reasonableness of the more extensive baseline study and its associated costs.

* 1. **Frequency of Cost-Effectiveness Evaluations And Reporting Results And Timing of TRC Reports (*e.g.*, When To Freeze Data And Inputs)**

a) Summary of Issue and Proposed Resolution

The Tentative Order proposed that the results of the TRC test should be reported annually. The TRC test would then be included as a part of the EDCs’ Act 129 final annual reports submitted to the Commission each November. Additionally, the TRC B/C ratio for each EDC program, and the portfolio, would be included in the EDCs’ Act 129 final annual report. The B/C ratios would be based upon the latest available program costs and savings.

The Commission recognized that the EDCs’ final Act 129 annual reports include mostly verified energy savings and actual program costs, as opposed to estimated savings and costs. Directing the EDCs to submit TRC test results annually in their Act 129 final annual reports would ensure that the data set used to identify the savings and costs will be complete and that the actual cost-effectiveness of the programs will be more accurately determined.

b) Discussion of Comments and Reply Comments

Duquesne and PPL agree with the Commission regarding the frequency of cost-effectiveness evaluations, reporting results, and timing of TRC reports (Duquesne Comments at 6; PPL Comments at 18). No comments received objected to the annual reporting of TRC results.

c) Final Resolution

The Commission adopts the proposed reporting timeframe for the results of the TRC test. Accordingly, the EDCs are directed to report the results of the TRC test annually in the EDCs’ Act 129 final annual reports that are submitted to the Commission each November.

**F. Additional Issues**

 There was no discussion of these issues in the Tentative Order. These issues were raised by the stakeholders in their comments.

 **1. Price Suppression Benefit of DR Programs**

1. Summary of Proposal and Comments

PECO states that the DR measures implemented by EDCs pursuant to Act 129 will accrue wholesale energy market price reductions. As such, PECO submits that these price reductions should be included as benefits in the TRC test. PECO recommends quantifying such benefits by simulating the PJM market with and without the Act 129 DR programs. PECO submits that a recommended simulation model should be developed by the SWE and working group (PECO comments at 7). This topic was introduced in comments to the Tentative Order, and no reply comments were received relevant to this issue.

1. Final Resolution

 The Commission sees value in further analyzing the potential benefits that EDC DR programs may manifest via wholesale energy market price reductions. After all, such price reductions appear to be the underlying objective of the Act 129 DR mandates. The Commission will not, however, mandate the creation of a working group on this topic at this time. Rather, the Commission directs that any discussion and evaluation of these potential benefits take place within the Technical Working Group for future phases of Act 129.

**2. TRC Test Period**

a)Summary of Proposal and Comments

PECO seeks clarity on the test period to be used for TRC calculations of program measures added after an EE&C plan is approved. PECO is of the opinion that it is appropriate to calculate savings for measures with a 15 year life for a 15-year period, regardless of the year of installation (PECO comments at 7). This topic was introduced in comments to the Tentative Order, and no reply comments were received relevant to this issue.

1. Final Resolution

The Commission agrees with PECO that any savings manifested up to 15 years from the start of a program measure should be included in the TRC calculations regardless of when the program measure was installed. Rejecting such a proposal would only allow EDCs to include benefits manifested during the 15-year period starting at the beginning of Act 129 plans. Such a restriction would burden EDCs to provide cost-effective EE&C programs in the latter years of Act 129 plans, as the passage of time would inevitable restrict allowable TRC benefits. Therefore, the Commission clarifies that all TRC calculations for EE&C program measures are allowed to use up to 15 years worth of benefits and costs, as applicable to specific program measures, regardless of the year of program implementation.

1. **Determination of Avoided Distribution Costs**

a)Summary of Proposal and Comments

FirstEnergy submits that, for the next phase of Act 129, the treatment of avoided distribution costs should be revisited because the current method of evaluating distribution costs is not completely accurate. In particular, the convention for including retail distribution rates as avoidable costs, as well as escalating any distribution rates with capacity and/or energy cost projections. FirstEnergy states that it is committed to working with the Commission, EDCs, Staff and stakeholders in this proceeding to support an alternative methodology (FirstEnergy comments at 16). This topic was introduced in comments to the Tentative Order, and no reply comments were received relevant to this issue.

1. Final Resolution

Given the lack of comments from other parties of similar substance, the Commission will not direct a specific procedure or working group to resolve FirstEnergy’s issues at this time. At its discretion, FirstEnergy may raise its concerns regarding distribution avoided costs in the Technical Working Group for future phases of Act 129.

1. **References to performance during the Top 100 Hours**

a)Summary of Proposal and Comments

FirstEnergy suggests that any reference to performance during the top 100 hours be clarified by the Commission as specific to the current phase of Act 129 as to avoid any implications regarding the next phases of Act 129 implementation (FirstEnergy Comments at 16, 17). This topic was introduced in comments to the Tentative Order, and no reply comments were received relevant to this issue.

1. Final Resolution

At present, any reference to the top 100 hours in the Tentative Order or in this order are specifically intended to reflect the top 100 hours for the current phase of Act 129. However, this does not restrict the Commission from further adopting these specifics concerning the top 100 hours for any future phases of Act 129. Rather, the Commission clarifies that it will decide such at a future point in time.

**IV. CONCLUSION**

Consistent with the discussion herein, this order sets forth the parameters of the 2011 TRC test for use in Pennsylvania; **THEREFORE,**

**IT IS ORDERED:**

 1. That the 2011 Pennsylvania Total Resource Cost Test is adopted for use in Pennsylvania, consistent with this order, to evaluate the cost effectiveness of energy efficiency and conservation (EE&C) plans in accordance with the requirements of 66 Pa.C.S. § 2806.1(c)(3) and (d) (2).

 2. That a copy of this order shall be served upon the Office of Consumer Advocate, the Office of Small Business Advocate, the Office of Trial Staff, all jurisdictional electric distribution companies, all licensed electric generation suppliers, the Pennsylvania Department of Environmental Protection, all parties who commented on the *2009 Pennsylvania Total Resource Cost Test Order*., and all parties who commented on the *2011 TRC Test Tentative Order*.

 3. That this *2011 Pennsylvania Total Resource Cost Test Order* be posted on the Commission’s website.

4. That the contact person for technical issues related to this order and TRC testing is Gregory A. Shawley, Bureau of Conservation, Economics and Energy Planning, 717‑787-5369 or gshawley@state.pa.us. The contact person for legal and process issues

related to this order and TRC testing is Louise Fink Smith, Law Bureau, 717-787-5000 or finksmith@state.pa.us.

**BY THE COMMISSION**

Rosemary Chiavetta

Secretary

(SEAL)

ORDER ADOPTED: July 28, 2011

ORDER ENTERED: August 2, 2011

**Appendix A**

The definitions and formulae to be used for the

Pennsylvania-specific TRC test, consistent with Act 129 of 2008,

are set forth in this Appendix.

The definitions and formulae in this Appendix are taken from

pages 10 – 12, 15-17, and 22 of the

2002 *California Standard Practice Manual* (CA SPM)[[10]](#footnote-10)

without further specific attribution.

**TRC Formulae**

The formulae for the net present value (NPVTRC), the benefit/cost ratio (BCRTRC), and the levelized costs are:

|  |  |  |
| --- | --- | --- |
| NPVTRC | = | BTRC – CTRC |
| BCRTRC | = | BTRC/CTRC |
| LCTRC | = | LCRC/IMP |

The BTRC, CTRC, LCRC, and IMP terms are defined as follows. The first summation in the BTRC equation should be used for conservation and load management programs. For fuel substitution programs, both the first and second summations should be used.

$$B\_{TRC}= \sum\_{t=1N}^{}\frac{UAC\_{t}+ TC\_{t}}{\left(1+d\right)^{t-1}}+ \sum\_{t=1}^{N}\frac{UAC\_{at}+ PAC\_{at}}{\left(1+d\right)^{t-1}}$$

$$ C\_{TRC } = \sum\_{t=1}^{N}\frac{PRC\_{t}+ PCN\_{t}+ UIC\_{t}}{\left(1+d\right)^{t-1}} $$

$$LCRC= \sum\_{t=1}^{N}\frac{PRC\_{t}+PCN\_{t}- TC\_{t}}{\left(1+d\right)^{t-1}}$$

$$IMP= \frac{\sum\_{t=1}^{n}\left[\left(\sum\_{i=1}^{n}∆EN\_{it}\right) or (∆DN\_{it} where I=peak period) \right]}{\left(1+d\right)^{t-1}}$$

#### The utility avoided cost terms (UACt, UICt, ,and UACat) are determined by costing period to reflect time-variant costs of supply:

$$UAC\_{t}= \sum\_{i=1}^{I}\left(∆EN\_{it} × MC:E\_{it} ×K\_{it}\right)+ \sum\_{i=1}^{I}\left(∆DN\_{it} × MC:D\_{it} × K\_{it}\right)$$

|  |  |  |
| --- | --- | --- |
| *UACat* | = | Use *UACt* formula but with marginal costs and costing periods appropriate for the alternate fuel utility. |

$$UIC\_{t}= \sum\_{i=1}^{I}\left(∆EN\_{it} × MC:E\_{it} ×(K\_{it}- 1)\right)+ \sum\_{i=1}^{I}\left(∆DN\_{it} × MC:D\_{it} ×(K\_{it}- 1)\right)$$

**Glossary of Terms**

|  |  |  |
| --- | --- | --- |
| ∆DNit |  | Reduction in net demand in costing period *i* in year *t* |
| ∆ENit |  | Reduction in net energy use in costing period *i* in year *t* |
| BCRTRC | = | Benefit/cost ratio of total costs of the resource |
| BTRC | = | Benefits of the program |
| CTRC | = | Costs of the program |
| D | = | Interest rate (discount) |
| E | =  | Discounted stream of system energy sales (kWh or therms) or demand sales (kW) for first year customers.  |
| Et | = | System sales in kWh, kW, or therms for first year customers |
| I | = | Number of periods of a participant’s participation |
| IMP | = | Total discounted lead impacts of the program |
| Kit | = | 1 when ∆EGit or ∆DGit is positive (*i.e.*, a reduction) in costing period *i* in year *t*, and 0 (zero) otherwise |
| LCRC | = | Total resource costs used for levelizing |
| LCTRC | = | Levelized cost per unit of the total cost of the resource (cents/kWh for conservation programs; $/kWh for load management programs) |
| MC:Dit |  | Marginal cost of demand in costing period *i* in year *t* |
| MC:Eit |  | Marginal cost of energy in costing period *i* in year *t* |
| NPVTRC | = | Net present value of total costs of the resource |
| PACat | = | Participant avoided costs in year t for the alternate fuel devices (*i.e.*, costs of devices not chosen) |
| PCN | = | Net participant costs; in PA, the costs of the end-user customer (participating or non-participating) |
| PRCt | = | Program administrator costs in year *t*; in PA, the EDC |
| TCt | = | Tax credits year t |
| UACat | = | Utility avoided supply costs for the alternate fuel in year *t* |
| UACt | = | Utility avoided supply costs in year *t* |
| UICt | = | Utility increased supply costs in year *t* |

**Appendix B**

**List of Acronyms**

2002 CA SPM: 2002 California Standard Practice Manual

B/C: Benefit/cost

CEEP: Bureau of Conservation, Economics and Energy Planning

CFL: Compact Fluorescent Light bulb

CSP: Curtailment Service Provider

CPUC: California Public Utility Commission

DSP: Default Service Provider

DR: Demand Response

EDC: Electric Distribution Company

EE: Energy Efficiency

EE&C: Energy Efficiency and Conservation

EM&V: Evaluation, Measurement, and Verification

FSWG: Fuel Switching Working Group

ISO: Independent transmission System Operator

LED: Light-Emitting Diode

LSE: Load Serving Entity

NPV: Net Present Value

NTG: Net-to-Gross

PJM: The regional transmission organization (RTO) covering, *inter alia*, Pennsylvania

Protocols: Demand Response Cost-Effectiveness Protocols

PUC: Public Utility Commission

RTO: Regional Transmission Organization

SWE: Statewide Evaluator

TRC: Total Resource Cost

TRM: Technical Reference Manual

WACC: Weighted Average Cost of Capital

1. *See* Docket No. M-2009-2108601for a complete history of the proceeding. [↑](#footnote-ref-1)
2. Section 2806.1(c)(3) provides 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.” Section 2806.1(d)(2) provides that, based on a review to be concluded by November 30, 2013, if “the commission determines that the benefits of the plans exceed the costs, the commission shall set additional incremental requirements for reduction in peak demand for the 100 hours of greatest demand or an alternative reduction approved by the commission.” [↑](#footnote-ref-2)
3. *Energy Efficiency and Conservation Program*, Docket No. M‑2008‑2069887 (January 16, 2009). *See* <http://www.puc.state.pa.us//pcdocs/1033196.doc>. [↑](#footnote-ref-3)
4. *Implementation of Act 129 of 2008 – Total Resource Cost (TRC) Test*, Docket No. M‑2009-2108601 (June 23, 2009), corrected by *errata* on page 7 on October 19, 2009 (*2009 PA TRC Test Order*). [↑](#footnote-ref-4)
5. The PJM-CSP may be the EDC or an independent CSP. [↑](#footnote-ref-5)
6. CA PUC, Attachment 1 - 2010 DR Cost Effectiveness Protocols, Docket R.07-01-041, December 16, 2010. [↑](#footnote-ref-6)
7. PECO also requested clarification of the citation for:

The CA Protocols provide guidance on treatment of payments from EDCs to CSPs or to participants of DR programs and highlight the importance of considering customer costs arising from the loss of electric service (*e.g.*, losses in productivity and comfort) as an element of TRC in DR.

The Tentative Order cited CA Protocols at 17. The full citation is CA PUC, CA Protocols, Attach. 1 - 2010 DR Cost Effectiveness Protocols, Docket R.07‑01-041, December 16, 2010, Table 1 on page 17 and discussion on pages 34 to 35. [↑](#footnote-ref-7)
8. *Implementation Order* at 29:

To be in compliance the EDCs must demonstrate that its EE&C plan produced demand savings during the 100 hours of highest demand for the period June 1, 2012, through September 30, 2012, equal to at least 4.5% of the average of the 100 highest peak hours during the period from June 1, 2007, to September 30, 2007. [↑](#footnote-ref-8)
9. *See* *2009 PA TRC Test Order* at 25, footnote 40, for definitions. [↑](#footnote-ref-9)
10. *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>. [↑](#footnote-ref-10)