**PENNSYLVANIA**

**PUBLIC UTILITY COMMISSION**

**Harrisburg, PA. 17105-3265**

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|  | Public Meeting held June 18, 2009 |
| Commissioners Present: |  |

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| James H. Cawley, Chairman | |
| Tyrone J. Christy, Vice Chairman | |
| Kim Pizzingrilli | |
| Wayne E. Gardner  Robert F. Powelson | |
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| Implementation of Act 129 of 2008 –  Total Resource Cost (TRC) Test | Docket No. M‑2009-2108601 |

**ORDER**

**BY THE COMMISSION:**

This order sets out the nature of the Total Resource Cost (TRC) test to be used in Pennsylvania. Act 129 of 2008 directs the Commission to use a TRC test to analyze the costs and benefits of the energy efficiency and conservation (EE&C) plans that certain electric distribution companies (EDCs) are required to file. The EE&C plans are due July 1, 2009.

**Background and History of Proceeding**

Act 129, 66 Pa. C.S. §§ 2806.1, *et seq*., requires an EDC with 100,000 or more customers to adopt an EE&C plan, subject to approval by the Commission, to reduce electric consumption by at least one percent (1%) of the EDC’s expected load for the period from June 1, 2009, through May 31, 2010, adjusted for weather and extraordinary loads. This one percent (1%) reduction is to be accomplished 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 three percent (3%). Also, by May 31, 2013, the EDC is expected to reduce its peak demand by a minimum of four-and-a-half percent (4.5%) of the EDC’s annual system peak demand in the 100 hours of highest demand, as measured against the EDC’s peak demand during the period from June 1, 2007, through May 31, 2008.

On January 16, 2009, the Commission’s *Implementation Order* was entered.[[1]](#footnote-1)

As we said in the *Implementation Order*, Act 129 requires that an analysis of the costs and benefits of each EDC’s EE&C plan, in accordance with a TRC test, be approved by the Commission. In particular, Act 129 requires an EDC to demonstrate that its plan is cost-effective using the TRC test, and that the EDC provide a diverse cross section of alternatives for customers of all rate classes. 66 Pa. C.S. § 2806.1(b)(1)(i)(I). Act 129 defines a TRC test as “a standard test that is met if, over the effective life of each plan not to exceed 15 years, the net present value 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). Thus, the TRC test will be a critical measuring tool in determining the cost effectiveness of the EDCs’ EE&C plans.

On May 29, 2009, we circulated a TRC test proposal[[2]](#footnote-2) among interested parties in the Act 129 process at the *Implementation Order* docket and posted the proposal on the Commission’s website[[3]](#footnote-3) seeking comments relative to TRC testing in Pennsylvania. Ten entities filed comments: Allegheny Power (for West Penn Power Company) (Allegheny); FirstEnergy (for Metropolitan Edison Company, Pennsylvania Electric Company, and Pennsylvania Power Company) (FirstEnergy); PECO Energy Company (PECO), PPL Electric Utilities Corporation (PPL), the Energy Association of Pennsylvania (EAPA); Joint Supporters (for E Cubed Company, LLC; Capstone Turbine Corporation; Climate Energy, LLC; Energy Concepts Engineering, PC; Energy Spectrum, Inc.; ECR International, Inc.; and Quad-K energy Conservation) (Joint Supporters); the National Association of Energy Service Companies (NAESCO); the Sustainable Energy Fund (SEF); the Office of Consumer Advocate (OCA); and the Lawrence Berkeley National Laboratories (LBNL).[[4]](#footnote-4)

**Recap of Pennsylvania-Specific TRC Test Modifications in the *Implementation Order*[[5]](#footnote-5)**

As we said in the *Implementation Order*, the TRC test to be used in Pennsylvania 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. In addition, the benefits calculated in the TRC test will include the avoided supply costs, such as the reduction in transmission, distribution, generation, and capacity costs valued at marginal cost for the periods when there is a consumption reduction.[[6]](#footnote-6) The avoided supply costs will be calculated using net program savings, savings net of changes in energy use that would have happened in the absence of the program. The persistence of savings over time will also be considered in the net savings.

Further, we proposed that the costs calculated in the TRC test would include the costs of the various programs paid by an EDC (or a default service provider (DSP)) and the participating customers,[[7]](#footnote-7) and would reflect any net change in supply costs for the periods in which consumption is increased in the event of load shifting. Thus, for example, equipment, installation, operation, and maintenance costs, cost of removal (less salvage value), and administrative costs, regardless of who pays for them, would be included.

In addition, the results of the TRC test are to be 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 of this test over a specified period of time, *i.e.*, the expected useful life of the energy efficiency measure. The NPV is a measure of the change in the total resource costs due to the program. An NPV above zero indicates that the program is a less expensive resource than the supply option upon which the marginal costs are based. A discount rate must be established to calculate the net present value. PECO and EAPA, in comments underlying the *Implementation Order*, each asserted that an EDC’s post-tax weighted average cost of capital (WACC) is the most appropriate discount rate to use in calculating the net present value for the TRC test.

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 energy efficiency measure. The B/C gives an indication of the rate of return of this program to the utility and its ratepayers. A B/C ratio above one indicates that the program is beneficial to the utility and its ratepayers on a total resource cost basis.[[8]](#footnote-8) The explicit formulae for use in Pennsylvania are set forth in the Appendix to this order.

As we said in the *Implementation Order*, Pennsylvania will not use the Societal Test as part of the TRC test. Inclusion of the Societal Test actually results in a variant or expanded TRC test analysis that goes beyond the legislative intent of Act 129. In particular, the Societal Test attempts to quantify the change in TRC to society as a whole rather than in respect to a particular service territory. Act 129, however, specifically provides that only “monetary” benefits and costs are to be factored into the TRC test. 66 Pa. C.S. § 2806.1(m). Therefore, Pennsylvania’s version of the TRC test will exclude environmental and societal costs and benefits unless such costs and benefits are otherwise already embedded in the wholesale cost for the generation of electricity. As Allegheny, EAPA, and FirstEnergy pointed out in their comments preliminary to our *Implementation Order*, a number of such environmental costs are already reflected in energy market prices.

**Preliminary Matters**

Before looking at the specifics of the Pennsylvania TRC test, we shall address a few preliminary issues raised in the comments: use of TRC test assumptions; amendments to EE&C plans; new technologies; and a stakeholder group.

**Use of TRC Test Assumptions for Other Matters**

FirstEnergy (at 2), PECO (at 5), and EAPA (at 8) urged the Commission to specifically limit use of the TRC test assumptions and/or the TRC test results to TRC testing matters. Specifically, they contend that the assumptions underlying the TRC test are not appropriate for use in prudence or cost of service determinations because the TRC test assumptions have to apply to a wide range of measures implemented over a tight time frame. We agree that the TRC test assumptions will not be generally developed with an intended use in prudence or cost of service inquiries, but we do not believe that a blanket exclusion is appropriate. Accordingly, the EDCs and other parties will not be bound by TRC test assumptions in prudence, cost of service, or other inquiries, but if there are significant differences between the TRC test assumptions and the assumptions or facts at issue in such other proceedings, parties may enquire into the validity of such differences in those, or in the TRC test, proceedings.

**Amendments to EDC EE&C Plans re TRC Test**

FirstEnergy (at 2 & 7) and EAPA (at 2) suggest that the Commission should recognize that the timing of this TRC test order and due date for the EDCs’ EE&C plans mitigate in favor of amendments to the EDCs’ EE&C plans. We recognize the tight time constraints and will allow amendments[[9]](#footnote-9) prior to August 1, 2009. Amendments to the July 1, 2009 EE&C plans after that time will be at the discretion of the presiding officer or by leave of the Commission.

**New Technologies**

The Joint Supporters (at 2) request that the Commission indicate that this process is not designed to slow or deter innovations such as substitution technologies including combined heat and power (CHP) and micro combined heat and power (micro-CHP). We believe that the focus of Act 129 and TRC testing is not on particular technologies but rather on bottom line energy efficiency and demand reduction. As will be discussed later in the order, TRC testing will be at the plan level. This should give any new technologies sufficient opportunity to establish whether they are able to contribute to the energy efficiency and demand reduction goals of Act 129.

**Stakeholders Group**

Many issues involved in the EE&C plans, program implementation, and operation of the TRC test will be ongoing. As will be seen, several specific issues are identified below which will require additional consideration and discussion. Accordingly, we have determined to convene a stakeholder group to address these issues, as well as future issues which will undoubtedly arise as the plans move forward. A future Secretarial letter will announce details of the stakeholder group.

**Further Pennsylvania Specific Modifications to the TRC Test**

In determining how to structure the TRC test for use in Pennsylvania pursuant to Act 129, the *California Manual* leaves open a number of issues. We have identified the following open issues relative to using the TRC test in Pennsylvania pursuant to Act 129: (a) level at which to measure TRC; (b) calculation of avoided costs of supplying electricity; (c) maximum 15-year measure life; (d) incentive payments from an EDC; (e) incentive payments from outside sources; (f) savings claims from Act 1[[10]](#footnote-10) programs and Act 129 programs[[11]](#footnote-11); (g) net-to-gross (NTG) issues; (h) discount rate; and (i) incremental costs.

We have considered the open issues and will resolve them for use in Pennsylvania as follows:

**(a) Level at Which to Measure TRC**

Act 129 requires that an EDC’s EE&C plan provide measures for customers of all rate classes, 66 Pa. C.S. § 2806.1(b)(1)(I)), and establishes specific requirements for inclusion of low-income programs, 66 Pa. C.S. § 2806.1(b)(1)(G), and government programs, 66 Pa. C.S. § 2806.1(b)(1)(B), in an EDC’s EE&C plan. Based on Section 2806.1(b)(1)(I), an EDC is to demonstrate that its EE&C plan is cost effective using the TRC test.

There was general support expressed by most commenters for measuring the TRC at the plan level (PECO at 2; PPL at 2; Joint Supporters at 4; EAPA at 4; NAESCO at 4; LBNL at 1; OCA at 1). Accordingly, we shall adopt the position that each EDC’s EE&C plan will be evaluated by the entirety of all its programs taken in total, otherwise noted as the plan level. The overall determination as to whether an EDC’s plan will be deemed cost effective using the TRC test will be made at the plan level. This means that the TRC test will be applied at the plan level rather than at the component, program, or measure level. Further, all aspects of an EDC’s plan will be included in the TRC testing analysis. Therefore, each EDC’s plan will be evaluated by the entirety of all its programs taken in total. Some programs may not pass the TRC, but so long as all the programs in an EDC’s EE&C plan taken in total pass the TRC test, then the EDC’s EE&C plan will be deemed cost-effective.

While no commenter opposed testing the TRC at the plan level, the Joint Supporters, NAESCO, and OCA suggested that EDCs should also be required to calculate and provide information on the TRC at the program level as well. We shall adopt this recommendation that EDC plans should also provide information on the TRC at the program level. This will facilitate interested parties and this Commission in reviewing the balance of programs that EDCs select for their EE&C plans.

#### (b) Avoided Costs of Supplying Electricity

In the*Implementation Order*, we noted that the benefits calculated in the TRC test would include the avoided supply costs such as reductions in transmission, distribution, and generation (including capacity) (GTD) costs for the period when there is a consumption reduction. *See* 66 Pa. C.S. § 2806.11(m). For the purposes of calculating the TRC test, we must determine the appropriate methodologies for calculating the avoided monetary cost of supplying electricity that includes these GTD cost components.[[12]](#footnote-12) The avoided costs provisions of the TRC test proposal prompted the most comments.

Our discussion of the proposal and the comments shall focus on two aspects: prediction assumptions and adjustments. We shall address each in turn.

#### Prediction Assumptions: We shall address prediction assumptions in several subparts: predictions spread over 15 years; first, second, and third five years’ generation costs; transmission, distribution, and capacity costs; and other comments.

**Predictions Spread over Fifteen Years**: The proposal specified that the 15‑year period for calculating avoided electricity supply costs would be broken into three segments of five years each.

EAPA (at 5) suggested that we use a single 15-year period rather than three five-year periods. OCA (at 2-3) was concerned that the predictive assumptions used to calculate the cost of generation over the 15-year period may be unnecessarily complex for the intended purpose. OCA (at 3) pointed out that NYMEX futures prices can be volatile and can change on a daily basis. OCA suggested that the Commission specify the use of an average of futures prices over a defined period. For consistency across the programs, OCA recommended that the Commission select a specific 30 or 60 day period for the NYMEX futures data that is to be used by all EDCs.

We elected to retain the three five-year periods, concluding that three five-year periods more accurately reflect the predictive process. The nature and number of predictions change the farther out on the 15-year timeline that one goes. Using three periods allows us to take better advantage of known conditions relative to future uncertainty.

**First Five Years Generation Costs**: For the first five years, the proposal specified that we would use the wholesale electric generation prices as reflected in the NYMEX PJM[[13]](#footnote-13) futures price. This would be adjusted to reflect both on- and off-peak prices on a 50% on- and 50% off-peak basis. This would possibly be further adjusted to reflect historical EDC-specific usage characteristics by customer, and rate, class.

#### After review of the comments, with respect to the NYMEX electric price, we shall specify use of the NYMEX “prompt month,” two months prior to the filing date, for use for the first five-year period calculations. For these instant filings, we will use the May 28, 2009 closing data. For 2010, that date would be May 27, 2010.[[14]](#footnote-14)

**Second Five Years Generation Costs**: For the second five-year period, the proposal specified that we would use the NYMEX natural gas futures price. The natural gas futures price would be converted into an estimated wholesale energy price through the use of a spark price spread[[15]](#footnote-15) calculation.

With regard to the second five-year segment, OCA (at 3) asserted that this methodology would introduce a level of complexity and uncertainty that may not be needed for the purposes of TRC test calculations. OCA (at 3) and PPL (at 3) noted the EIA**[[16]](#footnote-16)** AEO[[17]](#footnote-17) could be used in the TRC test for the second five years. Allegheny (at 3) recommended not using the spark price spread and asked for a clarification on the marginal heat rate to be used in the spark price spread calculations. PECO (at 2) would incorporate a market-implied heat rate.

Upon review of the comments, we shall retain use of the NYMEX natural gas futures price[[18]](#footnote-18) but will adopt a timeline similar to the one we used for the first five years. That is, we shall use the NYMEX prompt month, two months prior to the filing date. As a rule, this date is about one day prior to the electric close.

With respect to the NYMEX natural gas issue,[[19]](#footnote-19) we shall adopt the heat rate used in the EIA AEO for 2009.[[20]](#footnote-20) This will be adjusted annually, at the start of each new planning cycle, to reflect the updated EIA AEO assumptions. We shall also adopt LBNL’s suggestion to specify the Mid‑Atlantic zone as the measure,[[21]](#footnote-21) which will be converted to cents/kWh by using 3413 BTUs/kWh. We shall reject the use of the EIA AEO electric price data for years five through ten for two reasons: The AEO data do not reflect the competitive energy market as fully as the NYMEX does, and historically the AEO electric price estimates have been shown to be more than 19% too high over time.[[22]](#footnote-22)

#### Third Five Years Generation Costs: As proposed, the third five-year period would use the EIA AEO. OCA (at 3) and PPL (at 3) supported use of the EIA AEO for the third five years. We shall use the EIA AEO for the third five-year period.

#### Transmission, Distribution, and Capacity Costs: The proposal provided that transmission prices, as set by FERC, to the EDC zone will be included; as will EDC distribution rates. We proposed including an estimated price for the PJM RTO’s RPM[[23]](#footnote-23) capacity price, broken down into a cents/kWh value. Generally accepted ancillary service rates would be included to the extent known.

#### Allegheny (at 4) requested direction on the RPM prices after the last available PJM auction date. PECO (at 4) would use an escalation factor to develop future capacity cost prices. PPL (at 5) would have us escalate RPM capacity costs at an appropriate rate and suggested that we not include an adjustment of auction determined rates. LBNL (at 4) supported using a marginal T&D system cost.

#### Consistent with the proposal, transmission prices, as set by FERC, to the EDC zone will be included as will EDC distribution rates. Generally accepted ancillary service rates will be included to the extent known. For estimates of PJM RPM between the end of the 2013 planning year and the beginning of the use of the EIA AEO data in year 11, we will escalate the RPM at the U.S. Bureau of Labor and Statistics (BLS), the Electric Power GTD sector, industry index for Electric Power Generation, [NAICS 221110](http://data.bls.gov/PDQ/servlet/SurveyOutputServlet?series_id=PCU221110221110).[[24]](#footnote-24) We will also escalate T&D and ancillaries prices at the BLS factor to develop future price estimates. We do, however, reject the use of marginal T&D costs at this time. We feel that introducing marginal costs for T&D, although hypothetically more economically accurate, would increase the complexity without adding any assurance of greater accuracy.

#### Transmission, Distribution, and Capacity Costs: The proposal provided that transmission prices, as set by FERC, to the EDC zone will be included; as will EDC distribution rates. We proposed including an estimated price for the PJM RTO’s RPM[[25]](#footnote-25) capacity price, broken down into a cents/kWh value. Generally accepted ancillary service rates would be included to the extent known.

#### Allegheny (at 4) requested direction on the RPM prices after the last available PJM auction date. PECO (at 4) would use an escalation factor to develop future capacity cost prices. PPL (at 5) would have us escalate RPM capacity costs at an appropriate rate and suggested that we not include an adjustment of auction determined rates. LBNL (at 4) supported using a marginal T&D system cost.

#### Consistent with the proposal, transmission prices, as set by FERC, to the EDC zone will be included as will EDC distribution rates. Generally accepted ancillary service rates will be included to the extent known. For estimates of PJM RPM between the end of the 2013 planning year and the beginning of the use of the EIA AEO data in year 11, we will escalate the RPM at the U.S. Bureau of Labor and Statistics (BLS), the Electric Power GTD sector, industry index for Electric Power Generation, [NAICS 221110](http://data.bls.gov/PDQ/servlet/SurveyOutputServlet?series_id=PCU221110221110).[[26]](#footnote-26) We will also escalate T&D and ancillaries prices at the BLS factor to develop future price estimates. We do, however, reject the use of marginal T&D costs at this time. We feel that introducing marginal costs for T&D, although hypothetically more economically accurate, would increase the complexity without adding any assurance of greater accuracy.

We proposed to convert the PJM RTO’s RPM capacity price into a cents/kWh value. Upon reflection, we realize that this should be stated as dollars/MW-day relative to on-peak energy savings, especially in the context of demand-side programs (peak day reduction programs[[27]](#footnote-27)). This is consistent RPM pricing and recognizes that the assumptions in reaching a cents/kWh projection will be different from the assumptions inherent in formulating a dollars/MW-day projection. A baseline dollars/MW-day projection can be translated to cents/MWh for each project, if appropriate and useful, based on that project’s profile and load factor. To start with cents/kWh,[[28]](#footnote-28) one would need to make numerous assumptions; *e.g.*, capacity factors. We believe that it will be more accurate, and easier, for the EDCs to use the appropriate factor for a particular class in their territory than it would be for the Commission to specify all of these parameters for each class, for each EDC. Starting with the PJM dollars/MW-day will accomplish this.

**Other Comments**: FirstEnergy (at 7) did not support including full retail GTD and ancillary rates, asserting that many of these costs are fixed and do not vary with the customers usage levels and asserted that full cost treatment would not reflect the marginal value of saved benefits. PECO (at 3) recommended a number of changes in the calculation of the avoided costs, some of which would mathematically illustrate how the calculations would be performed such that confusion and future debate is minimized. PPL (at 4) would have us allow for the inclusion of market prices based on that EDC’s POLR[[29]](#footnote-29) bids that have taken place to date.

As we said earlier in conjunction with prior suggestions, some of these recommended adjustments could be beneficial, but we believe it is inappropriate to adopt them without the other stakeholders having the opportunity to comment on them. More to the point, while adding some certainty, these suggestions could also add complexity, without any assurance of accuracy, to a model that has already been criticized as being too complex. The parties are welcome to revisit these issues in the stakeholder group sessions.

PECO (at 3) would have us allow an EDC to use its “best judgment” in determining energy prices. We reject this suggestion as there are adequate provisions for determining the market price of energy.

FirstEnergy (at 8) suggested development of a “proxy plant” to be used for avoided cost calculations after the final known RPM auction. Although used by the Commission in the past, we decline to use a “proxy plant” for capacity calculations. Using it in TRC testing would add unnecessary complexity to the process and there are sufficient alternative means for addressing cost calculations after the final known RPM auction.

#### Adjustments: The proposal provided that the wholesale electric generation prices would be modified to reflect: class time-of-use characteristics; congestion; zonal locational basis differences; losses; and, a market uncertainty adjustment. GTD costs, not so adjusted, would be adjusted for losses, and market uncertainty. Finally, gross receipts taxes would be added.[[30]](#footnote-30) Not all the issues generated comments. Those that did will be discussed in several subparts: market uncertainty adjustments; uniform application; end-use adjustment; locational, temporal, and zonal adjustments; and AEPS Act and carbon issues.

**Market Uncertainty Adjustments**: OCA (at 3) questioned the proposal to adjust for market uncertainty. OCA claimed it is unclear what such an adjustment is intended to reflect and asserted that, if such an adjustment is to be retained, then the Commission should explain it in detail and provide a uniform method of calculating the adjustment for all of the EDCs so that there is consistency in plan analysis. Upon review, we shall withdraw the use of a market uncertainty adjustment.

**Uniform Application**: OCA (at 2-3) suggested that the proposed adjustments may lack sufficient specificity to ensure that they are uniformly applied across the EDCs. As regulators, we recognize that selective compliance and innocent misunderstanding of requirements will always be a factor in any process such as this. At best, the annual reviews will assist the Commission, the statutory advocates, the EDCs, commercial and industrial user groups, consumers, and other interested parties an opportunity to compare the performances of the various EDCs under the requirements of Act 129 and our orders. The EDCs should understand that we are looking for substantially uniform interpretation and application of the requirements.

**End-Use Adjustments**: PPL (at 5) suggested that end-use profiles for the efficiency program should be used rather than general overall rate class profiles. For example, CFLs[[31]](#footnote-31) would be adjusted for the residential use profile, not class time-of-use characteristics.

We agree. It is appropriate to use end-use profiles for the program at hand. Accordingly, EDCs are directed to use device-specific profiles, if available. If not, the EDC should use the class average. For example, CFLs are typically used during the night rather than during the day, yet overall residential usage profiles can be heavy during the day due to air conditioning and cooling load.

**Locational, Temporal, and Zonal Differences**: Allegheny (at 3) added that NYMEX forward prices vary by both timing of the forward price estimates and by EDC zone. PECO (at 4) noted that the NYMEX PJM contract is only quoted through 2013. PPL (at 4) supported zonal adjustment. EAPA (at 5) raised concerns about ~~would have us allow for~~ regional differences. The Joint Supporters (at 5) asked the Commission to direct the EDCs to consider the locational and temporal differences for such factors as losses rather than simply allowing a regional average annual loss factor to be employed. The Joint Supporters alleged that losses are greater in the periphery of a distribution system than at the core, especially at times of special conditions, *e.g.*, peak demand. The Joint Supporters suggested that the TRC test for programs and measures should be accorded advantaged treatment in such situations. According to the Joint Supporters (at 6), the locational value of an energy efficiency measure, including self-generation, to be reflected in a TRC test evaluation can be noticeably improved in such circumstances. LBNL (at 2) offered some clarifying points and (at 3) would include the Henry Hub forwards as specified in the proposal plus the basis differential between Henry Hub and Pennsylvania,[[32]](#footnote-32) plus the appropriate pipeline delivery tariff for electric generation.

After reviewing the comments, we shall modify the proposal to provide for EDC zonal basis adjustments made based on the *PJM State of the Market* report data “Zonal real-time, simple average LMP[[33]](#footnote-33) (dollars per MWh).”[[34]](#footnote-34) Further, we shall provide for a basis adjustment to the natural gas prices in years six through ten, using the basis differential between the Henry Hub as the source and TETCO M-3 as the destination for utilities west of the Susquehanna and Transco Zone 6 as the destination for utilities east of the Susquehanna.

PECO (at 4) would calculate the zonal basis over the last 24 months. In particular, this suggestion would result in tens of thousands of calculations for each of the 24 months. PECO does not show any data to indicate that such a further complication of the process would add any benefit or be any more reliable than the method originally proposed. In response to EAPA’s concern, we note that each EDC is TRC-tested individually.

**Compliance with AEPS Act**[[35]](#footnote-35) **and Carbon Issues**: PECO (at 4) would have us allow for the inclusion of carbon reduction related expenses. PPL (at 5) would include a cost associated with AEPS Act compliance. EAPA (at 3) suggested that the model should allow for the costs of AEPS Act compliance.

We will include the costs of compliance with the AEPS Act, which is known and knowable, but will exclude (at least until legislation is passed) carbon reduction expenses. The cost of compliance with the AEPS Act is applicable to all the power “avoided” and is, therefore, an avoided cost. Carbon costs legislation does not yet exist, and, thus, carbon “costs” and the costs of compliance with carbon legislation are not known or knowable and, thus, are not avoidable at this time.

**(c) Maximum 15-Year Measure Life**

Act 129 limits the evaluation and TRC test process to consideration of energy efficiency effective measure lives of 15 years or less. Several commenters (PECO at 5; PPL at 5-6; EAPA at 6; LBNL at 6) expressed agreement with the position that, for the purpose of TRC test calculation purposes, the energy or savings benefits of any given measure be limited to a maximum of 15 years.

The Commission recognizes that EE&C plans may include the provision and installation of measures that may have shorter or longer useful lives than 15 years. However, for the purposes of calculating the TRC, the definition contained in the statute limits the energy or demand savings’ benefits of any given measure to a maximum of 15 years even where the measure may have a useful life beyond 15 years. For example, if a high-efficiency product with an expected useful life of 20 years is placed in service as a result of an EDC’s EE&C plan, the annual savings of only the first 15 years will be factored into the cost/benefit analysis under the TRC test. Accordingly, for the purposes of the TRC test calculation, any given measure is limited to a maximum of 15 years of savings benefits. The discussion, however, is not limited to this one aspect.

PPL (at 5-6) raised the additional issue of measures placed into service with useful lives longer than the time remaining in an EDC’s EE&C plan. EAPA (at 6) suggested that if a measure has a useful life greater than 15 years, then the remaining useful life beyond 15 years should be includable in a future EE&C plan. LBNL (at 6) suggested that measures with useful lives beyond 15 years be specifically identified in an EDC’s plan and reports. PPL and EAPA, in essence, requested that we permit the inclusion of measures with lives greater than 15 years in the evaluation measurement and valuation (EM&V) process.

We agree that for the purposes of capturing the energy or demand savings in EM&V protocols, savings beyond 15 years, or beyond the term of a particular EE&C plan, should be captured where warranted and may also be included in future EE&C plans. In this way the full savings of measure with lives beyond 15 years will be captured, reported and credited to the Act 129 Programs. The suggestion that EDCs identify and report measures with useful lives expected to exceed 15 years will facilitate the capture of benefits that would otherwise not be factored into a TRC test. Accordingly, useful lives longer than 15 years will be identified and reported, and benefits from useful lives that exceed 15 years or the end of EE&C plan during which they are placed in service may be carried forward to the next EE&C plan providing such measures could have been included in the new plan under the requirements then in effect for plan inclusion.

**(d) Incentive Payments from an EDC**

The *Implementation Order* directs that the TRC test take into account the effects of an EE&C plan on both participating and non-participating customers based on costs incurred by the EDC and participating customers. In the TRC test proposal, we proposed that costs calculated in the TRC test would include EE&C plan costs whether paid by the EDC or by the participants. Incentive payments from an EDC to a customer would not be included in the TRC test because such costs would be a cost to the EDC and a benefit to the customer that would cancel each other out.

PECO (at 6), the Joint Supporters (at 5), and OCA (at 4) expressed agreement with the Commission’s proposed language regarding incentive payments from an EDC. PPL (at 6) and EAPA (at 6) both commented that the proposed language could be read as being inconsistent and suggested the addition of two words (“generally” and “however”) to clarify the proposal and avoid uncertainty. We agree with this suggestion. Accordingly, costs calculated in the TRC test will generally include EE&C plan costs whether paid by the EDC or by the participants. Incentive payments from an EDC to a customer will not, however, be included in the TRC test because such costs are a cost to the EDC and a benefit to the customer that cancel each other out.

**(e) Incentive Payments from Outside Sources**

Consistent with the *California Manual*, tax credits will be considered a reduction to costs for the TRC test.

Also, it is possible that some customers may participate simultaneously in Act 1 programs and in Act 129 programs. This situation gives rise to the possibility that an end-use customer could be a recipient of an incentive/rebate from both Act 1 and Act 129 programs. The amount of incentives that Pennsylvania customers can receive for energy efficiency and conservation measures have expanded and will likely continue to expand as new programs develop from the implementation of Act 1 and from moneys received through the American Recovery and Reinvestment Act of 2009.

In the TRC test proposal, we proposed that incentive payments from sources outside of the Act 129 programs should be considered benefits that decrease costs to customers participating in programs and should be accounted for in the TRC calculations. These incentives, whether they be rebates or tax credits, would reduce the participating customers’ costs, and they should, therefore, be reflected in lower program costs and be factored into an EDC’s TRC test.

PPL (at 6), the Joint Supporters (at 5), EAPA (at 7), and OCA (at 4) agreed with the proposal. EAPA added that this approach “encourages coordination of energy efficiency and conservation programs sponsored by parties other than EDCs, allowing for greater participation by consumers who may very well need multiple incentives to install a particular measure particularly in light of the present economy.”

PECO (at 6) qualified its agreement with the proposal by suggesting that EDCs should not be required to search out every possible incentive as such research would drive up EE&C plan costs. We acknowledge that EDCs are not financial or tax consultants, but Section 2806.1(k) does mandate that each EDC “***shall***, upon request by any person, provide a list of all eligible federal and state funding programs available to ratepayers for [EE&C measure. Said] list shall be posted on the [EDC’s] internet website.” (Emphasis added.) This is obligatory, not optional, language. Furthermore, it clearly behooves an EDC to be aware of such incentives and rebates as participant costs are factored into the TRC test, and awareness of such cost-reducing incentives and rebates works to an EDC’s advantage in the long run.

SEF (at 3) recommended having payments related to environmental attributes such as alternate energy credits (AECs) and carbon financial instruments (CFIs) be specifically included in the TRC test. In our opinion, including these attributes would add unwarranted complexity to the calculations based on the uncertainty of value for the environmental attributes. Accordingly, the Commission declines to adopt the specific inclusion of payments related to environmental attributes to the TRC test.

LBNL (at 4) recommended that Gross Receipts Tax savings be excluded as a benefit, that Act 1 funds be excluded from the TRC test, and that federal tax credits and ARRA[[36]](#footnote-36) funds be considered a benefit. LBNL asserted that most states use federal tax savings as benefits to the state (and federal tax costs are a cost for the state) but exclude sales tax savings and costs from the TRC test calculation. The assumption is that state taxes that are reduced as a result of energy efficiency or (demand reduction) will be offset by either increases in tax rates or structures or by a decrease in state services that affect the same population.

In our opinion, the avoidance of the GRT and the inclusion of incentives from Act 1should be viewed as incentives received by customers, similar to incentive payments to customers from EDCs. The GRT and Act 1 effects would, however, be cancelled out by tax payments by Pennsylvania residents and businesses over time. Accordingly, the Commission shall exclude GRT avoidance and Act 1 incentive payments from the TRC test cost/benefit calculations, consistent with the LBNL comments. Further, we also agree with LBNL on the treatment of federal tax credits and ARRA incentive payments, specifically that federal tax credits and ARRA incentive payments should be considered benefits in TRC testing. This treatment of costs and benefits for TRC test purposes will help ensure that Act 129 programs reflect true program costs and benefits to Pennsylvania residents and businesses and will ensure that ratepayer funds are used in a more optimal and economic manner when choosing efficiency and conservation. This TRC test standard does not otherwise discourage participation in Act 1 programs. Despite the exclusion of the GRT and state incentives in the TRC test calculations as benefits, residents and businesses are encouraged to participate in all available local, state, and federal incentive programs.[[37]](#footnote-37)

**(f) Savings Claims from Act 1 Programs and Act 129 Programs**

As noted above, it is possible that customers may participate simultaneously with Act 1 programs and Act 129 programs.[[38]](#footnote-38) This raises the issue as to how the savings benefits will be attributed to the two programs. We said in the TRC test proposal that, as a practical matter, it would be very difficult and time consuming to determine on a case-by-case basis the precise role an Act 1 incentive/rebate versus an Act 129 incentive/rebate played in motivating the customer to participate in the program. Thus, it would be virtually impossible to determine how to attribute savings to each program in proportion to the degree of motivation each incentive played in the customer’s decision.

PECO (at 6), PPL (at 7), EAPA (at 7), LBNL (at 4), and OCA (at 5) expressed general support for the position that for the purpose of TRC testing, if the end-use customer is a recipient of an incentive/rebate from an Act 129 program then the EDC should be able to claim the entire savings of that equipment or service regardless of whether the customer may have also received an incentive/rebate from an Act 1 Program. Parties noted that this provision would tend to support cooperation between the programs, rather than competition that could hinder Act 129 program participation.

Accordingly, EDCs will be able to fully include a measure’s benefits in the TRC test if any portion of the measure is attributable to Act 129. For the purposes of TRC testing, if the end-use customer is a recipient of an incentive/rebate from an Act 129 program, even if the customer is also a recipient of an Act 1 incentive or rebate for the same equipment or service, we conclude that the entire savings of that equipment or service can also be claimed by the EDC for TRC testing purposes.

**(g) Net-to-Gross (NTG) Adjustments to Savings**

A common consideration for determining the cost benefit of energy efficiency programs is whether to make adjustments to gross energy savings through the use of a NTG ratio. In the absence of data specific to Act 129 programs, we proposed not to require NTG adjustments for the first year. A NTG adjustment would adjust the cost-effectiveness results so that the results would only reflect those energy efficiency gains that are attributed to and are a direct result of the energy efficiency program in question.[[39]](#footnote-39) A NTG would give evaluators an estimate of savings achieved as a direct result of program expenditures by removing savings that would have occurred even absent a conservation program. Three common factors among others addressed through the NTG are “free riders,” “take-back effect,” and “spillover effect” sometimes referred to as “free drivers.”[[40]](#footnote-40)

NTG adjustments are likely to be influenced by program- or measure-specific applications. The degree to which free-riders and take-back and spillover effects are factors that are present in EDC programs is best determined by research conducted at the program-participant level. This research comes at a cost and would, thus, increase program costs. If adjustments are to be made through NTG that result in reductions to claimed savings because of free-riders and take-back effects that are not cancelled out by spillover effects, then EDCs would have to implement additional reduction measures to meet the mandated reduction targets. The EDCs would incur additional program costs to implement the additional reduction measures. On the other hand, with the implementation of additional reduction measures, there would be the potential for incremental reductions in the future cost of wholesale power which could benefit all customers.

In order to assess the potential for incorporating NTG adjustments when determining the cost-effectiveness of Act 129 programs, the Commission proposed a two-step process. First, in the absence of data specific to Act 129 programs, there would be no NTG adjustments made for the first year of the programs. Second, the Commission would direct EDCs to initially study the degree to which free-riders, take-back effect, spillover effect, or other factors that affect the NTG adjustment are present for the more prevalent efficiency measures that are implemented pursuant to their EE&C plans. The EDC studies would be coordinated and overseen by a statewide evaluator should the Commission decide to contract for statewide evaluation services.[[41]](#footnote-41) The results of the studies would be used to determine if NTG adjustments should be made in the future and, if so, what efficiency measures should have adjustments as well as what, if any, the NTG ratio adjustment should be (*i.e.*, the magnitude of adjustments).

The comments on this issue supported the proposal to have no NTG adjustment for at least the first year of EE&C programs. OCA (at 5-6) agreed with the proposal as drafted. PECO (at 7) noted that data may not be available to make such an adjustment until the second or third program year. Allegheny (at 3-4) suggested that no NTG adjustment should be made for the initial four year EE&C plans. PPL (at 8) noted that if a NTG adjustment is to be made, then a NTG ratio is needed for each year of the life of the program because the market may change over a long life measure.

Allegheny (at 3), PPL (at 8), EAPA (at 8) and NAESCO (at 6) were concerned about the cost of conducting a NTG study at the program level. Allegheny proposed that any NTG study be funded through a surcharge. PPL proposed that the costs of a NTG study not come out of EE&C plan budget and suggested that the statewide evaluator should be responsible for the study. EAPA supported EDCs recovering the costs of NTG studies outside of EE&C plan spending budget. NAESCO provided a history of California’s experience with calculating the NTG ratio including the expense and contested environment created between various parties, noting that California is considering discontinuing using the NTG adjustment.

PECO (at 7) and EAPA (at 8) suggested that the NTG study should be a coordinated effort between the EDCs and the statewide evaluator. PECO (at 8), PPL (at 8), and LBNL (at 5) stressed that NTG adjustments should only be prospective.

After reviewing the comments, we shall go forward without a NTG ratio (and adjustment) for the first year. We shall, however, convene a stakeholder process to examine the issues associated with developing a NTG adjustment rather than direct the EDCs to study the matter. The issues will include, but not be limited to:

* How to conduct a cost-effective NTG adjustment?
* How many NTG adjustments are needed?
* Should they be measure-specific by EDC and do they change by measure year?
* How should the studies be funded?
* How should the NTG adjustment studies be coordinated between EDCs and their evaluators and the statewide evaluator(s)?
* When, if ever, should NTG adjustments be initiated?
* If initiated, how should NTG adjustments be timed or applied?
* To what extent, if any, should the NTG adjustment be limited to prospective application?

**(h) Discount Rate/Cost of Capital/Weighted Cost of Capital (WACC)**

We did not address this issue as a separate item of discussion in the TRC test proposal. It was mentioned in particular in conjunction with the adjustments portion of the avoided generation costs segment. Specifically, the proposal provided that the total annual GTD costs, as modified and reflected on a cents/kWh basis, would be discounted[[42]](#footnote-42) over the 15-year study period. An EDC’s WACC, calculated each year at the time of the EDC’s filing, would be used as the discount factor. The aggregated set of discounted benefits avoided by the project would be defined as its “net benefit” of the project. The net benefit would then be compared to the net cost.

Several commenters raised the question of what discount rate should be used in the TRC test. The Joint Supporters (at 6) urged the adoption of the historic twelve-month average of ten-year Treasury note yields as the discount rate, asserting that this is the method adopted by the Massachusetts Department of Public Utilities. In support of their position, the Joint Supporters (at 6) asserted that an EDC’s own WACC is significantly higher than the cost of capital available to the customers that the EDC is seeking to assist. NAESCO (at 4-5) presented a detailed argument that discount rates should be keyed to the specific individual programs to reflect a program‑relevant cost of capital. NAESCO noted that an EDC’s WACC is not an accurate representation of the cost of capital for programs such as retrofits of residential, public, and institutional buildings. NAESCO suggested that the rate on a second mortgage or home equity line-of-credit may be a more appropriate discount rate for residential programs and that municipal leases may be a more appropriate comparison for discount rate for public and institutional buildings. NAESCO noted that currently these rates are lower than a typical EDC’s WACC and that the use of an EDC’s WACC would inaccurately lower net present values and TRC test scores of an energy efficiency program or the entire portfolio.

LBNL (at 5) supported using an EDC’s post-tax WACC as the discount rate. LBNL noted the importance of explicitly stating that the time period examined is the expected useful life of the measure. OCA (at 3) claimed that the Commission should provide additional detail as to the determination of the EDC’s WACC that is to serve as the discount rate in the calculation, including the time period used to determine the WACC and the methodology. For consistency of program review across the EDCs, OCA (at 4) asserted that each EDC should use the same methodology and time frame for determining their WACC for purposes of the discount rate. Further, OCA (at 3-4) requested more clarification on an EDC’s use of its WACC and the time frame for discounting.

We agree that using an EDC’s WACC may cause some energy efficiency programs to be undervalued and that the appropriate discount rate requires further consideration. Because of the short time period to complete this Order, for the first year of TRC testing we shall, nonetheless, use the EDC’s post-tax WACC as the discount rate. The source of the discount rate will be an EDC’s (or its parent’s) WACC based on its most recent SEC 10-Q report.[[43]](#footnote-43) We envision that this will be the April 1st SEC report filing.[[44]](#footnote-44) The discounted time period will be the expected useful life of the measure. Our decision to take this approach for the first year will not, however, be controlling for future years.

Accordingly, while we will use the EDC’s post-tax WACC as the discount rate for the first year, on a going-forward basis for years beyond the first year of TRC testing, the issues of the appropriate discount rate, whether we should adopt multiple discount rates, and the sources of the discount rates will be addressed in the future in stakeholder working group sessions.

**(i) Incremental Costs**

LBNL (at 5) recommended a clarification of incremental costs be made by incorporating explicit language to address what is implied. LBNL suggested that the TRC test proposal implies “for the purposes of calculating the energy efficiency costs, only the incremental energy efficiency costs and savings should be used.” LBNL noted that the 2007 NAPEE *Guide to Resource Planning with Energy Efficiency*[[45]](#footnote-45) provides a description of incremental costs and savings to use with varying types of energy efficiency programs. LBNL suggested that the Commission should include a definition of incremental costs that would recognize that energy efficiency costs and savings will vary with measure implementation relative to the natural life of the equipment or device being replaced.

We agree with LBNL that energy efficiency cost calculations should use only the incremental energy efficiency costs and savings, and we recognize that the incremental costs and saving will vary depending on the type of energy efficiency device or measure being implemented. In this context, incremental cost for a device[[46]](#footnote-46) or measure that has reached the end of its useful life is the additional cost incurred to purchase an efficient device or measure over and above the cost of the standard (*i.e.*, less efficient) device or measure. For replacement of a functioning device, incremental cost is the whole amount of the new efficient device or measure (including installation costs) being purchased. The use of incremental costs will provide more accurate calculations for the measures being implemented. Accordingly, we shall incorporate incremental costs where appropriate in the TRC test process, and we shall direct EDCs to use calculations that include incremental costs. For the purpose of defining incremental costs, the Commission will look to Section 4.1 of the Guide to Resource Planning with Energy Efficiency, A Resource of the National Action Plan for Energy Efficiency, November 2007, for guidance.

**TRC Test Formulae for use in Pennsylvania**

The definitions and formulae to be used in Pennsylvania-specific TRC testing are set forth in the Appendix to this order. Our original proposal had included several definitions and formulae not specifically relevant to the TRC test. At the suggestion of PECO (at 8), PPL (at 8), and EAPA (at 6-7), we have eliminated the definitions and formulae that do not apply to TRC testing. Generally speaking, the definitions and formulae have been taken from the *California Manual* without further specific attribution.

**Conclusion**

The EDCs must file their EE&C plans by July 1, 2009. In order to design the plans, the EDCs must know how results will be tested. The EDCs should structure their EE&C plans consistent with the TRC testing constraints set forth in this order. The actual formulae and definitions are set forth in the Appendix, hereto; **THEREFORE,**

**IT IS ORDERED:**

1. That the Commission hereby adopts use of a total resource cost (TRC) test, consistent with this order.

2. That a stakeholder group be convened by Commission staff to address the issues identified herein and such other issues as may arise in the total resource cost test process.

3. That the TRC test established by this order may be amended in the future by order of the Commission based upon our experience and/or input from stakeholders.

4. That copies of this order be served upon the Office of Consumer Advocate, the Office of Small Business Advocate, and parties to *Energy Efficiency and Conservation Program*, Docket No. M‑2008‑2069887. That a copy of this order be posted on the Commission’s Act 129 website page.

5. That the contacts for this order are Wayne Williams, Bureau of Conservation, Economics, and Energy Policy (CEEP), [waywilliam@state.pa.us](mailto:waywilliam@state.pa.us); Louise Fink Smith, Law Bureau, [finksmith@state.pa.us](mailto:finksmith@state.pa.us); and Kriss Brown, Law Bureau, [kribrown@state.pa.us](mailto:kribrown@state.pa.us).

**BY THE COMMISSION**

James J. McNulty

Secretary

(SEAL)

ORDER ADOPTED: June 18, 2009

ORDER ENTERED:

**Appendix**

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 *California Manual*[[47]](#footnote-47) 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.

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

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

**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* |

1. *Energy Efficiency and Conservation Program*, Docket No. M‑2008‑2069887. *See* <http://www.puc.state.pa.us//pcdocs/1033196.doc>. [↑](#footnote-ref-1)
2. As anticipated by the *Implementation Order*, we are using the California TRC test as a model for designing a TRC test to meet the unique requirements of Act 129 and this Commonwealth’s electric industry. *See* *California Standard Practice Manual – Economic Analysis of Demand‑Side Programs and Projects*, July 2002, at 18, (*California Manual*). *See* <http://drrc.lbl.gov/pubs/CA-SPManual-7-02.pdf>. [↑](#footnote-ref-2)
3. *See* <http://www.puc.state.pa.us/electric/Act_129_info.aspx>. [↑](#footnote-ref-3)
4. We have duly considered all comments whether or not discussion herein specifically mentions a particular point. Any issue that we do not specifically address herein has been duly considered and will be denied without further discussion. It is well settled that we are not required to consider expressly or at length each contention or argument raised by the parties. *Wheeling & Lake Erie Railway Co. v. Pa. PUC*, 778 A.2d 785, 794 (Pa. Cmwlth. 2001)*,* also *see, generally, Univ. of PA v. Pa. PUC*, 485 A.2d 1217 (Pa. Cmwlth. 1984). [↑](#footnote-ref-4)
5. This section recaps discussion from the *Implementation Order* without further specific attribution. [↑](#footnote-ref-5)
6. By this, we mean to say that we will look at avoided supply costs such as the reduction in forecasted zonal wholesale electric generation prices, ancillary services, losses, generation capacity, transmission capacity, and distribution capacity. [↑](#footnote-ref-6)
7. In this regard, we hereby clarify that the TRC test will use the *incremental* costs of services and equipment. This matter is discussed in more detail below in the segment addressing incentive payments from an EDC. [↑](#footnote-ref-7)
8. *See* the Appendix of this order. *See*, *also*, *California Manual* (at 18‑19) for the underlying methodology to calculate the NPV and B/C ratio of the TRC test. [↑](#footnote-ref-8)
9. The July 1, 2009 due date for the EDCs’ EE&C plans was established by Act 129. The amendment provision contemplated herein relates solely to TRC test items that cannot reasonably be incorporated into an EDC’s EE&C plan by July 1, 2009; it is not a blanket waiver of the due date for an EDC’s EE&C plan, in whole or in part. The EE&C plans are due July 1, 2009, and must contain all the requisite elements based upon the statute and the template, including provisions for TRC testing. *See* our May 7, 2009 Secretarial letter for detailed instructions on the timely and complete filing of EE&C plans that are due on or before July 1, 2009; the Secretarial letter may be found on our website at <http://www.puc.state.pa.us/electric/Act_129_info.aspx>. [↑](#footnote-ref-9)
10. The Alternative Energy Investment Act, 64 Pa.C.S. §§ 1515, *et seq.* Act 1 of 2008 (Act 1) provides incentives including grants, loans, rebates, and tax credits for individuals, businesses, nonprofit economic development organizations, and political subdivisions. Incentives are provided for energy efficiency measures, energy conservation measures, and alternative energy generators. Act 1 programs are administered by the Pennsylvania Department of Environmental Protection, the Pennsylvania Department of Economic Development, the Pennsylvania Treasury Department, and the Pennsylvania Housing and Finance Agency. [↑](#footnote-ref-10)
11. Within each EDC’s EE&C plan, there will be numerous programs. Such Act 129 programs could consist of a group of projects with similar characteristics and installed in similar applications. An example would be a residential high efficiency appliance rebate program. [↑](#footnote-ref-11)
12. For the purposes of TRC testing, we shall require EDCs to credit self-generation customers at the full retail rate when estimating avoided energy and capacity costs for the calculation of the benefits in the TRC test. This is consistent with the regulations we adopted on July 2, 008, pursuant to Section 1648.5 of the Alternative Energy Portfolio Standards Act, 73 P.S. § 1648.1, *et seq*., (AEPS), relative to net metering. In particular, we modified Section 75.13(c) to read, in part: “The EDC shall credit a customer-generator at the full retail rate, which shall include generation, transmission, and distribution charges, for each kilowatt-hour produced. . . .” 52 Pa. Code § 75.13(c). [↑](#footnote-ref-12)
13. PJM Interconnection (PJM) is a federally-regulated regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states, including Pennsylvania, and the District of Columbia. [↑](#footnote-ref-13)
14. *See*  <http://www.nymex.com/JM_term.aspx>. [↑](#footnote-ref-14)
15. “Spark price spread” can be defined as the difference between the price of electricity sold by a generator and the price of the fuel used to generate it, adjusted for equivalent units. The spark price spread can be expressed in $/MWh or $/MMBTUs (or other applicable units). To express in $/MWh, the spread is calculated by multiplying the price of gas, for example (in $/MMBTU), by the heat rate (in BTU/KWh), dividing by 1,000, and then subtracting from the electricity price (in $/MWh). The heat rate is defined as the ratio of energy inputs used by a generating facility expressed in BTUs (British Thermal Units), to the energy output of that facility expressed in kilowatt-hours. *See* <http://moneyterms.co.uk/spark-spread/>. [↑](#footnote-ref-15)
16. US Energy Information Agency (EIA) within the US Department of Energy; develops official energy statistics for the US government. [↑](#footnote-ref-16)
17. Annual Energy Outlook (AEO); a compilation of various energy price projections. [↑](#footnote-ref-17)
18. Instead of EIA’s AEO electric price projections or the NYMEX electric futures/NYMEX PJM electric generation futures price. [↑](#footnote-ref-18)
19. We note the lower trading volumes over the mid to longer time horizons. We also note the regulatory criticisms of NYMEX during the recent past. Finally, we note the existence of the IntercontinentalExchange® (ICE®), which operates regulated global futures exchanges and over-the-counter (OTC) markets for energy contracts. Even given the foregoing, we prefer, at this time, to use NYMEX energy data due to its more consistent ability to reflect market behavior. [↑](#footnote-ref-19)
20. That heat rate, for an nth of its kind Convention Combustion turbine, is 10,450 BTU/kWh. *See* <http://www.eia.doe.gov/oiaf/aeo/assumption/electricity.html> [↑](#footnote-ref-20)
21. *See* line 2215 of the EIA 2009 AEO at <http://www.eia.doe.gov/oiaf/aeo/supplement/stimulus/regionalarra.html>. [↑](#footnote-ref-21)
22. *See* <http://www.eia.doe.gov/oiaf/analysispaper/retrospective/pdf/table2.pdf>. [↑](#footnote-ref-22)
23. Reliability Pricing Model; for capacity pricing. [↑](#footnote-ref-23)
24. <http://data.bls.gov/PDQ/servlet/SurveyOutputServlet?series_id=PCU221110221110>. This escalator is widely accepted in the industry and financial markets, energy-industry-specific, readily ascertainable, and easy to use. Like its more familiar counterparts, the BLS’ Consumer Price Index (CPI) and the Producer Price Index (PPI), it will produce expected values of future market variables within reasonable limits. The debate herein was not whether to use an escalator, but rather which escalator to use. Accordingly, we shall use the BLS escalator. [↑](#footnote-ref-24)
25. Reliability Pricing Model; for capacity pricing. [↑](#footnote-ref-25)
26. <http://data.bls.gov/PDQ/servlet/SurveyOutputServlet?series_id=PCU221110221110>. This escalator is widely accepted in the industry and financial markets, energy-industry-specific, readily ascertainable, and easy to use. Like its more familiar counterparts, the BLS’ Consumer Price Index (CPI) and the Producer Price Index (PPI), it will produce expected values of future market variables within reasonable limits. The debate herein was not whether to use an escalator, but rather which escalator to use. Accordingly, we shall use the BLS escalator. [↑](#footnote-ref-26)
27. Peak day reduction programs often do not reduce energy usage; they usually result in shifting usage to off-peak hours. [↑](#footnote-ref-27)
28. We recognize that load profile assumptions will probably vary for each project and program and that it may be easier to discuss specific projects and programs using cents/kWh so long as all the load profile assumptions are clearly delineated for the specific program or project. [↑](#footnote-ref-28)
29. Provider of last resort. [↑](#footnote-ref-29)
30. *See* disposition in (e) Incentives Payments from Outside Sources. [↑](#footnote-ref-30)
31. Compact fluorescent lights. [↑](#footnote-ref-31)
32. We interpret this as a reference to the NYMEX Texas Eastern Zone M3 Basis Swap. [↑](#footnote-ref-32)
33. Locational marginal pricing. [↑](#footnote-ref-33)
34. <http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2008/2008-som-pjm-volume2-sec2.pdf> , page 52. [↑](#footnote-ref-34)
35. Alternative Energy Portfolio Standards Act. 73 P.S. §§ 1648.1-1648.8. [↑](#footnote-ref-35)
36. American Recovery and Reinvestment Act of 2009. *See* <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h1enr.pdf>. [↑](#footnote-ref-36)
37. Indeed, Section 2806.1(k) requires the EDCs to provide information on the availability of such incentive programs. [↑](#footnote-ref-37)
38. In summary, energy efficiency and conservations measures include technologies, management practices, or other measures that reduce electric consumption or demand if the costs of the acquisition or installation of the measure is directly incurred in whole or in part by the EDC. 66 Pa. C.S. § 2806.1(m). [↑](#footnote-ref-38)
39. National Action Plan for Energy Efficiency (2008). *Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers*. Energy and Environmental Economics, Inc. and Regulatory Assistance Project. [www.epa.gov/eeactionplan](http://www.epa.gov/eeactionplan). [↑](#footnote-ref-39)
40. The concept of free riders is that a number of customers may take advantage of rebates or cost savings available through conservation programs even though they would have installed the efficient equipment on their own. Take-back effect occurs if customers use the reduction in bills/energy to increase their energy use to be more comfortable or for convenience. Spillover is the opposite of the free rider effect where customers that adopt efficiency measures because they are influenced by program-related information and marketing efforts although they do not actually participate in the program. NTG adjustments for free riders and take-back effects result in the subtraction of claimed energy savings whereas spillover effects NTG adjustments result in an addition of claimed energy savings. [↑](#footnote-ref-40)
41. The Commission is currently in the process of considering the selection of a statewide evaluator. [↑](#footnote-ref-41)
42. *See* section (h) below for a discussion of discount rate/cost of capital. [↑](#footnote-ref-42)
43. The quarterly financial report filed with the Securities and Exchange Commission. [↑](#footnote-ref-43)
44. If an EDC expects to a different SEC 10-Q report as the source of its WACC, the source should note in its EE&C plan to be filed July 1, 2009. [↑](#footnote-ref-44)
45. National Action Plan for Energy Efficiency (NAPEE) (2007). *Guide to Resource Planning with Energy Efficiency*. Prepared by Price, Snuller, *et al.*  Energy and Environmental Economics, Inc. [www.epa.gov/eeactionplan](http://www.epa.gov/eeactionplan). [↑](#footnote-ref-45)
46. Our use of the terms “equipment” and “device” in this sense are generally interchangeable and stem from the use of both terms in the NAPEE Guide. For purposes of TRC testing, the terms are interchangeable; in practice “equipment” would suggest something that has multiple components such as an HVAC system, and “device” would be a thing such as a light bulb, a refrigerator, or a specific component of a system such as a programmable thermostat. [↑](#footnote-ref-46)
47. *The California Standard Practice Manual – Economic Analysis of Demand‑Side Programs and Projects*, July 2002, p. 18. *See* <http://drrc.lbl.gov/pubs/CA-SPManual-7-02.pdf>. [↑](#footnote-ref-47)