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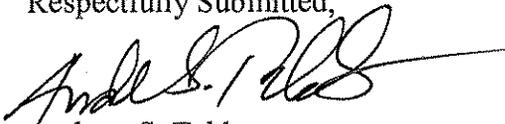
Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

RE: Implementation of the Alternative Energy Portfolio Standards of 2004: Standards for the Participation of Demand Side Management Resources - Technical Reference Manual 2012 Update - Docket No. M-00051865

Dear Secretary Chiavetta:

Enclosed for filing are the Comments of PPL Electric Utilities Corporation in the above-referenced proceeding.

Respectfully Submitted,



Andrew S. Tubbs

AST/jl
Enclosure

cc: Gregory A. Shawley, Bureau of Technical Utility Services (*via E-mail*)
Kriss Brown, Law Bureau (*via E-mail*)

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Implementation of the Alternative Energy :
Portfolio Standards of 2004: Standards for : Docket No. M-00051865
the Participation of Demand Side :
Management Resources - Technical :
Reference Manual 2012 Update :

**COMMENTS OF
PPL ELECTRIC UTILITIES CORPORATION**

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

I. INTRODUCTION

By Tentative Order entered September 23, 2011, the Pennsylvania Public Utility Commission (“Commission”) requested comments on the proposed 2012 update of the Commission’s Technical Reference Manual (“TRM”).¹ PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) has actively participated in all of the proceedings instituted by the Commission to implement Act 129 of 2008, 66 Pa.C.S. § 2806.1 (“Act 129”). The Company appreciates this opportunity to comment on the Commission’s proposed 2012 revisions to the TRM (“2012 TRM”). PPL Electric generally agrees with many of the changes proposed in the 2012 TRM. However, the Company has identified some areas that it believes require modification and/or clarification. In addition, PPL Electric maintains its previously stated concerns related to the potential use of TRM revisions to adversely impact an electric distribution company’s (“EDC”) compliance with Act 129.

¹ *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update* (Order entered September 23, 2011), Docket No. M-00051865 (“*Tentative Order*”).

II. BACKGROUND

The energy conservation provisions of Act 129 are prescriptive. They establish mandatory minimum demand and energy conservation reduction requirements; they establish mandatory non-discretionary deadlines for compliance with these requirements; they establish a hard cost cap on the amount each EDC can spend on energy conservation programs; the programs must be cost effective under a total resource cost test; and they may impose civil penalties of \$1 million to \$20 million for non-compliance.

Act 129 requires an EDC to demonstrate that its plan is cost effective using a total resource cost test (“TRC”) approved by the Commission.² 66 Pa.C.S. § 2806.1(a)(3). In implementing this requirement, the Commission determined to use the TRM that was originally developed by the Commission pursuant to the Pennsylvania Alternative Energy Portfolio Standards Act.³ Specifically, the Commission “initiate[d] a process to update and expand the TRM to provide for additional energy efficient technologies, under Docket No. M-00051865.” *Implementation Order*, p. 13.

In order to monitor and verify data collection, quality assurance and the results of each EDC’s Energy Efficiency & Conservation plans (“EE&C Plans”), in the first quarter of 2009, the Commission initiated a process to update and expand the TRM. In addition, the Commission stated “[t]hereafter, the Commission will periodically review and initiate the process to update the TRM as needed. Any such updates will be prospective in nature and applicable to measures undertaken after final approval of any TRM changes.” *Implementation Order*, p. 14. By Order

² In re: Implementation of Act 129 of 2008 – Total Resource Cost (TRC) Test (Order entered June 23, 2009), Docket No. M-2009-2108601.

³ Energy Efficiency and Conservation Program Implementation Order (Order entered January 16, 2009), Docket No. M-2008-2069887 (“Implementation Order”).

entered June 1, 2009, the Commission approved the 2009 version of the TRM (“2009 TRM”).⁴ In approving the 2009 TRM, the Commission noted that, “the TRM will provide vital guidance to EDCs in developing their EE&C plans.” *2009 TRM Order*, p. 9. Consistent with the Commission’s statement, PPL Electric relied upon the 2009 TRM as guidance to develop its EE&C Plan.

On July 1, 2009, PPL Electric filed its EE&C plan with the Commission in compliance with Section 2806.1(b)(1)(i) of Act 129 and the Commission’s January 16, 2009 *Implementation Order*. Consistent with the Commission’s *Implementation* and *2009 TRM Orders*, PPL Electric relied on the 2009 TRM as guidance to develop its 2009-2013 EE&C Plan. PPL Electric’s EE&C Plan proceeding was a fully litigated proceeding and included the participation by statutory advocates, the Department of Environmental Protection, customer group and potential competitive service providers (“CSPs”) and other interested parties. The Company’s EE&C Plan filing was approved by the Commission on October 26, 2009 (“2009-2013 EE&C Plan”).⁵ The 2009 TRM was used by the Commission in evaluating and ultimately approving PPL Electric’s 2009-2013 EE&C Plan.

The Commission, in a Tentative Order adopted on November 19, 2010, sought comments on the proposed 2011 TRM annual update.⁶ In an Order entered February 28, 2011, the

⁴ *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update* (Order entered June 1, 2009), Docket No. M-00051865 (“2009 TRM Order”).

⁵ *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan* (Order entered October 26, 2009), Docket No. M-2009-2093216.

⁶ *See Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update* (Tentative Order entered November 24, 2010), Docket No. M-00051865.

Commission promulgated the 2011 TRM.⁷ On March 30, 2011, PPL Electric filed a Petition for Review from the Order of the Commission, entered February 28, 2011, at Docket No. M-00051865.⁸ On September 15, 2011, PPL Electric and the Commission filed a Joint Stipulation and Request to Discontinue and Withdraw in Docket No. 558 C.D. 2011 (“Stipulation”). The Stipulation provided that PPL Electric and the Commission agreed: (a) that the *2011 TRM Order* is a statement of policy and does not establish a binding norm; (b) that the Commission will not challenge PPL Electric’s right to file a subsequent petition for review challenging any issues raised in PPL Electric’s instant petition for review; and (c) that PPL Electric’s Petition for Review pending before the Commonwealth Court at Docket No. 558 C.D. 2011 should be discontinued and withdrawn without prejudice. On September 16, 2011, the Commonwealth Court issued an Order stating that the PPL Electric’s petition for review was withdrawn without prejudice.

III. PPL ELECTRIC’S TECHNICAL COMMENTS ON THE 2012 TRM UPDATE

In this section, PPL Electric provides specific technical comments on the proposed modifications contained in the proposed 2012 TRM. As noted above, the Commission undertakes an annual review and update of the TRM. PPL Electric supports this process, as it provides necessary guidance to EDCs in identifying new measures that may be added to their existing EE&C Plans through established procedures and provides needed clarifications and corrections. Further, the continued updating of the TRM serves to provide the EDCs with a

⁷ See *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update* (Order entered February 28, 2011), Docket No. M-00051865 (“*2011 TRM Order*”).

⁸ PPL Electric, *inter alia*, sought judicial review of the Commission’s authority to require electric distribution companies to amend or modify their previously approved EE&C Plans without the due process requirements of an adjudication or formal rulemaking.

useful tool in preparing for possible future EE&C Plans following the conclusion of their existing programs.

Generally, PPL Electric agrees with the proposals contained in the *Tentative Order*. PPL Electric commends the Commission for taking the initiative to significantly improve the TRM update process. Due to the thorough and timely efforts of the Technical Working Group (“TWG”), EDCs had the opportunity to collaborate with the Commission and provide feedback for influencing the 2012 TRM.

PPL Electric has organized its technical comments in the same order that the topics are addressed in the *Tentative Order*. To the extent that PPL Electric does not comment on a particular proposal, that fact is noted in the appropriate section.

A. ADDITIONAL RESIDENTIAL EE&C MEASURE PROTOCOLS

In the *Tentative Order*, the Commission stated that an expansion of the residential portion of the TRM is essential for the accurate and timely measurement and verification of an EDC’s Act 129 energy efficiency programs. *Tentative Order*, p. 6. The proposed update to the TRM includes the addition of 10 new residential EE&C measures. *Id.*

PPL Electric supports the addition of the new residential measures, as they provide customers with more options for pursuing energy efficiency initiatives. Furthermore, the 2012 TRM provides a clearly defined, streamlined approach for collecting data and calculating energy savings related to the new measures, which minimizes the use of custom methodologies that are costly and administratively burdensome to EDCs, conservation service providers (“CSPs”) and customers. Of the new residential measures, PPL Electric will only comment on the Refrigerator/Freezer Recycling and Replacement measure.⁹

⁹ For the remaining residential EE&C measure proposals, PPL Electric has no comment at this time.

Regarding the Refrigerator/Freezer Recycling and Replacement measure, PPL Electric believes that all recycled refrigerators should have a gross deemed saving of 1659 kWh/yr, regardless of whether they are replaced with an ENERGY STAR unit, replaced with a non-ENERGY STAR unit or not replaced. Therefore, there should be a single TRM measure with deemed savings of 1659 kWh/yr. The following is an example that demonstrates the savings are the same, regardless of whether the recycled refrigerator is replaced:

Customer Retires an Old Refrigerator and Does not Replace it:

- Before retirement, the usage of the old refrigerator is 1659 kWh/yr (the current TRM deemed value for a removed refrigerator). This would be the total usage seen by the grid, if the customer does not permanently remove the old refrigerator from the grid.
- After retirement, the usage = 0.
- Gross deemed savings = $1659 - 0 = 1659$ (the full energy savings of the retired refrigerator).

Customer Retires an Old Refrigerator and Replaces it, *i.e.*, a customer replaces their kitchen refrigerator with a new one:

- Before retirement, the usage of the old refrigerator is 1659 kWh/yr (the current TRM deemed value for a removed refrigerator). This would be the total usage seen by the grid, if the customer does not permanently remove the old refrigerator from the grid.
- Usage of the new refrigerator = 500 kWh/yr.
- Total usage (old + new) = $1659 + 500 = 2159$ kWh/yr. This would be the total usage seen by the grid, if the customer does not permanently remove the old refrigerator from the grid. Both refrigerators would be connected to the grid (for example, the old refrigerator would remain in operation in the customer's garage or on the secondary market).
- After retirement, the usage = 500 (the utility recycles the old refrigerator so only the new refrigerator remains in operation).
- Gross deemed savings = $2159 - 500 = 1659$ (the full energy savings of the retired refrigerator). This is the same gross deemed savings as the scenario above, where the recycled refrigerator is not replaced.

Therefore, the gross savings is the full deemed savings of the retired refrigerator (1659 kWh/yr), regardless of whether the customer replaces the old refrigerator. If the utility's appliance recycling program permanently removes the refrigerator from the grid, then the deemed saving is 1659 kWh/yr. The net-to-gross evaluation adjusts gross savings to account for program attribution, *i.e.*, what would have happened to the old refrigerator in the absence of the utility's recycling program.

If the Commission disagrees and decides to include the proposed recycling with non-ENERGY STAR replacement protocol in the TRM, the Commission should be aware that the addition of this measure will require further data collection from customers and changes to the CSP's database, PPL Electric's tracking system, PPL Electric's Quality Assurance and Quality Control procedures and PPL Electric's Evaluation, Measurement and Verification Plan. PPL Electric recommends that the savings (1091 kWh/yr) for a non-ENERGY STAR replaced unit be added to the table at the beginning of Section 2.22 – Refrigerator/Freezer Recycling and Replacement in the 2012 TRM. Currently, only the value for an ENERGY STAR replaced unit is shown in the aforementioned table.

B. ADDITIONAL COMMERCIAL AND INDUSTRIAL EE&C MEASURE PROTOCOLS

Expansion of the Commercial and Industrial ("C&I") section of the TRM, according to the Commission, is essential for measurement and verification purposes. *Tentative Order*, pp. 6-7. Therefore, the Commission proposes an additional 17 C&I EE&C measures for the 2012 TRM update.

PPL Electric favors the specific addition of exterior lighting to the Lighting Equipment Improvements measure and the addition of Table 3-3: Baseline Exterior Lighting Power Densities. The Company has received several applications for exterior lighting and the additions

to the 2012 TRM will simplify the application process and reduce the administrative burden associated with processing exterior lighting as a custom measure.

PPL Electric seeks clarification and raises a question concerning the ENERGY STAR Electric Steam Cooker measure. In the 2012 TRM, Table 3-70, entitled Default Values for Electric Steam Cookers by Number of Pans, contains default values for electric steam cookers. Footnote 189, applicable to Table 3-70, states as follows: “efficient model values calculated from a list of ENERGY STAR qualified products.” However, the value of 26% for a baseline model for the efficiency parameter (“Eff”) used in Table 3-70 does not appear to be appropriate, because ENERGY STAR values for these parameters are 30%. PPL Electric requests that the Commission clarify and explain the use of an Eff value of 26% or revise the Table 3-70 to include an Eff value of 30% in order to be consistent with the ENERGY STAR parameters.

In addition, PPL Electric agrees with the Ductless Mini-Split Heat Pumps – Commercial < 5.4 tons and Heat Pump Water Heaters measure proposals. Furthermore, although PPL Electric currently does not offer the following measures, the Company agrees with the Commission’s related proposals: Refrigeration – Night Covers for Display Cases, Strip Curtains for Walk-In Freezers and Coolers, Refrigeration – Auto Closers, Refrigeration – Door Gaskets for Walk-in Coolers and Freezers, Refrigeration – Suction Pipes Insulation, Refrigeration – Evaporator Fan Controllers, and Refrigeration – Special Doors with Low or No Anti-Sweat Heat for Low Temp Case.

For the remaining C&I EE&C measure proposals, PPL Electric has no comment at this time.

C. GENERAL IMPROVEMENTS

1. Mapping Zip Codes to Reference Cities for Weather-Dependent Measures

In the *Tentative Order*, the Commission proposes adding Allentown as an additional reference city, which was previously omitted in C&I protocols. *Tentative Order*, p. 8. Allentown, in addition to Erie, Harrisburg, Philadelphia, Pittsburgh, Scranton and Williamsport, will serve as the seven reference cities when weather-dependent variables are required. In addition, the Commission proposes the use of a zip code mapping table to assign a reference city to each zip code in Pennsylvania. Finally, the Commission proposes the use of a mapping table, Table 1-2, California CZ Mapping Table, to assign a California Climate Zone to each reference city in Pennsylvania. *Id.*

PPL Electric agrees with the addition of Allentown as a reference city for weather-dependent Heating, Ventilation and Air-Conditioning (“HVAC”) measures. This addition will result in a more accurate ex-ante savings estimate for customers in that part of PPL Electric’s service territory. For cities which PPL Electric will map to Allentown instead of Harrisburg, cooling Equivalent Full Load Hours (“EFLH”) and cooling savings will decrease slightly; however, heating EFLH and heating savings will increase slightly.

PPL Electric supports the addition of the proposed zip code mapping table for mapping each Pennsylvania zip code to one of the reference cities. Although this addition will not require significant changes to PPL Electric’s tracking system, the mapping for several zip codes in the southeastern part of the state will have to change from the current reference cities of Allentown or Harrisburg to Philadelphia. This aligns with the American Society of Heating, Refrigerating and Air Conditioning Engineers (“ASHRAE”) standards for cities with close proximity to water. For cities which PPL Electric will map to Philadelphia instead of Allentown or Harrisburg,

cooling EFLH and cooling savings will increase slightly; however, heating EFLH and heating savings will decrease slightly.

PPL Electric also agrees with the addition of the table for assigning a California Climate Zone to each Pennsylvania reference city. This will provide flexibility by enabling use of the Database for Energy Efficient Resources for determining savings for weather-dependent measures using Californian-based models.

2. Determination of Baselines for Measures Replaced Upon Failure or at End of Useful Life

The *Tentative Order* states that annual savings (for goal compliance) and lifetime savings (for TRC calculations) for a measure are highly dependent on what is considered the baseline for that measure. *Tentative Order*, p. 9. Differences exist primarily between the “burnout” and “early replacement” scenarios. *Id.* The Commission proposes that the baseline be defined for each scenario as needed on a measure-by-measure basis, beginning with the high impact measures.

PPL Electric agrees with the Commission that the baseline condition (burnout or early replacement) needs to be determined correctly to provide the most accurate estimate of savings. However, determining whether equipment was replaced on burnout or early replacement requires an EDC (or program CSP) to obtain significant information from customers that may not be available, may be unreliable, may confuse customers, and/or may add a level of complexity to a rebate application that will discourage customers from participating in the program. Furthermore, this additional information must also be recorded in an EDC’s/CSP’s tracking system, confirmed by a EDC/CSP, and verified by the EDC’s independent evaluator, all of which will increase tracking and evaluation costs.

If a residential customer, for example, replaces an air source heat pump, the customer would have to provide PPL Electric with the make and model number of their old unit, the installation date or approximate age of the old unit, and an explanation of why it was replaced (*i.e.*, whether it was too costly to repair regardless of age, whether repair parts are not available, too noisy, under/oversized, or whether the unit was operational, but the customer wanted to purchase a more efficient unit, *etc.*) in order for PPL Electric to determine if the unit was replaced on burnout, or if it was an early replacement. Customers may not have that information on hand. Even if customers have that information, it would be impossible for PPL Electric to obtain that information before the customer replaces the heat pump, before the customer submits the rebate application, and before PPL Electric records the transactions, *i.e.*, determines the savings, unless PPL Electric implements a three-step application process.

In a three step process, the customer would have to notify PPL Electric that they want to replace the heat pump. Then, PPL Electric would have to inspect the existing unit to verify the information listed above. The customer could then replace the heat pump and submit the rebate application. The three-step process would be extremely burdensome on the customer and the EDC, and may not be practicable if the customer's heat pump is inoperable and the customer needs to replace it immediately. Also, it is not practical to request this information after the customer replaces the heat pump (*i.e.*, PPL Electric continues with its current 1-step rebate application, whereby the customer submits the rebate application after replacing the heat pump), because the customer will likely not have the instruction manual, receipt, or other information about the old heat pump, and the old unit will not be there for PPL Electric to physically inspect.

Furthermore, under the TRM methodology, replacement on burnout has lower savings than early replacement. Therefore, PPL Electric recommends that the Commission provide

EDCs with the discretion to determine if they want to assume replacement on burnout (and claim lower savings), or incur the additional cost and complexity to determine if the equipment was an early replacement (and claim greater savings).

3. Eligibility of Fuel Switching (Non-Electric to Electric)

a. Baseline Fuel Source

The Commission proposes to allow EDCs to continue proposing fuel switching programs based on both electric and non-electric energy sources as part of their Act 129 EE&C Plans. *Tentative Order*, p. 11. The Commission, however, is concerned that improperly constructed incentives could unfairly impact non-electric fuel sources. *Id.*, p. 12. According to the Commission, improperly constructed rebates could be construed as marketing devices that incent fuel switching (for example, from gas equipment to electric equipment) for the primary purpose of increasing market share, as opposed to incenting efficient use of energy. Therefore, the Commission explained that the rebates should focus on the purchase of high efficiency appliances by those customers who have already decided to change energy sources, and the review of proposed rebates will be based on such a premise. *Id.*

PPL Electric agrees with the Commission that EDC rebates should encourage the purchase of higher efficiency appliances (compared to the minimum efficiency required by code) by customers who have already decided to change energy sources. For example, if an EDC offers a rebate for a high efficiency air source heat pump, the amount of that rebate should be designed to offset a portion of the incremental cost, *i.e.*, the difference in total installed cost between the SEER 16 heat pump and the standard SEER 13 heat pump. If that incremental cost is \$1,000, a typical rebate would be approximately \$400 to help offset the customer's incremental cost. That \$400 rebate is sufficient to incent the customer to install a higher

efficiency heat pump, but is not sufficient to incent the customer to switch from a gas furnace to an \$8,000 heat pump. In that case, customers already have decided to install a heat pump and replace their gas furnace for reasons other than the EDC's rebate. The rebate encourages the customer to install a higher efficiency heat pump than the customer would have selected in the absence of the rebate.

b. Impacts and Measure Lives

In the *Tentative Order*, the Commission requested comments on fuel switching deemed savings and measure lives. *Tentative Order*, p. 13. PPL Electric has no comment on fuel switching deemed impacts and measure lives at this time.

4. Use of Residential Protocols in Commercially Metered Spaces

The Commission proposes that EDCs apply measures from the residential or C&I section based on usage characteristics, rather than the sector under which the account is metered. *Tentative Order*, p. 13. For example, where a measure typically found in residences is located behind a commercial meter and operates as it would in a residential setting, *e.g.*, a refrigerator or dishwasher is located in an office break room. For this scenario, the Commission proposes the use of a residential measure because the item is operating as it would in a residential setting. *Id.* Another example is where a measure typically found in a residence is operating in a commercial setting and is behind a commercial meter (*e.g.*, large laundry rooms with washers and dryers in an apartment complex). For this scenario, the Commission proposes the use of C&I measures that are based on the residential measures, adjusted to reflect their commercial use. The residential measure would be inappropriate because the measure is not operating under residential conditions. *Id.*

PPL Electric agrees with the Commission that EDCs should use measures from the residential or C&I section according to usage characteristics, rather than the sector under which the account is metered. This flexibility will simplify implementation of these measures and will encourage additional customer participation. It will also reduce customer confusion and lessen the implementation burden by allowing for streamlined rebate application forms. PPL Electric encourages the Commission to separate the rationale contained in Section 1.17 of the proposed 2012 TRM, related to sector metering, into a separately labeled subsection in Section 1. This addition would ensure that the use of residential measures for commercially metered spaces is fully described and identifiable in the 2012 TRM.

D. IMPROVEMENTS TO EXISTING RESIDENTIAL EE&C MEASURE PROTOCOLS AND PROCESSES

1. Clarification of Electric HVAC Protocols

a. Heating Savings for Heat Pumps

In the *Tentative Order*, the Commission explained that the residential electric HVAC measures were constructed in such a way to account for cooling savings only, and therefore do not reflect heating season savings for heat pumps. *Tentative Order*, p. 14. The Commission proposes the addition of heating season savings for heat pumps by crediting the incremental efficiency gain between a high-efficiency heat pump and a minimally code-compliant heat pump. *Id.* PPL Electric agrees with this proposed change. However, the Company notes that heating savings were already included in the calculation for ASHP as part of the 2011 TRM revision. The change proposed for the 2012 TRM applies only to Maintenance and Duct Sealing measures for residential HVAC systems.

b. Modification of High Efficiency Furnace Fan Protocol

Due to the difficulty of collecting specific independent variables for the furnace fan measure, the Commission proposes that the furnace fan measure be based on stipulated variables, as it was in the 2010 TRM. *Tentative Order*, p. 15. PPL Electric agrees with this change. Given the relatively low savings for this measure, this approach is more reasonable and cost-effective than a partially-deemed algorithm that would require considerable data collection from the customer and considerable monitoring and verification by the evaluator.

2. Clarification of Lighting Protocols

a. CFL Hours of Operation per Day

The Commission proposes maintaining 3.0 as the value for compact fluorescent light (“CFL”) hours of usage (“HOU”) in the 2012 TRM. *Tentative Order*, p. 17. Consistent with the Company’s comments relative to the 2011 TRM, PPL Electric strongly supports the Commission’s proposal. The 3.0 hour value remains a reasonable estimate for Pennsylvania.

b. Methodology for Determining Delta Watts for CFLs

The Commission explained in the *Tentative Order* that the annual energy savings for residential CFLs are determined by multiplying hours of usage in one year, in-service rate¹⁰ and delta watts (the difference between the CFL and the baseline bulb). *Tentative Order*, p. 18. The Commission proposes that the delta watts be determined by calculating the difference between the CFL wattage and the “equivalent incandescent bulb” wattage, which is defined as the incandescent bulb with similar lumen output as the new bulb. *Id.*

PPL Electric agrees with the proposed method for determining delta watts. However, PPL Electric suggests providing additional clarity for distinguishing between specialty and non-

¹⁰ The term in-service rate as used in the 2012 TRM means the percentage of units rebated that are actually installed.

specialty lamps by referencing the Energy Independence and Security Act of 2007 (“EISA 2007”) lamp definitions and exclusions.

The *Tentative Order* references a mapping table for determining baselines for “specialty” bulbs. *Tentative Order*, p. 18. PPL Electric requests that more information be provided on this table, as it appears to be missing from the 2012 TRM. If the Commission intended to reference Table 2-43 in the 2012 TRM for “non-specialty” bulbs, PPL Electric recommends that the language in the *Tentative Order* be revised accordingly.

PPL Electric recommends removing footnotes 85 and 107 from the ENERGY STAR Lighting and ENERGY STAR LEDs measures which state that the In Service Rate (“ISR”) is subject to verification through evaluation. PPL Electric recommends that the ISR value be updated, if necessary, in future TRMs. The TWG would be an appropriate forum for this determination.

c. Implementation of Federal Legislation and Regulations Related to Residential Lighting

EISA 2007 introduced new minimum efficacy standards for general service bulbs, effectively phasing out current incandescent bulbs between 2012 and 2014. *Tentative Order*, p. 18. The Commission explained in the *Tentative Order* that the new standards are introduced January 1st of each of the associated years, starting with the 100 watt bulb in 2012, 75 watt bulb in 2013, and 60 watt and 45 watt bulbs in 2014. *Id.* The Commission proposes that the baseline for CFLs be updated per the EISA 2007 standards. *Id.*

PPL Electric supports the Commission’s concept for implementing EISA 2007 standards for CFL baselines, even though this change will reduce savings for 100 watt-equivalent CFLs by approximately 37%. However, PPL Electric believes this should be implemented beginning June 1, 2013, not June 1, 2012. PPL Electric agrees that the baseline changes should coincide

with annual TRM updates. However, to account for the stockpile effect described in the *Tentative Order*, a reasonable time between the effective date of EISA 2007 changes and the date those changes becomes effective for Act 129 EE&C is required. For the EISA 2007 change related to 100 watt-equivalent CFLs, PPL Electric recommends June 1, 2013 (*i.e.*, the 2013 TRM) as the effective date. This should allow sufficient time to address any accumulated stockpiling and for EDCs to incorporate the lower savings into their post-2013 EE&C Plans. Furthermore, it is not appropriate to reduce the savings in the fourth year of a four-year program because that provides insufficient time to modify the plan to make-up any shortfall.¹¹ Making this change effective June 1, 2013 would also be consistent with the Commission's recommendation for commercial lighting impacted by EISA 2007.¹²

3. Refrigerator and Freezer Retirement and Recycling

In the *Tentative Order*, the Commission explained that the 2010 and 2011 TRMs relied on the average of the results from seven evaluation studies to derive a deemed level of energy savings per recycled appliance. *Tentative Order*, p. 19. According to the Commission, both of these estimates relied on averages that may or may not accurately reflect conditions in Pennsylvania. The Commission, therefore, proposes that the TWG review the applicability of the California Appliance Recycling Program's regression model, based on in situ metering data, to update deemed savings values every year. *Id.*

PPL Electric generally agrees with the Commission's proposal to update deemed savings over time to reflect more accurate savings. However, this should be done only if there is reason

¹¹ PPL Electric hereby incorporates by reference its comments relative to the 2011 TRM regarding subsequent changes to the TRM, the potential impact of such changes on an EDC's Commission-approved EE&C Plan and the legal and policy issues associated with the application of subsequent TRM changes in verifying an EDC's compliance with Act 129. *See* Section IV, *infra*.

¹² *See e.g.*, *Tentative Order*, p. 21.

to believe the current savings is significantly inaccurate, the measure is a significant contributor to portfolio savings, the cost to determine more accurate savings does not exceed the benefit of more-accurate information, and the updated savings becomes effective with the beginning of an EE&C planning cycles, *i.e.*, do not change savings values mid-stream. In addition, PPL Electric recommends that the following statement, which was added to Section 2.22 of the 2012 TRM, Refrigerator/Freezer Recycling and Replacement, be added to Section 2.23, Refrigerator/Freezer Retirement (and Recycling): “This protocol applies to both residential and non-residential sectors, as refrigerator usage and energy usage are assumed to be independent of customer rate class.” 2012 TRM, p. 90. Further, the following should be included as a footnote to the aforementioned statement: “For example, non-residential rate class usage cases include residential dwellings that are master-metered, usage in offices or any other applications that involve typical refrigerator usage.” This recommendation reflects PPL Electric’s support of the Commission’s proposal to apply TRM measures according to usage characteristics rather than metered account sector.¹³

4. ENERGY STAR Appliances Default Fuel Mix

The Commission, in the *Tentative Order*, proposes the use of the default fuel mix, as described in Section 2.25, ENERGY STAR Appliances. *Tentative Order*, p. 20. The *Tentative Order* further states that, although the Commission proposes to include a default fuel mix in the TRM to address potential instances of fuel switching, it will still be necessary for EDCs to continue to collect data regarding instances of fuel switching. *Id.*

PPL Electric agrees with the Commission’s proposal to use the default fuel mix, as described in Section 2.25 of the 2012 TRM because it is accurate, simple and avoids costly

¹³ See Section II.C.4, above.

evaluation to determine the actual fuel mix. However, PPL Electric recommends that the Commission verify the energy savings value for ENERGY STAR dehumidifiers. The 2012 TRM provides a savings of 342 kWh for 54-75 pint dehumidifiers. However, the ENERGY STAR Calculator provides for 185 kWh in savings.

E. IMPROVEMENTS TO EXISTING COMMERCIAL AND INDUSTRIAL EE&C MEASURE PROTOCOLS AND PROCESSES

1. Clarification of Lighting Protocols

a. Implementation of Federal Legislation and Regulations Related to Commercial Lighting

The Commission proposes that the Energy Policy Act of 2005 and EISA 2007 standards for linear fluorescent bulbs and ballasts continue to be monitored in the TWG. *Tentative Order*, p. 22. PPL Electric agrees with the Commission's recommendation because it is a rational approach, given the early replacement nature of C&I lighting and customer and retail stockpiles of bulbs which will be phased out. PPL Electric would like to point out that a Department of Energy ("DOE") rule dictated linear fluorescent efficacy requirements, not EISA 2007, as stated in the *Tentative Order*.¹⁴

b. Modification of Usage Group Thresholds

In the *Tentative Order*, the Commission proposes to eliminate requirements for usage groups and proposes that EDCs determine when usage groups are most appropriate for each customer. *Tentative Order*, p. 23. Specifically, the Commission eliminated Table 3-1: Usage Groups Recommended per Building Type and Table 3-2: Hours of Use for Usage Groups from

¹⁴ *Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps*, 74 Fed. Reg. 34080 (July 14, 2009). The DOE rule is available at http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/74fr34080.pdf.

the 2012 TRM. The Commission also proposes that evaluators verify that EDCs are reasonably applying usage groups. *Id.*

PPL Electric appreciates the improvements and increased flexibility proposed in the 2012 TRM. However, the language in the *Tentative Order* does not align with that in the 2012 TRM. The *Tentative Order* proposes to eliminate the requirement for usage groups; however, at the same time, the 2012 TRM states that fixtures should be separated into usage groups for projects with connected load savings greater than 20 kW. See Section 3.2.6 of the 2012 TRM (Quantifying Annual Hours of Operation). PPL Electric recommends revising the TRM language to clearly indicate that usage groups should be considered, but are not required. This would align the TRM with the proposal set forth in the *Tentative Order* and would lessen the significant impact that a usage group requirement would have on the implementer's systems, processes and costs.

c. Determination of Hours of Use and Coincidence Factor

The *Tentative Order* proposes that additional flexibility be built into the C&I lighting measure such that sufficient means of documentation can serve as an alternative source for determining hours of usage for a particular building. *Tentative Order*, p. 23. In addition, the Commission proposes that flexibility be introduced to calculate custom coincidence factors, if hours of operation are determined for a site, using the non-weather dependent coincident peak demand calculator, which calculates demand by weighting time bins according to when the top 100 hours are most likely to occur based on historical data. *Id.*, p. 24.

PPL Electric agrees with the additional flexibility proposed for determining HOU for facilities with operating hours which vary significantly from the default values in the TRM. The stipulated HOU in the existing TRM significantly underestimates savings for these types of

facilities and could be modified only through metering, which is costly, takes time and is intrusive to customers. PPL Electric supports the proposed use of the non-weather dependent coincident peak demand calculator for calculating custom a Coincidence Factor (“CF”) when using non-stipulated HOU for a site. This tool, however, should be included as an appendix to the 2012 TRM.

d. Modification of Metering Requirements for Lighting Projects

The *Tentative Order* proposes metering requirements for the evaluation of C&I lighting projects for high impact and high uncertainty projects. *Tentative Order*, p. 24. High impact projects are those with connected load savings of over 200 kW. High uncertainty projects are those where hours are variable and/or are difficult to ascertain and can be determined at the discretion of the evaluator. *Id.*

PPL Electric agrees with limiting the metering requirement to projects with high savings impact or HOU that differ significantly from TRM default values given the high cost, logistical complications, and the inconvenience (a minimum of two site visits to install and remove light logging equipment) to the customer caused by metering. In addition, PPL Electric provides the following miscellaneous recommendations regarding lighting:

- PPL Electric recommends updating or removing footnote 125 in the 2012 TRM, because it is outdated. The footnote states that: “This value was agreed upon by the Technical Working Group convened to discuss updates to the TRM. This value is subject to adjustment for the 2012 Update based on implementation feedback during PY2 and PY3.” Footnote 125 applies to the following statement: “Actual wattages of fixtures determined by manufacturer’s equipment specification sheets or other independent sources may not be used unless (1) the wattage differs from the Standard Wattage Table referenced wattage by more than 10% ...”.
- PPL Electric recommends updating or removing the outdated note pertaining to Table 3-4 on p. 157 of the 2012 TRM. The note states as follows: “* Coincidence Factors were not agreed upon prior to release of this document in January 2011.”

- PPL Electric recommends deleting “fluorescent” from the “Lighting Control Adjustments” section on p. 160 of the 2012 TRM. According to the 2012 TRM (p. 160) controls can be applied to other types of fixtures as well: “If a lighting improvement consists of solely lighting controls, the lighting fixture baseline is the existing fluorescent fixtures with the existing lamps and ballasts or, if retrofitted, new fluorescent fixtures with new lamps and ballasts as defined in Lighting Audit and Design Tool shown in Appendix C.”
- PPL Electric requests clarification as to whether the following statement from the New Construction and Building Additions section on p. 151 of the 2012 TRM, applies only to exterior lighting: “HOU and CF values are the same as those shown in Table 3-4 for dusk-to-dawn lighting unless shorter hours are required by ASHRAE or the fixtures are demonstrated to operate longer hours for signage or shading (as in a parking garage).” The quoted text appears to apply only to exterior lighting; however, the Company requests clarification to confirm this interpretation.
- Regarding Appendix C – Lighting Audit and Design Tool:
 - PPL Electric recommends adding fixture codes to the Appendix C Wattage Table for lighting products commonly submitted by contractors on specification sheets, *i.e.*, for fixtures not currently in Appendix C. One example is a 6-lamp 221 watt high light output T8 fixture (GE632MAX-H90, product code 74117). PPL Electric can provide additional examples upon request. This would help to simplify the customer’s application for retrofit lighting.
 - PPL Electric recommends adding the new Building Types from Table 3-4 to the corresponding lookup table in Appendix C.
 - PPL Electric recommends removing reference to the 50 kW usage group threshold from definition for Facility Type in the Appendix C Glossary.
 - PPL Electric recommends that the following line be removed from the manual for Appendix C: “This tool is required for projects over 20 kW of connected load savings to facilitate calculation of savings pursuant to the PA TRM. It is not required for projects under 20 kW of connected load savings.” Otherwise, the use of Appendix C for projects under 20 kW should be strongly recommended. Doing so would help to prevent customer confusion or pushback against EDC requirements, since some EDCs require its use for projects of all sizes.
 - PPL Electric also recommends clarifying Appendix C, Lighting Audit and Design Tool, so that it aligns with the proposed language and requirements in TRM. For example, the Manual tab in Appendix C currently states that facility interviews, logging, or published evaluation reports can be used to document HOU, whereas the 2012 TRM states that facility interviews,

posted hours, or metered data can be used. Logging should be required only for high impact or high uncertainty projects, per the TRM, and the meaning of “published evaluation reports” is unclear.

2. Clarification of Motor and Variable Frequency Drive (“VFD”) Protocols

a. Determination of Energy Savings Factor and Demand Savings Factor Values for Baseline Conditions for Non-Constant Volume Systems

The Commission proposes expanding the VFD measure so that savings for other baseline systems, such as inlet guide vane and discharge damper systems, can be quantified using the TRM. *Tentative Order*, p. 25. In the absence of primary data collection, the Commission proposes that the EDC research secondary sources to inform the stipulated energy and demand savings variables. *Id.* PPL Electric agrees with the inclusion of the inlet vane baselines and the expansion of the measure to include other baselines.

b. Metering Requirement for Motors and VFD Projects

The Commission proposes that all motors under a certain threshold be eligible for deemed savings according to the TRM measures to appropriately balance cost and rigor. *Tentative Order*, p. 25. The Commission also proposes that the TWG conduct additional research to examine and propose an appropriate baseline for motor replacements. *Id.* Based on its research, the TWG is to provide recommendations for an appropriate baseline to the Commission during future TRM updates.

PPL Electric agrees with simplifying the metering requirements for motors and VFD projects. This change will reduce the need to process projects with small savings following a custom methodology, which is costly and administratively burdensome for the customer and the EDC. However, PPL Electric believes that the metering threshold levels should be determined at the discretion of the EDC evaluator. These thresholds would be presented in PPL Electric’s

updated Evaluation Plans for the Efficient Equipment and Custom Programs and approved by the Statewide Evaluator (“SWE”).

In addition, PPL Electric provides the following miscellaneous recommendations regarding motors and Appendix D, Motor and VFD Audit and Design Tool:

- In the lookup table for EFLH, Appendix D, motors, the hours have decimals for HVAC fan applications. PPL Electric suggests adjusting these hours to align with those in the corresponding TRM Table 3-15.
- PPL Electric suggests combining facility types for “Hospitals & Healthcare – HVAC” and “Hospitals & Healthcare – Pumps” into one facility for “Hospitals & Healthcare,” for consistency with the other facility types and the TRM.
- Regarding the table labeled “Post-Installation Data (Equipment Survey of Proposed Motors),” only the first row formula for post-installation peak kW is multiplied by DSF. However all of the post-installation peak kW cells should be multiplied by DSF.
- Regarding post-installation line item 7, the formula is missing for Total kWh (cell V39).
- Correction appears to be needed to array reference for base motor efficiency in order to accurately calculate the savings. For example, a pre-installation motor of 200 HP, 3600 RPM, and ODP type in PY4 shows a nominal efficiency of 95.8% instead of 95.0%.

3. Clarification of HVAC Protocols

a. Addition of Sources to Table 3-19: Variables for HVAC Systems

The Commission proposes the use of an 80% CF for both HVAC and chiller measures, which is an average of CF values found in other TRMs. *Tentative Order*, p. 26. PPL Electric agrees with revising HVAC CF values to reflect average CF values found in other TRMs. However, it should be noted that CF appears to be the only HVAC variable to currently use engineering estimates, whereas the *Tentative Order* states that this is the case for several variables. Implementing this change will have the effect of increasing demand savings for HVAC systems (CF would increase to 80% from 67% in 2011 TRM) and decreasing demand

savings for Chiller systems (CF would decrease to 80% from 90% in 2011 TRM). This change would also require revisions to PPL Electric's tracking system and calculation spreadsheets.

In addition, PPL Electric provides the following miscellaneous recommendations regarding HVAC:

- PPL Electric recommends adding the same footnote to Packaged Terminal Systems in New Construction as used for Replacement. The footnote, which was present in both places in the 2011 TRM, reads: "Cap represents the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7,000 Btu/h, 7,000 Btu/h is used in the calculation. If the unit's capacity is greater than 15,000 Btu/h, 15,000 Btu/h is used in the calculation." This recommendation would apply to all TRM sections using the same table, such as HVAC Systems, Chiller Systems, and Geothermal Systems.
- PPL Electric recommends that the Commission correct Tables 3-21 and 3-25. Specifically, as applicable to the Waste Water Treatment Plant values, the cooling EFLH shown for each Pennsylvania reference city should be revised to align with the 2011 TRM values. In the proposed 2012 TRM, the cooling EFLH for this Building Type appear to have been overwritten with the heating EFLH.
- PPL Electric recommends that the introductory text in Section 3.6 concerning ground source, groundwater source, and water source heat pumps points to Section 3.18 in the TRM where those systems are addressed.

b. Determination of Heat Pump Baselines

The Commission proposes adjusting all baselines for water-source, ground-source and groundwater-source heat pumps to include the incremental efficiency gains over air-source heat pumps. *Tentative Order*, p. 27. PPL Electric supports the Commission's proposal to adjust the baselines for Geothermal systems. The Company notes that if implemented, this change will correct the savings algorithm for Ground Source Heat Pumps.

In addition, PPL Electric provides the following miscellaneous recommendations regarding motors applicable to Geothermal HVAC Systems:

- PPL Electric recommends adding a note to Table 3-6: Default Baseline Equipment Efficiencies, to indicate the ASHP baseline for geothermal systems. In the proposed 2012 TRM, the only baselines shown for these systems are the

code efficiencies for equivalent geothermal systems. This recommendation would apply to all TRM sections utilizing this table, including HVAC Systems and Chiller Systems.

- PPL Electric recommends adding all three types of geothermal systems, rather than one or two, to the definitions for EER and COP to prevent confusion.
- In Table 3-62, for the BtuHheat variable, PPL Electric recommends changing “CAPYcool” to “BtuHcool” in the statement that reads, “Use CAPYcool if the heating capacity is not known.” This will prevent confusion, since the term CAPYcool is not used in this measure.
- PPL Electric recommends correcting the references in Table 3-62 for SEER, EER, HSPF, and COP from Table 3-21 to Table 3-20, and for η_{eepump} change “See Table 2” to Table 3-64.
- PPL Electric recommends replacing the default “HOURSbasepump” and “HOURSeepump” values of 8,760 hours with “EFLHcool + EFLHheat” in Table 3-62. This change would provide a more accurate estimate of ex-ante savings.

F. DEMAND RESPONSE

The Commission proposes the inclusion of a new demand response or peak load reduction section. *Tentative Order*, p. 28. PPL Electric agrees with the proposed demand response measure in Section 4 of the 2012 TRM. PPL Electric notes that there are some operational and evaluation details that need to be resolved. PPL Electric recommends that it is more appropriate to resolve these details via SWE Guidance Memos, the Audit Plan or in EDC Evaluation Plans, rather than in the TRM. For example, the fundamental premise of a customer baseline (for purposes of load curtailment programs) is that it should represent “normal” load, *i.e.*, load which would have occurred, but for actions taken to reduce load. To ensure this premise holds true, EDCs need to make sure that PJM and Act 129 baselines do not include event days called for by Act 129 or by PJM. In addition, when PJM and Act 129 events are called on the same day, but not at the same time, steps need to be taken to assure that activation of one program in the adjustment window of the other program does not cause that program’s

performance to be reduced. The existing TRM appears to address the issue of not counting PJM event days in Act 129 baseline days, but PJM rules may need to be changed to do the same.

PPL Electric recommends adding the following to Section 4 of the 2012 TRM: “The top 100 hours during June 1 - September 30 shall exclude weekends, holidays, weekdays before 12:00 PM, and weekdays after 8:00 PM.” This language is recommended for three reasons. First, since the TRM requires the use of PJM procedures for determining the magnitude of the demand response reductions (such as load curtailment and direct load control), it is reasonable to define the applicable peak times consistent with PJM’s definition of “peak periods.”¹⁵

Second, this definition of “peak hours” is consistent with Table 1.1 in the TRM “Periods for Energy Savings and Coincident Peak Demand Savings.” Since peak load reductions from energy efficiency measures (lighting, HVAC, *etc.*) and demand response measures (direct load control and load curtailment) both contribute toward an EDC’s peak load reduction target, the definition of applicable “peak hours” must be consistent for demand response measures and for energy efficiency measures.

Third, with the exception of the 8:00 AM to 12:00 PM time period, an EDC cannot reasonably be expected to staff their Act 129 programs during most of those excluded timeframes. It would not be a prudent additional expense to require EDCs to staff the excluded hours to monitor load and determine if Act 129 events shall be called.

G. SECTION 1.11 - VERIFIED GROSS ADJUSTMENTS

PPL Electric also recommends modifying the methodology proposed in Section 1.11 of the 2012 TRM for calculating “Verified Gross Adjustments.” PPL Electric suggests allowing “independent evaluator judgment” to determine if the excess quantity is due to spillover (which

¹⁵ PJM Manual 18: PJM Capacity Market Operations, page 29.

would be handled via the net-to-gross analysis) or if it is due to customer error in filling out the rebate application correctly. Some examples of such errors are transposing numbers on a rebate application for measure counts, forgetting to include a measure on an application or a line item on a lighting spreadsheet, *etc.* Notably, inaccurate measure quantities due to customer error would be adjusted through the realization rate.

IV. IMPACT OF SUBSEQUENT REVISIONS TO THE TRM ON PREVIOUSLY APPROVED EE&C PLANS

As addressed above, PPL Electric has identified technical issues related to the 2012 TRM. Although PPL Electric generally supports the proposed changes set forth in the 2012 TRM, PPL Electric maintains its previously presented legal arguments relative to the Commission's use of the TRM process to modify the Company's Commission-approved EE&C Plan and the potential adverse affect that the TRM process could have on an EDC's compliance with Act 129. PPL Electric incorporates by reference its previously stated legal arguments on these issues.¹⁶

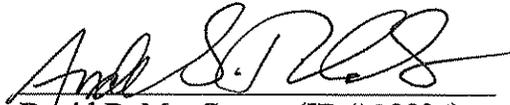
In short, PPL Electric does not oppose the Commission's annual review and updating of the TRM. However, it is PPL Electric's position that the Commission may not require that subsequent revisions to the TRM be applied to previously approved EE&C Plans without following established procedures, particularly where any proposed revisions would jeopardize an EDC's ability to comply with Act 129.

¹⁶ Specifically, PPL Electric incorporates the legal arguments contained in the "Comments of PPL Electric Utilities Corporation" filed on December 27, 2010 at Docket No. M-00051865, pp. 29-46 (as applicable), and its Petition for Review of the Order approving the 2011 TRM.

V. CONCLUSION

For all of the reasons stated above, PPL Electric Utilities Corporation recommends that the Public Utility Commission proceed with development of the 2012 TRM consistent with PPL Electric Utilities Corporation's comments.

Respectfully submitted,



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