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File #: 140069

October 15, 2013

VIA ELECTRONIC FILING

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 2014 Update - Docket Nos. M-2012-2313373 & M-00051865

Dear Secretary Chiavetta:

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

Respectfully submitted,

Andrew S. Tubbs

AST/jl
Enclosure

cc: Megan G. Good (*Via E-Mail*)
Kriss E. Brown (*Via E-Mail*)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Implementation of the Alternative Energy Portfolio Standards of 2004: Standards for the Participation of Demand Side Management Resources - Technical Reference Manual 2014 Update	Docket Nos.	M-2012-2313373 M-00051865

COMMENTS OF
PPL ELECTRIC UTILITIES CORPORATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

I. INTRODUCTION

By Tentative Order entered September 13, 2013, the Pennsylvania Public Utility Commission ("Commission") requested comments on the proposed 2014 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 2014 revisions to the TRM ("2014 TRM").

PPL Electric generally agrees with many of the changes proposed in the 2014 TRM. However, the Company has identified some areas that it believes require modification and/or clarification. Further, although PPL Electric generally supports the proposed changes set forth in the 2014 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 Energy

[1] *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual 2014 Update* (Order entered September 13, 2013), Docket Nos. M-2012-2313373 and M-00051865 ("*Tentative Order*").

Efficiency & Conservation plan ("EE&C Plan")[2] and the potential effects that the TRM process could have on an electric distribution company's ("EDC") cost and compliance with Act 129. PPL Electric incorporates by reference its previously stated legal arguments in this docket on these issues.[3]

II. PPL ELECTRIC'S COMMENTS ON THE 2014 TRM UPDATE

PPL Electric provides specific technical comments on the proposed modifications contained in the proposed 2014 TRM. As noted above, the Commission undertakes an annual review and update of the TRM. PPL Electric generally 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. However, the proposed revisions to the 2014 TRM are the most-extensive of any yearly TRM revision to date. Almost every measure has undergone some type of change, including the fully deemed savings value for a measure, changes to an algorithm or method for determining the savings of a measure, changes to a baseline, changes to stipulated values in an algorithm, changing from fully stipulated savings to an algorithm, and changing from stipulated variables to site-specific variables in an algorithm.

PPL Electric appreciates the Commission's effort to improve the accuracy of savings estimates and generally agrees that the proposed changes will improve the accuracy of the savings estimates. However, PPL Electric recommends that future extensive revisions of the

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[2] *See, e.g., 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; *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan* (Order Entered February 17, 2010), Docket No. M-2009-2093216; *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan* (Order Entered May 6, 2011), Docket No. M-2009-2093216.

[3] 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.

TRM should coincide with the beginning of an EE&C Phase in time for EDCs to incorporate the extensive changes into their EE&C Plan for that phase. Extensive revisions to the TRM in the second year of a three-year EE&C Plan are very disruptive to the momentum of programs, confusing to customers and trade allies, and are costly to implement. This is especially true following the significant effort and costs incurred by EDCs to design and launch new programs less than three months ago. Nearly every proposed change in the 2014 TRM will impact PPL Electric's EE&C Plan programs, measures, savings, tracking system, and other Phase 2 implementation details. To address these impacts, PPL Electric will need to revise its existing Phase 2 EE&C Plan to modify program design, eliminate or modify some energy efficiency measures, and change rebates. In addition, the changes to the 2014 TRM will increase the amount and the type of data that must be collected from customers, increase the number of site visits to obtain or verify site-specific information, cause changes to some CSP contracts, and significantly change the Company's tracking system and CSP systems (savings calculations, data collected, etc.). To avoid or minimize these impacts on an EDC's EE&C Plan, PPL Electric recommends that future "mid-phase" updates to TRM should be limited and consider the potential impacts on currently operating EE&C Plans. This will help to reduce the cost of implementing EE&C Plan programs, minimize customer and trade ally confusion, and improve continuity and momentum in the market.

In the following sections PPL Electric provides its technical comments on proposals contained in the *Tentative Order*, PPL Electric has organized its technical comments by TRM Section. Most of the comments are suggestions to improve the clarity of a TRM protocol or are obvious corrections. PPL Electric does not provide technical comments on every Commission proposal.

A. GENERAL IMPROVEMENTS

PPL Electric recommends changing "Custom Measure Protocols (CMP)" to "Site Specific M&V Protocols (SSMVP)" throughout the TRM. Custom Measure Protocols are no longer used, consistent with the SWE's Evaluation Framework (previously titled as the Audit Plan).

1. TRM Section 1.3- Definitions

PPL Electric recommends the Commission ensure consistency between definitions in the TRM and other documents such as Evaluation Framework and Quarterly/Annual Reports. For example, the term "EDC Reported Gross Savings" in the TRM should include "also known as ex-ante savings" in the definition. Also, the term "EDC Estimated Savings" should be deleted from the TRM definitions because is not used in TRM. Also, the term "Retrofit on Burnout" in the TRM should be changed to "Replace on Burnout" to be consistent with other Pennsylvania documents and industry references, and to avoid confusion with the term "Retrofit Measure." PPL Electric also recommends that the term "Verified Savings" should be changed to "Verified Gross Savings" to ensure consistency with other savings terms (on a gross, not a net basis).

2. TRM Section 1.1- Purpose

PPL Electric suggests adding "annualized energy" and "peak demand savings" to the second sentence in the second paragraph of Section 1.1--"The algorithms in this document focus on the determination of the per unit ***annualized energy*** savings ***and peak demand savings*** for the energy efficiency measures." [emphasis added]. These additions will clarify that all energy savings for the protocols are annualized values, which is on the same basis as the energy savings compliance target (kWh/yr or MWh/yr), and that the TRM is also used to determine peak demand savings. In addition, PPL Electric suggests that all references to energy savings

throughout the TRM should state "annualized energy savings" or kWh/yr". Currently, some are stated as kWh and some as kWh/yr

3. TRM Section 3.2.6- Quantifying Annual Hours of Use (for non-residential lighting retrofits)

The Commission proposes that all non-residential lighting projects with an expected energy savings greater than 500,000 kWh/yr must be metered to determine hours-of-use (and energy savings). For the reasons set forth below, PPL Electric recommends changing the metering threshold from 500,000 kWh/yr to 1,000,000 kWh/yr because the proposed threshold will result in excessive and costly collection of site-specific data, primarily light logging to determine hours-of-use (HOU), that outweighs the possible benefit of improved accuracy. In addition, PPL Electric recommends clarifying whether the metering applies to all projects above the threshold or only to those projects in the evaluation sample (where the sample is selected from the population of projects above the threshold).

The existing threshold for logging HOU is a lighting project with a change in connected load greater than 200 kW. Under the existing metering threshold, approximately 7 lighting projects would require metering per program year. Pursuant to the proposed metering threshold, PPL Electric estimates that approximately 60 lighting projects would be metered per program year[4], an increase of over 800% compared to the existing threshold. At an estimated cost of $7,000[5] per project to develop a site-specific measurement and verification plan, schedule and coordinate site visits, time and expenses to install light loggers, time and expenses to remove light loggers, QA/QC of the light logging data, analyze the results for a large lighting project,

[4] This is based on Program Year 4 non-residential lighting projects, which PPL Electric believes are representative of Phase 2 lighting projects,

[5] 3 people x 8 hours (including travel time) x 2 site visits (install & remove) x $100/man-hour = $5000 for the site visits alone. The cost of the loggers, preparation time, and the analysis of results by the implementer and the evaluator are additional costs.

and write-up the evaluation report, the additional cost to meet the proposed threshold is approximately $420,000 per program year and over $800,000 for the remaining two program years. That estimate is only for commercial lighting retrofit projects and, since the metering threshold applies to other measures and programs, the additional cost will likely be higher. PPL Electric believes it is more prudent to spend that money on rebates and incentives, instead of additional evaluation rigor.

The benefit of this metering is intended to be higher accuracy.[6] However, the higher accuracy does not warrant a guaranteed increase in cost of over $800,000 (for lighting alone). In addition, the installation and removal of metering (light loggers) is intrusive to customers. The loggers usually require the customer to dedicate 1 to 2 full days to escort the installer throughout the customer's facility and to provide access to install and remove the loggers.[7]

PPL Electric proposes to change the metering threshold to 1,000,000 kWh/yr. Approximately 21 commercial lighting projects per year would require metering at that threshold, compared to 7 under the current threshold and 60 under the threshold proposed by the Commission. It is PPL Electric's position that this is a more reasonable balance between cost, customer intrusion, and savings accuracy.

PPL Electric also recommends that if both ex-ante and ex-post savings are to be calculated using site specific inputs for projects above the threshold, the metering requirements be limited to the determination of ex-post savings. Methods for estimating site specific inputs for ex-ante savings should be left to the discretion of the EDC.

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[6] "Accuracy" in this context means the savings are based on site-specific hours of use, instead of TRM default HOU values for the comparable building type and space type for a non-residential lighting project. The site-specific HOU is intended to improve the accuracy of the savings estimate.

[7] The projects that meet the metering threshold are usually large facilities with a lot of light fixtures, various space types, and therefore require a lot of light loggers.

B. RESIDENTIAL EE&C MEASURE PROTOCOLS

1. TRM Section 2.1- Electric HVAC Protocols

PPL Electric recommends that the Commission add PPL Electric-specific equivalent full load hours (EFLH) for Williamsport and Philadelphia in Tables 2-2 and 2-3 since PPL Electric has customers with zip codes that map to those cities. In addition, PPL Electric recommends that the Commission add EDC data gathering as an option for HSPFm, in Table 2-1. This addition would ensure consistency with other variables, such as SEERm and EERm, for air source heat pumps and central air conditioning maintenance. Finally, PPL Electric recommends changing T_{hot} (hot water temperature) in Table 2-1 from 124 degrees to 123 degrees to ensure consistency with Table 2-4.

2. TRM Section 2.3- Efficient Electric Water Heaters

The simplified deemed savings algorithm in Section 2.3.5 appears to have an error. If the same open variables are used in the algorithms in Section 2.3.5 and 2.3.2, the algorithms produce materially different savings results. In addition, PPL Electric requests that the Commission clarify which of these algorithms should be used, or if the EDC has the option of using either algorithm.

3. TRM Section 2.4- Electroluminescent Nightlight

The deemed savings in the first table (not numbered) in this protocol and shown in Section 2.4.1 use the incorrect ISR (in-service rate). The ISR should be updated from 84% to 96% in accordance with the ISR for CFLs. PPL Electric also recommends adding EDC data gathering as an option for determining the ISR in Table 2-6 because the definition in section 2.4.2 states that ISR is "to be revised through surveys."

4. TRM Section 2.5- Furnace Whistle

The "EFLH" variable in Section 2.5.2 and in Table 2-7 should be defined separately as "$EFLH_{cooling}$" and "$EFLH_{heating}$" to match the variables in the updated algorithm.

5. TRM Section 2.6- Heat Pump Water Heaters.

In Section 2.6.6 titled "deemed savings", the term "heat pump water heater" was incorrectly replaced with "efficient electric water heater", which is a different measure in the TRM.

The TRM protocol includes two different algorithms (Sections 2.6.6 and 2.6.2) to estimate savings and includes fully stipulated deemed savings values for two Energy Factors in the table in Section 2.6. PPL Electric requests that the Commission clarify which of the algorithms should be used, or if the EDC has the option of using either algorithm or the fully stipulated deemed savings. In addition, the algorithm in Section 2.6.6 does not replicate the fully stipulated deemed savings values in the table in Section 2.6 for either of the Energy Factors listed. Therefore, it is unclear if the stipulated deemed savings values or the algorithm are incorrect.

The Unit Energy Savings shown for 2.3 Energy Factor has a typographical error. The savings should be 1,774 kWh/yr, not 1.774.

6. TRM Section 2.7- LED Nightlight

The deemed savings in the first table (not numbered) in this protocol and shown in Section 2.7.3 use the incorrect ISR (in-service rate). The ISR should be updated from 84% to 96% in accordance with the ISR for CFLs. PPL Electric also recommends adding EDC data gathering as an option for determining the ISR in Table 2-18 because the definition in section 2.7.2 states that ISR will be reconciled through survey activities.

7. TRM Section 2.8- Low Flow Aerators

The Commission should clarify if EDCs can use the fully deemed savings value listed in the Table at the top of this protocol as a default or if EDCs must use the algorithm (supported by site-specific data gathering) to calculate savings. A similar protocol for low flow showerheads (2.9) has no fully deemed savings value. Further, the average time of hot water usage per person per day for the "unknown" installation location appears to be incorrect. PPL Electric requests that the Commission clarify whether it should be a weighted average of kitchen and bathrooms instead of the sum of the kitchen and bathroom values.

The algorithm for kW (kW = ISR x Energy Impact x F_{ED}) is incorrect because it applies ISR to the energy impact but the energy impact (i.e. the kWh/yr savings) already includes ISR. Therefore, ISR should not be in the kW algorithm or it will be double counted.

8. Section 2.9- Low Flow Showerheads

The naming convention of variables in the algorithm should be corrected to match those in Table 2-20. For example, "Npersons" in the algorithm is listed as "People" in the table. Similar corrections are required for "S/home" (listed as "Showers" in the table) and for "EnergyToDemandFactor" (listed as "F_{ED}" in the table).

9. TRM Section 2.12- Smart Strip Plug Outlets

The measure life needs to be updated in Appendix A to align with Section 2.12.

10. TRM Section 2.14- Electric Water Heater Pipe Insulation

PPL Electric suggests adding a six foot default value for the length of insulation as an option. This provides an EDC with an option to use the default in lieu of requiring customers (or CSPs) to measure the length at each site, providing that value with their rebate application, and requiring EDC evaluators to verify the length via a site visit or phone survey. Those steps are intrusive to customers, unnecessarily costly for evaluators, and do not seem warranted given the

relatively low savings for this measure (approximately 50 kWh/yr) and the very small contribution to portfolio total savings. The six foot length is based on the typical length of un-insulated, accessible hot water piping above an electric water heater.[8]

11. TRM Section 2.16- Ductless Mini Split Heat Pumps

PPL Electric recommends adding a table with EDC-specific EFLH (reflecting housing demographics) as an alternative to default EFLH and EDC billing analysis. This change would mirror the proposed change to the Residential HVAC protocol, although secondary EFLH would also be required for this measure. In addition, PPL Electric recommends updating the language in Section 2.16.6 from "verification of installation coupled with assignment of stipulated energy savings" to "verification of installation coupled with EDC data gathering" since savings are not stipulated for this measure.

PPL Electric recommends changing SEERb for room air conditioners to 11.3 instead of 11 as currently shown in Table 2-29. Doing so would result in an EERb value of 9.8, when used in the conversion "(11.3/13) x SEERb" provided in Table 2-29. The 9.8 EERb value would match the EERb value specifically provided in the Table for room air conditioners. Finally, SEERb of 11.3 would align with the value provided in Section 3.19 Ductless Mini-Split Heat Pumps- Commercial < 5.4 tones, Table 3-68.

12. TRM Section 2.17- Fuel Switching, Domestic Hot Water

For clarity, as this protocol applies to fossil fuels in addition to natural gas, PPL Electric recommends renaming Measure Name in the table in Section 2.17 from "Fuel Switching DHW Electric to Gas" to "Fuel Switching DHW Electric to Fossil Fuel Water Heater". The same change is recommended for the title of Table 2-31.

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[8] There is no, documented reference for this length. The six foot length is based on PPL Electric's judgment and is likely low.

13. TRM Section 2.18- Fuel Switching, Heat Pump Water Heater

For clarity since this protocol applies to fossil fuels in addition to natural gas, PPL Electric recommends renaming "Measure Name in the table in Section 2.17 from "Fuel Switching Heat Pump Water Heater to Gas Water Heater" to "Fuel Switching Fuel Switching Heat Pump Water Heater to Fossil Fuel Water Heater". The same change is recommended for the title of Table 2-37. PPL Electric also recommends reinstating the footnote from Table 2-35 regarding Energy Factor value for fossil-fuel tankless water heater. Removing that footnote implies that tankless fossil fuel water heaters are ineligible replacements for a heat pump water heater.

14. TRM Section 2.19- Fuel Switching Electric Heat to Gas/Propane/Oil Heat

PPL Electric recommends replacing all instances of "gas" and "natural gas" with "fossil fuel" to reflect the expanded eligibility of those fuel types. This change applies to language in Sections 2.19.1, 2.19.2, and Table 2-38. PPL Electric also recommends utilizing the Interim TRM Protocol's separate algorithms for electric baseboard heaters and electric furnaces because EFLH variables in those algorithms will now be specific to the type of heating system.

The algorithms in Section 2.19 need to be updated with EFLH variables that align with the new variable names as shown in Definitions Section 2.19.2.

For ASHP and electric furnace units, the motor consumption of the new gas furnace is subtracted from the savings for the electric unit in the proposed TRM. PPL Electric believes this subtraction is not relevant because the existing system also has a fan motor with similar electric consumption. PPL Electric recommends removing the subtraction of the natural gas furnace motor consumption and adding the following language, consistent with Section 3.40- Fuel Switching: Commercial Electric Heat to Natural gas/propane/oil heat: "The motor consumption

of a gas furnace is subtracted from the savings for a baseboard heating system, as this existing system does not require a fan motor while the replacement furnace does (the electric furnace and air source heat pumps require fan motors with similar consumption as a gas furnace and thus there is no significant change in motor load)."

15. TRM Section 2.20- Ceiling/Wall Insulation

The default value for Rwall,ee is 9.0 based on DOE recommendation to add R-6 to Rwall,bl. Since Rwall,bl increased from 3.0 to 5.0, PPL Electric recommends increasing Rwall,ee to 11.0 (i.e. Rwall,bl 5.0 + 6.0).

16. TRM Section 2.21- Refrigerator/Freezer Recycling with and Without Replacement

PPL Electric recommends adding the following to this TRM protocol: "The quantity of recycled appliances that are replaced shall be determined using the UMP protocol methodology for program-induced replacement." This statement will clarify that the appliance replacement rate is determined in accordance with UMP. Using the UMP to determine the replacement rate is consistent with the other aspects of the TRM protocol that follow the UMP. In addition, the TRM protocol should state: "Since the UMP applies the impact of program induced replacements as a net savings adjustment and Pennsylvania's compliance target is on a gross savings basis, Evaluation Contractors will have to calculate the UMP-determined induced replacement impact separately from free-ridership and apply it to gross verified savings."

Further, PPL Electric recommends that the Commission clarify that the term "NET" in Equation 2 (Section 2.21.1) does not mean net savings (i.e. free-ridership and spillover) and clarify that the term "NET" is intended to be the difference in energy consumption between the recycled appliance and the replacement appliance. Also, PPL Electric recommends clarifications/corrections to Tables 2-46, 2-47, 2-48, and 2-49. These tables are titled "Deemed

Savings Values" but the deemed savings are not included in these tables. The tables include variables, such as estimated UEC savings, that are used in the algorithm, but do not include the deemed savings (energy or peak load reduction) that result from the algorithm. Deemed savings values for kWh/yr and kW should be added to each table. Also, deemed kW savings are not provided and the protocol does not include an algorithm for calculating kW savings. It is unclear how to apply the statement "Per unit kW demand savings are based upon annual hours of use of 5,000 and a peak coincidence factor of 62%." In addition, the source reference for the UMP can be updated because the UMP protocol was finalized April 2013 (www.eere.doe.gov/ump).

17. TRM Section 2.23- Energy Star Refrigerators

Appendix A shows a 12 year measure life but the protocol shows both a 12 and 13-year measure life. Also, the Commission should clarify the intent of the most-efficient side-mount configuration because it is included in Table 2-55 but was deleted from Table 2-56.

18. TRM Section 2.26- Energy Star Dishwashers

PPL Electric requests that the Commission clarify which default fuel mix is correct for this measure. Table 2-65 shows 43% and Table 2-66 shows 42%.

PPL Electric also requests that the Commission clarify which measure life is correct. Appendix A and the Table in Section 2.26 show 11 years and Section 2.26.3 shows 10 years.

19. TRM Section 2.28- Energy Star Room Air Conditioners

PPL Electric requests that the Commission clarify which measure life is correct. The table (unnumbered) and Appendix A show 9 years but Section 2.28.3 shows 10 years.

20. TRM Section 2.29- Energy Star Lighting (CFLs)

PPL Electric recommends clarifying the protocol to state that ISRcfl (in-service rate per CFL) can be used as a default for all CFLs covered by this protocol and the in-service rates for each CFL type listed in the protocol (ISR- torchiere, ISR- indoor fixture, ISR- outdoor fixture,

and ISR- ceiling fan fixture) are optional. Since most CFLs covered by this program are provided by an upstream discount type program, EDCs do not know the specific customers who purchased the discounted CFLs and do not know the type of fixture where the CFL is installed. Therefore, it is not practical to use the specific in-service rates nor cost-effective to verify them.

PPL Electric believes the algorithm for Ceiling Fan with ES Light Fixture is incorrect. The algorithm contains (1 – IE) but algorithms for all other fixtures use (1 + IE). PPL Electric also requests that the Commission clarify the source for IE in Table 2-73. The source for IE is labeled "6" in the table but there is no source #6 listed below the table. The correct source is likely GDS simulation which is labeled as source #7 below the table. In addition, PPL Electric recommends adding language to this protocol that was added to the LED protocol regarding the use of existing lamp wattage for direct install programs. Further, it is recommended that the Commission add guidance, such as "use manufacturer-rated wattage for determining the baseline for a bulb that is not General Service and is not on the DOE list." This will clarify the baseline requirements for bulbs such as candelabras that do not have a medium screw base.

21. Section 2.33- Energy Star Televisions

The table names and column headings for Tables 2-82 and 2-83 should be corrected as they continue to reference version 5.3 instead of 6.0. However, PPL Electric notes that the savings values in these tables are updated to reflect 6.0. PPL Electric also notes that the measure life listed in the protocol is 6 years but is 15 years in Appendix A.

22. Section 2.35- Energy Star LEDs

Interactive factor (IE) is missing from the algorithm. Also, the source for IE is mislabeled in Table 2-86.

PPL Electric recommends adding guidance, such as "use manufacturer-rated wattage for determining the baseline for a bulb that is not General Service and is not on the DOE list." That

will clarify the baseline requirements for bulbs such as candelabras that do not have a medium screw base.

23. Section 2.40- Variable Speed Pool Pumps with Load Shifting Option

The default value is listed as 1.364 W but should be 1.364 kW. Also, the variables titled "kWbase" and kWvfd" in the delta kW algorithm of Section 2.43.2 should be revised to agree with the new terminology of this protocol "kWbasepeak" and "kwvfdpeak".

24. Section 2.41- Duct Sealing and Insulation

PPL Electric requests that the Commission clarify the correct measure life. The measure life shown in Appendix A of the TRM is 14 years but the protocol shows 20 years. Elsewhere in the Commission's directives, the maximum allowable measure life for any measure is 15 years so PPL Electric believes 14 years is the correct life for this measure.

25. Section 2.42- Water Heater Temperature Setback

The text in Section 2.42.3 does not appear to be applicable to this protocol, it applies to water heater insulation. Further, the title of Table 2-99 should be changed to reflect this measure "Water Heater Temperature Setback Assumptions" instead of "Efficient Electric Water Heater Assumptions." Finally, PPL Electric suggests that the Commission clarify the basis for the 0.6 factor in the savings algorithm in Section 2.42.2

C. COMMERCIAL AND INDUSTRIAL EE&C MEASURE PROTOCOLS

1. Section 3.2.7- New Construction Lighting

There are conflicting requirements between Section 3.2.7 and Appendix E (PA spreadsheet for new construction lighting), and between Section 3.2.7 and general industry practice for new construction lighting. These conflicting requirements are related to "usage groups". To eliminate the conflicting requirements, PPL Electric recommends changing the second sentence in the second paragraph of Section 3.2.7 from "HOU shall be determined in

accordance with Section 3.2.6." to "HOU shall be determined in accordance with Section 3.2.6, ***except usage groups are not required.***" [emphasis added]. The conflicts are explained below.

The second paragraph in Section 3.2.7 states "HOU [for new construction lighting] shall be determined in accordance with Section 3.2.6." Section 3.2.6 requires usage groups for any project with a change in connected load greater than 20 kW. A "change in connected load" is a concept applicable to lighting retrofits where there is a difference between the connected load of the original lighting and the connected load of the efficient lighting. However, for new construction lighting, savings is based on the difference in lighting density (watts per square feet) between the efficient lighting and code requirements.

In addition, the concept of usage groups is inconsistent with industry practice for the design and installation of new construction lighting. Industry practice is to use the ASHRAE Whole Building Method and lighting engineers and contractors do not use "usage groups" in their software packages to determine HOU. Usage groups are not available from these trade allies. Requiring usage groups for Act 129 new construction lighting would discourage participation in the program or force lighting trade allies to change their established practices and software.

In addition, Appendix E (PA spreadsheet for new construction lighting) does not include the capability to establish usage groups. Therefore, if the Commission decides to continue the proposed requirement for usage groups, Appendix E will require significant revision.

2. Section 3.3- Premium Efficiency Motors

Table 3-14 incorrectly references PY3 and PY4 (program years 3 and 4)

3. Section 3.16- Wall and Ceiling Insulation

PPL Electric recommends using ASHRAE 90.1- 2007 as the reference for existing buildings in Table 3-56 (HVAC Baseline Efficiency for Non-Residential Building) instead of

ASHRAE 90.1- 2004. The 2007 version is currently in effect, supersedes 2004, and is referenced in other TRM protocols (such as section 3.2.7).

4. Section 4.1 Automatic Milker Takeoffs.

In the Sources Section 4.1.4, references to "vacuum pump VFD IMP" and "dairy vacuum pump TRM protocol" for sources 5 and 6 should be updated with reference to Section 4.7- Variable Speed Drive (VS) Controller on Dairy Vacuum Pumps, now that the vacuum pump measure has been formalized as a TRM protocol.

5. Section 4.4- Heat Reclaimers

The Commission should clarify which measure life applies – Appendix A and the table in Section 4.4 show 15 years and Section 4.4.5 shows 14 years.

6. Section 4.5- High Volume Low Speed Fan

In Table 4-8, the references for Wconventional and WHVLS are incorrect. They should point to Table 4-9, not 4-4.

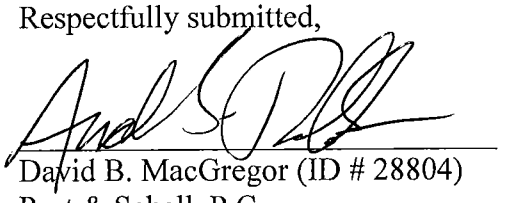
7. Section 4.8- Low Pressure Irrigation System

The OPHRS variable (average irrigation hours per growing season) should be included in Table 4-13 with all other variables.

III. CONCLUSION

For all of the reasons stated above, PPL Electric Utilities Corporation recommends that the Pennsylvania Public Utility Commission proceed with development of the 2014 TRM consistent with PPL Electric Utilities Corporation's comments.

Respectfully submitted,



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Date: October 15, 2013