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October 14, 2014

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 Act of 2004:
Standards for the Participation of Demand Side Management Resources - Technical
Reference Manual 2015 Update
Docket Nos. M-2012-2313373 & M-00051865**

Dear Secretary Chiavetta:

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

Respectfully submitted,

Devin T. Ryan

DTR/jl

cc: Megan G. Good (*via E-mail*)
Kriss Brown (*via E-mail*)

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Implementation of the Alternative Energy :
Portfolio Standards Act of 2004: Standards : Docket Nos. M-2012-2313373
for the Participation of Demand Side : M-00051865
Management Resources - Technical :
Reference Manual 2015 Update :

**COMMENTS OF
PPL ELECTRIC UTILITIES CORPORATION**

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

I. INTRODUCTION

By Tentative Order entered September 11, 2014, the Pennsylvania Public Utility Commission (“Commission”) requested comments on the proposed 2015 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, P.L. 1592, 66 Pa.C.S. §§ 2806.1-2806.2 (“Act 129”). The Company appreciates this opportunity to comment on the Commission’s proposed 2015 revisions to the TRM (“2015 TRM”).

PPL Electric generally agrees with most of the changes proposed in the 2015 TRM. However, the Company has identified some areas that it believes require technical modification and/or clarification. Further, although PPL Electric generally supports the proposed changes set forth in the 2015 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

¹ *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual 2015 Update*, Docket Nos. M-2012-2313373, M-00051865 (Order Entered Sept. 11, 2014) (“*Tentative Order*”).

Energy 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 2015 TRM UPDATE

PPL Electric provides specific technical comments on the proposed modifications contained in the proposed 2015 TRM. As noted above, the Commission undertakes an annual review and update of the TRM. In general, PPL Electric supports this process because 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.

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 TRM should coincide with the beginning of an EE&C Phase in time for EDCs to incorporate the extensive changes into their EE&C Plans for that phase. Nearly every proposed change in the 2015 TRM will impact PPL Electric’s EE&C Plan programs, measures, savings, tracking system, and other Phase II implementation details. To address these impacts, PPL Electric will need to

² See, e.g., *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan*, Docket No. M-2009-2093216 (Order Entered Oct. 26, 2009); *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan*, Docket No. M-2009-2093216 (Order Entered Feb. 17, 2010); *Petition of PPL Electric Utilities Corporation for Approval of its Energy Efficiency and Conservation Plan*, Docket No. M-2009-2093216 (Order Entered May 6, 2011); *Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase II Energy Efficiency and Conservation Plan*, Docket No. M-2012-2334388 (Order Entered Mar. 14, 2013).

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.

revise its existing Phase II EE&C Plan to modify program design, eliminate or modify some energy efficiency measures, and change rebates. In addition, the changes to the 2015 TRM will increase the amount and 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 conservation service provider (“CSP”) contracts, and significantly change the Company’s tracking system and CSP systems (e.g., savings calculations, data collected). To avoid or minimize these impacts on an EDC’s EE&C Plan, PPL Electric recommends that future “late-phase” updates to the 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. However, PPL Electric does not provide technical comments on every Commission proposal.

A. GENERAL IMPROVEMENTS

1. TRM Section 1.2.4 Applicability of the TRM for estimating *Ex Ante* (Claimed) savings

PPL Electric recommends rewording the first sentence of this section to specifically address appliances installed in new construction homes. The following language in bold is recommended to avoid overstating savings as a result of using permit date as the in-service date for appliances installed in new construction homes:

For replacements, **retrofits and new construction appliances**,⁴ the applicable date for determining which TRM version to use to estimate EDC claimed savings is the “in-service date” (ISD) or “commercial date of operation” (CDO) – the date at which the measure is “installed and commercially operable,”⁵ and when savings actually start to occur.

This would apply to the appliances, such as water heaters, refrigerators, etc., as those will be purchased closer to the building finish/rebate date than to the permit date of the home. For the shell measures, efficiency levels will be dictated by the building code that is in effect at the time the home is permitted.

2. TRM Section 1.17 Impact of Weather

PPL Electric requests clarification that California climate zone 11 will be used in the 2015 TRM. The Tentative Order states that California climate zone 4 will be used.⁶

B. ADDITIONAL RESIDENTIAL EE&C MEASURE PROTOCOLS

None.

C. ADDITIONAL COMMERCIAL AND INDUSTRIAL EE&C MEASURE PROTOCOLS

None.

D. EXISTING RESIDENTIAL EE&C MEASURE PROTOCOLS AND PROCESSES

1. TRM Section 2.1.1 ENERGY STAR Lighting

PPL Electric recommends correcting the IE subscript in the algorithm for ENERGY STAR Indoor LED Fixture (hard-wired, pin-based) from IEkwh to IEkwh-LED so that the algorithm reads:

⁴ Appliances include: dishwashers, clothes washers, dryers, ovens/ranges, refrigerators, and freezers.

⁵ *Energy Efficiency and Conservation Program*, Docket Nos. M-2012-2289411, M-2008-2069887, p. 107 (Order Entered Aug. 3, 2012) (Phase II Implementation Order).

⁶ *Tentative Order*, p. 24.

$$\Delta kWh/yr = \frac{Watts_{base} - Watts_{IF}}{1000 \frac{W}{kW}} \times IF_{hours} \times (1 + IE_{kWh-LED}) \times 365 \frac{days}{yr} \times ISR_{IF}$$

Further, the website link to the Energy Independence and Security Act of 2007 (“EISA”) fact sheet referenced in footnotes 35 and 36 (pp. 21-22) is out of date.⁷ The link should be updated with the following: <http://www.lightingfacts.com/Library/Content/EISA>.

PPL Electric also requests clarification on the contradictory instructions regarding EISA-exempt bulbs. Section 2.1.1 of the 2015 TRM states, “For bulbs that do not fall within EISA regulations, such as exempt bulbs and bulbs with lumens greater than 2,600, the manufacturer rated equivalent wattage should be used as the baseline.” Then, under the baseline wattage values for specialty bulbs, Section 2.1.1 provides, “For EISA exempt specialty bulbs, use the Wattsbase value in column (c) in Table 2-3.” Therefore, it is unclear whether the manufacturer rated equivalent or the Wattsbase value in column (c) in Table 2-3 should be used for EISA-exempt specialty bulbs.

Clarification is also requested on the classification of candelabra-base bulbs. It is not completely clear that candelabra-base bulbs (exempt from EISA) are considered “decorative” and, thus, subject to column (a) in Table 2-3. While this is most likely the case, PPL Electric recommends explicit language such as that provided for reflector lamps on page 23: “Reflector (directional) bulbs fall under legislation different from GSL and other specialty bulbs. For these bulbs, EDCs can use the manufacturer rated equivalent wattage as printed on the retail packaging, or use the default WattsBase (column (c)) in Table 2-4 below.”

2. TRM Section 2.1.4 LED Nightlight

PPL Electric recommends adding footnotes 48 and 49, as they appear to be missing.

⁷ See also *Tentative Order*, p. 29 n.89.

3. TRM Section 2.2.1 Electric HVAC

In Table 2-11, which defines the Residential Electric HVAC references, an Early Retirement option is provided for the Seasonal Energy Efficiency Ratio of the Baseline Unit (“SEERb”) and the Heating Seasonal Performance Factor of the Baseline Unit (“HSPFb”). PPL Electric seeks clarity as to whether there will be a common, statewide definition of how contactors will designate a unit as “early retirement.” This has implications for energy savings because a utility could report higher savings by using a more liberal definition of early retirement and, therefore, designating most of its units as early retirement.

For the Energy Efficiency Ratio of the Baseline Unit (“EERb”), please clarify whether the default value for replace on burnout should remain 11.3 for an Air Source Heat Pump (“ASHP”), or whether it should increase to approximately 12 because in SEERb the default value for replace on burnout increased to 14 for ASHP. Similarly, PPL Electric seeks clarification on whether the ratio for the Energy Efficiency Ratio of the unit being installed (“EERe”) should now be 12/14 instead of 11.3/13 for ASHP.

Finally, also in Table 2-11, the value for Demand Coincidence Factor (“CF”) is expressed as a percentage, while all other factors are expressed as decimals. For sake of consistency, PPL Electric recommends using the same format for all factors.

4. TRM Section 2.2.5 Room AC (RAC) Retirement

In Section 2.2.5, PPL Electric recommends adding a definition for the term “EERee” to Table 2-27 because it appears in the Algorithms section. Further, in Table 2-28, the values for Energy Impact (kWh) do not appear to be updated in accordance with variable updates in Table 2-27. Therefore, Table 2-28 should be updated as appropriate.

5. TRM Section 2.2.7 Furnace Whistle

In Table 2-31, PPL Electric recommends adding an EDC Data Gathering option for the In-Service Rate (“ISR”) variable, with the option to use the default value. An EDC Data Gathering option would yield ex-ante savings with greater accuracy and would align the methodology with that used for other kit measures, such as Electroluminescent Nightlights, Low Flow Faucet Aerators, and Low Flow Showerheads. Moreover, in the Default Savings section, the values for ΔkW_{peak} below each table should be updated, considering that the value for the CF was updated.

6. TRM Section 2.3.1 Efficient Electric Water Heaters

Given that the value of the variable Temperature of hot water (“Thot”) changed to 119 degrees Fahrenheit for commercial water heating measures, as shown in Table 3-79, PPL Electric requests clarification as to whether the same change should be applied to residential water heating measures, as expressed in Table 2-42. This same comment applies to TRM Sections 2.3.2 Heat Pump Water Heaters (Table 2-44), 2.3.3 Solar Water Heaters (Table 2-49), 2.3.4 Fuel Switching: Electric Resistance to Fossil Fuel Water Heater (Table 2-51), 2.3.5 Fuel Switching: Heat Pump Water Heater to Fossil Fuel Water Heater (Table 2-55), 2.3.6 Water Heater Tank Wrap (Table 2-61), and 2.3.7 Water Heater Temperature Setback (Table 2-63).⁸

7. TRM Section 2.3.2 Heat Pump Water Heaters

PPL Electric recommends clarifying that the first algorithm shown in the Algorithms section applies only if the Heat Pump Water Heater (“HPWH”) is installed in a location inside conditioned space. Otherwise, the alternative algorithms in the Default Savings section must be used. Additionally, for the alternative algorithms in the Default Savings section, the

⁸ For Tables 2-61 and 2-63, this comment applies to the values for the Temperature of hot water in tank (“Tsetpoint”) and the Temperature setpoint of water heater after setback (“Thot_f”), respectively.

Commission should clarify whether garages and basements fall into this category of “not located inside conditioned space.”

8. TRM Section 2.3.11 Thermostatic Shower Restriction Valve

In the Eligibility section of Section 2.3.11, the TRM states that “savings associated with this measure may be combined with a low flow showerhead.” For combination low-flow showerhead / restriction valve units (i.e., single devices), the Commission should clarify that the savings would be the sum of low-flow showerhead savings (baseline = 2.5 gallons per minute (“GPM”)) and valve savings (also assuming baseline = 2.5 GPM), and not the installed flow rate of the low-flow showerhead.

In addition, the $\Delta\text{kWh/yr}$ algorithm on page 120 appears to have a discrepancy in the expression “ $N_{\text{persons}} \cdot N_{\text{showers-day}}$.” It appears that these variables should be multiplied, based on the similar algorithm used in the Low Flow Showerheads protocol in Section 2.3.10. Another possible discrepancy is that the variable for Average length of shower (“TPerson-Day”), which can be found in Table 2-67, does not appear in the algorithm on page 120. If this variable does, in fact, belong in the algorithm, the “Unit” for “TPerson-Day” should be changed from “Fixed” to “minutes/day” for consistency with the Low Flow Showerheads protocol (*See* Table 2-66). Updates to the algorithm and the Default Savings table would also be necessary. In addition, the values in the Default Savings table appear to be inaccurate when calculated using the inputs in Table 2-67. These savings values should be verified and updated if necessary.

Finally, PPL Electric recommends adding an EDC Data Gathering option for the T_{out} variable with the option to use the default value of 101 degrees Fahrenheit. An EDC Data Gathering option would yield ex-ante savings with greater accuracy when EDCs have metered data available to substantiate a better value.

9. TRM Section 2.4.3 Refrigerator / Freezer Recycling with and without Replacement

Citing previous net-to-gross (“NTG”) discussions with the Statewide Evaluator (“SWE”) for appliance recycling PPL Electric believes it was clear that starting in the 2015 TRM, replacement would be treated as a net savings, not gross savings, to ensure consistent methods between the Pennsylvania TRM and the Uniform Methods Project (“UMP”) protocol for appliance recycling. Having replacement as both a gross and net issue complicates NTG and in order to avoid double counting replacements, the NTG method calculates net savings from UEC*Part use rather than gross savings because UEC*Part use is gross savings in most evaluations (and in the UMP).

In the 2013 TRM final order,⁹ the Commission’s rationale for replacements as a gross issue is based on the following:

The 2012 Residential Baseline Study also collected information on what actually happened to the refrigerators and freezers that were removed. The results of this research show that 64% of the refrigerators and 46% of the freezers removed were either hauled away by a big box store for recycling, were recycled by the utility or were disposed of at a waste transfer station. According to the 2012 Residential Baseline Study, less than 20% of refrigerators and 40% of freezers were donated or sold and were eligible to be reconnected to the electric grid in Pennsylvania. This data indicates that the majority of refrigerators and freezers removed by customers during the five-year period from 2008 to 2012 were not reconnected to the grid in Pennsylvania.¹⁰

However, applying the savings adjustment for all replacements implicitly assumes that 0% of the units would have continued to operate on the grid in Pennsylvania. The findings cited

⁹ *Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual 2013 Update*, Docket Nos. M-2012-2313373, M-00051865 (Order Entered Dec. 20, 2012).

¹⁰ *Id.* at pp. 52-53 (footnote omitted).

indicate that the number of units that were eligible to be reconnected to the grid is not zero, but rather at least 20% of refrigerators and 40% of freezers.

Additionally, the baseline study does not consider the case when a participant would have kept the unit if the appliance recycling program had not been available. In this case, it is very likely that the appliance would have remained on the grid. Moreover, one could argue that non-replaced units represent appliances that would have been kept. However, this is not necessarily the case because many units that are not replaced are secondary units that the household no longer requires.

Also, the research appears to consider all disposals rather than just working units. The appliance recycling program specifically targets working units. Therefore, the proportions that fall into the categories listed in the baseline study could differ significantly if one were to separate out working and non-working units. Further, all of the considerations the Commission raises regarding how many of the units would have likely continued to operate on the grid in absence of the program are specifically addressed in the UMP and accordingly must be included in the net savings analysis.

In addition, in the Default Savings Calculation section, Program Year Four (“PY4”) utility data is cited as the basis of the Unit Energy Consumption (“UEC”) calculation. PPL Electric recommends updating these data with Program Year Five (“PY5”) utility data. Between the 2013 and 2014 TRMs, the data for the regression algorithm was updated using Program Year Three (“PY3”) data in 2013 to PY4 data in 2014. Consistent with the data used in the 2013 and 2014 TRMs, PY5 data should be used for the 2015 TRM.

Regarding part use factors, the 2015 TRM contains the following language on page 139:

In Program Year 3, the Commission determined that the average removed refrigerator was plugged in and used 96.9% of the year

and the average freezer was plugged in and used 98.5% of the year. Thus, the default value for the part-use factor is 96.9% (and 98.5%) based on program year 3 data for all EDCs. EDCs may elect to calculate an EDC specific part-use factor for a specific program year. In the event an EDC desires to calculate an EDC specific part-use factor, EDCs should use the following methodology. Using participant surveys, evaluators should determine the amount of time a removed refrigerator is plugged in.

This is inconsistent with the methods outlined in the UMP. The UMP recommends considering part use prospectively, that is, considering how the unit would likely have been used if it had not been recycled through the program rather than just historical part use. Moreover, the UMP recommends part use to be updated every other year. The part use estimates included in the 2015 TRM are from PY3, but this TRM will apply to PY7. Thus, PPL Electric recommends that the default method for the EDCs to calculate part use is the method outlined in the UMP.

Finally, a reference to Table 2-49 on page 140 appears to be incorrect and should be revised to point to the appropriate table.

10. TRM Section 2.5.3 Smart Strip Plug Outlets

PPL Electric recommends adding an ISR variable, with options for EDC Data Gathering or the use of a default value of 100% for direct install measures. An EDC Data Gathering option would yield ex-ante savings with greater accuracy and would align the methodology with that used for other kit measures, such as Electroluminescent Nightlights, Low Flow Faucet Aerators, and Low Flow Showerheads. In essence, EDC Data Gathering provides the input necessary to compute an ISR for each of these measures individually.

11. TRM Section 2.6.4 Residential New Construction

In Table 2-110, PPL Electric recommends updating the value of Seasonal Energy Efficiency Ratio of the baseline unit (“SEERbase”) from 13 to 14 for ASHP installed on or after June 1, 2015, to accurately reflect the code baseline change effective on that date.

12. TRM Section 2.6.6 ENERGY STAR Manufactured Homes

In Table 2-114, PPL Electric recommends updating the value of Season Energy Efficiency Ratio of the baseline unit (“SEERb”) from 13 to 14 for ASHP installed on or after June 1, 2015, to accurately reflect the code baseline effective in 2015. Similarly, the default value for the BLEER component, which is the factor to convert baseline SEERb to Energy Efficiency Ratio of the baseline unit (“EERb”), should be updated from 11.3/13 to 12/14 for ASHP installed on or after June 1, 2015. Furthermore, in Table 2-115, the SEER and HSPF values for ASHP should be updated as well. Specifically, SEER should be increased from 13 to 14, and HSPF should be increased from 7.7 to 8.2, both effective June 1, 2015.

13. TRM Section 2.7.1 Pool Pump Load Shifting

In Table 2-116, PPL Electric recommends updating the default value for the electric demand of single speed pump at a given flow rate (“kW_{pump}”), which is currently 1.364 kW. This value is based on California Energy Commission’s (“CEC”) 2008 Appliance Database (“CEC2008”), but a more recent dataset exists (i.e., CEC’s 2014 Appliance Database (“CEC2014”). Further, in Table 2-117, the column heading references appear to be missing and/or contain unnecessary asterisks. Therefore, the Commission should clarify as appropriate.

14. TRM Section 2.7.2 Variable Speed Pool Pumps (with Load Shifting Option)

The algorithm for this measure is provided as follows:

$$\Delta kWh/yr = kWh_{base} - kWh_{VFD}$$

PPL Electric recommends revising the kWh terms to “kWh/yr” for both the base and VFD variables because all energy savings in Pennsylvania are expressed as annualized savings (i.e., kWh/yr).

PPL Electric also has the following comments for variables in Table 2-118:

- HOU_{ss} and HOU_{vfd,filter} – PPL Electric recommends updating with EDC data collected in previous evaluations. While these are sourced from the Mid-Atlantic TRM, they appear to reference a Southern California Edison (“SCE”) study that may not be appropriate for Pennsylvania because the ENERGY STAR calculator assumes different hours of operation (“HOU”) depending on location.
- HOU_{vfd,clean} – The source reference is missing from table.
- kW_{ss} – The value is based on CEC2008, but a more recent dataset exists (i.e., CEC2014). If an update is made based on the more recent dataset, Source # 1 would also require an update. In addition, the value of 1.364 W should be corrected to kW, per the 2014 TRM errata update.
- kW_{vfd,filter} and kW_{vfd,clean} – In the Electric Demand and Pump Flow Rate section, the TRM provides that “most VFD pool pumps can display instantaneous flow and power. Power measurements or readings in the final flow configuration are encouraged.” For cases where there is an exception to “most” pumps, PPL Electric recommends providing default values or a table if spot measurements are not available or provided to the EDC.
- HOU_{peak,filter} and HOU_{peak,clean} – Source references are missing from table.

Finally, in Table 2-119, the Commission should clarify the column heading “Average Pump Power (W)” by replacing “(W)” with “(kW_{ss})” and should convert the values in that column from W to kW.

E. COMMERCIAL AND INDUSTRIAL EE&C MEASURE PROTOCOLS

1. TRM Section 3.1.1 Lighting Fixture Improvements

PPL Electric requests clarification for the last sentence of the following paragraph from page 216. That sentence provides:

For whole facility lighting projects where the facility's actual lighting hours deviates by more than 10% from hours for the appropriate building type, use of the "other" category may be used at the discretion of the EDCs' implementation and evaluation contractors. If this option is chosen, EDC implementation and evaluation contractors should apply this methodology consistently throughout a program year for all projects to which it pertains.

The Commission should clarify whether this means all projects where the actual hours deviate by more than 10%, or whether it means only the building type for which the "other" category was selected.

2. TRM Section 3.1.2 New Construction Lighting

There is an inconsistency between Section 3.1.2 and Appendix E. The first paragraph on page 227 states, "Within a single project, to the extent that there are different control strategies (SVG), hours of use (HOU), coincidence factors (CF) or interactive factors (IF), the ΔkW will be broken out to account for these different factors." However, Appendix E does not support different hours of use within a single project. Furthermore, HOU should be a user populated field in Table B-1 on the "Interior Lighting" tab of Appendix E.

3. TRM Section 3.2.1 HVAC Systems

In Table 3-23, cooling Equivalent Full Load Hours ("EFLH") are provided for building type "Education-Relocatable Classroom." However, this building type does not exist in Table 3-25. The Commission should clarify whether or not heating EFLH are available and update the table as necessary.

4. TRM Section 3.2.3 Water Source and Geothermal Heat Pumps

In the ΔkWh_{cool} algorithm for air-cooled base case units with cooling capacities less than 65 kBtu/h, the term SEER_{ee} was changed from EER_{ee} in this TRM revision. However, it should remain EER_{ee}, since Ground Source Heat Pumps (“GSHPs”) are rated in Energy Efficiency Ratio (“EER”) regardless of size.

5. TRM Section 3.2.6 Small C/I HVAC Refrigerant Charge Correction

PPL Electric recommends correcting the term “EFLH_{mh}” in both algorithms for kWh_{heat}. As defined in Table 3-40, this term should be “EFLH_h.”

6. TRM Section 3.4.1 Electric Resistance Water Heaters

PPL Electric requests clarification on whether or not the numerical values in the default energy savings algorithms in Table 3-70 should be updated to align with the change to the T_{hot} variable. This same comment applies to TRM Section 3.4.2 Heat Pump Water Heaters (Table heading and number missing; see page 328 of TRM), TRM Section 3.4.6 Fuel Switching: Electric Resistance Water Heaters to Gas/Oil/Propane (Table 3-81), and TRM Section 3.4.7 Fuel Switching: Heat Pump Water Heaters to Gas/Oil/Propane (Table 3-86).

7. TRM Section 3.4.2 Heat Pump Water Heaters

PPL Electric recommends providing a default value for Energy Factor of baseline water heater (“EF_{base}”) in Table 3-73 for instances where customers do not or cannot provide this information on their rebate applications. This would be consistent with the residential HPWH protocol (*See* Section 2.3.2 Heat Pump Water Heaters, Table 2-44).

8. TRM Section 3.4.4 Low Flow Pre-Rinse Sprayers for Time of Sale / Retail Programs

Table 3-76 provides a fixed value of 125.6 degrees Fahrenheit for the “Th” variable. However, the Tentative Order states that this variable is 105.6. The Commission should confirm which value is correct and update the TRM, if necessary.

9. TRM Section 3.5.1 High-Efficiency Refrigeration/Freezer Cases

PPL Electric requests that Tables 3-90 and 3-91 be updated. The corrections to the default Demand Impacts in Tables 3-90 and 3-91 were not carried over from the 2014 TRM errata. Thus, these tables should be updated accordingly.

10. TRM Section 3.7.1 High-Efficiency Ice Machines

In the Eligibility paragraph, the TRM states, “The machine must conform to the minimum ENERGY STAR efficiency requirements, which are equivalent to the CEE Tier 2 specifications for high-efficiency commercial ice machines.” However, it is unclear whether the CEE Tier 2 specifications are equivalent to the Energy Star specifications. Therefore, the eligibility requirements must refer to either CEE Tier 2 or the Energy Star requirements. If referring to CEE Tier 2 requirements, then the Commission should consider expanding the eligibility requirements to water-cooled machines as well because unlike Energy Star specifications, the CEE Tier 2 specs do not exclude water-cooled equipment. Additionally, the reference provided in the footnote to the aforementioned statement does not confirm that CEE Tier 2 is equivalent to Energy Star specs. Therefore, this provision must be revised accordingly.

Furthermore, the last sentence in the Eligibility section states that “[t]he baseline equipment is taken to be a unit with efficiency specifications less than or equal to CEE Tier 1 equipment.” PPL Electric recommends changing “CEE Tier 1” to “the current federal standard.” Moreover, Source # 1 would require an update.

In addition, PPL Electric recommends rewording the sentence in the Algorithms section. It currently reads, “The energy savings are dependent on machine type and capacity of ice produced on a daily basis.” PPL Electric proposes revising the sentence to provide, “The energy savings are dependent on capacity of ice produced on a daily basis and the duty cycle.” In short, the revision would remove “machine type” and add “duty cycle.”

Lastly, in the Default Savings section, the TRM states that “[t]he default energy consumption for the baseline ice machine (kWhbase) is calculated using the formula for CEE Tier 1 specifications, and the default energy consumption for the high-efficiency ice machine (kWh_h) is calculated using the formula for CEE Tier 2 specifications.” If the equipment is required to meet Energy Star specifications, and there is no confirmation that the Energy Star specs are equivalent to CEE Tier 2 specs, then this provision must be changed to refer to the Energy Star specs. Otherwise, projects are allowed to use default values that are lower or higher than the minimum required for Energy Star-qualified equipment. This change would also impact the “High-efficiency energy use per 100 lbs of ice” column in Table 3-133 and Source # 2. Additionally, in the aforementioned statement in the Default Savings section, PPL Electric recommends replacing “CEE Tier 1 specifications” with “minimum federal efficiency standard.”

F. AGRICULTURAL EE&C MEASURE PROTOCOLS

1. TRM Section 4.1.1 Automatic Milker Takeoffs

PPL Electric requests clarification that the savings in the algorithm are per system, not per individual milker take-off nozzle. If so, the Commission should rename the Measure Unit to “Milker Takeoff System” on page 466.

2. TRM Section 4.1.4 Heat Reclaimers

The default values for Energy savings for specified system (“ES”) in Table 4-7 are transposed from the original algorithm, but should be changed to the values in the 2014 TRM.

The values for ES must be revised as follows:

- System with precooler should be 0.29; and
- System without precooler should be 0.38.

3. TRM Section 4.1.5 High Volume Low Speed Fans

PPL Electric recommends adding “New Construction” as an option for Measure Vintage on page 479 (i.e., in addition to “Replace on Burnout”) to bring this in line with other agricultural protocols.

4. TRM Section 4.1.6 Livestock Waterer

PPL Electric requests clarification that the savings in the algorithm are per system, not per waterer. The algorithm is for the whole project, and in Table 4-11, “QTY” is defined as the “Number of livestock waterers installed.” Therefore, the units are per project, not per waterer. Accordingly, the Commission should rename the Measure Unit to “Livestock Waterer System” on page 482. However, if the SWE prefers it remain per waterer, the “QTY” variable should be removed from the tables and algorithms.

5. TRM Section 4.1.7 Variable Speed Drive (VSD) Controller on Dairy Vacuum Pumps

PPL Electric recommends adding “New Construction” as an option for Measure Vintage on page 485 (i.e., in addition to “Retrofit”). Per the description in the Eligibility section, new construction, meaning new pumps with VFDs, are eligible for participation.

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 2015 TRM consistent with PPL Electric Utilities Corporation's comments.

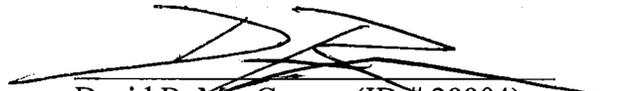
Respectfully submitted,

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