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**To:** [Morris, Jennifer](#)  
**Cc:** [Cheryl Jenkins](#); [Sam Dent](#); [iltradministrator@veic.org](mailto:iltradministrator@veic.org); "Celia Johnson"; [EXT Lusson, Karen](#)  
**Subject:** [External] RE: EE SAG: Final IL TRM v7.0 "Objections"  
**Date:** Thursday, September 27, 2018 5:23:13 PM  
**Attachments:** [e-mail MEYERS to CELIA and VEIC RE Illinois Energy Code Omissions References 2018-07-27.txt](#)

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Greetings Ms. Morris ...

I gather that you represent ICC "STAFF" as outlined in the request below. I realize that today, is September 27<sup>th</sup>, where the September 20<sup>th</sup> date for offering "objections" to the 2019 IL-TRM Version 7.0 dated September 13, 2018 to the Commission has passed.

However, given the sheer plethora of e-mails, attachments, outlook meeting requests, minutes, drafts, SharePoint and non-SharePoint requests and recommendations, etc., coming from the Offices of the SAG/TAG facilitator this month, it was not until yesterday afternoon that I was made aware that the 2019 IL-TRM Version 7.0 comment period had opened. Accordingly, I took all of today, at my "first opportunity" to review the 2019 IL-TRM Version 7.0 dated September 13, 2018 and author comments.

Given the sheer volume and nature of the "oversights and omissions" (my view) that I have identified in the 2019 IL-TRM Version 7.0 dated September 13, 2018, and articulated below; I thought I should share these oversights and omissions with you directly on the chance that they may be of some use to the Commission:

The overarching comment for Staff and the Commission's consideration is summed in Comment #1:

1. **COMMENT RE TRM v.7: Established Code Baseline.** The 2015 IECC became the effective energy conservation code in the State of Illinois on January 1, 2016. This means by way of secondary reference, an equivalent path for compliance is also that of ANSI/ASHRAE/IES Standard 90.1-2013. [The Capital Development Board](#) (CDB), in conjunction with the [Illinois EPA Office of Energy](#) (EPA OE), is nearing completion of the cycle for the Illinois Energy Conservation Code (IL ECC) to update from the 2015 ICC *International Energy Conservation Code* (IECC w/ ASHRAE 90.1-2013) to the 2018 IECC (w/ ASHRAE 90.1-2016). In accordance with the [Energy Efficient Building Act](#), CDB is required to review and adopt the most current version of the IECC within one year after its publication date. The Code will then become effective within 6 months following its adoption by CDB. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

The sections of the TRM v.7 that should have been revised by VEIC in response to my comments submitted to VEIC and the Offices of the SAG/TAG facilitator to reflect current state of Illinois Law via the [Energy Efficient Building Act](#).

2. **Vol 2., Various Sections and Footnotes throughout.** There are 16 instances throughout TRM

v.7.0 Vol.2 where either a reference to “IECC 2012/2015,” a reference to “an efficiency value based on IECC 2012/2015 performance requirement.” The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

3. **Vol 2., Specific Footnotes and Sections.** These particular footnotes and they way they are crafted in the TRM beg for clarification with respect to their interpretation or use in energy measure calculations and assumptions.
  - **Sections 4.3.5, Definition of Efficient Equipment and Definition of Baseline Equipment** refer to the efficiency requirements of water heaters in accordance with Table C404.2 of the 2012, 2015, 2018 IECC Editions. While it is clear these measures will be evaluated during the period of time where the 2015 IECC is applicable – “before 03/01/19” – and where the 2018 IECC is applicable – “on or after 03/01/19,” it is which of these code edition years and associated tables are to be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
  - **Sections 4.4.9, Air and Water Source Heat Pump Systems –**
    - **Definition of Baseline Equipment** refers to an assumption of “... a standard-efficiency air cooled or water source heat pump system that meets the **Code** *[[Which code edition and year, specifically?]]* energy efficiency requirements (**IECC** *[[Which edition year, specifically?]]* or Code of Federal Regulations whichever is higher) in effect on the date of equipment purchase (if date unknown assume **current Code** minimum *[[Guidance for the assumption citation should be given in terms of “before 03/01/19” (i.e., 2015 IECC) and “on or after 03/01/19” (i.e., 2018 IECC)]]*).
    - The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
    - The measure Air and Water Source Heat Pump efficiencies (Sub-categories, COP) are different technically, when comparing 2012 IECC Tables C403.3.2(2) to 2015 IECC Tables C403.3.2(2) to 2018 IECC Tables C403.3.2(2). If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be

presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited specifically so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

o **Section 4.4.15, Single-Package and Split System Unitary Air Conditioners –**

- **Definition of Baseline Equipment** refers to an assumption of “... a standard-efficiency air-, water, or evaporatively-cooled air conditioner that meets the **Code** *[[Which code edition and year, specifically?]]* energy efficiency requirements (**IECC** *[[Which edition year, specifically?]]* or Code of Federal Regulations whichever is higher) in effect on the date of equipment purchase (if date unknown assume **current Code** minimum *[[Guidance for the assumption citation should be given in terms of “before 03/01/19” (i.e., 2015 IECC) and “on or after 03/01/19” (i.e., 2018 IECC)]]*).
- The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
- The measure air-, water, or evaporatively-cooled air conditioner efficiencies (EER, kW/ton, COP) are different technically, when comparing 2012 IECC Table C403.3.2(1) to 2015 IECC Table C403.3.2(1) to 2018 IECC Table C403.3.2(1). If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited specifically so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

o **Section 4.4.17 Variable Speed Drives for HVAC Pumps and Cooling Tower Fans –**

- **In the Description refers to IECC 2007?!** There is no such edition of the International Energy Conservation Code. Edition years where the IECC was published by the International Code Council include the 1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018 Editions.
- **Definition of Baseline Equipment.** The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will

expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

- Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

○ **Section 4.4.26 Variable Speed Drives for HVAC Supply and Return Fans –**

- **Definition of Baseline Equipment.** The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
- Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

○ **Section 4.4.27 Energy Recovery Ventilator –**

- In the **Description** and **Definition of Baseline Equipment**. The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

- Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
- **Footnotes 105, 107, 243, 245, 246, 263, 270, 272, 330, and 373** – Make reference to “IECC 2012/2015,” the commercial energy conservation provisions of these editions of the IECC are different, technically. The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019. Guidance should be given in terms of “before 03/01/19” and “on or after 03/01/19.”
- **Footnote 325** – Reads, “2008 Database for Energy-Efficiency Resources (DEER), Version 2008.2.05, “Cost Values and Summary Documentation”, California Public Utilities Commission, December 16, 2008. Calculated as the simple average of screw and reciprocating air-cooled chiller incremental costs from DEER2008. This **assumes** that baseline shift from IECC 2012 to IECC 2015 carries the same incremental costs. Values **should be verified** during evaluation.”
  - Is the **assumption** outlined in this footnote and dating to a 10-year old study, being made by VEIC staff and with sufficient engineering analysis to corroborate the assumption and reflecting the advancement of chiller technology since 2008?
  - How might those who would be evaluating this energy measure be judged as “qualified” or “minimally competent” to conduct the **verification** asserted by Footnote 325 to corroborate this assumption based on the advancement of chiller technology between the years of 2008 to this year?
- **Footnote 330** – Reads, “Integrated Part Load Value is a seasonal average efficiency rating calculated in accordance with ARI Standard 550/590. It may be calculated using any measure of efficiency (EER, kW/ton, COP), but for consistency with IECC 2012, it is expressed in terms of IPLV here.”

The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

- The measure electric chiller efficiencies (EER, kW/ton, COP) are different technically, when comparing 2012 IECC Table C403.2.3(7) and electric chillers sold before and after 1/1/2010 to 2015/2018 IECC Table C403.2.3(7) and electric chillers sold before and after 1/1/2015. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
  - The measure gives no explicit statement or guidance to those who would be evaluating this energy measure whether compliance shall be established based on Path 'A' or Path 'B'. Put simply, VEIC has offered no guidance to the evaluator on this subject and subjects the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
  - Guidance should be given in terms of “use IECC Table C403.2.3(7) before 03/01/19” and “IECC Table C403.2.3(7) on or after 03/01/19.”
- **Footnote 379** – Clarifying the unit “ $EER_{\text{exist}} = \text{Actual}$ . If unknown **assume** 8.1  $EER^{379}$ ” reads, “Estimated using the 2000 IECC building energy code, for equipment up until year 2003, p107, and **assuming** a 1 ton unit;  $EER = 10 - (0.16 * 12,000/1,000) = 8.1$ .”
- Is the **assumption** outlined in this footnote and tied to a calculation for Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP) and based on 18-year-old PTAC/PTHP technology being made by VEIC staff and with sufficient engineering analysis to corroborate the assumption?
  - Does the **assumption** outlined in this footnote and tied to an 18-year-old calculation reflect the advancement of PTAC/PTHP technology and EER since the year 2000?
  - Is this assumption reasonable given the advancement of PTAC/PTHP EER and related technologies since the year 2000?
- **Footnote 381** – Clarifying the unit “ $COP_{\text{exist}} = \text{Actual}$ . If unknown **assume** 1.0 COP for PTAC units and 2.6  $COP^{301}$  for PTHPs.” reads, “Estimated using the 2000 IECC building energy code, for equipment up until year 2003, p107, and **assuming** a 1 ton unit;  $COP =$

2.9 – (0.026 \* 12,000/1,000) = 2.6.”

- Is the **assumption** outlined in this footnote and tied to a calculation for Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP) and based on 18-year-old PTAC/PTHP technology being made by VEIC staff and with sufficient engineering analysis to corroborate the assumption?
  - Does the **assumption** outlined in this footnote and tied to an 18-year-old calculation reflect the advancement of PTAC/PTHP technology and COP since the year 2000?
  - Is this assumption reasonable given the advancement in PTAC/PTHP COP and related technologies since the year 2000?
- **Footnote 439** – Reads, “The natural gas energy savings was calculated using TMY3 weather data and methodology consistent with ASHRAE standards. Savings are calculated on an annual basis for each given temperature zone in Illinois. Energy savings for DCV were developed utilizing standards, inputs and approaches as set forth by ASHRAE 62.1 *[[Which edition year of this Standard, specifically?]]* and 90.1 *[[Which edition year of this Code, specifically?]]*, respectively. Building input parameters like square footage, equipment efficiencies and occupancy match those used in the EFLH calculations. Reference calculation found in Demand Control Ventilation 12-30-13.xls.”
- The occupant density thresholds in both the 2015 and 2018 IECC Editions, which pre-date the “Demand Control Ventilation 12-30-**13**.xls” analysis have changed from 40 persons per 1,000 s.f. of conditioned floor area in the 2009 edition of the IECC to now 25 persons per 1,000 s.f. of conditioned floor area.
  - Has the “Demand Control Ventilation 12-30-**13**.xls” analysis and the **assumptions** outlined therein been reviewed by VEIC as based on a contemporary (i.e., circa calendar years 2015-2018) engineering analysis to corroborate the “... building input parameters like square footage, equipment efficiencies and occupancy match those used in the EFLH calculations ...” and validity of the 12-30-13 analysis?
  - Do the **assumptions** outlined in the Demand Control Ventilation 12-30-**13**.xls analysis and tied to an 18-year-old calculation reflect the advancement of Demand Control Ventilation technology since the year 2013?
- **Footnote 566** – Reads, “ANSI/ASHRAE/IESNA Standard 90.1-2007, “Energy Standard for Buildings Except Low-Rise Residential Buildings,” ASHRAE Standard (2007): Table 5.5-4 and Table 5.5-5”
- The reference to ASHRAE Standard 90.1-2007 is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2009 IECC (and Standard

90.1-2007 therein) became law and was effective in the State of Illinois was August 28, 2009 to December 31, 2012. The dates where the 2012 IECC (and Standard 90.1-2010 therein) became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC (and Standard 90.1-2013 therein), with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC (and Standard 90.1-2016 therein), with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

- **Footnote 751** – Reads, “Refer to the referenced code documents for specifics on calculating lighting power density using either the whole building method (IECC) *[[Which edition of the IECC? The most current edition is 2018 IECC. However, the 2015 IECC is effective before 03/01/19” while the 2018 IECC is effective on or after 03/01/19.”]]* or the Space by Space method (current ASHRAE 90.1 *[[Which edition of ASHRAE Standard 90.1? The most current edition is Standard 90.1-2016. However, Standard 90.1-2013 is effective before 03/01/19” while Standard 90.1-2016 is effective on or after 03/01/19.”]]*).
- **Footnote 603** – Reads, “Efficiency of existing systems assumed from ASHRAE 90.1 – **2010** and manufacturer’s specification sheets for various equipment. Steam unit heaters have a lower efficiency due to steam distribution losses.”
  - The reference to the ASHRAE 90.1-2010 Standard is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC (and Standard 90.1-2010 therein) became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC (and Standard 90.1-2013 therein), with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC (and Standard 90.1-2016 therein), with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
- **Footnote 603** – Reads, “Roof and Wall Insulation R-values are based on ASHRAE 90.1-**2010**. (Jim Young 2014) (K. Gowri 2009)”
  - The reference to the ASHRAE 90.1-2010 Standard is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC (and Standard 90.1-2010 therein) became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC (and Standard 90.1-2013 therein), with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC (and Standard 90.1-2016 therein), with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
  - Wall insulation R-values between the 90.1-2010 Edition of the Standard, the 90.1-2013 Edition of the Standard, and the 90.1-2016 Edition of the Standard



have changed, substantively since K.Gowri's 2009 analysis and the corresponding wall insulation R-value assumption of R-15 [[max Uo-0.067](#)]. Specifically:

- 90.1-2010 specifies: R-13.0 + R-7.5ci [[max Uo-0.064](#)] for steel frame walls and  
... R-13.0 + R-3.8ci [[max Uo-0.064](#)] for wood frame walls
- 90.1-2013 specifies: R-13.0 + R-10.0ci [[max Uo-0.055](#)] for steel frame walls and  
... R-13.0 + R-7.5ci [[max Uo-0.051](#)] for wood frame walls
- 90.1-2016 specifies: R-13.0 + R-10.0ci [[max Uo-0.055](#)] for steel frame walls and  
... R-13.0 + R-7.5ci [[max Uo-0.051](#)] for wood frame walls

- **Footnote 753** – Reads, “See IECC 2012 and 2015 - Reference Code documentation for additional information.” The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

4. **For the following Sections**, there is use of language in some form or fashion, that incorrectly limits the scope and application of the Illinois Energy Conservation Code (2015 IECC or 2018 IECC) to “new construction” only. The scope and application of the [Energy Efficient Building Act](#) (i.e., and these codes referenced therein) is not so limited. Rather, each edition of the IECC is applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy **to existing buildings** and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

- **Vol 2., 4.3.1 Storage Water Heater.** In “Baseline Equipment”
- **Vol 2., 4.3.5 Tankless Water Heater.** In the “Description.”

5. **Vol 2., 4.3.5 Tankless Water Heater – Reference Tables.** This section references two tables, each entitled “Table C404.2” with an accompanying footnote. We believe the implication is that one version of Table C404.2 is from the 2012/2015 IECC and the other from the 2018

IECC. The commercial energy conservation provisions of Table C404.2 in the 2012 IECC are different from those of Table C404.2, technically and should not be combined. Guidance for the use of each Table C404.2 citation should be given in terms of “before 03/01/19” (i.e., 2015 IECC) and “on or after 03/01/19” (i.e., 2018 IECC).

6. **Vol 2., 4.3.7 Multifamily Central Domestic Hot Water Plants.** In the “Description” of the measure, the language of the TRM v.7.0 Vol.2 incorrectly limits the scope and application of the Illinois Energy Conservation Code (2015 IECC or 2018 IECC) to “new construction” only. The scope and application of this code is not so limited. Rather, it is applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

7. **Vol 2., 4.3.9 Heat Recovery Grease Trap Filter.**

- In the “Electric Energy Savings,” equation for the measure, the language of the TRM v.7.0 Vol.2 reads, “ $\eta_{\text{HeaterElec}} = \text{Actual}$ . If unknown, use the table C404.2 in IECC 2012 (or IECC 2015 if through new construction) to assume values based on code estimates.” The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). Moreover, the “Actual Efficiency,” for this calculation will be out of date and inconsistent with the with [Energy Efficient Building Act](#) on and after March 1, 2019. Guidance should be given in terms of “before 03/01/19” and “on or after 03/01/19.” Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
- In the “Natural Gas Savings,” equation for the measure, the language of the TRM v.7.0 Vol.2 reads, “ $\eta_{\text{HeaterGas}} = \text{Actual}$ . If unknown, use the table C404.2 in IECC 2012 (or IECC 2015 if through new construction) to assume values based on code estimates.” The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). Moreover, the “Actual Efficiency,” for this calculation will be out of date and inconsistent with the with [Energy Efficient Building Act](#) on and after March 1, 2019. Guidance should be given in terms of “before 03/01/19” and “on or after 03/01/19.” Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits

for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

8. **Vol 2, 4.4.6 Electric Chiller.** The reference to a 2012 IECC is out of date and inconsistent with [Energy Efficient Building Act](#). The reference to a 2015 IECC will be out of date and inconsistent with the with [Energy Efficient Building Act](#) on and after March 1, 2019. It is unclear as who or whom will determine the “date of building permit application,” and the corresponding indeterminate references to Tables or Sections from the 2012, 2015 or 2018 editions of the IECC. Guidance should be given in terms of “before 03/01/19” and “on or after 03/01/19.” Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) are not limited solely to new construction. Rather, these codes are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.
  
9. **Vol 2, 4.4.19 Demand Controlled Ventilation – Definition of Baseline Equipment**, states the “base case” is a space with no demand control capability. Each of the 2009, 2012, 2015 and 2018 IECC Editions and their respective Sections addressing Demand controlled ventilation, as well as the respective 90.1-2007, -2010, -2013, -2016 Editions governing Ventilation Controls for High-Occupancy Areas, have required such fundamental controls in buildings for the 10 years since the effective date of a commercial energy conservation code in the State, August 28, 2009. The **Baseline Equipment** declaration presuming “no demand control capability,” and associated **Deemed Lifetime** and **Deemed Measure Cost** for this energy measure is incorrect to presume and requires revision.

Note also, the scope and application of all editions of the IECC (2009, 2012, 2015 and 2018) and the respective editions of ASHRAE Standard 90.1 (-2007, -2010, -2013, -2016) are not limited solely to new construction. Rather, these code and standard editions are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein.

Simply put, it is likely some of the candidate buildings in their current, existing or after change of occupancy state, will likely already have been equipped, or in the absence of the 4.4.19 Measure sponsored by the IOU’s, should have been equipped with Demand Controlled Ventilation in accordance with the aforementioned minimum standards of energy efficient construction practice in the State of Illinois.

10. **Section 4.8.2 Roof Insulation for C&I Facilities –**

- **Definition of Baseline Equipment.** The reference to a “2012 IECC or ASHRAE 90.1-2010” is out of date and inconsistent with [Energy Efficient Building Act](#). The dates where the 2012 IECC (and Standard 90.1-2010 therein) became law and was effective in the State of Illinois was January 1, 2013 to December 31, 2015. The effective date for the 2015 IECC (and Standard 90.1-2013 therein), with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. This will expire April 30, 2019. The effective date for the 2018 IECC (and Standard 90.1-2016 therein), with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
- **(If unknown assume IECC 2015)** ... Guidance for the use of a “Roof Insulation” R-value should be given in terms of telling the evaluator to use “the 2015 IECC Table C402.1.3 before 03/01/19” and “the 2018 IECC Table 402.1.3 on or after 03/01/19.”
- Additionally, the scope and application of all editions of the IECC (1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018) and the respective editions of ASHRAE Standard 90.1 (-1999, -2001, -2004, -2007, -2010, -2013, -2016) are not limited solely to new construction. Rather, these code and standard editions are each applicable to all new construction permits including all permits for alterations, repairs, additions and changes of occupancy to existing buildings and structures defined therein. If the intention is that remaining useful life and/or associated actual efficiency of equipment is to be presumed using an indeterminate reference, either the efficiency level or the code edition year and associated table shall be cited so not to subject the evaluation of said measure to nonuniform interpretation and nonuniform enforcement.

Please call or write if I can provide additional feedback in this regard.

-Darren Meyers



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**From:** Celia Johnson <celia@celiajohnsonconsulting.com>

**Sent:** Thursday, September 13, 2018 2:58 PM

**To:** Adam Burke <aburke@opiniondynamics.com>; Chelsea Lamar <chelsea.lamar@navigant.com>; David Diebel <david@admenergy.com>; Frank Greb <Fgreb@ecw.org>; Hannah Arnold <harnold@opiniondynamics.com>; James Gowen <james.gowen@admenergy.com>; Jane Colby <Jane.Colby@cadmusgroup.com>; Jeff Erickson <jeff.erickson@navigant.com>; Jennifer Fagan

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**Cc:** Celia Johnson <celia@celiajohnsonconsulting.com>

**Subject:** EE SAG: Final IL TRM v7.0

### **Illinois EE SAG Participants:**

Please see the email from the IL-TRM Administrator below – the final Illinois Technical Reference Manual Version 7.0 has been posted to SharePoint [here](#).

Attached is a public notice memo from ICC Staff to all interested parties regarding the final IL-TRM Version 7.0 and two issues that are currently non-consensus. Please note the following:

- Any party wishing to object to the submission of the final 2019 IL-TRM Version 7.0 to the Commission for approval should address their objections to Jennifer Morris at [Jennifer.Morris@illinois.gov](mailto:Jennifer.Morris@illinois.gov) and the TRM Administrator at [iltrmadministrator@veic.org](mailto:iltrmadministrator@veic.org) no later than September 20, 2018. In the event that Staff does not receive any objections by Thursday, September 20, 2018, Staff will represent to the Commission that there are no objections when Staff submits the 2019 IL-TRM Version 7.0 dated September 13, 2018 to the Commission for approval. If Staff receives an objection from a stakeholder concerning submission of the 2019 IL-TRM Version 7.0 to the Commission by September 20, 2018, then Staff will make note of that objection in its Staff Report to the Commission.
- In addition, Staff understands there are two non-consensus issues related to this IL-TRM Update as reflected in VEIC's Comparison Exhibits of Non-Consensus Issues, namely: (1) Advanced Thermostat 'Percent Cooling\_Reduction' assumption – i.e., the assumed average percentage reduction in total household cooling energy consumption due to installation of an advanced thermostat,<sup>6</sup> and (2) Interaction of load reducing measures (e.g., shell) with HVAC replacement measures.<sup>7</sup> Unless Staff is made aware that these two non-consensus issues have been resolved in a manner acceptable to the SAG by September 20, 2018 or unless all parties indicate that they do not seek a Commission proceeding on an issue, Staff will request that the Commission initiate a separate proceeding to resolve these non-consensus issues.

Final IL-TRM Version 7.0 documents are also available for download on the [IL-TRM Version 7.0 page](#) of the SAG website.

Please contact me [iltrmadministrator@veic.org](mailto:iltrmadministrator@veic.org) if you have questions.



Thank you,

Celia

Celia Johnson | SAG Facilitator  
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**From:** Cheryl Jenkins <[cjenkins@veic.org](mailto:cjenkins@veic.org)>  
**Sent:** Thursday, September 13, 2018 1:42 PM  
**Subject:** Final IL TRM v7.0

**Good Afternoon IL EE SAG & TAC Participants:**

VEIC has just uploaded the final version of IL TRM v7.0 to SharePoint for your review [here](#). This includes all four volumes, each presented in a clean Word version, a Word version with redlines of all changes made since v6.0, and a PDF document.

We have also uploaded two non-consensus memos, one related to the Advanced Thermostat 'Percent Cooling Reduction' assumption, and one for Shell and HVAC Replacement Interactions, and a copy of the memo outlining Errata to IL TRM v6.0 identified during our work this year. These are all on SharePoint [here](#).

This is the final version of the TRM v7.0. On our TAC call on Tuesday, Jennifer indicated that she does not have to file with the ICC until later in the month, and left the window open for us to make adjustments and publish a "final final" version if any resolution occurs related to the non-consensus issues. Should changes be made, we will post a final version on SharePoint. Adjustments related to those two issues are the only potential changes anticipated – we would not be making changes for anything else at this point (barring any really significant issue not yet identified).

Please contact me or [iltrmadministrator@veic.org](mailto:iltrmadministrator@veic.org) if you have questions, have problems uploading your comments, or need help navigating the IL TRM TAC SharePoint site.

Thank you once again for a successful year navigating a significant number of changes and enhancements – we really appreciate the value of this collaborative process!

Cheryl, Sam, Steph, and the TRM Team

*Cheryl*  
**Cheryl Jenkins**  
**Strategic Operations Director**

**VEIC**

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**From:** Sam Dent  
**To:** [dmeyers@ieccode.com](mailto:dmeyers@ieccode.com); "Celia Johnson"  
**Cc:** [Cheryl Jenkins](#); [Illinois TRM Administrator](#); [Asa Parker](#)  
**Subject:** RE: EE SAG: Policy Proposal from 6/21 IL-TRM Policy Issues Meeting (COMMENT)  
**Date:** Thursday, June 28, 2018 10:36:24 AM

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Hi Darren,

Thanks for your email. VEIC are delivering our first draft of Version 7 today but want to acknowledge receipt of these comments. What we suggest is we have this be an agenda item on one of the next wave of TAC meetings which will begin 24<sup>th</sup> July. I don't believe you are a regular attendee of those calls so we will be sure to invite you when it occurs.

Some of the issues below may not be relevant since many of these measures are retrofit only as opposed to NC. Of those that do include NC baselines, we have run on the assumption that the permit date is the relevant date in terms of applicable code. It may be appropriate to add 2018 requirements to some measures upon knowledge that the new code will be in effect March 1<sup>st</sup>. And we agree that we need to make sure the version of 90.1 is made clear.

We will be in touch when we start to develop agendas for the TAC calls and thanks again for bringing this to our attention.

Sam

**Sam Dent**  
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**From:** dmeyers@ieccode.com [mailto:dmeyers@ieccode.com]  
**Sent:** Wednesday, June 27, 2018 2:16 PM  
**To:** 'Celia Johnson' <Celia.Johnson@futee.biz>  
**Cc:** Sam Dent <sdent@veic.org>; Cheryl Jenkins <cjenkins@veic.org>  
**Subject:** RE: EE SAG: Policy Proposal from 6/21 IL-TRM Policy Issues Meeting (COMMENT)

Hello Celia (Sam, Cheryl),

I have a few comments RE: TRM v.7: Established Code Baseline ...

**COMMENT RE TRM v.7: Established Code Baseline.** The 2015 IECC became effective in Illinois on January 1, 2016. This means by way of secondary reference, an equivalent path for compliance is also that of ANSI/ASHRAE/IES Standard 90.1-2013. [The Capital Development Board](#) (CDB), in conjunction with the [Illinois EPA Office of Energy](#) (EPA OE), is nearing

completion of the cycle for the Illinois Energy Conservation Code (IL ECC) to update from the 2015 ICC *International Energy Conservation Code* (IECC w/ ASHRAE 90.1-2013) to the 2018 IECC (w/ ASHRAE 90.1-2016). In accordance with the [Energy Efficient Building Act](#), CDB is required to review and adopt the most current version of the IECC within one year after its publication date. The Code will then become effective within 6 months following its adoption by CDB. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

The following sections of the TRM v.6 should have been revised circa February 8, 2017 to reflect the current state of Illinois Law via the [Energy Efficient Building Act](#). We are suggesting these sections of TRM v.6 will likely be affected by the update to 2018 IECC (ASHRAE 90.1-2016) as a result:

### **RESIDENTIAL MEASURES, Volume 3 ...**

- Calculations of Savings for these measures are incorrect as they rely on “dated” information inconsistent with the [Energy Efficient Building Act](#) and require revision. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019. Please note the whole house air sealing, duct sealing, window replacement and whole-house-ventilation measures of the [Illinois Amendments](#) will likely affect baseline equipment presumptions, deemed lifetimes and deemed measure costs for various energy measures therein and will likely require revision.

### **COMMERCIAL & INDUSTRIAL MEASURES, Volume 2 ...**

- RE: 4.4.19 Demand Controlled Ventilation – Definition of Baseline Equipment, states the “base case” is a space with no demand control capability. IECC Section C403.2.6.1, Demand controlled ventilation, and 90.1 Section 6.4.3.8 Ventilation Controls for High-Occupancy Areas, require such fundamental controls in most buildings. The baseline equipment presumption, deemed lifetime and deemed measure cost for this energy measure is incorrect and requires revision.
- RE: 4.4.34 De-stratification Fan – Calculation of Savings for this measure is incorrect as it relies on “dated” information inconsistent with the [Energy Efficient Building Act](#) and requires revision. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.

- RE: 4.4.35 Economizer Repair and Optimization - Calculation of Savings for this measure is incorrect as it relies on “dated” information inconsistent with the [Energy Efficient Building Act](#) and requires revision. The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019. Both the 2015/2018 IECC and Section 6.4.3.12 Economizer Fault Detection and Diagnostics (FDD), of 90.1-2016 require the installation of Fault Detection and Diagnostic controls.
  
- RE: 4.4.39 High Temperature Heating and Ventilation (HTHV) Direct Fired Heater. Calculation of Savings for this measure is incorrect as it relies on “dated” information, roof and wall insulation R-values inconsistent with the [Energy Efficient Building Act](#) and requires revision.
  
- RE: 4.8.2 Roof Insulation for C&I Facilities. Calculation of Savings for this measure is incorrect as it relies on “dated” information inconsistent with the [Energy Efficient Building Act](#) and requires revision. For instance, what is meant by, “For new construction use R-value from IECC 2012 or ASHRAE – 90.1 – 2010, or use IECC 2015 or ASHRAE – 90.1 – 2013, depending on the IECC in effect on the date of the building permit (if unknown assume IECC 2015)...?” (see p.481 of TRM v.6) Revise to reflect measures consistent with the [Energy Efficient Building Act](#). This section requires revision.
  
- There are 16 instances throughout TRM v.6 where either a reference to “90.1” without an Edition citation or a reference to ANSI/ASHRAE/IESNA Standard 90.1-2007, 90.1-2010, ASHRAE 90.1-2013 or the 2015 IECC are made. These references are internally incompatible (i.e., favorable or “dated” Editions selected over Illinois statutory requirements), they are “dated” and they are inconsistent with the [Energy Efficient Building Act](#). The effective date for the 2015 IECC, with [Illinois Amendments](#), to become law in the State of Illinois was January 1, 2016. The effective date for the 2018 IECC, with Illinois Amendments, to become law in the State of Illinois will be March 1, 2019.
  - Footnote 426 – 90.1 (No Edition year cited. Please clarify Edition consistent w/ Illinois statute)
  - Footnote 427 – 90.1 (No Edition year cited. Please clarify Edition consistent w/ Illinois statute)
  - Footnote 546 – 90.1-2007 (Edition year shall be consistent w/ Illinois statute)
  - Footnote 554 – 90.1-2007 (Edition year shall be consistent w/ Illinois statute)
  - Footnote 557 – 90.1-2013 (Edition year shall be consistent w/ Illinois statute)
  - Footnote 568 – 90.1 (No Edition year cited. Please clarify Edition consistent w/ Illinois statute)
  - Footnote 589 – 90.1-2010 (Edition year shall be consistent w/ Illinois statute)
  - Footnote 593 – 90.1-2010 (Edition year shall be consistent w/ Illinois statute)

- Footnote 667 – 90.1 (No Edition year cited. Please clarify Edition consistent w/ Illinois statute)
- Note also, the EPA OE has issued a number of “formal interpretations” to the [Energy Efficient Building Act](#), in the form of Frequently Asked Questions (FAQs) which may be found [here](#). These interpretations have been known to impact decisions for IL Weatherization and IL Chiller Rebate and Installation programs.

Please call or write if I can provide additional feedback in this regard.



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**Subject:** EE SAG: Policy Proposal from 6/21 IL-TRM Policy Issues Meeting

#### **EE SAG Participants:**

SAG held a teleconference meeting on **Thursday, June 21** to discuss IL-TRM policy issues, as requested by the IL-TRM Administrator. [Click here to download the Attendee List and Meeting Notes](#). Meeting materials are available on the [SAG website](#).

As discussed during the call, below is a Policy Proposal for SAG review. Interested parties have 15

Business Days to review.

**If you have questions, comments, objections, and/or proposed edits, please send them to me no later than COB on Wednesday, July 18.** If I receive any substantive edits or objections to the Policy Proposal, a follow-up SAG teleconference meeting will be scheduled.

### **Policy Proposal**

1. **Secondary Electricity Savings from Reduced Water Use:** A “kWh per million-gallon” factor should be used to calculate secondary electricity savings from reduced water use. Specific details on the factor to be used and which measures it will apply to will be addressed by the TAC in the IL-TRM Version 7.0 process.
2. **Custom Measures:** For custom measures, the existing baseline could be used in savings calculations at the discretion of program administrators (for example, if the existing condition is not compliant with code and there is data to back that up, the existing condition can be used).
3. **Prescriptive Measures:** For prescriptive measures, code level will be assumed to be the baseline. Any adjustment should be made in the NTG ratio, not in TRM savings calculations.
4. **NTG Working Group Follow-Up:** The NTG Working Group will review how to make adjustments to NTG ratios for the below code baseline scenarios, for both prescriptive and custom measures.
5. **Seeking SAG Approval:** When a situation arises in the IL-TRM TAC where an efficient condition doesn’t meet code, the IL-TRM Administrator will seek SAG approval on a case by case basis before approving the measure.
6. **Memorializing Policy Agreements:** Policies should be included in either Policy Manual Version 2.0 or an updated version of the IL-TRM Policy Document. The SAG Facilitator will add this policy topic to tracking list.

Please reach out to me with any questions. Thank you,

Celia

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