Summary of changes to 2015 CBES since public hearing September 19th

1. Removed VRF exception (based on stakeholder comment) to C403.2.4.1.1
2. Added language clarifying C403.2.4.1.1 for supplementary heat is integral to the unit itself.
3. Section 101.2 Scope revised to reflect ASHRAE 90.1-2013 formatting and language per comment
4. In Table C403.2.3(9) a footnote has been added reading: "a.Air conditioners primarily serving computer rooms and covered by ASHRAE Standard 127 shall meet the requirements in Table C403.2.3(9). All other air conditioners shall meet the requirements of Table C403.2.3(1)."
5. Exception added to Section C403.3 Economizers. The exception is taken directly from ASHRAE 90.1-2013 per public comment.

Comment: #1) The revised language in SECTION C101.2 SCOPE is not clear. The ASHRAE 90.1 language is included in this new draft but does not include the bulletized formatting directly from ASHRAE 90.1 that clearly delineates the commercial scope versus what is included for manufacturing and industrial applications.

ASHRAE language excerpted below:

"2.1 This standard provides a. minimum energy-efficient requirements for the design and construction, and a plan for operation and maintenance of 1. new buildings and their systems, 2. new portions of buildings and their systems, 3. new systems and equipment in existing buildings, and 4. new equipment or building systems specifically identified in the standard that are part of industrial or manufacturing processes"

The language that was included in the latest draft below is not clear:

C101.2 Scope. This code applies to commercial buildings and the buildings' sites and associated systems and equipment. This code provides minimum energy-efficient requirements for the design and construction, and a plan for operation and maintenance of new equipment or building systems specifically identified in the code that are part of industrial or manufacturing processes.

This wording is confusing and the intent of item #4 in the ASHRAE scope statement is lost, which is to clearly note that ONLY the building systems and equipment for mfg/industrial processes specifically

identified in the standard are included. The language as formatted is not as clear as it could be without adopting the formatting from ASHRAE.

Response: Comment accepted. ASHRAE language and formatting inserted into 2015 CBES per comment.

Comment: Reducing the percentage of fenestrations from 40% to 30% could negatively impact our ability to daylight our spaces. There should be language to allow increased levels of glazed fenestrations, especially on southern aspects, or where view corridors are leveraged.

Response: The code explicitly allows 40% vertical fenestration, provided certain daylight responsive control criteria are met. Please see Section *C402.3.1.1 Increased vertical fenestration area with daylight responsive controls*.

Comment:

406.1.1 By requiring a building with a footprint of over 20,000 sqft to install on site renewable energy you are prorogating state wide energy policy that has not been debated or agreed upon. Who would regulate the on site system? is it net metered? What if the building site does not lend itself to any on site renewable energy system? Language that allows for buying off site generated renewable energy, priding the energy supplier can not sell the REC's maybe a better way to go.

407 Requiring building commissioning has no proven value added. This panders to the vendors.

404.9.3. Requiring 70% of heating energy be produced by "site recovered energy" puts an undue financial burden on the developer. It is an unreasonably high hurtle.

Response: These comments are no longer applicable. These sections had been removed prior to public hearing, also based on public comment.

Envelope
1.) **Table C402.1 Building Envelope Requirements – Opaque Assemblies and Elements** –
Our comment on the prior Draft:
"Though the IECC does not contain different requirements for semi-conditioned buildings, Standard 90.1 does. We have been involved with some buildings that fit in this category, and the less stringent envelope requirements make sense for these buildings; recommend adding."
Was responded with:
"The IECC does not contain semi-heated requirements because it would leave the door open for the construction of a semi-heated building and then the additional heating and cooling being incorporated at a later date without updating the building envelope. The voters at the IECC thought this could be a problem, ASHRAE does not."
Since the **503.2 Change in space conditioning**, and **505.1 Change of occupancy or use** requirements exist, it does not seem that the theoretical situation described of changing the conditioning of a building without changing the envelope is actually allowable by the CBES).

Response: While the situation described is theoretically possible (though Section 503.2 does state that "*Any nonconditioned or low-energy space that is altered to become conditioned space shall be required to be brought into full compliance with this code*."), including semi-conditioned buildings in the

prescriptive CBES code presents too much opportunity for subjective interpretation and a potential slippery slope for less stringent envelope requirements.

Comment:
C403.1.2 Electric resistance space heating – Should the electric resistance heat prohibition and/or exceptions be modified for this code revision or in the future? Allowing the use of electric resistance heat as a back-up heating source when used in conjunction with a cold climate heat pump or VRF system and an extremely efficient building envelope offers both a low equipment installation cost and a low operation cost. This may be of interest if the state wants to increase the rate of movement away from fossil fuels. A control requirement to assist with load management could also be added to minimize overall grid impact.

Response: The PSD is interested in having a larger discussion about a potential policy shift in the CBES accounting for the conditions cite din this comment. At this time, the prohibition of electric resistance heating, both integral to heat pump units and as primary or back up heating systems (with exceptions provided in the CBES) will remain.

Comment:
Table C403.2.3 (9) Minimum Efficiency Air Conditioners and Condensing Units Serving Computer Rooms – The smallest net sensible cooling capacity category is missing "<" for each equipment type.
Response: Corrected for all cases.

Comment: Table C403.2.3 (9) Minimum Efficiency Air Conditioners and Condensing Units Serving Computer
Rooms – These requirements appear to apply to any cooling equipment serving a computer room. There are many buildings which have small computer rooms which are served by a small DX split system, not a "computer room air conditioner (CRAC)" unit. CRAC units are rated with the applicable SCOP efficiency, but other types of cooling systems are not. How can compliance be shown if the installed equipment is not tested under the certain conditions and ratings published? It seems as though it would be best for the title of this table to be "Minimum Efficiency Requirements: Computer Room Air Conditioning Units", and only apply to those specific pieces of equipment.

Response: The IECC clearly dropped the applicable language when transferring this from ASHRAE 90.1. A footnote has been added reading: "a. Air conditioners primarily serving computer rooms and covered by ASHRAE Standard 127 shall meet the requirements in Table C403.2.3(9). All other air conditioners shall meet the requirements of Table C403.2.3(1)."

Comment: **C403.2.7 Energy recovery ventilation systems** – The table for this requirement appears to have been
omitted in this most recent draft. There was a comment based on the previous draft for this requirement, but that comment only applied to one column of the table.

Response: This was an oversight in the transfer of the 2015 CBES to the redlined 2011 CBES. Correct in 2015 CBES.
Comment: **C403.2.8 Kitchen exhaust systems** – The table for this requirement appears to have been omitted in this most recent draft.

Response: This was an oversight in the transfer of the 2015 CBES to the redlined 2011 CBES. Correct in 2015 CBES.

Comment:
C403.3 Economizers – The text "or water" appears to have been deleted from the previous draft, with no indication of the reasoning. Was this intentional? Recommend retaining the option of a water economizer.

Response: This was an oversight in the transfer of the 2015 CBES to the redlined 2011 CBES. Correct in 2015 CBES.

Comment:
C403.3 Economizers – The current Draft requires economizers on all cooling system, regardless of the application. 90.1 on the other hand has different requirements for comfort cooling and computer room cooling applications. Specifically, for Vermont's climate zone, economizers are required only for computer rooms with a cooling capacity of ≥135,000 Btu/h. Recommend including this exception.

Response: The comment is incorrect in that there is no climate zone-specific exception for computer room applications (at least not in 90.1-2007 or 90.1-2013). However, the commenter is correct that this ASHRAE exception is valuable, and the current 4-part ASHRAE 90.1-2013 exception has been added to the 2015 CBES.

Comment:
C403.4.2.4 Part-load controls – The comment made on the previous draft recommended decreasing the pump motor power threshold from 5 to 10. This is reasonable, but should be changed for both requirement 2 and 3. It currently appears to have just been changed for 3.

Response: Comment accepted and value changed from 10hp to 5hp.

Comment:
C404.1.1 Electrical water heating limitation –The reasoning of why the maximum 5 kW electrical power input requirement was initially put in place (demand on electric grid, high energy cost) still exists. Furthermore, the market has advanced substantially since then, and even more energy efficient domestic water heating products are available, and at a reasonable price. We do not support increasing the electrical power input threshold for water heating. If agree and support 5 KW limit for electric hot water, also need to adjust section 401.2.1 – applicable provisions to Standard 90.1 – 2013, exceptions to section 6.2.3.

Response: Stakeholder comment referred to known safety issues with placing multiple smaller units in series. 12 kW will remain.
2.) **C404.1.1 Electrical water heating limitation** – If the change to 12 kW stands, it needs to be reflected in
all locations of the CBES. Table 404.2 currently indicates 5 kW.

Response: This was transcription error in 2011 redline version. This is adjusted in final 2015 CBES.