Residential Heating and Cooling Systems Initiative Revision

Overview of April 2020 Proposal
CEE and Market Transformation

What is a CEE Initiative?

**Objective:** Overcome market barriers, capture greater energy and demand savings

**Approach:** Identify a market strategy requiring common program actions across multiple jurisdictions

**Intended Use:** Local implementation by members

**Participation Requirements:** Indicate program support to market participants
CEE Residential HVAC Initiative

First published in 1995

Last revised in 2015, includes:

- Common Efficiency Specification
  - Central Air Conditioners
  - Air Source Heat Pumps
  - Furnaces and Furnace Fans
  - Boilers
- Quality Installation
- Education and Awareness Building
- CEE Directory

Currently under revision (2018-2020)
2018 Program Summary

HVAC Measures Offered by CEE Members

CEE Members (#)

- Air Source Heat Pump (Split): 68
- Furnace: 60
- Boiler: 50
- Central AC (Split): 48
- Ground Source Heat Pumps: 32
- Ductless Air-Source Heat Pumps: 37
- Energy Efficiency Kit: 30
- Programmable Thermostats: 68
- Communicating Thermostats: 70
- Air Source Heat Pump (Packaged): 14
- Direct Heating (Gas): 21
- Central AC (Packaged): 13
- Dual Fuel Heat Pumps: 6
- Variable Capacity Equipment: 1

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
Since 2015…

Member interest in updating aspects of the longstanding Initiative to reflect:

- Evolving portfolio goals
- Emerging new technologies
- Changing market conditions
- Dynamic program objectives

Equipment Differentiation
- Low-ambient Performance
- Variable Capacity Systems
- Ductless Heat Pumps
- Multifunction Heat Pumps
- ECM / Furnace Fans
- Gas Heat Pumps
- Low Load Furnaces

Connectivity and Controls
- Load Management
- EM&V
- On-board Diagnostics
- Thermostats

Non-Energy Benefits
- Indoor Air Quality, Health, and Comfort
- Remote Control and Maintenance

Trade Ally Networks
- Quality Installation
- Education and Training

Program Design
- Holistic Home Upgrades
- Market Segments (i.e. low income)
- Midstream Models
- Customized Recommendations and Roadmaps

Improved Metrics and Test Methods
CEE Initiative Assessment Criteria

- Magnitude of savings opportunity
- Member interest and suitability for member programs
- Permanency of savings
- Timing of savings
- Complexity of marketplace
- Consistency in markets across regions
- Complexity of influencing decision-makers
- Cost and time required to affect market
- National relevance vs. regionally-concentrated savings
- Available resources (CEE, partners, related efforts, etc.)
CEE Committees (Res HVAC – gas and electric, Emerging Technologies, Behavior, Portfolio Managers) develop new components and criteria. Vet with industry and key stakeholders at multiple stages.

Emerging Tech. Working Groups on Advanced ASHPs

One on one calls with HVAC OEMs to discuss connected

Letter out to industry

Published revised CEE Res HVAC Initiative

Publish CEE Connected Thermostat Program Guide

Assess comments with CEE Committee and incorporate feedback

Published revised CEE Res HVAC Initiative?
Agenda

Res HVAC Initiative Background and Context

Key Proposed Changes

• Initiative Strategy and Long-Term Objectives
• Proposed Efficiency Specification Structure
  – Natural Gas: Boilers and Furnaces
  – Electric: Central A/C and Air Source Heat Pumps
• Connectivity and Load Management Criteria

Remaining Questions and Next Steps
Strategy and Long-Term Objectives
Proposed Initiative Strategy – Part I

Increased emphasis on the role of equipment selection and tailored system considerations

- New technologies, equipment, and connected capabilities have led to even greater number of customer choices for heating and cooling
- Programs are encouraged to incorporate design and educational components into their offerings
Existing federally regulated rating metrics for differentiating equipment are not consistently reliable indicators of actual in-field performance

- Proposed draft continues to leverage DOE metrics (SEER, EER, HSPF)
- Will revise efficiency levels to comply with M1 test methods (SEER2, EER2, HSPF2) when those go into effect January 1, 2023
- CEE is exploring alternative approaches to defining and testing systems that better represent in-field use for future consideration
Several areas that members are interested in addressing further in future revisions (but are NOT included in this scope) include:

- Additional quality installation opportunities, diagnostics, and maintenance related considerations

- New equipment and system specifications (combination space and water heating, furnace fans, multifunction ASHPs, etc.)

- Integrated demand side management features and components that address a greater range of applications within the CEE Integrated Home
Efficiency Specifications
NATURAL GAS EQUIPMENT
## Boiler Specification

<table>
<thead>
<tr>
<th>Level</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>≤300,000 BTU/h</td>
<td>≤300,000 BTU/h</td>
<td>No</td>
<td>DOE definitions</td>
</tr>
<tr>
<td>Tier 0</td>
<td>≥ 85% AFUE</td>
<td>≥ 85% AFUE</td>
<td>Yes – sunset in 2021</td>
<td>In retrofits where condensing operation is not possible</td>
</tr>
<tr>
<td>Tier 1</td>
<td>≥ 90% AFUE</td>
<td>≥ 90% AFUE</td>
<td>Outdoor Reset Control</td>
<td>ENERGY STAR</td>
</tr>
<tr>
<td>Tier 2</td>
<td>≥ 95% AFUE</td>
<td>≥ 95% AFUE</td>
<td>Outdoor Reset Control</td>
<td>ENERGY STAR Most Efficient</td>
</tr>
<tr>
<td>Advanced Tier</td>
<td>N/A</td>
<td>≥ 120% AFUE</td>
<td>NEW; Outdoor Reset Control</td>
<td>Optional criteria for data/energy reporting</td>
</tr>
</tbody>
</table>

CEE Tier 0 for residential boilers is intended for boiler systems where condensing equipment meeting Tier 1 or Tier 2 is not practicable due to system or building constraints. Additional considerations for condensing equipment are described in the Initiative.
Incorporation of an Advanced Tier

A CEE Advanced Tier represents an aspirational level of efficient and product performance agreed by manufacturers to be technically feasible. While few or no products may fulfill the Advanced Tier specification requirements at the time it goes into effect, and those that exist may not be appropriate for all applications, it lays the groundwork for future programs. It establishes a longer-term aspiration, creates a consistent goal for the market to move towards, and provides recognition for the first manufacturers to develop products that achieve even greater levels of performance.

GAS HEAT PUMP TECHNOLOGIES

- Annual Fuel Utilization Efficiency (AFUE)
- COP @5° F (such as ≥ 1.10)
- Rated Output (such as down to -5° F)
- Greenhouse Gas Emission
## Gas Heat Pump Products to Date

<table>
<thead>
<tr>
<th>Technology Family</th>
<th>Manufacturer</th>
<th>COP</th>
<th>Product Readiness</th>
<th>U.S. Market Availability</th>
<th>Out of U.S. Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption</td>
<td>Robur</td>
<td>&gt;1.3</td>
<td>Released</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Absorption</td>
<td>Stone Mountain Technologies Inc.</td>
<td>&gt;1.3</td>
<td>In development</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Internal Combustion</td>
<td>Tecogen</td>
<td>&gt;3.0</td>
<td>Released</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Internal Combustion</td>
<td>Yanmar</td>
<td>&gt;3.0</td>
<td>Released</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Internal Combustion</td>
<td>Sierra Fresh Air Systems</td>
<td>&gt;3.0</td>
<td>Released</td>
<td>Y</td>
<td>Unknown</td>
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<tr>
<td>Adsorption</td>
<td>HBAB</td>
<td>&gt;1.0</td>
<td>In development</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Ejector</td>
<td>Unknown</td>
<td>&gt;1.1</td>
<td>In development</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Vuilleumerier Stirling</td>
<td>ThermoLift</td>
<td>&gt;1.5</td>
<td>In development</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Duplex Stirling</td>
<td>BoostHEAT</td>
<td>&gt;1.2</td>
<td>Released</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Thermo-acoustic Stirling</td>
<td>SoundEnergy</td>
<td>&gt;1.0</td>
<td>Released</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

Source: NEEA Research 2019
Outdoor Reset Control

Intention is to address the return water temperature allows condensing, for boilers with an AFUE of 90% or above (proposed CEE Tier 1 and above).
Background Data – Model Availability

AHRI Boilers ≤300,000Bth/H

<table>
<thead>
<tr>
<th>Level</th>
<th>AFUE</th>
<th>% More Efficient Than Federal Standard (82%; will be 84% in 2021)</th>
<th># of Available Models</th>
<th>% of Available Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Tier 0</td>
<td>≥ 85%</td>
<td>3%</td>
<td>818</td>
<td>100%</td>
</tr>
<tr>
<td>Proposed Tier 1</td>
<td>≥ 90%</td>
<td>8%</td>
<td>651</td>
<td>79%</td>
</tr>
<tr>
<td>Proposed Tier 2</td>
<td>≥ 95%</td>
<td>13%</td>
<td>477</td>
<td>58%</td>
</tr>
</tbody>
</table>

Total of 818 active furnace models, all sizes (July 2019)

AHRI/CEE Directory, accessed July 2019
Background Data – Program Activity

50 Member Programs

Proposed Tier 0
≥ 85% AFUE
5 member programs

Proposed Tier 1
≥ 90% AFUE
22 member programs

Proposed Tier 2
≥ 95% AFUE
26 member programs

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
## Furnace Specifications

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>≤225,000 BTU/h</td>
<td>≤225,000 BTU/h</td>
<td>Yes</td>
<td>DOE definitions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤40,000 BTU/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 1</td>
<td>≥ 90% AFUE</td>
<td>≥ 92% AFUE</td>
<td>Yes</td>
<td>Almost no products (12 of thousands) between 90-92%; proposed DOE min.</td>
</tr>
<tr>
<td>Tier 2</td>
<td>≥ 95% AFUE</td>
<td>≥ 95% AFUE</td>
<td>No</td>
<td>ENERGY STAR North</td>
</tr>
<tr>
<td>Tier 3</td>
<td>≥ 97% AFUE</td>
<td>≥ 97% AFUE</td>
<td>No</td>
<td>ENERGY STAR Most Efficient</td>
</tr>
<tr>
<td>Advanced Tier</td>
<td>N/A</td>
<td>≥ 120% AFUE</td>
<td>Yes</td>
<td>ENERGY STAR Most Efficient</td>
</tr>
</tbody>
</table>
Background Data – Model Availability

AHRI Furnaces ≤225,000 Btu/H

<table>
<thead>
<tr>
<th>Level</th>
<th>AFUE</th>
<th>% More Efficient Than Federal Standard</th>
<th>Number of Available Models</th>
<th>Percent of Available Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Tier 1</td>
<td>≥ 92%</td>
<td>12% South</td>
<td>2% North</td>
<td>2,906</td>
</tr>
<tr>
<td>Proposed Tier 2</td>
<td>≥ 95%</td>
<td>15% South</td>
<td>5% North</td>
<td>2,540</td>
</tr>
<tr>
<td>Proposed Tier 3</td>
<td>≥ 97%</td>
<td>17% South</td>
<td>7% North</td>
<td>305</td>
</tr>
</tbody>
</table>

Total of 2,906 active furnace models, all sizes (July 2019)

AHRI/CEE Directory, accessed July 2019
Background Data – Program Activity

60 Member Programs

- Proposed Tier 1: ≥ 92% AFUE, 10 member programs
- Proposed Tier 2: ≥ 95% AFUE, 51 member programs
- Proposed Tier 3: ≥ 97% AFUE, 21 member programs
Specification for ≤40,000 BTU/h

- Programmatic opportunity to promote units with a lower input rating
  - Low energy use applications
  - Smaller houses or units
  - Tightly built homes

- Specification intended for members interested in distinguishing these uses

- As of November 2019 there were 376 available furnace models through AHRI
Background Data – Model Availability

AHRI Furnaces <40,000 Btu/H

<table>
<thead>
<tr>
<th>Level</th>
<th>AFUE</th>
<th>% More Efficient Than Federal Standard (80% South</th>
<th>90% North)</th>
<th>Number of Available Models</th>
<th>Percent of Available Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Tier 1</td>
<td>≥ 92%</td>
<td>12%South</td>
<td>2% North</td>
<td>376</td>
<td>100%</td>
</tr>
<tr>
<td>Proposed Tier 2</td>
<td>≥ 95%</td>
<td>15%South</td>
<td>5% North</td>
<td>306</td>
<td>81%</td>
</tr>
<tr>
<td>Proposed Tier 3</td>
<td>≥ 97%</td>
<td>17%South</td>
<td>7% North</td>
<td>11</td>
<td>3%</td>
</tr>
</tbody>
</table>

Total of 365 active furnace models, ≤40,000 BTU/h (July 2019)

AHRI/CEE Directory, accessed July 2019
Efficiency Specifications

ELECTRIC EQUIPMENT
US DOE Climate Regions

Figure 1. Seven of the eight US climate zones recognized by Building America occur in the continental United States. The sub-arctic U.S. climate zone, not shown on the map, appears only in Alaska.

Addition of Climate Zones in Spec

- The climate distinctions are for program purposes, they are NOT consumer facing.
- The delineated regions are suggested breakdowns, they are NOT intended to be absolute lines.
- For this Initiative revision, members feel that TWO zones are sufficient to meet program needs:
  - One specification for South and Southwest
  - One specification for North and Canada
## Central A/C Specification

### SPLIT SYSTEMS
All Climates (South, Southwest, North)

<table>
<thead>
<tr>
<th>Level</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SEER</td>
<td>EER</td>
<td>SEER</td>
</tr>
<tr>
<td>Tier 0</td>
<td>≥ 14.5</td>
<td>≥ 12.0</td>
<td></td>
</tr>
<tr>
<td>Tier 1</td>
<td>≥ 15.0</td>
<td>≥ 12.5</td>
<td>≥ 16.0</td>
</tr>
<tr>
<td>Tier 2</td>
<td>≥ 16.0</td>
<td>≥ 13.0</td>
<td>≥ 18.0</td>
</tr>
<tr>
<td>Tier 3</td>
<td>≥ 18.0</td>
<td>≥ 13.0</td>
<td></td>
</tr>
</tbody>
</table>
## Background Data – Model Availability

Total Models: 2,108,644

<table>
<thead>
<tr>
<th>Split Central A/C Specification</th>
<th>CEE Tier</th>
<th>SEER</th>
<th>EER</th>
<th>Number of Models</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>14.5</td>
<td>12.0</td>
<td>1,514,656</td>
<td>71.8%</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>15.0</td>
<td>12.5</td>
<td>1,204,006</td>
<td>57.1%</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>16.0</td>
<td>13.0</td>
<td>518,748</td>
<td>24.6%</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>18.0</td>
<td>13.0</td>
<td>36,034</td>
<td>1.71%</td>
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<td><strong>Proposed</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>16.0</td>
<td>12.5</td>
<td>592,642</td>
<td>28.11%</td>
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<tr>
<td>2</td>
<td>2</td>
<td>18.0</td>
<td>13.0</td>
<td>36,034</td>
<td>1.71%</td>
</tr>
</tbody>
</table>

AHRI/CEE Directory, accessed June 2019
Background Data – Model Availability

Total Models: 2,108,644
Background Data – Program Activity

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
Background Data – Program Activity

47 Members | 73 Program Data Points

Proposed CEE Tier 1

Proposed CEE Tier 2

Central A/C Split

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
Central A/C Specification

PACKAGED SYSTEMS
All Climates (South, Southwest, North)

<table>
<thead>
<tr>
<th>Level</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SEER</td>
<td>EER</td>
<td>SEER</td>
</tr>
<tr>
<td>Tier 1</td>
<td>≥ 15.0</td>
<td>≥ 12.0</td>
<td>≥ 16.0</td>
</tr>
<tr>
<td>Tier 2</td>
<td>≥ 16.0</td>
<td>≥ 12.0</td>
<td>≥ 17.0</td>
</tr>
</tbody>
</table>
## Background Data – Model Availability

- **Total Models:** 3,087

<table>
<thead>
<tr>
<th>Packaged Central A/C Specification</th>
<th>CEE Tier</th>
<th>SEER</th>
<th>EER</th>
<th>Number of Models</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>15.0</td>
<td>12.0</td>
<td>997</td>
<td>32.30%</td>
</tr>
<tr>
<td>2</td>
<td>14.0</td>
<td>12.0</td>
<td></td>
<td>485</td>
<td>15.70%</td>
</tr>
<tr>
<td><strong>Proposed</strong></td>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>16.0</td>
<td>12.0</td>
<td></td>
<td>485</td>
<td>15.70%</td>
</tr>
<tr>
<td>2</td>
<td>17.0</td>
<td>12.5</td>
<td></td>
<td>65</td>
<td>2.10%</td>
</tr>
</tbody>
</table>

AHRI/CEE Directory, accessed June 2019
Background Data – Model Availability

Total Models: 3,087
Background Data – Program Activity

6 Members | 11 Program Data Points

EER

SEER

Proposed CEE Tier 1

Proposed CEE Tier 2

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
## Air Source Heat Pump Specification

### SPLIT SYSTEMS

**All Climates (South, Southwest, North)**

<table>
<thead>
<tr>
<th>Level</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SEER</td>
<td>EER</td>
<td>HSPF</td>
</tr>
<tr>
<td><strong>Tier 0</strong></td>
<td>≥ 14.5</td>
<td>≥ 12.0</td>
<td>≥ 8.5</td>
</tr>
<tr>
<td><strong>Tier 1</strong></td>
<td>≥ 15.0</td>
<td>≥ 12.5</td>
<td>≥ 8.5</td>
</tr>
<tr>
<td><strong>Tier 2</strong></td>
<td>≥ 16.0</td>
<td>≥ 13.0</td>
<td>≥ 9.0</td>
</tr>
<tr>
<td><strong>Tier 3 / Advanced</strong></td>
<td>≥ 18.0</td>
<td>≥ 13.0</td>
<td>≥ 10.0</td>
</tr>
</tbody>
</table>

---

**SPLIT SYSTEMS**

**All Climates (South, Southwest, North)**
Background Data – Model Availability

Total Models: 393,915
Background Data – Program Activity

Proposed CEE Tier 1
Proposed CEE Tier 2
Proposed Advanced Tier

HSPF only

SEER only

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
Background Data – Program Activity

68 Members | 57 Program Data Points

- Proposed CEE Tier 1
- Proposed CEE Tier 2
- Proposed CEE Tier 3 & Advanced Tier

HSPF vs. SEER

CEE Residential HVAC Program Summary, 2018: https://library.cee1.org/content/2018-residential-hvac-program-summary/
# Air Source Heat Pump Specification

## PACKAGED SYSTEMS

All Climates (South, Southwest, North)

<table>
<thead>
<tr>
<th>Level</th>
<th>Current Specification</th>
<th>Proposed Specification</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SEER  EER  HSPF</td>
<td>SEER  EER  HSPF</td>
<td>Rated Capacity</td>
</tr>
<tr>
<td>Tier 1</td>
<td>≥ 15.0  ≥ 12.0  ≥ 8.2</td>
<td>≥ 16.0  ≥ 12.0  ≥ 8.2</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>*Align with ESTAR V6.0?</td>
</tr>
<tr>
<td>Tier 2</td>
<td>≥ 16.0  ≥ 12.0  ≥ 8.2</td>
<td>≥ 17.0  ≥ 12.0  ≥ 8.2</td>
<td>Optional</td>
</tr>
<tr>
<td>Tier 3 /</td>
<td></td>
<td>≥ 17.0  ≥ 12.0  ≥ 9.0</td>
<td>Yes</td>
</tr>
<tr>
<td>Advanced</td>
<td></td>
<td></td>
<td>North Climate Only</td>
</tr>
</tbody>
</table>

Optional values are indicated by *Align with ESTAR V6.0?*
Background Data – Program Activity

14 Members | 38 Program Data Points

Proposed CEE Tier 1
Proposed CEE Tier 2
Proposed CEE Tier 3 & Advanced Tier

HSPF

SEER

CEE Residential HVAC Program Summary, 2018:
https://library.cee1.org/content/2018-residential-hvac-program-summary/
Rated Capacity – Rationale

For “cold climates”, want a way of assuring performance throughout the heating season

The current DOE metrics (SEER, EER, and HSPF) do not accurately reflect in-field performance, especially for variable capacity equipment

* CEE is working with entities to assess and work toward alternative approaches to measure real world energy savings

In the near term, members are interested in having a means of distinguishing equipment that can consistently provide heating capacity needs
Rated Capacity – Approach

Having third-party certified data (i.e. AHRI) is typically an essential component of program design.

Members have proposed two potential strategies to achieve this objective:

1. Use existing AHRI certified data points as a proxy for minimum level of heat delivery (Ratio COP at 17°F/47°F)

2. Use a common data point that is not AHRI certified but may represent a relatively useful criteria (COP at 5°F)
Specification Notes

The Initiative strategy is increasingly focused on the need for customized solutions and approaches for HVAC selection and installation.

These specifications are NOT intended to be stand alone solutions or one-for-one replacements.

CEE recognized there is a LOT going on in the market, and are interested in working with industry to help achieve our goals while minimizing the burden on manufacturers.
Connectivity and Load Management
CONNECTED CRITERIA
## Energy Management

### ALL SYSTEMS AND EQUIPMENT

<table>
<thead>
<tr>
<th>Requirements</th>
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<tbody>
<tr>
<td><strong>A</strong></td>
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<td><strong>B</strong></td>
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<td><strong>C</strong></td>
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<td><strong>D</strong></td>
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</table>
# Demand Response

## VARIABLE CAPACITY EQUIPMENT

<table>
<thead>
<tr>
<th>Level</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>AHRI Standard 1380 as is: Either ANSI/CTA-2045-A OR OpenADR 2.0 communication interfaces.</td>
</tr>
<tr>
<td>Tier 2</td>
<td><strong>Both</strong> ANSI/CTA-2045-A AND OpenADR 2.0 communication interfaces; An open modular physical interface of ANSI/CTA-2045-A; <strong>and</strong> a secondary communication interface to facilitate customer interactions</td>
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</tbody>
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Notes on Connectivity

- Members are increasingly invested in integrated demand side management (IDSM)

- For heating and cooling, there are an array of potential benefits to utilities and consumers: EE, DR, Behavior, QI, Diagnostics, Maintenance, etc.

- CEE addresses both electric and gas opportunities

- This Initiative revision aims to adopt consensus criteria that members agree upon at this time; this will evolve over time as we work towards a more comprehensive Integrated Home
Timeline and Process

NEXT STEPS
Key Milestones

- One on one calls with YOU to discuss further!
- Written comments due to CEE by June 12th
- Staff will work with Committee to review all input and address feedback, follow up as needed
- CEE plans to share a full draft Initiative with industry partners when ready, ideally Fall 2020
- When ready, CEE will bring a final proposal to the Board of Directors for authorization
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