

Connected HVAC and Thermostats is a category of *Lighting & Homes for Tomorrow 2020*. For manufacturers interested in submitting connected HVAC equipment or thermostats, a summary of eligibility and product requirements is provided below.

Lighting & Homes for Tomorrow (LHFT) is focused on delivering a positive consumer experience with efficient, connected technology. In the past few years, there has been an influx of connected devices and systems entering the market, and LHFT sees an opportunity to ensure that residential products are delivering quality to customers as well as considering energy saving and management capabilities.

Connected HVAC and Thermostats Category Scope

The connected HVAC category of LHFT is open to products with primary applicability in the residential sector. Products must be suitable for sale by retailers serving the residential new construction and major renovation markets in the United States or Canada. If an entry is comprised of components from more than one manufacturer, LHFT encourages collaboration in the submission of the entry.

Categories include:

- Connected Thermostats
- Air Source Heat Pumps (ASHPs), split or packaged
- Central Air Conditioners (CACs), split or packaged
- Natural Gas Furnaces or Boilers
- Other

The competition is intended to highlight the connected HVAC products that are available for purchase in 2020. As such, products available or planned for introduction to the market between January 1, 2018 and January 31, 2021 are eligible to enter the competition.

If you are interested in submitting a product family or system, LHFT recommends that a manufacturer select one or two products as a representative for a product family and submit them individually along with a mention that the product is part of a larger family within the product description in the submission form. Manufacturers are also invited to submit images of other products within the family as well as marketing materials that show the product family.

If you are unsure whether your product falls within the category scope or have additional questions, please reach out to Kim Katz at info@lightingfortomorrow.com.

Desired Qualities and Capabilities

LHFT is seeking connected HVAC and thermostats that demonstrate energy savings. It is not expected that entries will include all of the following, but some desired qualities and capabilities include:

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- Meet CEE Tier 1/ENERGY STAR® Program Requirements for Residential Air Source Heat Pump (ASHP) and Central Air Conditioner (CAC) Equipment, if applicable. Products that meet CEE Tier 2 or 3 requirements would be awarded additional points.*†

CEE Residential High Efficiency Central Air Conditioners and Air Source Heat Pumps Specification†

Product Type/CEE Tier	SEER	EER	HSPF
Split ASHPs			
CEE Tier 1/ENERGY STAR	15	12.5	8.5
CEE Tier 2	16	13	9.0
ENERGY STAR Most Efficient	18	12.5	9.6
CEE Tier 3	18	13	10.0
Packaged ASHPs			
CEE Tier 1/ENERGY STAR	15	12	8.2
CEE Tier 2/ENERGY STAR Most Efficient	16	12	8.2
Split CACs			
CEE Tier 1/ENERGY STAR	15	12.5	
CEE Tier 2	16	13	
CEE Tier 3/ENERGY STAR Most Efficient	18	13	
Packaged CACs			
CEE Tier 1/ENERGY STAR	15	12	
CEE Tier 2/ENERGY STAR Most Efficient	16	12	

CEE Residential Gas Furnace and Gas Boiler Specification§

Product Type/CEE Tier	Required efficiency level	Optional furnace fan efficiency
Gas-fired Furnaces		
CEE Tier 1/ENERGY STAR U.S. South	≥ 90% AFUE	e ≤ 2.0%
CEE Tier 2/ENERGY STAR U.S. North	≥ 95% AFUE	e ≤ 2.0%
CEE Tier 3/ENERGY STAR Most Efficient	≥ 97% AFUE	e ≤ 2.0%
Gas-fired Boilers		
CEE Tier 1/ENERGY STAR	≥ 90% AFUE	
CEE Tier 2/ENERGY STAR Most Efficient	≥ 95% AFUE	

Please note that CEE Specifications will be changing in 2020. Products are expected to meet the above levels, not the new levels published in 2020.

* See the CEE Residential Heating and Cooling Systems Initiative Description for more information <https://library.cee1.org/content/cee-residential-heating-and-cooling-systems-initiative-description/>.

† See the ENERGY STAR Program Requirements for more information.

<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20CAC-ASHP%20V5.0.pdf>.

‡ <https://library.cee1.org/content/cee-residential-high-efficiency-central-air-conditioners-and-air-source-heat-pumps-specifica>

§ https://library.cee1.org/system/files/library/12048/CEE_ResHVAC_FurnaceBoilerSpecifications_1August2015.pdf

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- Meet ENERGY STAR Connected Thermostat Device Criteria, if applicable.*

Parameter	Performance Requirement
Static temperature accuracy	$\leq \pm 2.0$ °F
Network standby average power consumption	≤ 3.0 W average
Time to enter network standby after user interaction (on device, remote, or occupancy detection)	≤ 5.0 minutes

- The ability to receive and respond to a utility or third-party signal (i.e. pricing signal or curtailment signal).
- Demand response (DR) capabilities, defined as the ability to delay, curtail, or increase operation to enable load shifting from peak use or low supply periods to low use or high supply periods.
- Sensing capabilities to optimize HVAC operation based on occupancy detection through geofencing, motion sensing, or infrared signal sensing, or other capabilities.
- Customization, such as the ability for consumers to input preferences and parameters related to product operation.
- Ability for consumers to access energy consumption information, including remote access via an app, website, or home energy management system.
- Data sharing with consumer-authorized third parties, including operational status and energy consumption reporting.
- Customizable consumer notifications for events like system failures, power surges, planned device shutdowns, servicing requirements, or upcoming DR events.
- Programmable settings, such as vacation, away, or nighttime modes that reduce energy use.
- Continued functionality when cloud connection is lost.
- Ability to remotely verify quality installation (QI) and share results with consumers and consumer-authorized third parties like installers and utilities.
- Ongoing, active management of settings through features like automatic scheduling or learning-based schedule creation based on customer preferences and habits.
- Ability to collect, aggregate, and analyze HVAC performance data that enables ongoing energy savings measurement and verification (such as through Automated Fault Detection and Diagnostics (AFDD)), while being mindful of consumer personal privacy concerns.
- Ability to seamlessly operate with other connected devices, systems, and platforms within the home.
- Low barriers to device set up and use, including installation and account set up.
- Intuitive operation through multiple interfaces.

* <https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Program%20Requirements%20for%20Connected%20Thermostats%20Version%201.0.pdf>

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Again, it is not expected that entries will include all of the above capabilities; rather, products should include measures that save energy and provide a positive consumer experience. Additional capabilities beyond this list will also be considered in the judging process. Products with greater functionality generally receive more points (see judging criteria, below).

Entry Requirements

- Complete submission forms
- Entries selected for in-person judging:
 - All entries must share user interface information, such as the app or website and the availability of login information or a demo login, such as one used at a trade show, for the judges to access.
 - Connected thermostat entries selected for in-person judging must ship products to the judging location. For more information, please see the [Shipping Instructions](#) document.
 - Connected HVAC entries need only ship the accompanying thermostat.
 - All entries must provide printed or digital marketing materials that demonstrate the value proposition to the customer (may include product packaging, point-of-purchase materials, video advertisements, or other materials).
 - All entries must provide printed or digital installation instructions.
 - HVAC equipment finalists are expected to create and submit videos demonstrating set-up and regular use, such as what a technician demonstrates to a customer following installation. Full instructions will be shared with the selected finalists in late April. Only finalists are required to submit videos.
- If selected as a winner, entrants must:
 - Provide their AHRI directory reference number.
 - Complete a cybersecurity questionnaire and interview.

Competition Process

Evaluation of LHFT entries will take place in the following stages:

Connected HVAC Equipment

1. **Complete the Intent-to-Submit Form.** Entrants will be assigned entry number and receive access to the Final Submission Form.
2. **Complete the Final Submission Form** by June 5, 2020.
3. **Screening Entries.** The LHFT Steering Committee will review submissions to identify the most promising candidates for further assessment based on the evaluation criteria. All entrants will be notified of their results in late July 2020.
4. **Finalists must ship thermostats and supporting materials** and may be asked to create and share videos for evaluation by a panel of experts. Finalists will receive specific instructions for any videos or other media required to demonstrate the set-up and regular use of equipment.

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5. **In-person Judging.** The Judging Panel will review products, videos, and supporting documents and select winners according to the judging criteria (below).
6. **Notification of winners** and verification of energy performance and cybersecurity.
7. **Public announcement** and promotion of winners at relevant industry events.

Connected Thermostats

1. **Complete the Intent-to-Submit Form.** Entrants will be assigned entry number and receive access to Final Submission Form.
2. **Complete the Final Submission Form** by June 5, 2020.
3. **Screening Entries.** The LHFT Steering Committee will screen entries by reviewing submissions to identify the most promising candidates for further assessment based on the evaluation criteria. All entrants will be notified of their results in late July 2020.
4. **Finalists must ship products and supporting materials** to the judging location to be evaluated by a panel of experts. Shipping instructions will be provided to finalists.
5. **Installation and verification of submissions** by UL staff to make sure all parts necessary to mount and operate the product in its intended application are included and that the controls function properly.
6. **In-person Judging.** The Judging Panel will review products, videos, and supporting documents and select winners according to the judging criteria (below).
7. **Notification of winners and verification** of energy performance and cybersecurity.
8. **Public announcement** and promotion of winners at relevant industry events.

Judging Criteria

Judges will score each entry according to the following criteria:

Energy and Carbon Savings	How much energy does the device consume? Does it meet ENERGY STAR or CEE efficiency criteria? How does it support energy savings and how large are those savings?
Functionality	What amenities are offered to consumer? Are energy and load management capabilities included?
Interoperability	How well does the product integrate with other devices and systems? What is the level of integration? With how many? What is the market share of compatible devices and systems?
Data Sharing	What data is shared with the consumer and authorized third parties? How does that data benefit the consumer?
Cybersecurity*	What steps have been taken to address cybersecurity risks?
Reliability	What functionality is maintained with the loss of connectivity? How does the device reconnect after loss of power, internet, or software update?
Simplicity: Value Proposition	Is the value proposition easily understood?
Simplicity: Installation, Set Up, And	How easy is it to install, set up and use the device for a consumer

* Cybersecurity measures will not be evaluated directly by the Judging Panel. Winners will have to demonstrate cybersecurity measures as part of a final verification process prior to receipt of award.

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Use	(thermostats) or contractor (HVAC equipment)? This includes equipment installation and accessing consumer portals or connecting to other connected home devices.
Quality	Judges will use entrant provided performance data as an input when evaluating the in-person appearance of quality of user interfaces to inform their scoring. Judges may also consider quality metrics like zoning features and air quality.
Value to Cost	Is the price point commensurate with amenity and quality of the device?
Innovation in Design / Form Factor	Is the design unique or innovative? Does it look new and exciting?
Innovation in Engineering	Are there innovative technical elements?
Future Proofing	Does the entrant have plans and infrastructure to support contingencies such as new protocols and platforms entering the market, cyber-attack, or company changes?

Additional Points

The 2020 Judging Panel may award bonus points for entries exhibiting other desirable characteristics such as such as resiliency and niche applications like senior-friendly products, as determined by consensus of the Judging Panel.

Awards for Connected HVAC and Thermostats

Product awards will be announced at the HARDI Annual Conference, December 5-8, 2020. Winners will also be promoted through press releases to both consumer and trade publications and among CEE members, the *Lighting & Homes for Tomorrow* website, CEE Industry Partners Meeting, and materials at key industry events in 2021. In addition, CEE member efficiency program administrators may choose to recommend winning entries to their customers.

Additional Questions?

Check out the FAQ at <http://lightingfortomorrow.com/competition/> or contact Kim Katz at info@lightingfortomorrow.com with any questions.