

Updates in the 2021 IECC

**NASEO 2020 Energy Policy Outlook
Conference and Innovation Summit**

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Agenda

Background

- ACEEE research
- Recent IECC trends
- IECC process

Changes in the 2021 IECC

- Envelope & lighting
- Building equipment
- Alternate compliance paths

Conclusions

- What's next?
- Takeaways

Background

ACEEE released a report on pathways to achieving ZEB building codes in 2014 and a whitepaper update in 2018.

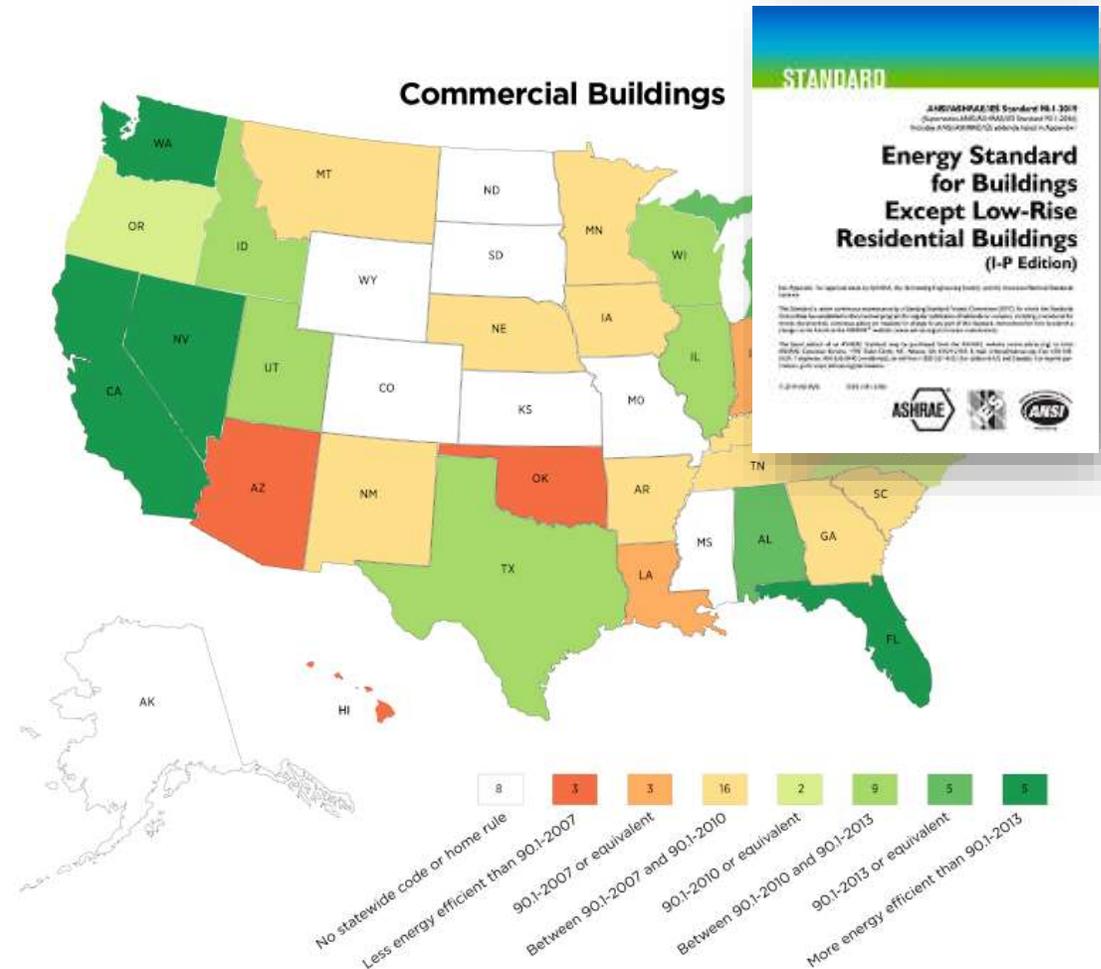


aceee.org/research-report/a1403

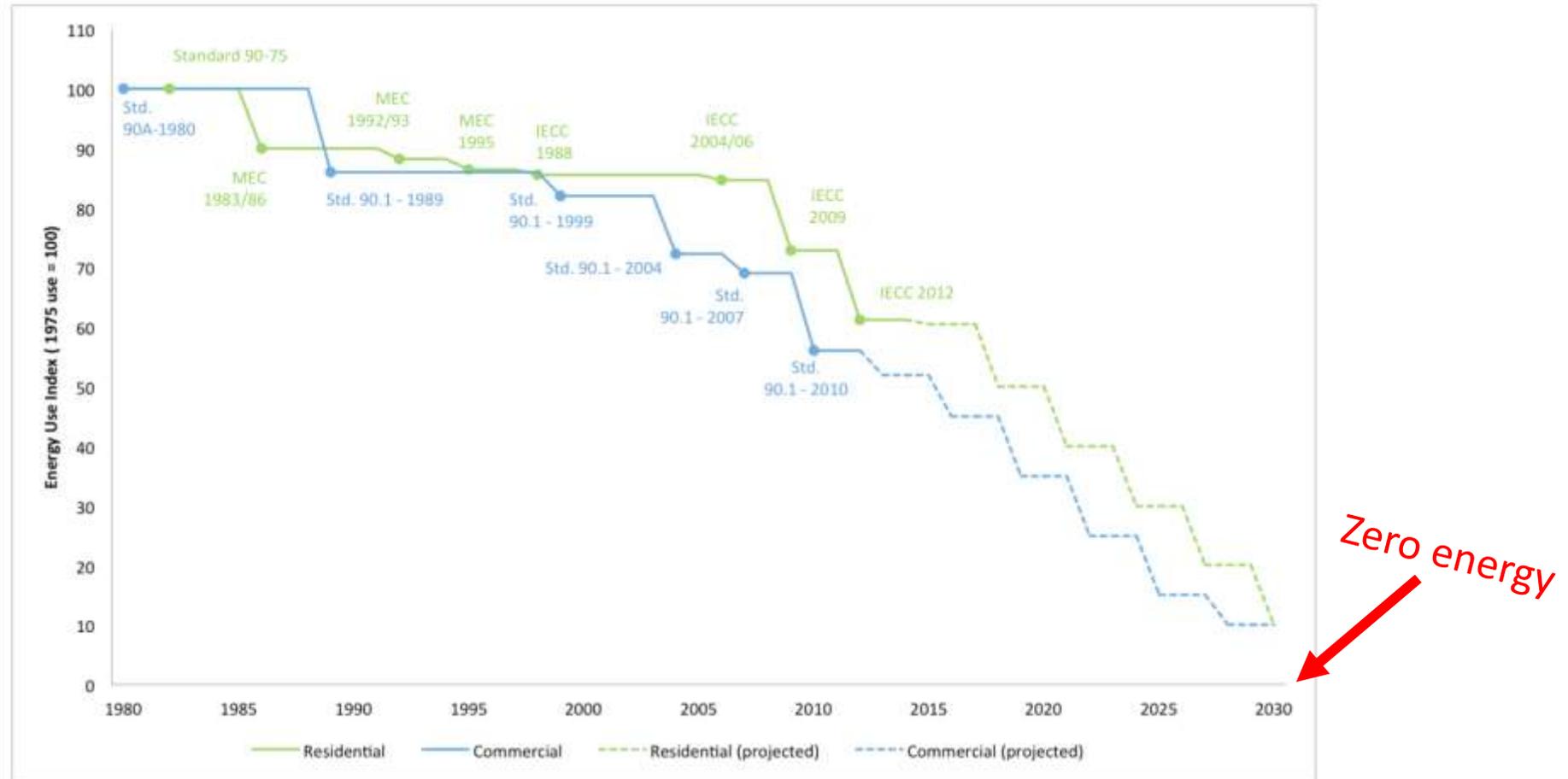


aceee.org/white-paper/zeb-codes

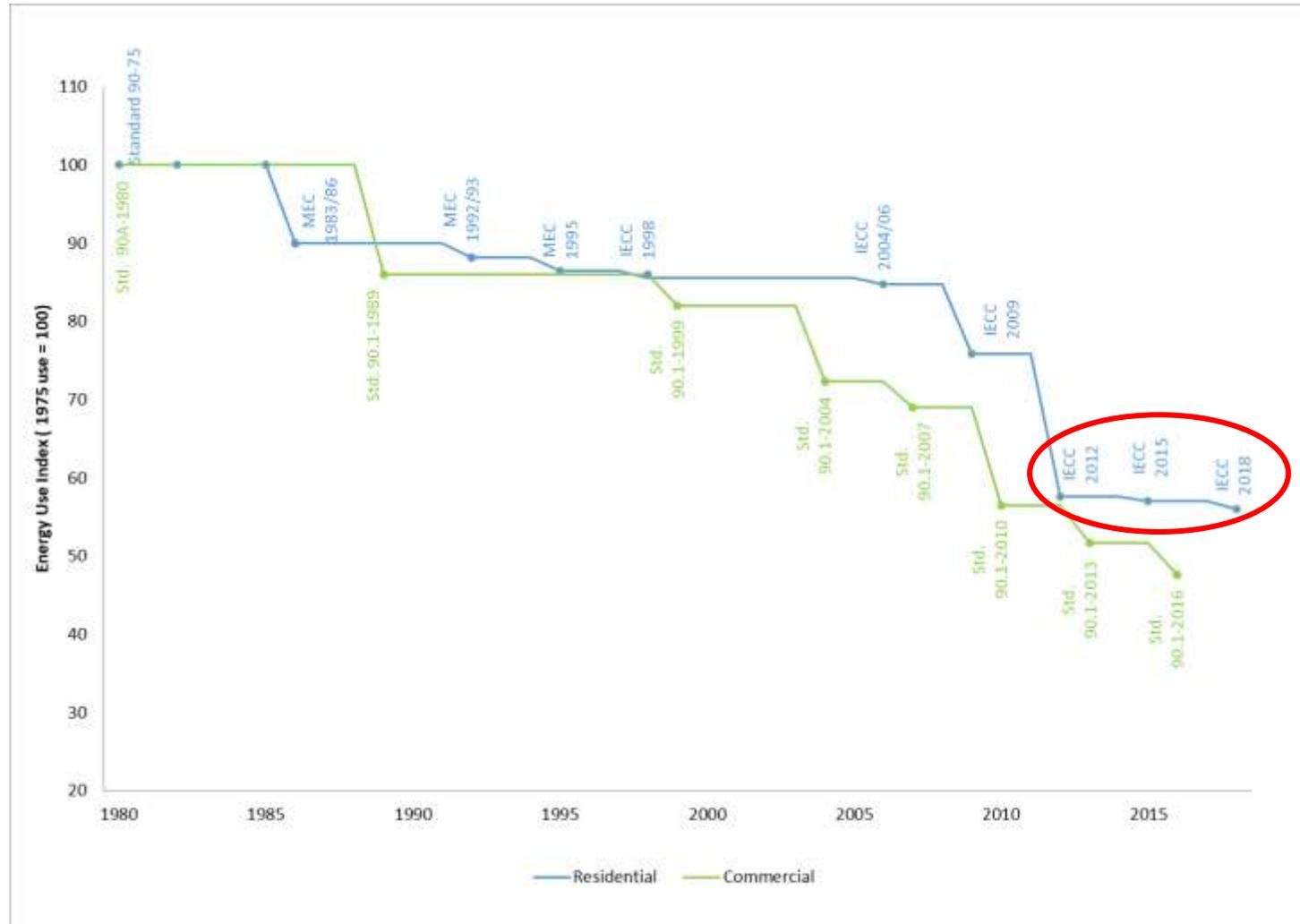
We believe model codes have some of the biggest potential impact for achieving nationwide energy savings.



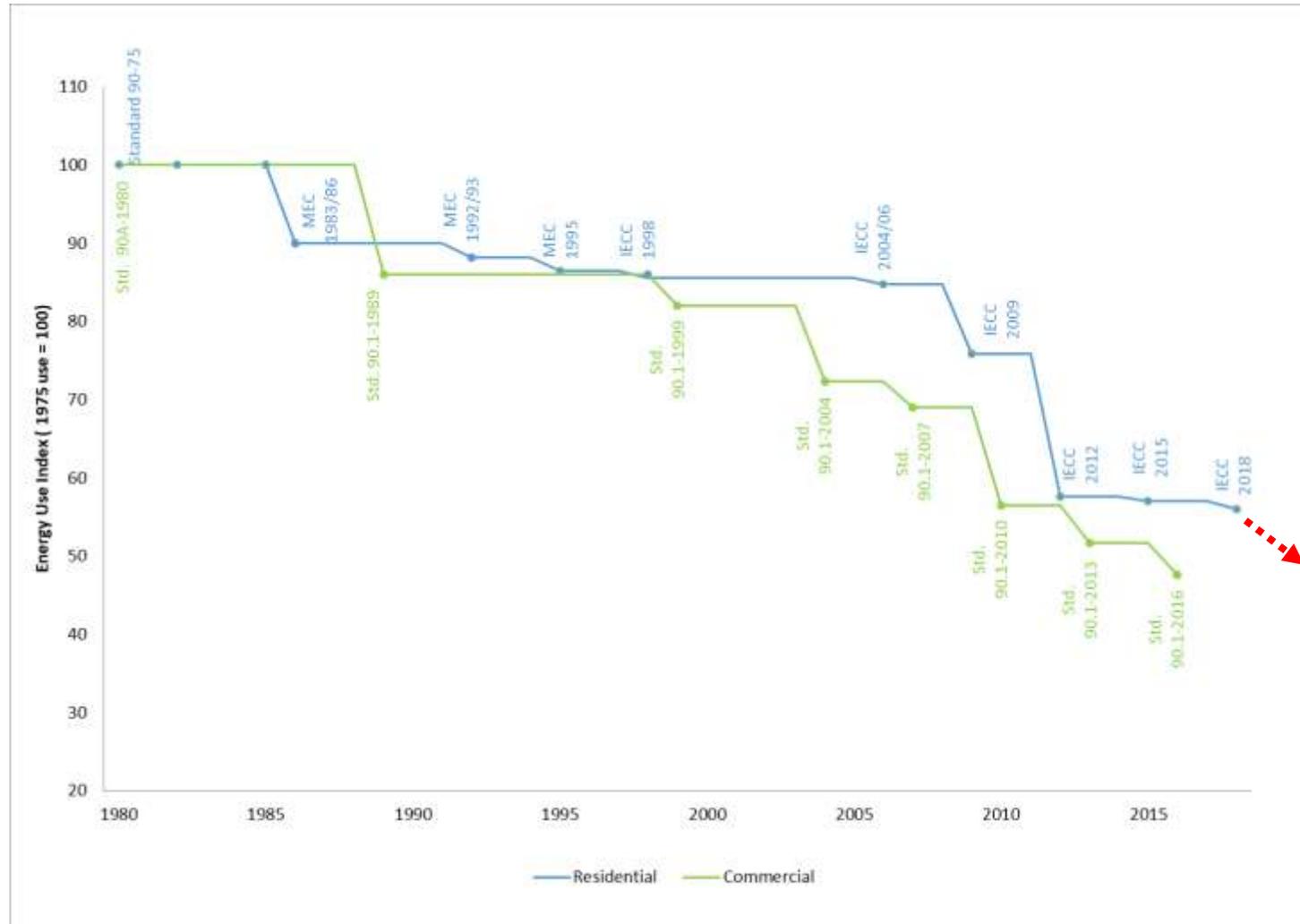
ACEEE advocates for gradual code improvement to nearly zero energy by ~2030.



ASHRAE 90.1 has made consistent improvements, but the 2015 and 2018 IECC had essentially stagnated.



However, the 2021 IECC appears to help get us back on track with regular saving energy.



A quick overview of the 2019 IECC timeline:

- **January:** Deadline for code change proposals
- **March:** Code change proposals posted online
- **April/May:** Committee Action Hearing in Albuquerque, NM
- **October:** Public Comment Hearing in Las Vegas, NV
- **November:** Online Governmental Member Vote
- **December:** Preliminary online voting results posted



Changes in the 2021 IECC*

*this list is not all-inclusive

Incremental efficiency improvements in envelope and lighting

- Envelope (in certain climate zones)
 - Residential insulation in wall, slab, floor, and ceiling
 - Commercial insulation in roofs, above grade walls, floor, slab edge
 - Windows
- Lighting
 - Residential
 - Commercial
 - Indoor agriculture



Smart energy management and controls

- HVAC fault detection and diagnostics systems in buildings $\geq 100,000$ SF
- Energy monitoring and metering in buildings $\geq 25,000$ SF
- Lighting controls in parking garages
- Automatic plug load requirements



Required to choose one of the following water heater options:

- High efficiency gas storage
- Electric resistance + on-site renewable energy
- High efficiency heat pump
- Tankless
- Grid-enabled
- Solar

Also plumbing requirements that reduce the pipe distance between water heater and fixtures.



© E Source; adapted from the Electric Power Research Institute

Flexible package of additional efficiency measures

Residential

Adds **new** package options:

- Enhanced envelope (envelope + fenestration)
- More efficient HVAC (furnaces, ASHP, GSHP)
- Energy-efficient water heating
- Thermal distribution (duct/ductless design)
- Air sealing/ventilation (ACH, ERV, HRV)

Commercial

Updates **existing** package options:

- Points-based tables
- More options
- 2.5% efficiency improvement

TABLE C406.1(5)
Additional Energy Efficiency Credits for Other^a Occupancies

Sub-section / Climate Zone:	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406 .2.1: 5% Heating Eff Imprv.	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	3
C406 .2.2: 5% Cooling Eff Imprv.	5	5	4	4	3	3	2	2	2	1	1	2	1	1	1	1	1
C406 .2.3: 10% Heating Eff Imprv.	NA	NA	NA	1	1	1	1	2	2	3	3	3	3	4	3	5	5
C406 .2.4: 10% Cooling Eff Imprv.	8	9	8	7	5	5	3	4	4	2	3	2	2	2	2	2	2
C406 .3: Reduced Light Power	8	8	9	9	9	9	10	8	9	9	7	8	8	8	8	8	7
C406 .4: Enh. Digital Light Ctrl	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	1
C406 .5.1: On-site Renewable Egy.	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7
C406 .6 : Dedicated OA Sys (DOAS)	3	4	3	3	4	3	2	5	3	3	5	4	3	7	5	7	6
C406 .7.2: Recovered/Renew SWH ^b	10	9	11	10	13	12	15	14	14	15	14	14	16	14	15	15	15
C406 .7.3: Eff fossil fuel SWH ^b	5	5	6	6	8	7	8	8	8	9	9	9	10	10	9	10	11
C406 .7.4: Heat Pump SWH ^b	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C406 .8: Enhanced Envelope Perf	3	6	3	4	3	4	1	5	4	3	5	5	4	7	6	9	10
C406 .9: Reduced Air Infiltration	3	2	2	4	4	2	NA	6	2	2	6	4	1	10	5	7	4

New EV-ready and EV-capable space requirements

Residential: 1 EV-ready space
Commercial and multifamily:

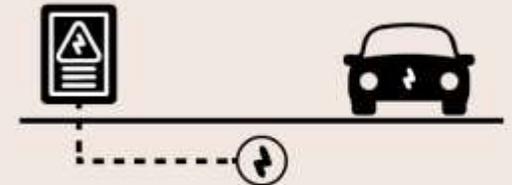
Total Number of Parking Spaces	Minimum number of EV Ready Spaces	Minimum number of EV Capable Spaces
1	1	1
2 – 10	1	1
11 – 15	3	3
16 – 19	4	4
21 - 25	5	5
26+	5	20% of total parking spaces

1. EV-Capable

Install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.

[Aspen, CO: 3% of parking is EV-Capable \(IBC\)](#)

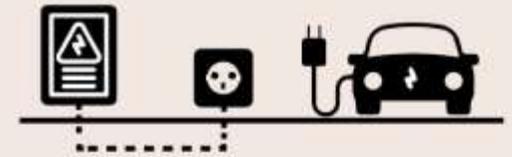
[Atlanta, GA: 20% is EV-Capable \(Ordinance\)](#)



2. EVSE-Ready Outlet

Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet (typical clothing dryer outlet).

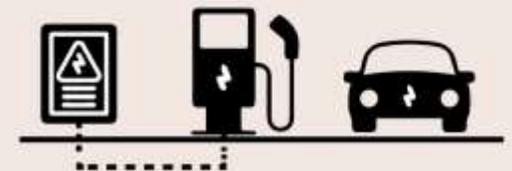
[Boulder, CO: 10% of parking is EV-Ready Outlet](#)



3. EVSE-Installed

Install a minimum number of Level 2 EV charging stations.

[Palo Alto, CA: 5-10% of parking is EV-Installed](#)



Electric circuits near natural gas and propane equipment

2018 International Energy Conservation Code

Add new text as follows:

R404.2 (IRC N1104.2) Electric readiness (Mandatory) Systems using gas or propane water heaters, dryers, or conventional cooking equipment to serve individual dwelling units shall comply with the requirements of Sections R404.2.1 and R404.2.2. All water heating systems shall comply with Section R404.2.3.

R404.2.1 (IRC N1104.2.1) Receptacle. A dedicated 125-volt, 20-amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, shall be provided within 3 feet from each gas or propane water heater, dryer, and conventional cooking equipment, accessible with no obstructions.

R404.2.2 (IRC N1104.2.2) Electrification-ready circuits. Both ends of the unused conductors shall be labeled with the word "SPARE" and be electrically isolated. A single pole circuit breaker space shall be reserved in the electrical panel adjacent to each circuit breaker for the branch circuit and labeled with the words "FUTURE 240V USE."

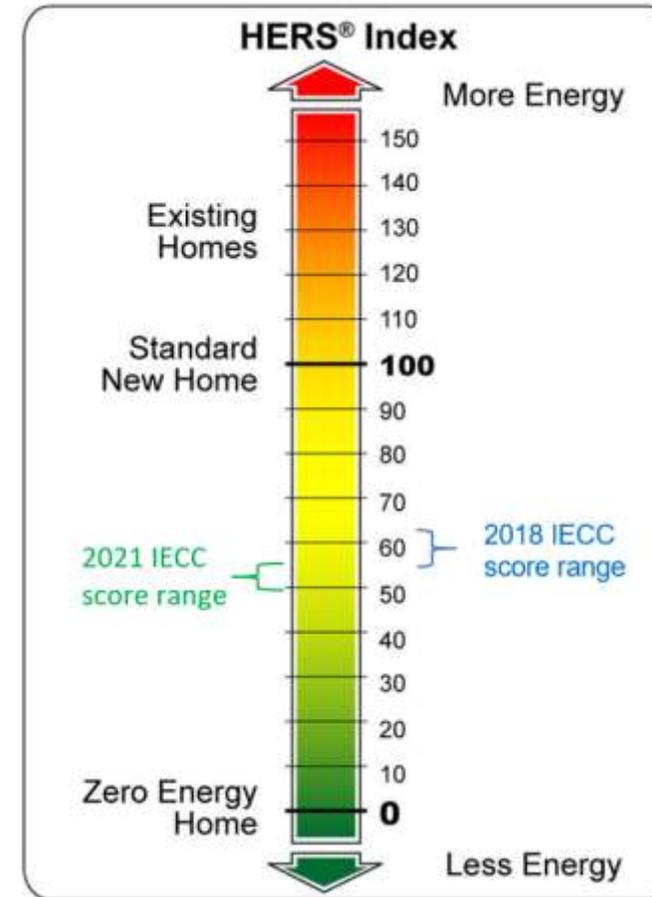
R404.2.3 (IRC N1104.2.3) Water heater space. An indoor space that is at least 3 feet by 3 feet by 7 feet high shall be available within 3 feet of the water heater.

Exception: The water heater space requirement does not need to be met where a heat pump water heater is installed.



Energy Rating Index (ERI) performance path scores returned to 2015 IECC levels after 2018 increase

CLIMATE ZONE	ENERGY RATING INDEX ^a
1	<u>57</u> <u>52</u>
2	<u>57</u> <u>52</u>
3	<u>57</u> <u>51</u>
4	<u>62</u> <u>54</u>
5	<u>61</u> <u>55</u>
6	<u>61</u> <u>54</u>
7	<u>58</u> <u>53</u>
8	<u>58</u> <u>53</u>



Optional zero energy appendices



**TABLE RB103.2 (IRC AQ103.2)
MAXIMUM ENERGY RATING INDEX^a**

CLIMATE ZONE	ENERGY RATING INDEX not including onsite power	ENERGY RATING INDEX including onsite power (as proposed)
<u>1</u>	<u>43</u>	<u>0</u>
<u>2</u>	<u>45</u>	<u>0</u>
<u>3</u>	<u>47</u>	<u>0</u>
<u>4</u>	<u>47</u>	<u>0</u>
<u>5</u>	<u>47</u>	<u>0</u>
<u>6</u>	<u>46</u>	<u>0</u>
<u>7</u>	<u>46</u>	<u>0</u>
<u>8</u>	<u>45</u>	<u>0</u>

Conclusions

What's next

- Upon ICC Board of Directors approval of the voting, the 30-day appeals window begins.
- Depending on what appeals are submitted, the board creates a committee with expertise on the issue and that committee makes a decision on each appeal.
- **The entire finalized 2021 code is expected to be available for adoption by October 1.**

Takeaways

- The 2021 IECC continued regular incremental progress
- There are many priority areas for future code cycles:
 - **Commissioning & automated commissioning**
 - **Monitoring, metering, and feedback**
 - **Outcome-based performance path**
 - **Solar-ready roofing & connections**
 - **Smart, connected equipment**
 - **Performance path scores**
 - **Carbon compliance path**
 - **System metrics**



Thank you!



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