

# **TECHNICAL+** MANUFACTURING conference

**Development, Direction and Adoption of the US and Canadian Energy Codes Craig Drumheller, VP Technical Activities WDMA** 





## **US "National" Energy Codes**

- The United States does NOT have a national energy code
- However, the Energy Conservation and Production Act (ECPA) references **ASHRAE Standard 90.1** for commercial energy and the ICC International Energy Conservation Code (IECC) for residential energy.
- DOE must perform a **determination** on these energy codes within 12 months of publication to see if the revised code "would improve energy efficiency".
- If the determination is positive, states must review and hold public hearings regarding adoption and notify DOE within 2 years.
- For the residential code, the state must certify to DOE that it has publically reviewed the latest code- but **DOES NOT NEED TO ADOPT**.
- For the commercial code, the state must certify to DOE that is has reviewed and adopted.
- There are no teeth to enforcement of ECPA.



#### NSI/ASHRAE/IES Standard 90.1-201 Energy Standard for Buildings Except Low-Rise Residential Buildings





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## **2021 IECC Determination by DOE**

- 2021 IECC published by ICC December 2020
- July 28 2021 DOE issued their 2021 IECC Determination
- DOE "determined" that the 2021 IECC will "improve energy efficiency"
- Estimates on a weighted national average an 8.66% reduction in annual energy cost.
- 114 approved code changes
- 35 impact energy use
- 29 reduce energy consumption
- 6 increase energy consumption



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## **2021 IECC Major Changes**

- Revision of climate zone map
- New Climate Zone 0 (not in US)
- Increase in insulation:
  - Fenestration U-Factor CZ 3-4 0.32 to 0.30
  - Walls CZ 4 & 5 R-20 to R-20+5
  - Slab insulation CZ 3-5
  - Ceiling insulation CZ 2-3 R-38 to R-49
  - Ceiling insulation CZ 4-8 R-49 to R-60
- Increased lighting efficacy
- Increased ventilation fan efficacy
- HRV's in CZ 7-8
- Additional Energy Efficiency Packages (5%)





## **Residential Fenestration U-Factor Evolution**

**IECC** Residential Fenestration U-Factors 2006-2024



Note: 2024 U-Factors are preliminary

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## **Residential Skylight U-Factor Evolution**

IECC Residential Skylight U-Factors 2006-2024



Note: 2024 U-Factors are preliminary



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## **State Energy Code Adoption**

- The building code is published on a 3-year cycle
- States adopt building codes on periodic basis
- 42 states adopt statewide
- Only California has a non-IECC based energy code
- Most states amend the code prior to adoption





### **ICC Governmental Consensus Process**





### **2019 ICC Code Development Cycle**

- Unusual Outcome on the 2019 Online Governmental Consensus Vote
- 20 Proposals that were disapproved in both of the first two steps of the process were approved with a 2/3 vote online.
- Over 1,200 new voters registered for the On-line vote
- Nearly half of the new voters were from Massachusetts
- Multiple appeals were submitted
  - Voting Irregularities (Denied)
  - Voter Eligibility (Denied)
  - Proposals Out of Scope and Intent (Upheld)
  - Proposals preempted by Federal Law (Upheld)
- Although some of the appeals were denied, ICC ultimately decided to change the development of the IECC from their governmental consensus process to a committee process





### New IECC Code Development Framework

- IECC Development
  - From Governmental Consensus Process
  - To Standards Development Process
- Code must be "life cycle cost-effective"
- Optional Supplemental Requirements
  - Net zero energy buildings
  - Greenhouse gas reduction
- Simplify code requirements
- Increased efficiency with each edition
- "Glidepaths that achieve zero energy buildings by 2030"



### LEADING THE WAY TO ENERGY EFFICIENCY

A Path Forward on Energy and Sustainability to Confront a Changing Climate

www.iccsafe.org



#### Committees and Subcommittees Created

#### Proposed Changes IEC Submitted

Proposed Changes Distributed To Subcommittees

> Subcommittees Make Recommendations to Full committee

Committee Votes on Individual Proposals New Code Edition Published

> IF NO CHANGES ARE MADE

Committee Votes out Approved Changes For Comment

### **IECC Standards Development Process**

#### Public Comments Distributed To Subcommittees

#### Public Comment Period



### 2024 IECC Development Schedule

- Proposals submitted Fall 2021
- Residential and Commercial Committees formed Fall 2021
- Committee meetings began February 2022
- Completion of initial committee disposition estimated to be end of June 2022
- Committee to vote recommended changes for public review July 2022
- First Public Review Period August-October 2022
- Two additional public reviews are anticipated
- Final approval expected Summer 2023



### **2024** Fenestration Proposals- Residential (Preliminary Status)

### **Approved:**

Climate Zone	0	1	2	3	4	5	6	7 & 8
Fenestration U-Factor	0.50	0.50	0.40	0.30	0.30	<del>0.30</del> <u>0.28</u>	<del>0.30</del> <u>0.28</u>	<del>0.30</del> <u>0.27</u>
Skylight U-Factor	<del>0.75</del> <u>0.60</u>	<del>0.75</del> <u>0.60</u>	<del>0.65</del> <u>0.60</u>	<del>0.55</del> <u>0.53</u>	<del>0.55</del> <u>0.53</u>	<del>0.55</del> <u>0.50</u>	<del>0.55</del> <u>0.50</u>	<del>0.55</del> <u>0.50</u>
Glazed Fenestration SHGC	0.25	0.25	0.25	0.25	0.40	<del>0.40</del> <u>NR</u>	NR	NR

### **Disapproved:**

- definition

- Removed SHGC requirements in Marine Zone and CZ 5
- Reduced U-Factor from 0.32 to 0.30 in CZ 5 and up for high elevations and windborne debris areas
- Removed SHGC tradeoffs in northern climate zones
- Reformatted prescriptive table
- Installation requirements for fenestration (WDMA opposed)

ENERGY STAR V7.0 (proposed) values Penalty for >15% window to floor area Prescriptive projection SHGC Tradeoffs • Remove Opaque Doors from fenestration



### **2024 Fenestration Proposals- Commercial (Preliminary Status)**

### **Approved:**

- Removed opaque doors from fenestration definition
- Fenestration orientation- prescriptive requirements

### **Disapproved:**

- More stringent U-Factors for fenestration
- Requirement to calculate U-Factor for all glazing sizes
- Remove reference to CFR 460
- Fenestration Backstops- Multiple proposals



### **2024 IECC Proposals- Residential Non-Fenestration**

Under consideration for the next edition:

- Electric Vehicle charging stations
- Mandatory solar
- Electrification
- Building tightness
- More efficient ERI scores
- Cool roof requirements in CZ 1-3



# Questions?

