

BUILDING ENERGY CODES: 2021 EFFICIENCY GAINS, ADOPTION, AND THE NEW DEVELOPMENT PROCESS

The Energy Efficient Codes Coalition

A project of the Institute for Market Transformation

September 16, 2021

EECC: Who We Are

- EECC brings together the public and private sectors to advocate for increasing stringency and protecting efficiency gains in the International Energy Efficiency Code (IECC)
- In 2019, EECC rallied governmental officials across the country to vote for the 2021 IECC
- EECC's network has proven to be highly responsive to calls to action, such as the response to ICC's plans to remove the final governmental vote from the IECC
- EECC and its supporters are already active in promoting adoption of the 2021 IECC

Governmental Member Impact

Year	IECC Update	IECC Update Energy Savings		Cumulative Energy Savings Over 2006 IECC	
		Residential	Commercial	Residential	Commercial
2008	2009 IECC (plus Residential Equipment Update)	10.5%	7.7%	10.5%	7.7%
		6.0%	N/A	16.5%	N/A
2010	2012 IECC	24.1%	10.4%	36.6%	17.4%
2013	2015 IECC	0.9%	11.5%	37.2%	26.9%
2016	2018 IECC	1.9%	5.3%	38.4	30.8
2019	2021 IECC	9%	11%	44%	38.5%

2021 Highlights

- Increased insulation R-values and fenestration U-factor requirements for certain climate zones
- Residential additional efficiency packages and new commercial points-based format
- Additional lighting efficiency and control measures
- Zero-energy appendices for both Residential and Commercial Codes

2021 Appeals

- As a result of the appeals process, code language related to the following areas was removed:
 - Electric and EV-ready requirements
 - Water heater efficiency
 - Gas-fired appliances

DOE Determination

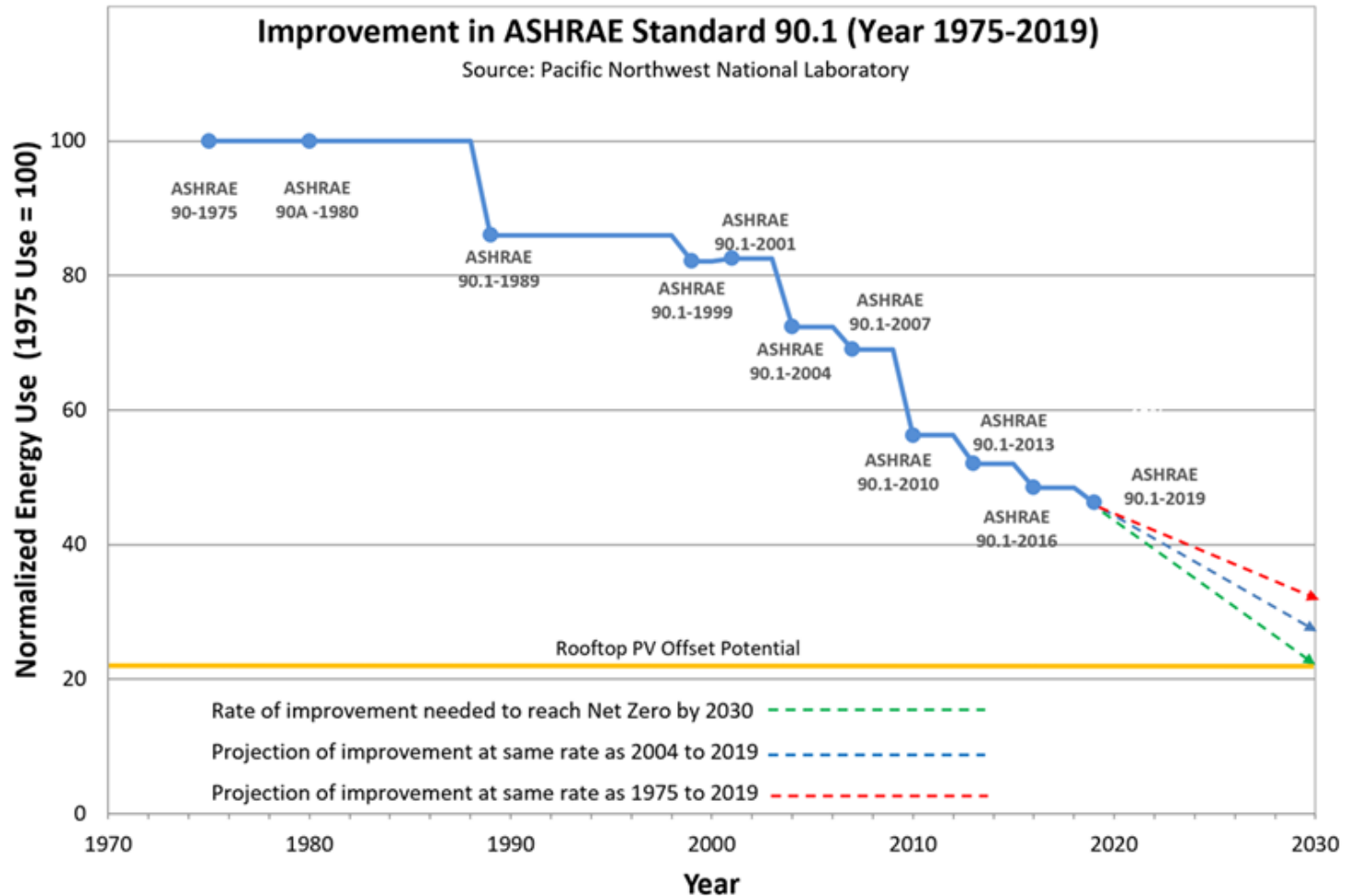
Commercial Code Savings: (ASHRAE 90.1-2019)

4.7 percent site energy
4.3 percent source energy
4.3 percent energy cost
4.2 percent carbon emissions

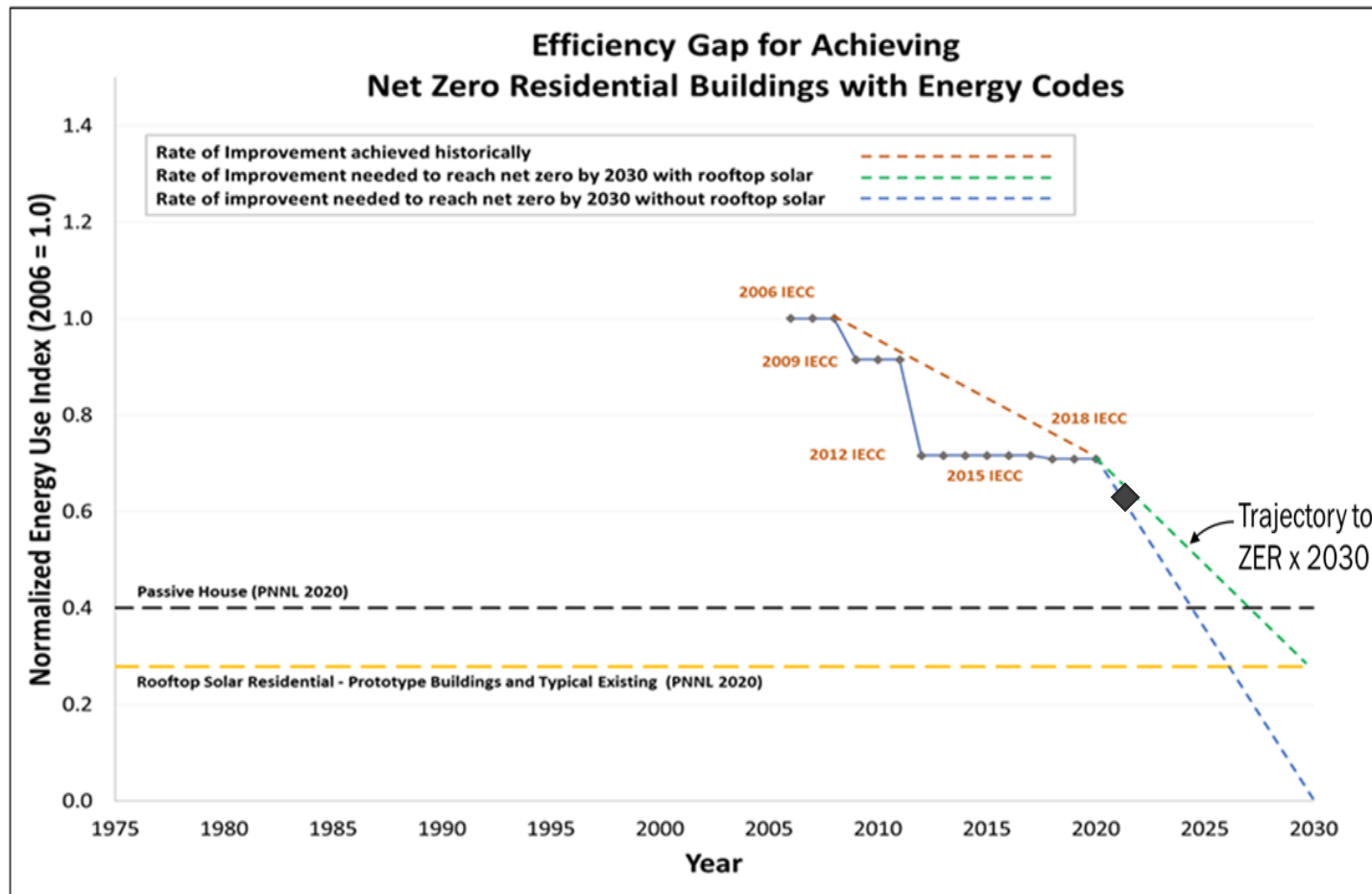
Residential Code Savings: (IECC 2021)

9.38 percent site energy
8.79 percent source energy
8.66 percent energy cost
8.66 percent carbon emissions

Commercial Code Improvement

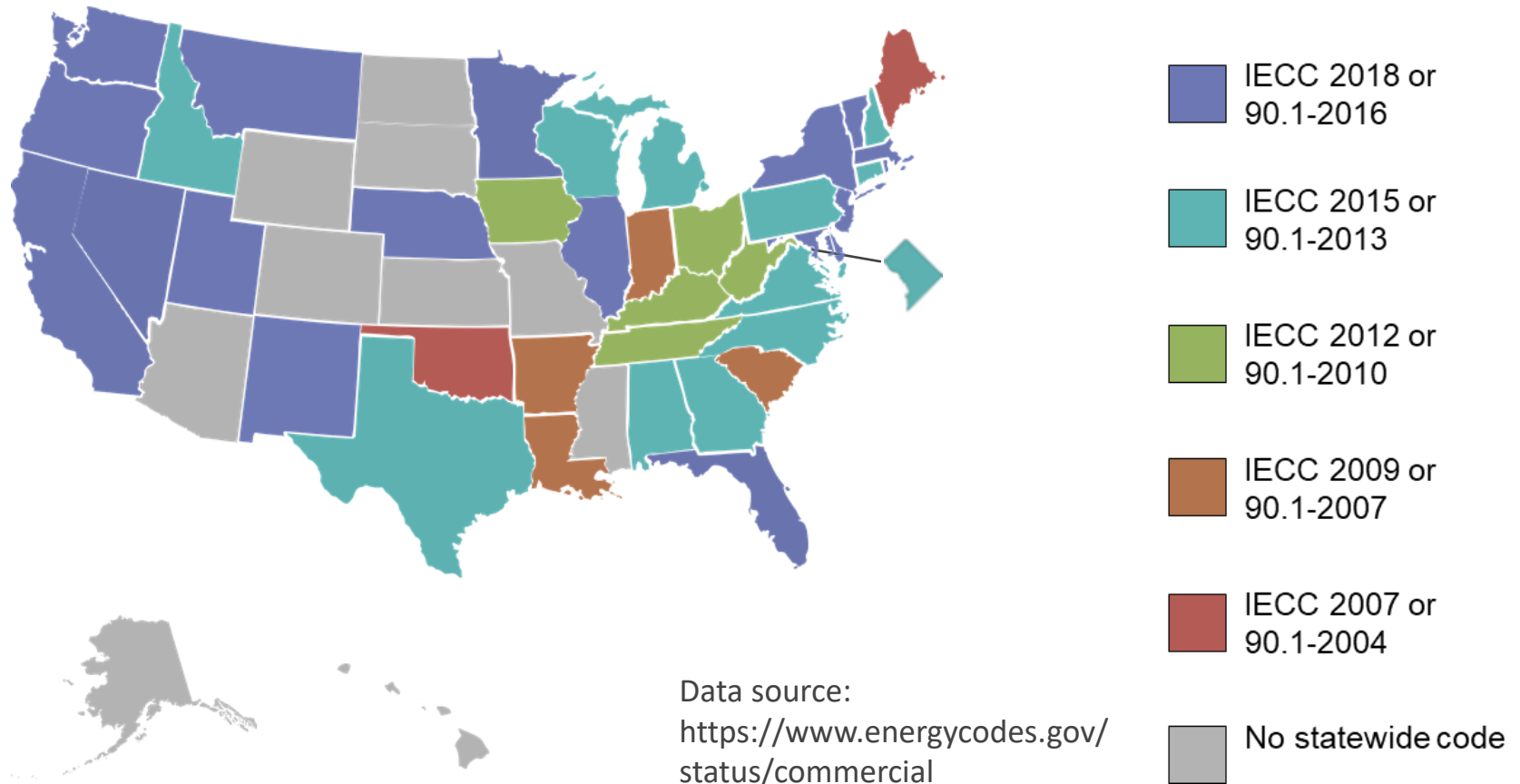


Residential Code Improvement

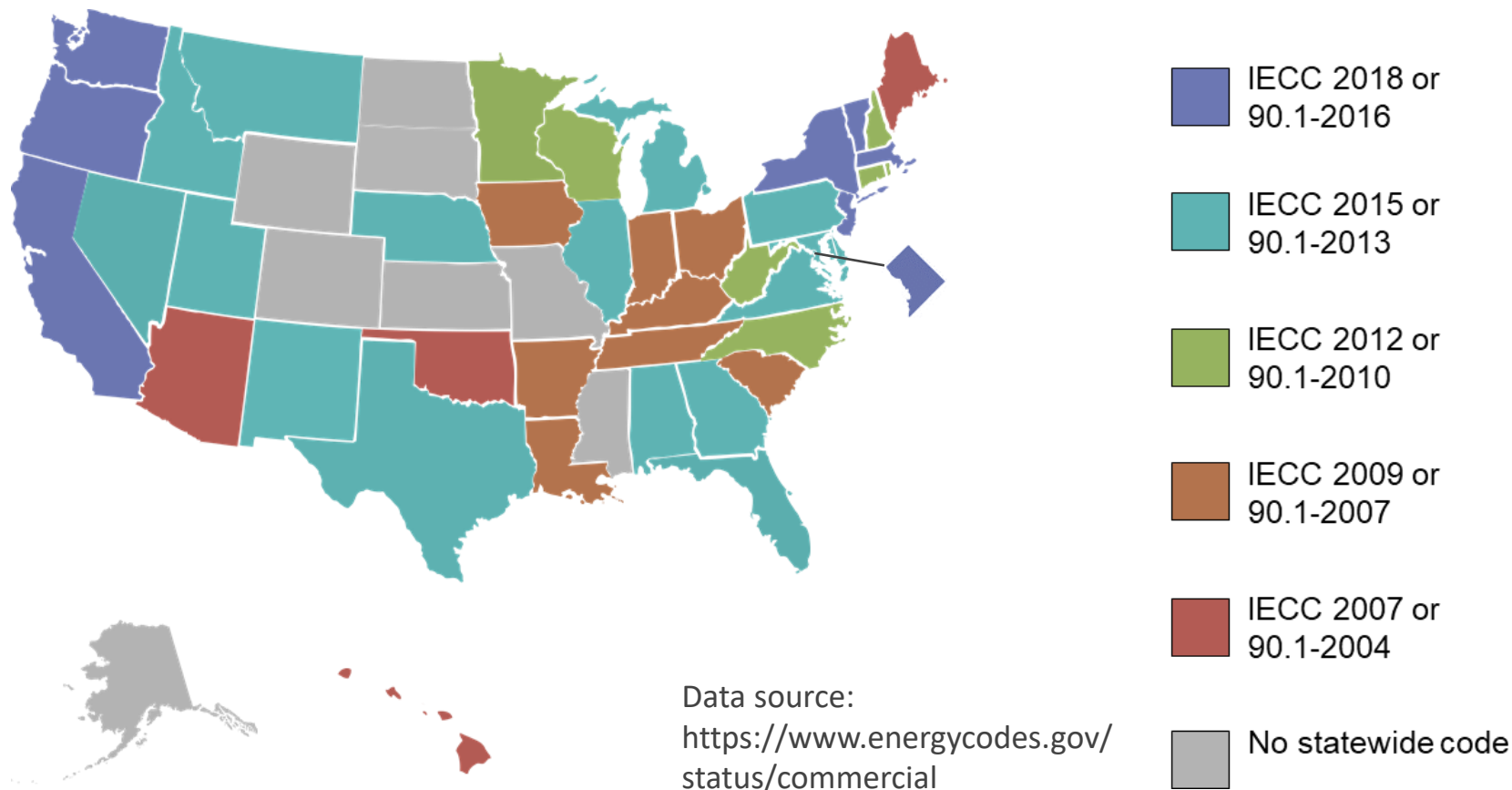


SOURCE: PNNL Feasibility Study (publication pending)

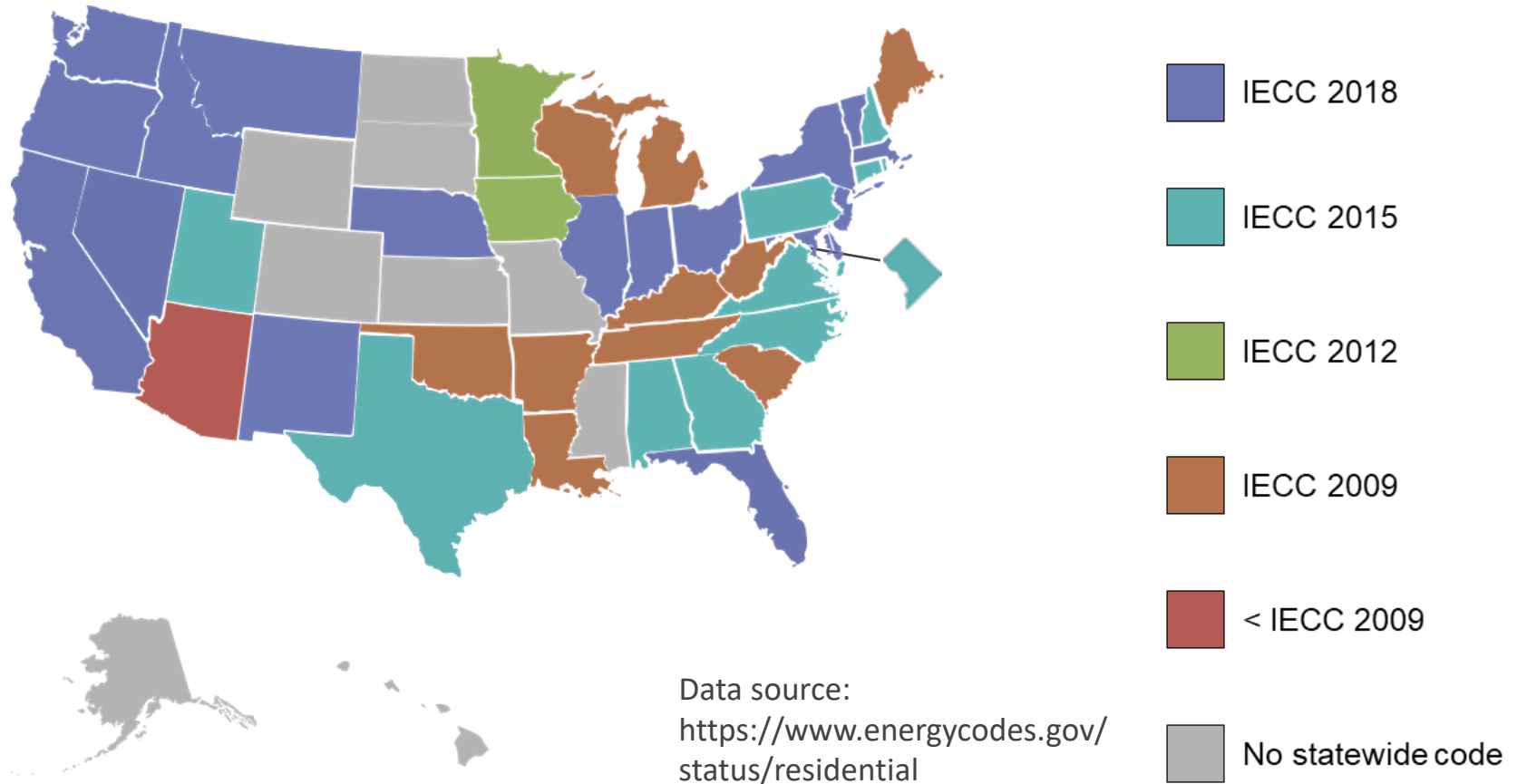
Commercial Code Status - Official



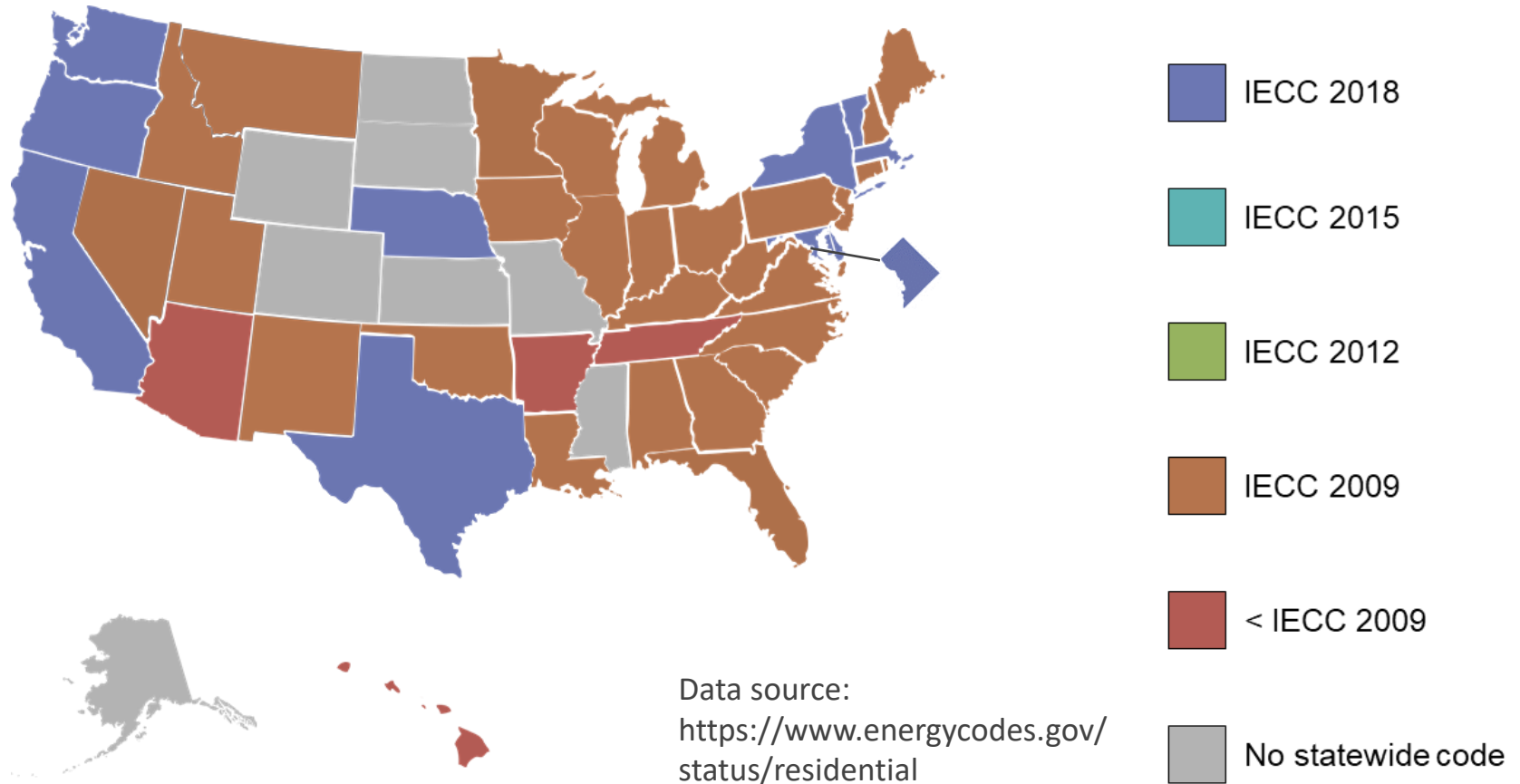
Commercial Code Status - DOE



Residential Code Status - Official



Residential Code Status - DOE



Codes Calculator

Step 1: Location and Baseline

1. Location

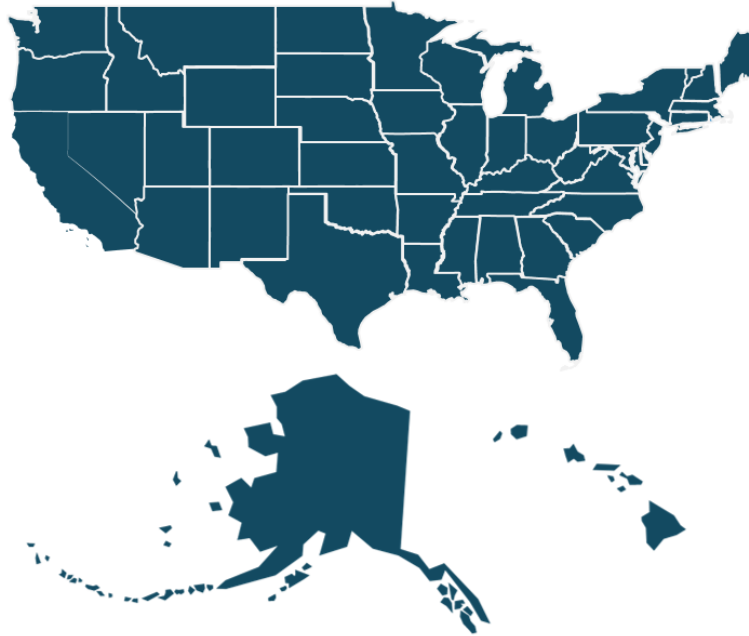
2. Building

3. Building

4. Display Results

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Step 1 Instructions

1. Select State/Territory by using the drop-down menu below or simply click on the desired state. Then select the relevant metro area.
2. Use drop-down menu to selected the most representative current model energy code for residential and commercial buildings. While states adopt the IECC, Standard ASHRAE 90.1 is the commonly used compliance pathway under the IECC. The U.S. Department of Energy tracks code adoption of the IECC and ASHRAE 90.1 and the following link includes current adoption information:
<https://www.energycodes.gov/status-state-energy-code-adoption>
3. The compliance rate input is a manual input of 0-100%, with the typical range being 75-95%.

State / Territory

Virginia

Metro Area

[statewide]

Model Residential Energy Code

IECC 2009

Compliance Rate

75%

Model Commercial Energy Code

ASHRAE 90.1 2013

Compliance Rate

75%

* Projected future code version with nominal savings estimates

Cover Page

Step 1 - Location

Step 2 - Building Growth

Step 3 - Code Updates

Ste ...

<https://www.imt.org/resources/building-energy-codes-emissions-calculator/>

Codes Calculator: Example

Location: Virginia - Statewide

2030 Snapshot - Electricity

Avoided Emissions / Energy	Residential	Commercial	Total
Additional Annual MWh	231,928	130,472	362,399
Cumulative MWh	2,077,936	1,193,443	3,271,379
Additional Annual Metric tons of CO2	130,556	73,445	204,001
Cumulative Metric tons of CO2	1,169,707	671,811	1,841,518

2040 Snapshot - Electricity

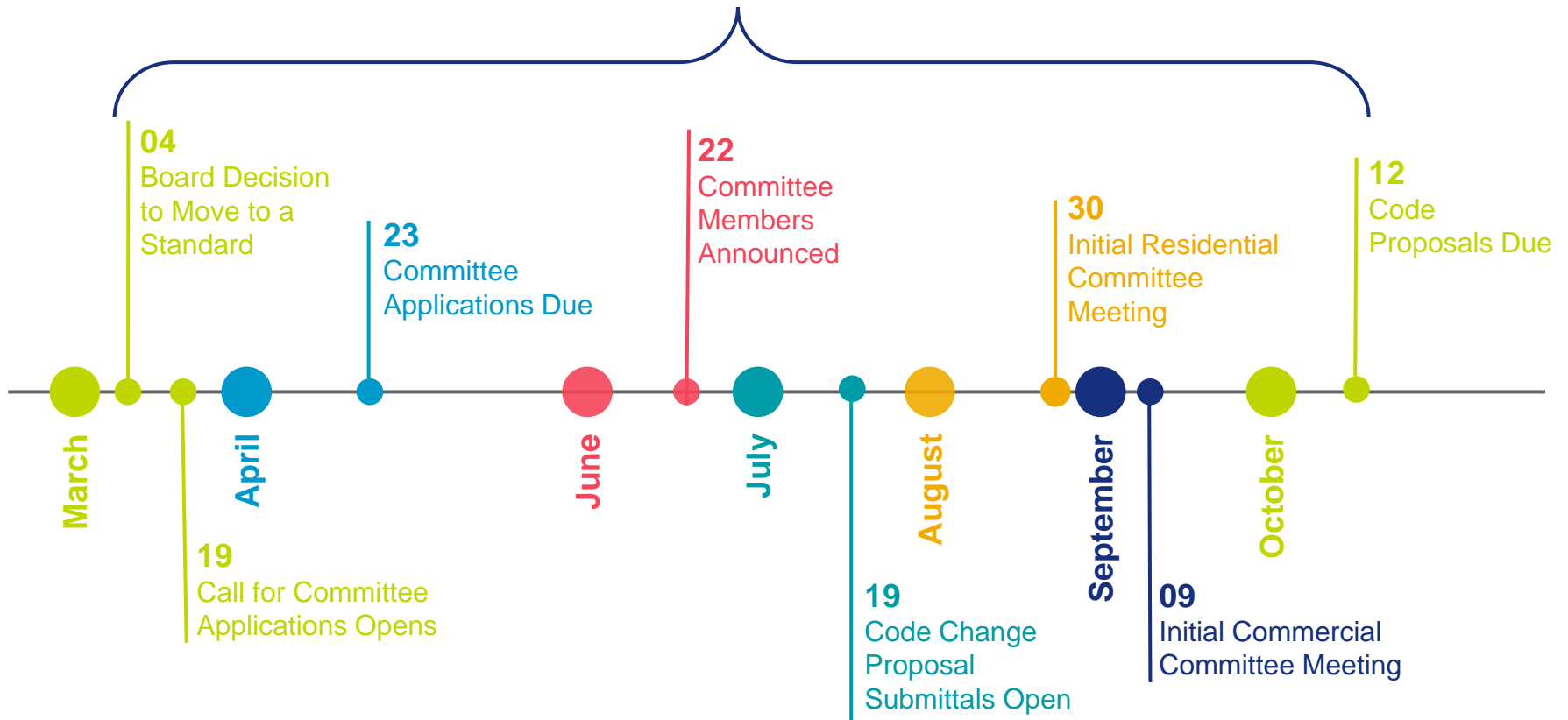
Avoided Emissions / Energy	Residential	Commercial	Total
Additional Annual MWh	240,101	162,198	402,299
Cumulative MWh	4,431,032	2,722,227	7,153,258
Additional Annual Metric tons of CO2	135,157	91,304	226,461
Cumulative Metric tons of CO2	2,494,307	1,532,390	4,026,697

Cost & Savings

Projections Through 2040	Residential	Commercial	Total
Energy Cost Savings (Millions \$ NPV)	\$1,611	\$752	\$2,363
Costs (Millions \$ NPV)	\$1,329	\$465	\$1,794
Benefit-Cost Ratio	1.21	1.62	1.32

From Code to Standard: Timeline

Six Month Timeframe



IECC Standards Process

IECC was previously part of Group B in the Code Development Cycle

Group B proposals are due January 10, 2022



STEP IN CODE DEVELOPMENT CYCLE	DATE	
	2021 – Group A Codes IBC- E, IBC - FS, IBC -G, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IWUIC, IZC	2022 – Group B Codes Admin, IBC-S, IEBC, IECC-C, IECC-R/IRC-E, IgCC (Ch. 1), IRC – B
2021 EDITION OF I-CODES PUBLISHED	IMC and IPC are published. Remaining I-Codes in the Fall/2020 (See Group B Codes on page 2 for the 2021 IgCC)	
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 1, 2020 for the 2021/2022 Cycle. Call for Committee posted in March/2020.	
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF CODE CHANGE PROPOSALS	January 11, 2021	January 10, 2022
WEB POSTING OF “PROPOSED CHANGES TO THE I-CODES”	March 1, 2021*	February 23, 2022*
COMMITTEE ACTION HEARING (CAH)	April 11 – 21, 2021 Rochester Riverside Convention Center Rochester, NY	March 27 – April 6, 2022 Rochester Riverside Convention Center Rochester, NY
ONLINE CAH ASSEMBLY FLOOR MOTION VOTE	Starts approx. two weeks after last day of the CAH. Open for 2 weeks.	Starts approx. two weeks after last day of the CAH.
WEB POSTING OF “REPORT OF THE COMMITTEE ACTION HEARING”	May 24, 2021	

ICC Energy Efficiency Strategy

- ICC's "Leading the Way to Energy Efficiency"
- Energy and Carbon Advisory Council
- Residential and Commercial Committees
 - Working Groups
- Energy-only cdpACCESS
- "Code on a Mission" Campaign

All resources above can be access via iccsafe.org/energy

Revised IECC Scope and Intent

The International Energy Conservation Code-Commercial provides market-driven, enforceable requirements for the design and construction of commercial buildings, providing minimum efficiency requirements for buildings that result in the maximum level of energy efficiency that is safe, technologically feasible, and **life cycle cost effective**, considering **economic feasibility**, including potential **costs and savings for consumers and building owners**, and **return on investment**. Additionally, the code provides jurisdictions with supplemental requirements, including ASHRAE 90.1, and optional requirements that lead to achievement of zero energy buildings, presently, and through glidepaths that achieve zero energy buildings by 2030 and on additional timelines sought by governments, and achievement of additional policy goals as identified by the **Energy and Carbon Advisory Council** and approved by the Board of Directors. Requirements contained in the code will include, but not be limited to, prescriptive- and performance-based pathways. The code may include nonmandatory appendices incorporating additional energy efficiency and **greenhouse gas reduction resources** developed by the Code Council and others. The code will aim to **simplify code requirements** to facilitate the code's use and compliance rate. The code is **updated on a three-year cycle** with **each subsequent edition providing increased energy savings over the prior edition**. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this intent. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

Energy and Carbon Advisory Council

- Per ICC, “the Energy and Carbon Advisory Council will meet to provide input on the Code Council’s codes, standards and other guidance, identify new guidance needs and gaps that should be filled”.
- The Council has not yet been formed, though ICC has performed some outreach to potential members

IECC Committees

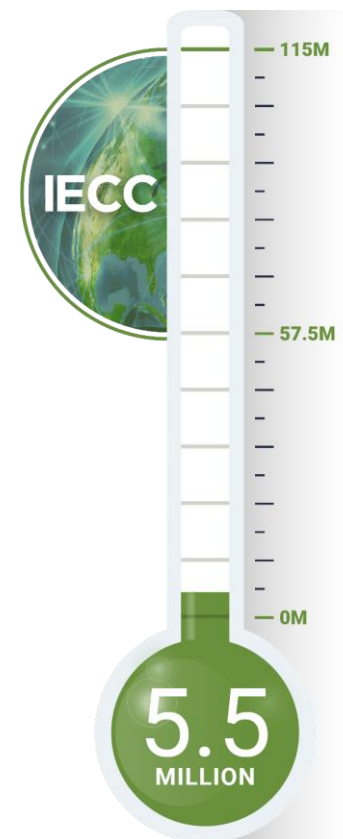
- Three-year terms
- Nine categories: Manufacturer, Builder, Standards Promulgator/ Testing Laboratory, User, Utility, Consumer, Public Segment, Government Regulator, Insurance
 - No Insurance representative on either, Consumer only on Commercial
- At least one-third of each committee is made up of government regulator category
- Residential
 - 48 people
 - Chair: JC Hudgison; Vice-chairs: Bridget Herring and Robin Yochum
- Commercial
 - 45 people
 - Chair: Duane Jonlin; Vice-chair: Emily Hoffman

Proposal Process

- Public proposals are due on October 12th
- Based on early meeting reports, priority for content may be given to proposals submitted by the public (not finalized)
- Submissions are through an energy-only version of cdpACCESS

Code on a Mission

- ICC’s “Code on a Mission” Campaign aims to get a third of the US population covered by energy codes based on the 2021 IECC by 2023
- ICC plans to develop resources to promote the benefits of the adoption of the 2021 IECC



How to Participate

- Draft and submit proposals
 - Due October 12th
- Volunteer for Residential and/or Commercial Working Groups
 - Tentative categories include Envelope, HVAC, Lighting/Elec, Modeling/Whole Building/Zero Energy, Compliance Path/Integration
- Apply for Energy and Carbon Advisory Council (if open call)



ENERGY-EFFICIENT
CODES COALITION

energyefficientcodes.com
Email: info@energyefficientcodes.com