

# Oregon Department of **ENERGY**

EO 20-04  
Implementation:  
Energy Code  
Stakeholders

Facilitator: Roger Kainu  
June 16, 2020  
1-2:30pm



# Agenda

Topic	Lead	Action	Time
Meeting purpose and structure	ODOE staff	Discuss purpose and structure of the panel to support energy code advancement.	15 min
Executive Order 17-20 and 20-04	ODOE staff	Share details included in EOs related to energy code.	5 min
Code adoption process	BCD/ODOE staff	Description of adoption process and current position.	5 min
2006 code baseline	ODOE and BCD	Describe specs of 2005/2006 code, to establish baseline for code analysis and advancement.	45 min
ZERH Equivalent Preview	ODOE and BCD	ODOE and BCD provide description of ZERH Equivalency to inform subsequent meetings.	15 min
Wrap-up	ODOE	Determine action items and announce next meeting.	5 min

# Meeting Purpose and Structure

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- Purpose
  - To discuss and understand how to advance Oregon's energy codes
  - Engage stakeholders in accordance with [ODOE and BCD plans for compliance with EO 20-04 published on May 15th of 2020](#)
- Structure
  - Facilitated discussion to encourage involvement
  - This group does not replace established code advancement process
- Meeting housekeeping
  - How to ask questions – chat feature and unmuted opportunities
  - We are “hear” to listen, plenty of time

# Roles

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- **Building Codes Division** – State agency, with responsibility to manage the code development process
- **Oregon Department of Energy** – State agency with responsibility to work with BCD and advise the code development process
- **Stakeholders** – Provide information and technical expertise to support understanding toward accomplishment of state energy goals

# Two Recent Executive Orders with Energy Code Components

17-20	20-04
<p>Full list at <a href="https://www.oregon.gov/energy/Get-Involved/Documents/BEEWG-Action-Items.pdf">https://www.oregon.gov/energy/Get-Involved/Documents/BEEWG-Action-Items.pdf</a></p> <p>BCD and Advisory Boards to amend commercial code to exceed IECC and ASHRAE 90.1 and meet or exceed measurable prescriptive energy efficiency portions of ASHRAE 189.1. by 10/1/2022</p> <p>BCD and Advisory Boards to amend code to require USDOE Zero-Energy Ready Homes Standard by 10/1/2023</p>	<p><a href="https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf">https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf</a></p> <p>Adopt energy efficiency goals for 2030 for new residential and commercial buildings. Goal shall represent at least a 60 percent reduction in new building annual site consumption of energy, excluding electricity used for transportation or appliances, from the 2006 building codes.</p> <p>Evaluate and report on progress for achieving steady progress over next three code cycles (2023,2026,2029) Update the Reach Code on the same timeline. Report to the Governor by September 15, 2020 on current progress and options. Update report every three years.</p>

# Executive Order 20-04 additional requirements

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20-04

[https://www.oregon.gov/gov/Documents/executive\\_orders/eo\\_20-04.pdf](https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf)

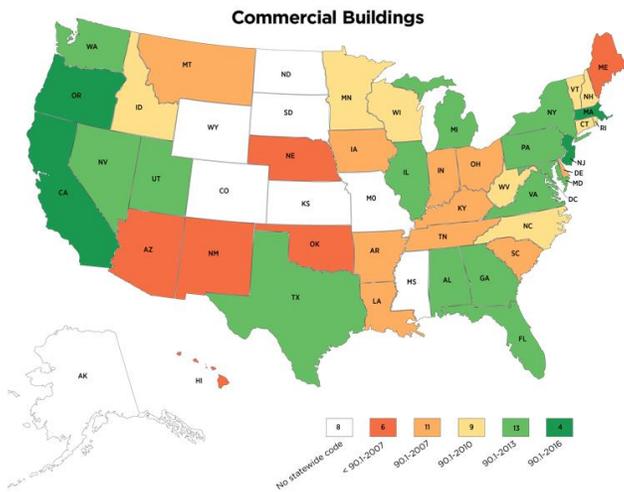
BCD, in cooperation with ODOE, is directed to agree on metrics, based on best practice and academic research, to inform the baseline and reductions associated with the code updates.

ODOE, in cooperation with BCD, is directed to contract with a third-party consulting firm to assess cost implications, including long-term energy cost savings, of the energy efficiency and building code actions set for the in this Executive Order.

# Code Adoption Process: Building Codes Division

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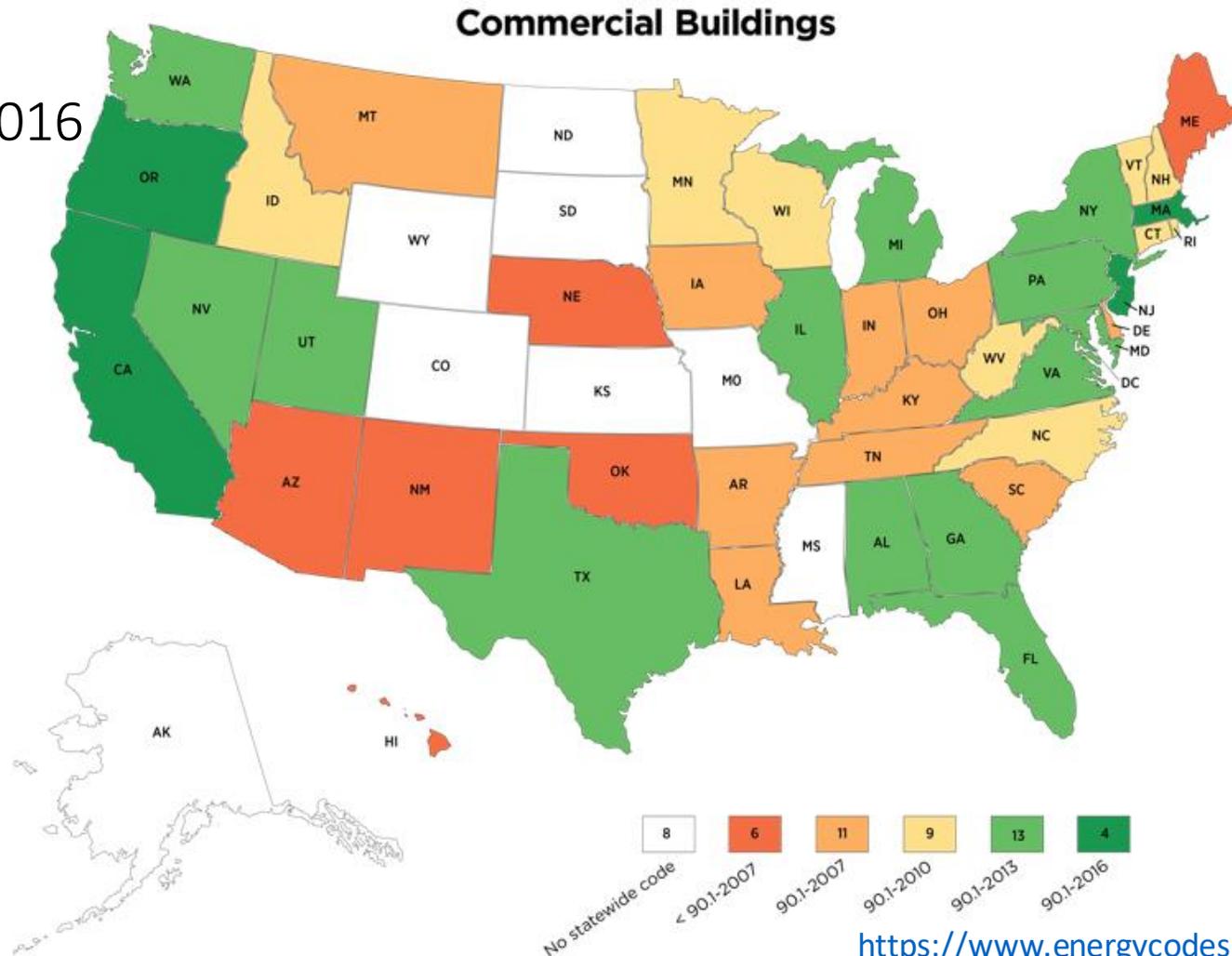
- Statutes and Rules
  - Building codes are adopted rules
- Boards
- Building Codes Division
  - Administrator
- Rulemaking
- Public Involvement
- Timelines for adoption, rulemaking, publication



Setting the table for discussion

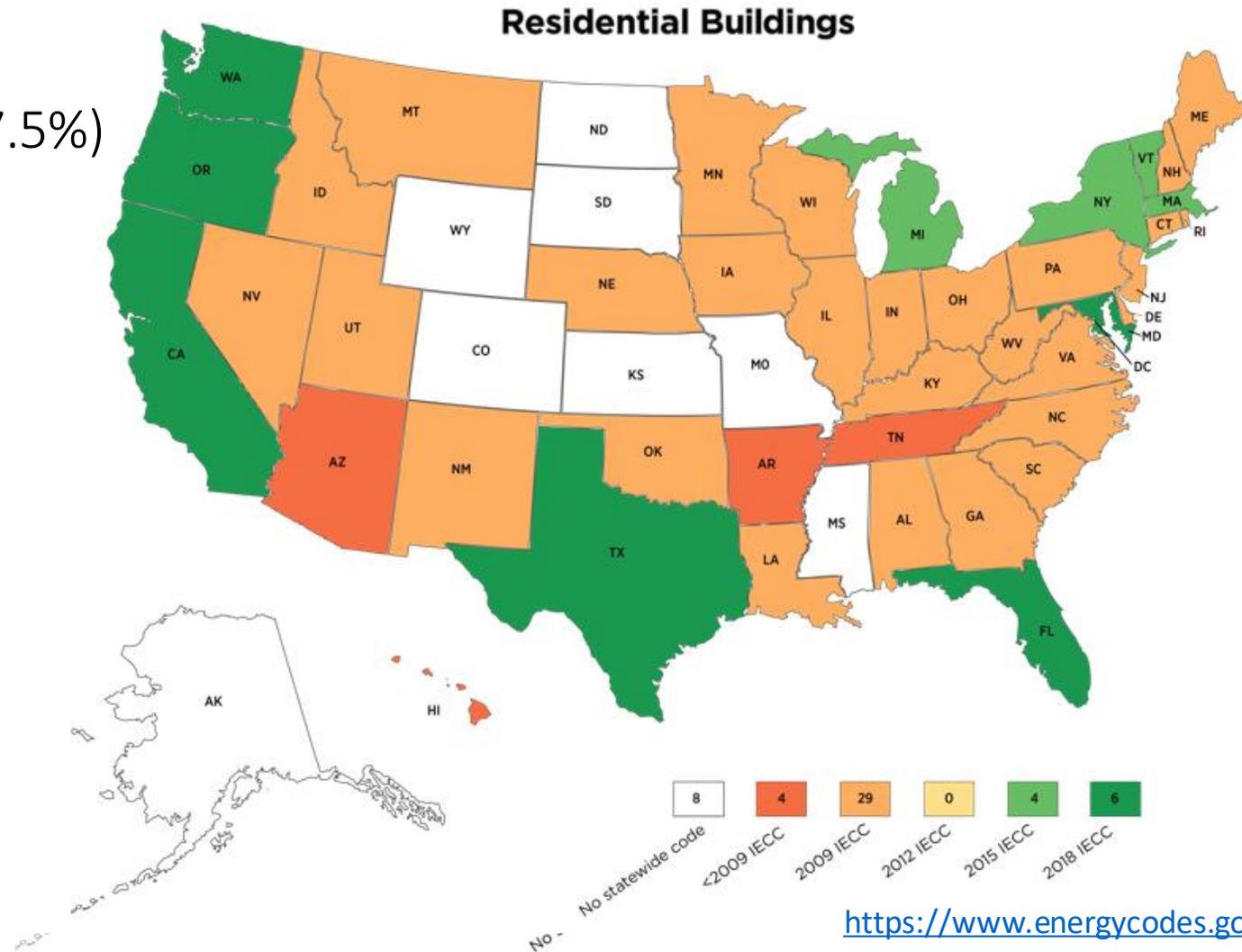
# USDOE determination of Energy Code Status

ASHRAE 90.1 2016



# Setting the table for discussion

2018 IECC (+~7.5%)



<https://www.energycodes.gov/status-state-energy-code-adoption>

# Setting a baseline for 2006

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EO 20-04: A 60% reduction in new building annual site energy consumption, excluding electricity used for transportation or appliances (unregulated loads), from the 2006 building codes in effect at that time.

## Commercial

Chapter 13 of the 2004 Oregon Structural Specialty Code (OSSC).

- Five percent more efficient than ASHRAE 90.1 2004

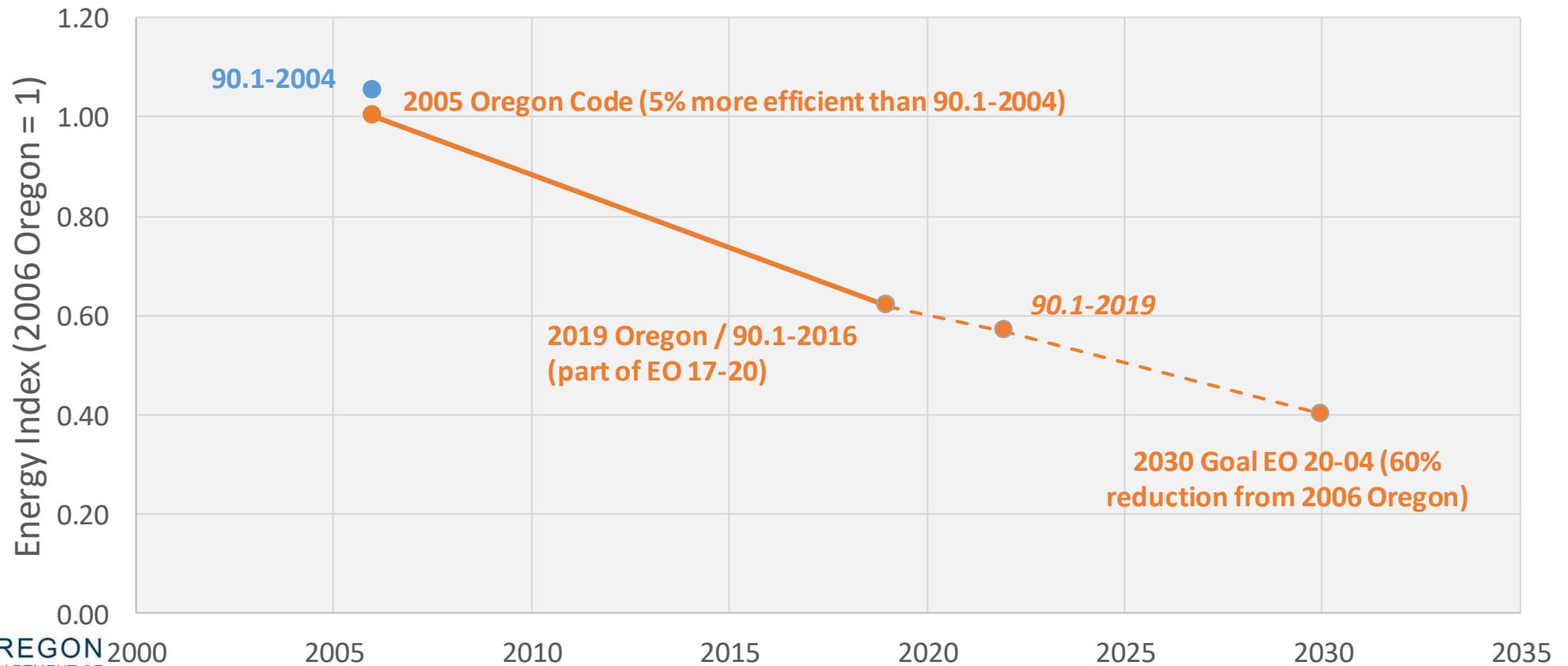
## Residential

Chapter 11 of the 2005 Oregon Residential Specialty Code (ORSC).

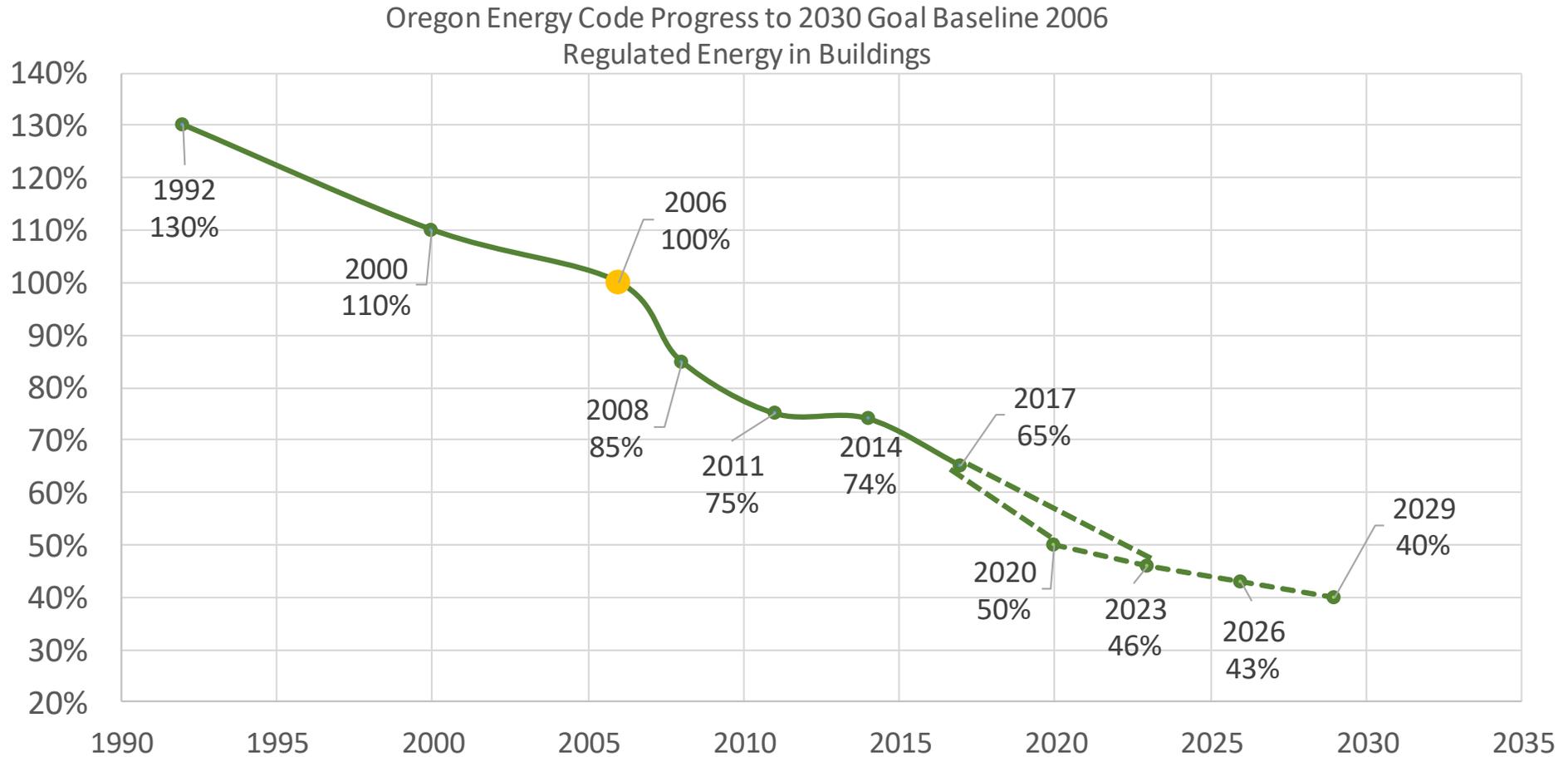
Both will be available on-line.

# 2006-2030: Commercial

Oregon Commercial Energy Code Progression (DRAFT)  
(without plug loads)



# 2006-2030: Residential



# Preview: ZERH Equivalent

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- What are concerns with equivalency?
  - ERV
  - ACH
  - Program requirements vs. prescriptive code equivalent
- Mandatory components
  - Modeling
  - Compliance
- Model performance baselines

# Residential Components NEEA

Component	2005 ORSC Table N1104.1(1) - Path 1	2017 ORSC	DOEZER Rev6 (model baseline)
<b>Envelope</b>			
Above Grade Wall	2x6 int. R-21	2x6 int. R-21	2x6 int. R-20
Glazing	U-0.40, SHGC-0.4	U-0.30, SHGC-0.4	U-0.27, SHGC-0.3
Roof (Flat Ceiling)	R-38	R-49	R-49
Floor Over Unheated	R-25	R-30	R-30
Slab-on-Grade	R-15 for 2ft	R-15 for 2ft	R-10 for 2ft
Doors	U-0.2	U-0.2	U-0.3
<u>Air-tightness</u>	7 ACH50 <sup>2</sup>	5 ACH50	2.5 ACH50 (Zone 4C) 2.0 ACH50 (Zone 5B)
<b>Heating and Cooling<sup>4,5</sup></b>			
Gas Furnace	Heat: 78% AFUE	Heat: 94% AFUE	Heat: 94% AFUE
Gas Furnace w/ AC (Heat+Cool)	Heat: 78% AFUE Cool: 13 SEER	Heat: 94% AFUE Cool: 13 SEER	Heat: 94% AFUE Cool: 13 SEER
DHP w/ Elec Zonal (Heat+Cool)	Heat: 7.7 HSPF Cool: 13 SEER	Heat: 10 HSPF Cool: 13 SEER <sup>6</sup>	Heat: 10 HSPF Cool: 13 SEER
Central Heat Pump (Heat+Cool)	Heat: 7.7 HSPF Cool: 13 SEER	Heat: 9.5 HSPF Cool: 15 SEER	Heat: 10 HSPF Cool: 13 SEER

# Residential Components NEEA

Component	2005 ORSC Table N1104.1(1) - Path 1	2017 ORSC	DOEZER Rev6 (model baseline)
<b>Vent, Ducts &amp; Control</b>			
Ventilation <sup>7</sup>	Exhaust fan, 0.9 cfm/W, 50 cfm Schedule: Cycle 8 hr/day	Exhaust fan, 2.8 cfm/W, 75 cfm Schedule: Cycle 8 hr/day	HRV, 60% SRE, 1.2 cfm/W, 65 cfm Schedule: 24 hr/day
Duct Location	Ducts outside, R-8 insulation, 12% system airflow leakage	Ducts located outside conditioned space, R-8 insulation, 6% system airflow leakage to exterior	Ducts and equipment located within conditioned space, 1% system airflow leakage to exterior <sup>8</sup>
Thermostat	7-Day Programmable	7-Day Programmable	7-Day Programmable
<b>Water Heating (DHW)<sup>9</sup></b>			
Gas	0.57 EF	0.62 UEF	0.67 EF
Electric	0.90 EF	0.95 EF	2.0 EF
Hot Water Consumption	Gallons/day: 23 +11*(#occ-1)	Gallons/day: 23 +11*(#occ-1) Add: 10% reduction for low-flow showerheads	Gallons/day: 23 +11*(#occ-1) Add: 10% reduction for low-flow showerheads
<b>Lighting and Unregulated Use</b>			
Lighting – ON: 1.8hr/day <sup>10</sup>	13% high efficacy (CFL Bulbs) <sup>11</sup>	95% high efficacy (LED fixtures) <sup>12</sup>	80% high efficacy (LED fixtures)

# Residential Components NEEA

Component	2005 ORSC Table N1104.1(1) - Path 1	2017 ORSC	DOEZER Rev6 (model baseline)
Appliances	Federal Minimum	Federal Minimum	EnergyStar
Plugs	Unregulated Load, 1,600kWh/yr.	Unregulated Load, 1,600kWh/yr.	Unregulated Load, 1,600kWh/yr.

# 2005 ORSC Components – BCD DRAFT

BCD/ODOE Components	2005 ORSC - Path 1 Table N1104.1
<b>Characteristics</b>	
Home Size	2-Story, 2,376 SF, 4-Bedrooms
Window Area	15% Window to Floor Area Ratio
<b>Envelope</b>	
Flat Ceiling	R-38
Wood Framed Walls	2x6 Int. R-21
Windows	U-0.40, SHGC-0.50
Doors	U-0.20
Underfloor	R-25
Slab Edge	R-15 for 2ft
Air-tightness	8 ACH50

BCD/ODOE Components	2005 ORSC - Path 1 Table N1104.1
<b>Heating and Cooling</b>	
Gas Furnace	Heat: 78% AFUE
Gas Furnace w/ AC (Heat+Cool)	Heat: 78% AFUE Cool: 10 SEER, 3-Ton
DHP w/ Elec Zonal (Heat+Cool)	Heat: 6.8 HSPF Cool: 10 SEER, 3-Ton
Central Heat Pump (Heat+Cool)	Heat: 6.8 HSPF Cool: 10 SEER, 3-Ton
Ducts	R-8, Outside Envelope, 12% Leakage, 8% LTO
Mech Ventilation Fan	50 cfm, 0.5 cfm/W, Cycle 8 hrs.
Thermostat	Manual

BCD/ODOE Components	2005 ORSC - Path 1 Table N1104.1
<b>Water Heating (DHW)</b>	
DHWH	40 Gal 0.56 EF (Gas) 50 Gal 0.82 EF (Elect.)
Fixtures & Pipe Insul	No low flow fixtures or pipe insulation
<b>Lighting</b>	
Lighting	0% CFL/100% Incan.
<b>Unregulated Loads</b>	
Appliances	18.5 Mbtu removed from
Plug Loads	REMrate Results. (Plug Load = 2,850 kWh/yr.)

## First Meeting Wrap-up



- Recording will be available
- Action items identified and distributed
- Next meeting date 7/15
- Any questions, please send to: [Roger.Kainu@Oregon.Gov](mailto:Roger.Kainu@Oregon.Gov)

- Meeting materials: <https://www.oregon.gov/energy/Get-Involved/Pages/Energy-Code-Stakeholder-Panel.aspx>

- BCD: <https://www.oregon.gov/bcd/Pages/index.aspx>