

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

- 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

- **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
Full list at https://www.oregon.gov/energy/Get-Involved/Documents/BEEWG-Action-Items.pdf 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 BCD and Advisory Boards to amend code to require USDOE Zero-Energy Ready Homes Standard by 10/1/2023	https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf 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. 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.

Executive Order 20-04 additional requirements

20-04

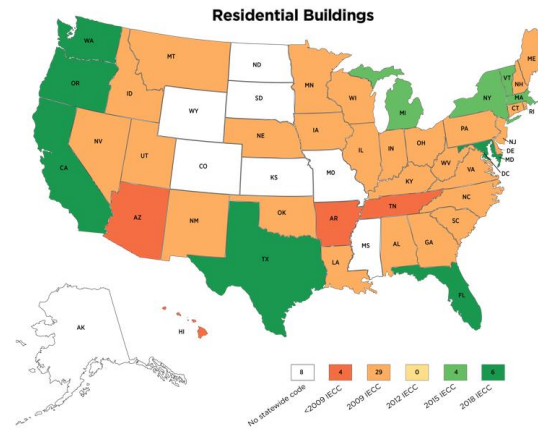
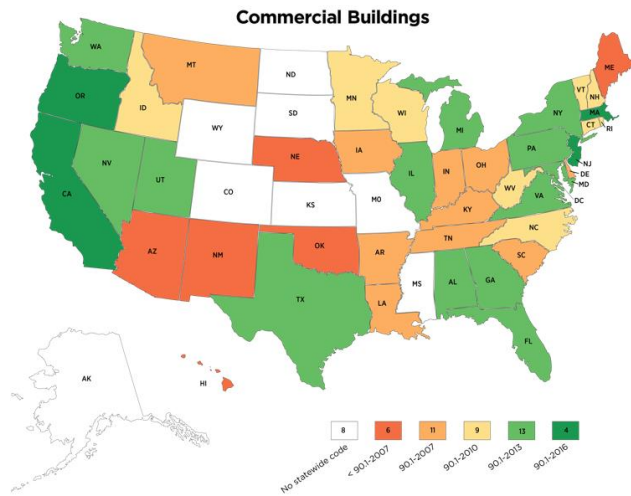
https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

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

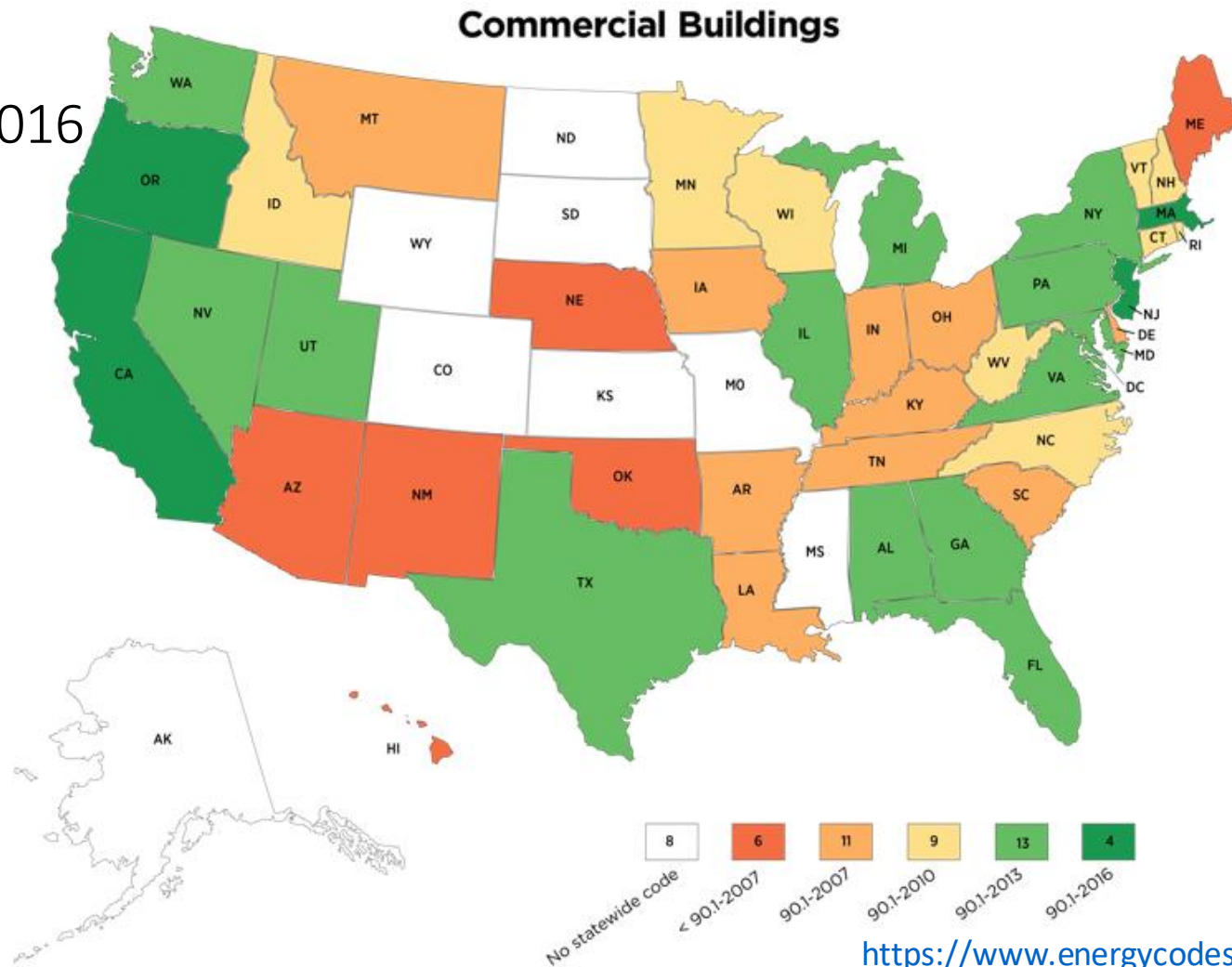
- Statutes and Rules
 - Building codes are adopted rules
- Boards
- Building Codes Division
 - Administrator
- Rulemaking
- Public Involvement
- Timelines for adoption, rulemaking, publication



Setting the table for discussion

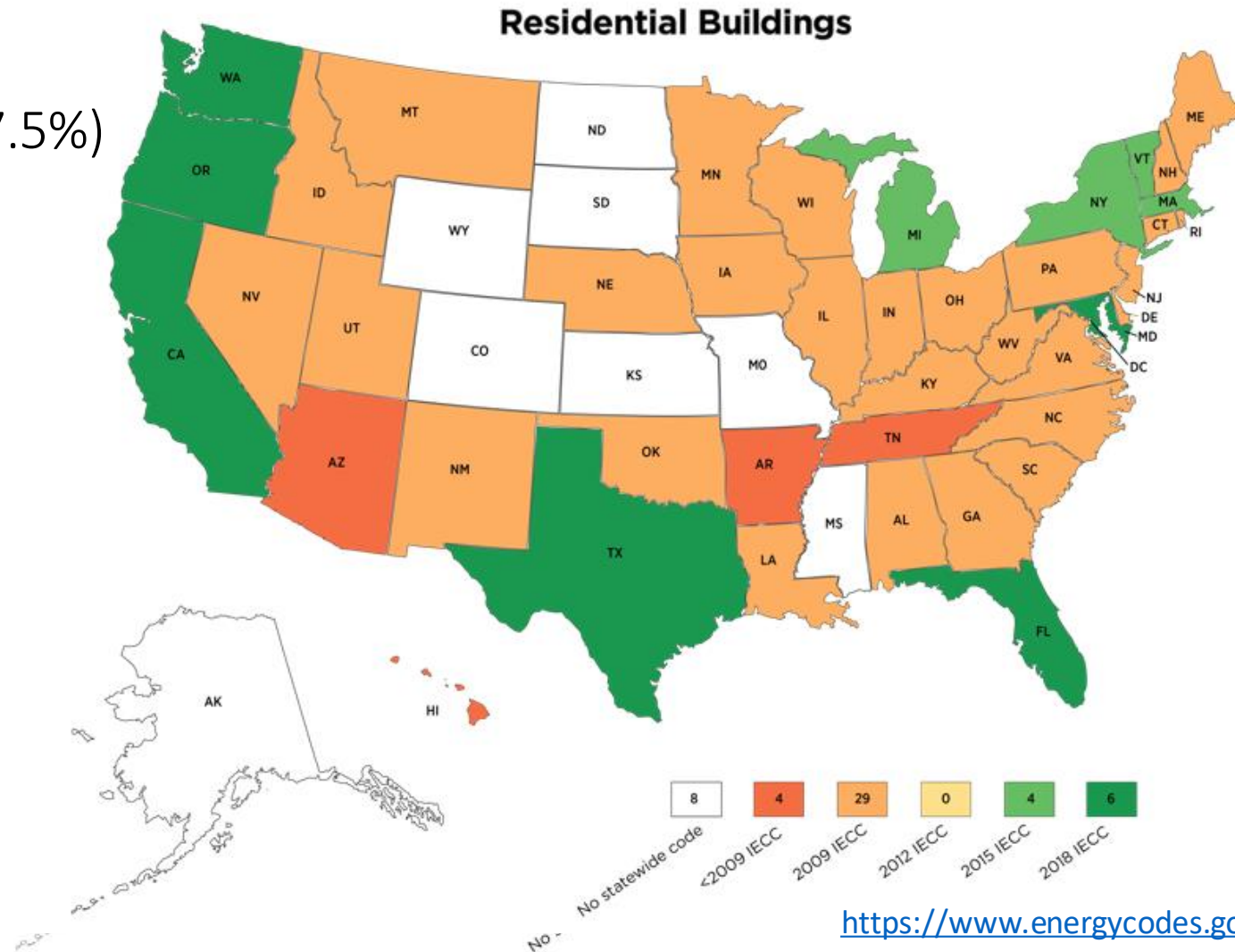
USDOE determination of Energy Code Status

ASHRAE 90.1 2016



Setting the table for discussion

2018 IECC (+~7.5%)



Setting a baseline for 2006

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

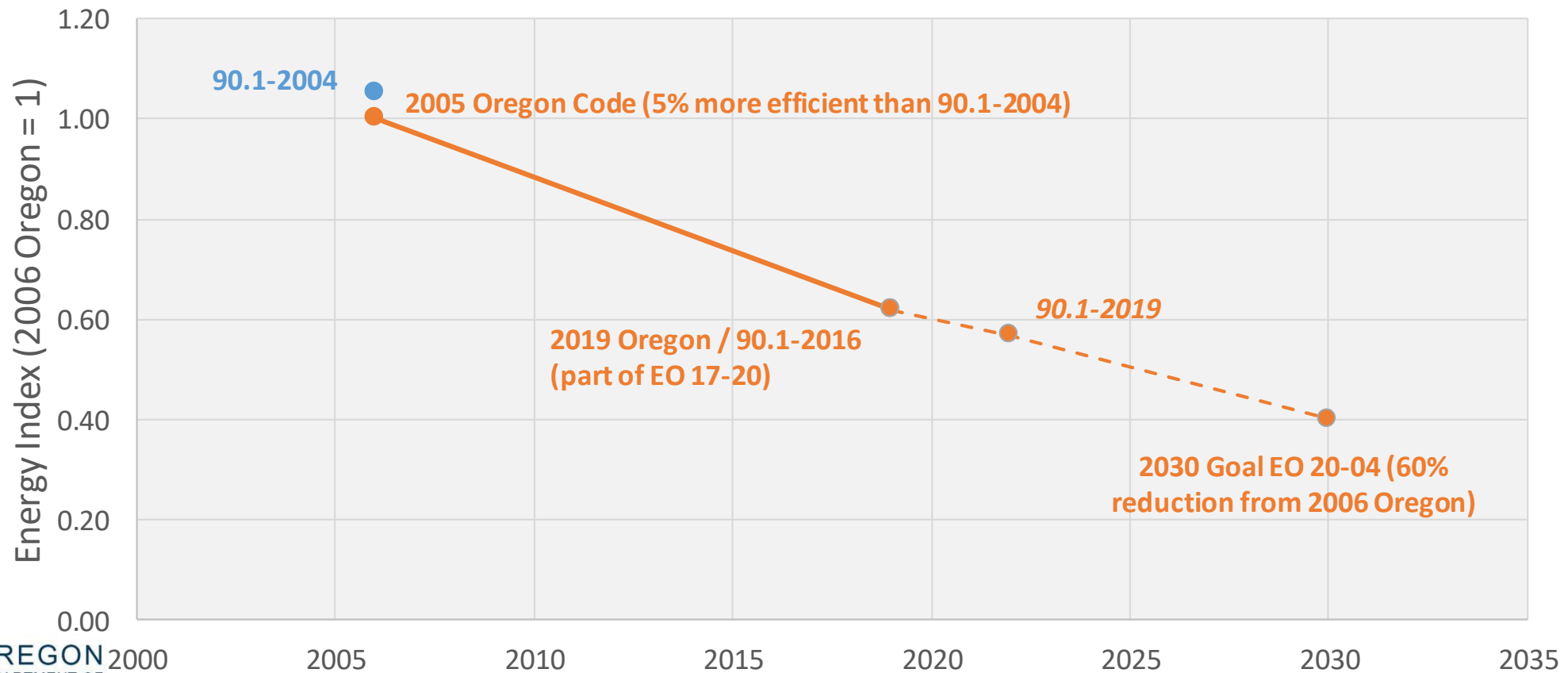
Residential

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

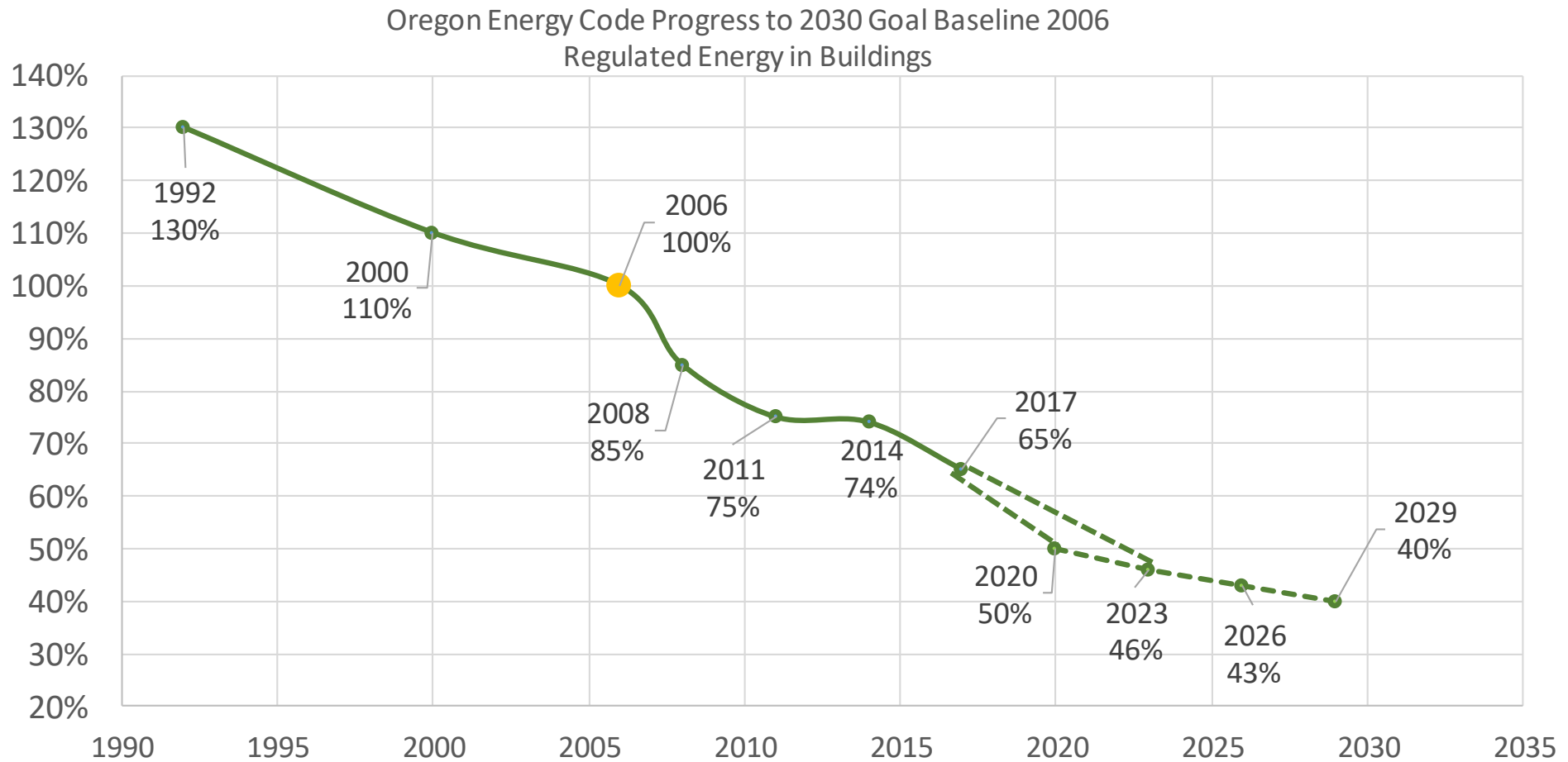
Both will be available on-line.

2006-2030: Commercial

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



2006-2030: Residential



Preview: ZERH Equivalent

- 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)
Envelope			
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 ²	5 ACH50	2.5 ACH50 (Zone 4C) 2.0 ACH50 (Zone 5B)
Heating and Cooling^{4,5}			
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 ⁶	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)
Vent, Ducts & Control			
Ventilation ⁷	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 ⁸
Thermostat	7-Day Programmable	7-Day Programmable	7-Day Programmable
Water Heating (DHW)⁹			
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
Lighting and Unregulated Use			
Lighting – ON: 1.8hr/day ¹⁰	13% high efficacy (CFL Bulbs) ¹¹	95% high efficacy (LED fixtures) ¹²	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
Characteristics	
Home Size	2-Story, 2,376 SF, 4-Bedrooms
Window Area	15% Window to Floor Area Ratio
Envelope	
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
Heating and Cooling	
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
Water Heating (DHW)	
DHWH	40 Gal 0.56 EF (Gas) 50 Gal 0.82 EF (Elect.)
Fixtures & Pipe Insul	No low flow fixtures or pipe insulation
Lighting	
Lighting	0% CFL/100% Incan.
Unregulated Loads	
Appliances	18.5 Mbtu removed from REMrate Results.
Plug Loads	(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

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