Residential and Manufactured Structures Board

Amended meeting agenda
(Item VII.C. added)

Meeting date: October 4, 2023
Time: 9:30 a.m.
In-person attendance: Building Codes Division Salem office in Conference Room A
Virtual connection and online streaming: View the live meeting or access the connection information for the Zoom meeting at: Oregon.gov/bcd/Pages/bcd-video.aspx

I. Board business

A. Call to order
B. Roll call
C. Approval of agenda and order of business
D. Approval of the draft board meeting minutes of July 12, 2023
E. Date of the next scheduled meeting: January 10, 2024
F. Board vote for Chair and Vice Chair of Residential and Manufactured Structures Board
G. Board vote for a member having practical experience in the residential or manufactured structure industry for membership to the Construction Industry Energy Board

II. Public comment

The board will hear public testimony, including testimony from individuals who have signed up in advance.

III. Reports and updates

A. Residential Program update
B. Energy Program update
C. Legislative update

IV. Communications

The division will present advisory information to the board. The board will also review any letters or emails submitted by stakeholders.

Executive Order 20-04 Directive 6(B) Report

V. Appeals

There are no appeals for this meeting.

VI. Unfinished business

There is no unfinished business at this time.

VII. New business

A. Board review and determination on the proposed rulemaking timeline for the 2023 Oregon Residential Reach Code
B. Board review and consultation of proposed changes to the Reach Code adoption process
C. Board review of the division's analysis of Oregon home size data and provide recommendations on use in the Oregon Residential Specialty Code

VIII. Announcements

The Board Chair or board members can make announcements during this time.

IX. Adjournment

Board meetings are generally adjourned by the Board Chair.

Interpreter services or auxiliary aids for persons with disabilities are available upon advanced request. For assistance, please contact Nathan Kramer at 503-899-2131.

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State of Oregon

Agenda Item I.D.

Residential and Manufactured Structures Board

Meeting minutes
July 12, 2023

Members present: Rebai Tamerhoulet, Vice-chair, building official
Gordon Anslow, home designer
John Chmelir, multi-family contractor
Douglas Lethin, remodeler/residential structural contractor
Emily Kemper, public member
Rich Tovar, residential building trade subcontractor
Matthew Lutter, utility/energy supplier

Members absent: James Austin, manufacturer of manufactured dwellings
Forrest Barnes, seller/distributor of new manufactured dwellings
Rich Fry, residential structural contractor

Staff: Alana Cox, administrator, Building Codes Division
Mark Heizer, mechanical and energy systems engineer, Policy and Technical Services (PTS)
Tony Rocco, residential, structural program chief, PTS
Kelly Thomas, energy policy analyst, PTS
Eric McMullen, senior building code specialist, PTS
Jeremy Williams, structural program engineer, PTS
Andy Boulton, senior policy advisor, PTS
Ian Paik, policy analyst, PTS
Laura Burns, policy technical services coordinator, PTS
Debi Barnes-Woods, boards coordinator/administrator, PTS

Guests: Adele Schaffeld, Malheur County
Alex Boetzel, Earth Advantage
Rose Herrera, Office of Developmental Disability Services
Whitley Sullivan
Don MacOrdum, TRC Companies

I. Board business

A. Call to order

The Residential and Manufactured Structures Board meeting of July 12, 2023, was called to order at 9:30 a.m. by Vice-Chair Tamerhoulet.

B. Roll call

Three members were excused: James Austin, Forrest Barnes, and Rich Fry

Chair Tamerhoulet was in person and six members were connected through ZOOM. This board has one vacant position.

C. Approval of agenda and order of business

Vice-Chair Tamerhoulet ruled the agenda and order of business approved as published.

D. Approval of the draft board meeting minutes

Vice-Chair Tamerhoulet ruled the draft meeting minutes of March 8, 2023, final.

E. Date of the next scheduled meeting

October 4, 2023.

F. Board vote for Chair and Vice Chair of Residential and Manufactured Structures Board

Ian Paik, policy analyst, explained the process for nominating and voting for a new chair and vice-chair. Member Tovar, asked if this item could be tabled until the next meeting. Vice-Chair Tamerhoulet asked the board if they want to table the item to the next meeting. All members agreed.

G. Board vote for CIEB membership

Ian Paik, policy analyst, described the options for a board vote for Construction Industry Energy Board(CIEB) membership. Vice-Chair Tamerhoulet asked the board if they want to table this item. All members agreed.

II. Public comment

Policy Analyst Ian Paik confirmed there were no general public testimony in-house or through ZOOM.

III. Reports and updates

A. Residential program update

Chief Rocco, structural program chief, informed the board the division is finalizing the Oregon Residential Specialty Code (ORSC) publishing process. The rulemaking hearing is on August 18. Work continues with International Code Council (ICC) on the printing of the code. The team is actively developing code update training information and presentations. Francisco Ramos and Laura Burns are coordinating the formatting and materials. The next meeting will have a legislative update for the board.

B. Energy program update

Kelly Thomas, energy and policy analyst, provided an update on progress towards the recent Executive Orders(EO). In addition to internal modeling, the University of Oregon is conducting modeling and a report is expected in August. Drafts indicate EO 17-20 will be met relative to 2017 Zero Energy Ready Home (ZERH). This also meets EO 20-04 by 2029. Technical bulletin updates are coming for ducts inside and air sealing code changes. The Energy Star rebates are possibly being extended to January 1, 2025, pending Environmental Protection Agency (EPA) guidance on the applicability of the state version. The ZERH program rebate may also be extended. The division received a database and refined its results regarding home size considerations for potential use in the Reach Code. Mr. Thomas asked for board questions, there were none.

IV. Communications – None

V. Appeals – None

VI. Unfinished business – None

VII. New business

A. Board review and provide a recommendation to the Administrator regarding low-rise electrical provisions

Ian Paik, policy analyst, introduced the item. At the March 23, 2023, Electrical and Elevator Board meeting, the board approved the proposed 2023 Oregon Electrical Specialty Code (OESC). The board requests review and approval of the low-rise residential electrical provisions and recommend the administrator proceed with rulemaking. The board packet includes a summary of the proposed code approved pertaining to low-rise residential electrical provisions.

Electric Program Chief Crise introduced himself to the board and summarized some changes. Working clearances, requiring work clearance areas to be as flat as possible. There are a number of ground fault circuit interrupter (GFCI) modifications. There is a new requirement for a 10 amp circuit for light-emitting diode (LED) lights. Countertop and island circuit requirements have changed.

Motion by Member Kemper to approve the Electrical and Elevator Board's recommendation to adopt the proposed low-rise residential electrical provisions and forward to the administrator for rulemaking and subsequent adoption, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Aye: Gordon Anslow, John Chmelir, Emily Kemper, Douglas Lethin, Rich Tovar, Matthew Lutter, Rebai Tamerhoulet
Nay: none

Motion carried unanimously

B. Board review and provide a recommendation to the Administrator regarding low-rise plumbing provisions

Ian Paik, policy analyst, introduced the item. At the April 20, 2023, Oregon Plumbing Board meeting, the board approved the proposed 2023 Oregon Plumbing Specialty Code (OPSC). The board requests review and approval of the low-rise residential plumbing provisions and recommend the administrator proceed with rulemaking. The board packet includes a summary of the proposed code approved pertaining to low-rise residential electrical provisions.

Plumbing Program Chief Skinner gave an overview of the code adoption cycle. The current 2021 Uniform Plumbing Code (UPC) was adopted as the base model code with some amendments from the 2024 UPC.

Motion by Member Kemper to approve the State Plumbing Board's recommendation to adopt the proposed low-rise residential plumbing provisions and forward to the administrator for rulemaking and subsequent adoption, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Aye: Gordon Anslow, John Chmelir, Emily Kemper, Douglas Lethin, Rich Tovar, Matthew Lutter, Rebai Tamerhoulet
Nay: None
Motion carried unanimously

C. Review and approve the division's proposed recommendation to retain Section R506.2.3 of the 2021 Oregon Residential Specialty Code (ORSC) in adoption of the 2023 ORSC

Ian Paik, policy analyst, said the division requests the board review and approve the division's proposed recommendation to retain Section R506.2.3 of the 2021 Oregon Residential Specialty Code (ORSC) in adoption of the 2023 ORSC.

In the 2021 International Residential Code (IRC) a significant change was made regarding the vapor retarder required by Section R506.2.3 for concrete slab-on-grade construction. This change was included in the adoption process for the 2023 ORSC, and recommended for adoption. However, during promulgation of the 2024 IRC, the change was rescinded and the language was reversed back to the 2018 IRC language due to the lack of scientific and technical substantiation and the significant increased cost associated with the change.

The division proposes to align with the 2024 IRC on this requirement, which would retain Section R506.2.3 of the 2021 ORSC in adoption of the 2023 ORSC.

Structural Program Chief Rocco confirmed the change will revert back to the current

code. The 2023 version carried a significant fiscal impact and the 2024 IRC will rescind the language at the national level. This is a great opportunity to maintain current code and align with the upcoming code.

Member Chmelir commented that a 6 mil vapor barrier has limited effectiveness when walked on. When vinyl is needed to be removed because of vapor, the cost can be greater than the savings on the vapor barrier. He supports the change as the rule is a minimum.

Member Lethin asked if adding a layer of sand under the vapor barrier is effective to prevent punctures.

Member Chmelir responded it prevents punctures, but can lead to concrete cracking due to variable thickness from the sand.

Member Kemper asked about the versions of the IRC referenced.

Residential Program Chief Rocco confirmed the proposed change will revert to the current version.

Motion by Member Lutter to approve the division's recommendation to retain R506.2.3 of current code for the upcoming 2023 ORSC and forward to the administrator for rulemaking and subsequent adoption, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Aye: Gordon Anslow, John Chmelir, Emily Kemper, Douglas Lethin, Rich Tovar, Matthew Lutter, Rebai Tamerhoulet
Nay: None
Motion carried unanimously

D. Review and approve the division's proposed amendments to the prescriptive basic wind speeds of the ORSC

Ian Paik, policy analyst, said the division requests the board review and approve the division's proposed amendments to the prescriptive basic wind speeds of the upcoming 2023 ORSC.

ASCE 7-16, provides design wind speed maps for the United States that serve as the basis for the design wind speeds provided in Table R301.2(1) of the 2023 ORSC.

To date, Oregon has historically retained existing design wind speeds for the identified special regions from prior code iterations without conducting an independent examination and analysis of the latest available regional climatic data for each region.

At the request of the division, in 2022 and 2023, CPP Wind Engineering Consultants collected and analyzed meteorological data for the identified special wind regions throughout Oregon and provided recommendations for updating the associated design wind speeds based on the statistical analysis methodology used and referenced by ASCE 7-16.

These recommendations from both CPP Project 17587 Final Report and CPP Project 16166 Final Report are captured in the associated table and figure in the attached proposed amendments to the 2023 ORSC. These reports and recommendations are also being presented to ASCE 7 wind committee members and are expected to be incorporated into ASCE 7-28 and directly referenced by the 2030 International Building Code (IBC).

Residential Program Chief Rocco said historically, conservative speeds were used based on lack of scientific and technical data. Oregon will be a leader regarding these special wind regions. It is generally a reduction in wind speeds. In some areas of the state this will lead to cost savings where seismic is not controlling the design. This is also being proposed to the Building Codes Structures Board.

Member Anslow said he is glad the technical study has been done. He supports the decision being made based on the science and leads to the intended goal of increased affordability.

Vice-chair Tamerhoulet said he thinks the changes will reduce the cost of building in the coastal area.

Motion by Member Lutter to approve the division's recommended code amendments for the upcoming 2023 ORSC and forward to the administrator for rulemaking and subsequent adoption, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Aye: Gordon Anslow, John Chmelir, Emily Kemper, Douglas Lethin, Rich Tovar, Matthew Lutter, Rebai Tamerhoulet
Nay: None
Motion carried unanimously

VIII. Announcements - None

IX. Adjournment

Vice-chair Tamerhoulet adjourned the meeting at 10:11 a.m.

Respectfully transcribed and submitted by Nathan Kramer, policy development coordinator

Legislative Update

Agenda Item III.C.

Table of Contents

The following is a brief summary of recently passed legislation which may be of interest to the board. These summaries are not a complete outline of the new law and the summary should not be relied upon for decision making. Please refer to the bill text for a complete description of the law change.

Bills Passed in the 2023 Session that may impact BCD Operations

HB 2001 Affordable housing omnibus bill

Bill

Summary: House Bill 2001 is the primary bill for the legislature's and the governor's housing expansion priorities. The bill was signed by the governor in March. The bill is significant and for a full overview of changes please refer to the bill page and the complete bill text. The bill establishes the Oregon Housing Needs Analysis within the Oregon Department of Administrative Services. The bill increases accountability of cities outside the Metro and the Metro for achieving the state's housing goals. The bill requires Oregon Housing and Community Services to develop and maintain a state wide housing production dashboard that includes data on housing affordability as well as equity indicators relevant to housing. The bill directs the Land Conservation and development commission to work to address local housing barriers and directs public bodies to use their authority to remove barriers to housing development. The bill expands the ability of the Department of Land Conservation and Development and the Land Conservation and Development Commission to pursue enforcement against a city that is not meeting its housing development goals. The bill outlines how cities address urbanization inside and outside the Metro. The bill expands the ability to address youth homelessness through grant programs. The bill increases protections for tenants being evicted for nonpayment of rent. The bill allocates funding for grant programs to support modular housing. The bill allocates funding for moderate income housing predevelopment loans. The bill directs the Department of Agriculture to provide grants to improve health and safety conditions of agriculture workforce housing.

Building Codes Division Specific: The housing production dashboard developed by Housing and Community Services will require a definition of housing accessibility and visitability and that definition will be created by rule by the division.

Plan: The bill requires that Oregon Housing and Community Services create the dashboard by January 1, 2025. The division intends to develop a definition for visitability and accessibility and bring it to the Residential and Manufactured Structures Board and the Building Codes Structures Board in advance of Housing and Community Services finishing the dashboard.

SB 80 Wildfire bill, updates to SB 762

Bill

Summary: Senate Bill 80 is this session's omnibus wildfire bill. It includes updates and fixes to aspects of SB 762 from the 2021 session. For a full review of all components of SB 80 please refer to the bill page. Senate Bill 80 changes the name of the state wildfire risk map to the statewide wildfire hazard map and eliminates the extreme and no risk hazard zones to leave three hazard zones (low, moderate, and high). The bill directs all agencies and public bodies involved with the development and roll out of the map as well as the accompanying rules to engage in specific and robust public engagement and education before finalizing the map and the associated rules. The landscape resiliency fund is established to allocate funds to the Department of Forestry specifically for actions to increase landscape resiliency. The prescribed fire liability pilot program is established to help cover liability created by using prescribed fire to mitigate future wildfire risk. The bill includes several conforming amendments and allocates funds to numerous ongoing programs related to wildfire protection.

Plan: The changes in Senate Bill 80 only impact the division in so far as the division's rulemaking that makes section R327 of the Oregon Residential Specialty Code mandatory for new construction in high wildfire hazard zones contained within the wildland urban interface will follow the final adoption of the wildfire hazard map. The division held a rulemaking advisory committee and a public rulemaking hearing for its rulemaking in 2022 before putting the rulemaking on hold pending the adoption of a final wildfire hazard map. The division intends to hold at least one additional hearing prior to adopting the rules but does not anticipate any changes to the construction provisions of section R327.

SB 582 Electric Vehicle Infrastructure Training Program

Bill

Summary: Senate Bill 582 directs the Electrical and Elevator Board to approve the Electric Vehicle Infrastructure Training Program (EVITP) as an approved continuing education program and that the board review equivalent training programs for approval. The bill requires the board to request information from EVITP providers about the number of electricians that have signed up for the course, completed the course, and passed the certification. Once the board certifies that 500 electricians have completed the EVITP or an equivalent program the board must notify the appropriate legislative committees. This also triggers requirements on using EVITP certified electricians on state funded projects that install electric vehicle charging systems. Residential construction with four or fewer units would be exempt from these requirements

Plan: The division on behalf of the Electrical and Elevator Board will set up reporting with EVITP on the number of Oregon electricians signing up for, completing, and being certified by the program. Additionally, the division will accept and process applications

from the EVITP and equivalent training programs to be considered by the board's continuing education committee and ultimately the board itself for approval as continuing education.

HB 3395 Additional Affordable housing legislation

Bill

Summary: House Bill 3395 is another substantial bill relating to housing. It combines several bills that were introduced earlier in the session and for a full overview of the bill's provisions please review the bill page on OLIS.

The bill prohibits local governments from denying the siting and development of residential uses on land zoned to allow only commercial use under certain conditions. The bill changes residential land use approval procedures. The bill requires local governments to approve an application for development or use of land for emergency shelters under certain conditions. The bill directs the Department of Consumer and Business Services to review and consider updates to the Oregon Structural Specialty Code to allow a residential occupancy to be served by a single exit and specifies considerations that should be taken into account. The bill clarifies that residential units subject to affordability restrictions are not included in the planned community definition. The bill restricts the ability of state or local governments to specifically impede the development of condominiums. The bill requires a local government accept letters from public funding sources as assurance when considering an application to develop a subdivision. The bill defines single room occupancy and requires local governments allow single room occupancy development within an urban growth boundary. The bill requires cities with 2,500 to 25,000 residents that are outside of a metropolitan service district allow siting duplexes on parcels zoned for single family detached dwellings. The bill creates provisions that allow the removal of discriminatory provisions from planned community or condominium declaration or bylaws without a vote of owners or board members. The bill allows public utilities to sell at or below market price, or gift, interest in real property for the purpose of developing affordable housing under certain conditions. The bill allocates money for affordable housing grants for low income college students. The bill establishes and funds the agricultural housing repair fund to provide grants to assist with the development of affordable agricultural worker housing. The bill allocates funds to the Department of Housing and Community Services to implement grant programs to assist with affordable housing.

Plan: The only requirement on the division is to review and consider updates to the Oregon Structural Specialty Code (OSSC) through the Building Codes Structures Board to allow residential occupancy to be served by a single exit in certain circumstances. The deadline in the bill is October 1, 2025, which is the planned adoption date for the next version of the OSSC and the division plans to include the recommendations for consideration in the normal development and adoption process for the 2025 OSSC.

HB 2889 Conforming amendments and updates to HB 2001

Bill
Summary: House Bill 2889 includes many conforming amendments to ensure alignment with House Bill 2001. The Department of Land Conservation and Development (DLCD) and the Department of Housing and Community Services (HCS) are tasked with assisting DAS. The bill outlines reporting and rulemaking requirements for DAS, DLCD, and HCS and lists a number of agencies that should be consulted in some of these rulemakings including the Department of Business and Consumer Services (DCBS). The bill outlines different requirements for municipalities' responsibilities under the OHNA depending on the size of the municipality and whether it is included in the Metro.

Plan: This bill does not require any action by the division but it is relevant to the larger discussion surrounding housing. The division will likely be consulting with other agencies on rulemakings related to housing on an ongoing basis.

HB 2727 Childcare facilities workgroup

Bill
Summary: House bill 2727directs the Department of Land Conservation and Development (DLCD) to convene a workgroup to examine strategies for expanding early learning and care facilities in the state. In addition to the legislators appointed to the task force, the bill directs DLCD, to the extent practicable, to select several additional task force members with certain roles defined in the bill. One of those roles includes "representatives from the Department of Consumer and Business Services with expertise in state and local building codes."

Plan: The task force created by the bill would include at least one person from the building codes division. The time commitment required of the person(s) serving on the taskforce will depend on the extent of engagement with the process and the number of meetings required.

HB 3409 Climate and greenhouse gas legislation

Bill
Summary: House Bill 3409 is the session's omnibus climate bill and it combines several bills introduced previously in the session including the four bills that came out of the Resilient Efficient Buildings Taskforce (SBs 868, 869, 870, 871). This bill is extensive and for a full breakdown of it's provisions please consult with the bill page on OLIS.

Designated State Agency Programs for Energy Efficiency in Buildings

The bill declares the following goals: for owners, operators, or residents to install and use at least 500,000 new heat pumps by 2030; provide programs and support to

accelerate purchase and use of heat pump technologies to help meet state's greenhouse gas (GHG) emissions reduction goals; prioritize environmental justice communities and individuals who reside in structures without functioning, adequate, or affordable heating or cooling system; evaluate adoption and use of heat pump technologies to determine if adoption rate will enable Oregon to meet GHG emission reduction goals; and executive branch agencies to lead by example by acquiring, installing, and using heat pump technologies. The bill requires in carrying out "designated state agency programs" (Designated Programs) that relate to promotion, implementation, incentivization, or regulation of energy efficiency in buildings State Department of Energy (ODOE), Housing and Community Services Department, Public Utility Commission, Department of Environmental Quality, Oregon Health Authority, and Department of Consumer and Business Services (Designated Agencies) shall consider actions to aid in achieving GHG emission reduction goals that include:

- consider GHG emission reduction goals in regulatory decisions;
- aligning the creation or operation of Designated Programs with GHG emissions reduction goals;
- working in consultation and aligning efforts with other agencies to simplify and improve program access that relate to energy efficiency and resilience, and where appropriate to reduce or eliminate barriers to accessing energy efficiency measures or appliances that will result in the greatest GHG emission reductions;
- prioritize actions that help environmental justice communities adapt from impacts from climate change and overcome cost burdens consistent with applicable federal and state laws and program requirements; and
- consult with Oregon Global Warming Commission and the Environmental Justice Council, and use when appropriate environmental justice mapping tool.

The bill requires ODOE to submit a heat pump market report that evaluates rate of adoption and progress towards meeting GHG emission reduction goals to the Governor and the Legislative Committee related to the Environment no later than September 15th of each odd numbered year. The bill provides minimum requirements for heat pump technologies report.

The bill requires ODOE to collaborate with Designated Agencies to reduce financial and nonfinancial barriers to home energy efficiency and resilience by: providing initial and continuing technical assistance and training to build capacity in developers, builders, community-based organizations, homeowners and tenants to conduct renovations and installations of energy efficient technologies and provide education and training to contractors, subcontractors, technicians, community based organizations and other installers and workers in industries related to construction and energy appliance installation.

<u>Department of Consumer and Business Services: Energy Efficiency in Buildings</u>

House Bill 3409 directs the Department of Consumer and Business Services (DCBS), as DCBS' responsibilities relate to efficiency or resiliency in buildings to:

- Exercise all authority and discretion to help facilitate, at a minimum, the achievement of greenhouse gas (GHG) emission reduction goals (ORS 468A.205).
- Prioritize and take actions necessary to accelerate reductions in GHG emissions, including but not limited to rulemaking processes in addition to DCBS' existing responsibilities; and
- Consider and integrate prevention or reduction of climate change impacts and GHG emissions reduction goals into planning, budgeting, investments, and policymaking decisions.

The bill directs DCBS to contribute towards achieving GHG emission reductions and mitigation of climate change impacts by: setting goals for improved energy efficiency; investigating options for, and feasibility of, reducing GHG emissions resulting from manufacturing, transporting, installing, disposing and recovering materials used in building construction; and investigating benefits and feasibility of updating building ventilation standards and specifying standards for air cleaners present in building mechanical systems and occupied indoor spaces.

The bill requires DCBS to: consult with advisory boards and committees and cooperate with ODOE to specify energy efficiency goals for new residential and commercial construction that aim to achieve at least 60 percent reduction in annual energy consumption from standards specified in the statewide 2006 building code and applicable specialty codes by 2030. Cooperate with ODOE to identify metrics to inform updates to statewide building codes and applicable specialty codes. Requires DCBS to report to Legislative Committee related to the environment every three years, beginning December 31, 2023, on progress towards achieving goals and options for achieving goals over the course of the subsequent three updates to the state building code and applicable specialty codes.

The bill requires DCBS to update Reach Code to reflect progress toward specified energy efficiency goals each time statewide building code and applicable specialty code are updated. It requires coordination with DEQ. It requires to extent feasible, in cooperation with DEQ, and taking into account Department of Transportation standards, DCBS identify options to reduce GHG emissions attributable to building materials so that lower carbon materials may serve the same function. Requires DCBS to consider industry standards. The bill requires DCBS to report to the Legislative Committee related to the environment, no later than December 31, 2024, on findings and recommendations on options for reducing GHG emissions that result from manufacturing, transporting, installing, disposing of, and recovering materials used in building construction including specifying lower carbon materials or other means.

<u>Energy Performance Standards for Covered Commercial Buildings</u>

House Bill 3409 directs the Oregon Department of Energy (ODOE) in consultation with the Department of Consumer and Business Services (DCBS) to adopt rules specifying an energy performance standard for covered commercial buildings. The bill also requires that a database of eligible building owners and covered commercial buildings that are subject to the requirements of the new rules be created. We assume that the department tasked with creating that database would be ODOE in consultation with DCBS but the language in the bill is ambiguous. The bill outlines notification and reporting requirements for buildings covered by the new rules. The bill directs ODOE to establish, with a third party, incentive programs.

State Agencies to Conduct Assessment of Energy Use

House Bill 3409 creates standards for implementing energy conservation measures into capital construction by or on behalf of state agencies. The bill includes development and implementation of a comprehensive assessment of energy use and greenhouse gas emissions by state owned buildings and a searchable database of the results of that assessment. The bill directs the Department of Administrative services to oversee state agency capital projects exceeding $1 million dollars in regards to meeting the requirements of the bill and each state agency to report to DAS and ODOE on the progress of capital projects underway.

Community Green Infrastructure Grant Program

The bill establishes the community green infrastructure grant program as a program administered by the Department of Land Conservation and Development (DLCD) for the purpose of: offsetting the cost of planning and developing community green infrastructure projects or green infrastructure community development projects; and providing direct social, environmental, and economic benefits to communities across Oregon through green infrastructure in the form of climate adaptation, mitigation, and resilience, local jobs, public or community benefits, and local food sovereignty.

College of Forestry, Oregon State University: Low Carbon Fuels From Woody Biomass Residues

The bill directs the College of Forestry at Oregon State University, in collaboration with the Department of Environmental Quality and the State Forestry Department, to research development of fuel pathways for low carbon fuels derived from woody biomass residues from forestry operations.

Rebate Program for Medium and Heavy Duty Zero-Emission Vehicles

The bill directs the Department of Environmental Quality to establish a program to provide rebates to persons that purchase or lease qualifying medium or heavy duty zero-emissions vehicles.

Finding Opportunities and Reducing Conflict in Siting Photovoltaic Solar Power Generation Facilities

The bill directs the Department of Energy and the Department of Land Conservation and Development to establish the Finding Opportunities and Reducing Conflict in Energy Siting Process to identify locations best suited to site renewable energy or transmission development and ways to streamline or expedite the siting process for renewable energy or transmission development.

Oregon Climate Action Commission

Changes name of "Oregon Global Warming Commission" to "Oregon Climate Action Commission." Modifies membership and duties of commission. Modifies state greenhouse gas emissions reduction goals. Directs state agencies to report to commission on progress toward achieving greenhouse gas emissions reduction goals. Directs Department of Environmental Quality, in consultation with commission, to evaluate opportunities to reduce Oregon's consumption-based greenhouse gas emissions and report to interim committees of Legislative Assembly related to environment no later than September 15, 2024.

State Policy for Natural Climate Solutions

The bill establishes state policy regarding natural climate solutions. Establishes Natural and Working Lands Fund and provides for transfer of moneys from fund to certain state agencies. Prescribes uses of moneys from fund and requires Oregon Global Warming Commission to report to legislature on uses of moneys from fund. Directs State Department of Energy and commission to prepare inventory, baseline, activity-based metrics and community impact metrics for net carbon sequestration and storage in natural and working lands and establish carbon sequestration and storage goals. Directs State Department of Energy, in coordination with commission, to study workforce training programs needed to support adoption of natural climate solutions and provide results to committees of Legislative Assembly related to environment no later than September 15, 2024. Authorizes commission to appoint natural and working lands advisory committee. Takes effect on 91st day following adjournment sine die.

Extends Sunset for Solar and Storage System Rebate Program

Extends to January 2, 2029, sunset of program for provision of rebate for construction or installation of solar electric system or paired solar and storage system, for residential customer or low-income service provider, on real property in Oregon. Modifies definition of "paired solar and storage system." Requires State Department of Energy, under renewable energy production system grant program, to waive requirement that construction begin within 12 months of grant award if construction was delayed because of supply chain or workforce disruptions or shortages related to COVID-19 pandemic and construction began between March 1, 2020, and March 31, 2022.

Residential Heat Pump Program; Air Conditioner and Air Filter Deployment Program
Extends Residential Heat Pump Fund until January 2, 2026. Appropriates moneys to Oregon Health Authority for air conditioner and air filter deployment program. Declares emergency, effective on passage.

Community Climate Investment Entities

The bill authorizes the Environmental Quality Commission to establish by rule the fee to be paid by community climate investment entities.

Harmful Algal Blooms

The bill declares harmful algal blooms to be menace to public health and welfare. Directs Oregon Health Authority to identify water sources susceptible to harmful algal blooms, monitor and test susceptible waters and develop protocol for advisory alerts. Directs Department of Environmental Quality to develop response strategy to harmful algal blooms, produce and maintain relevant data, identify sources of pollutants, develop strategies to reduce pollutants and determine causes of harmful algal blooms.

Resilience Hubs and Networks

The bill directs the Department of Human Services to provide grants, support and technical assistance for resilience hubs and networks in Oregon.

Plan for implementing House Bill 3409:

Most of the bill does not impact the division, but because the bill is so extensive, this summary will address the plan for each specific section that does impact the division separately.

Designated State Agency Programs for Energy Efficiency in Buildings

This section requires that the division consider greenhouse gas (GHG) emission goals as a part of executing agency actions. The division intends to seek legal advice from the DOJ on how best to balance the priorities outlined in this section of the bill with other statutory priorities that are set out for the division and the state building code.

Department of Consumer and Business Services: Energy Efficiency in Buildings

The division intends to fulfill the requirements of this section in consultation with the appropriate advisory boards.

Similarly to the previous section, the division intends to consult with DOJ agency counsel to get advice on the impact of the new priorities created by this section of the bill and how those priorities interact with already existing statutory requirements on the division and the state building code.

The division is determining the best way to consult with the Environmental Justice Council when evaluating the priorities that the department sets and actions the department takes to adapt to and mitigate the impacts of climate change. It will likely involve a regular check in with the council and updating on the relevant actions being taken by the division.

The division will continue to fulfill the reporting requirements that were first created by executive order 20-04 and with this bill are now required starting in 2023 and every three years after.

The division was appropriated funding for 1-2 additional positions to assist with the assessment of lower carbon building materials and anticipates contracting with a third party to help prepare the study of lower carbon materials in the statewide building code.

Energy Performance Standards for Covered Commercial Buildings

The division will be available to consult with the Department of Energy on the directives in this section.

HB 5506 End of session funding bill, grant program extension

Bill

Summary: This is the end of session “Christmas tree bill.” It is extensive with a few hundred sections. Please refer to the bill to get the full scope of its contents but the Building Codes Division does make special note of Section 270 which allocates $6,300,000 to continue funding the fire hardening grant program that the division has been administering in partnership with the counties impacted by the 2020 wildfires. The legislature extended the program through the end of the 2024-25 biennium and extended eligibility to those own buildings damaged in the 2021 wildfires.

Plan: The Building Codes Division will continue to partner with impacted counties to administer the grant program that has been operating since the start of 2022. The division has updated its rules to conform with the updated directive from the legislature and is executing new agreements with participating counties.

Agenda Item IV.

Executive Order 20-04 Directive 6(B) Report

BCD Building Codes Division

Department of Consumer and Business Services

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Table of Contents

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Background

Executive Order 20-04 (EO 20-04) was signed by Governor Kate Brown on March 10, 2020. EO 20-04 is intended to build on Executive Order 17-20 (EO 17-20) to further Oregon's goal of reducing Greenhouse Gas (GHG) emissions *"at least 75 percent below 1990 levels by 2050"* as described in ORS 468A.205.

EO 20-04 provides one set of general directives to 16 different state commissions and agencies, along with specific directives to those commissions and agencies with various reporting requirements and deadlines. The first reporting deadline was on May 15, 2020, and required 10 specified state agencies to report "*on proposed actions within their statutory authority to reduce GHG emissions and mitigate climate change impact*." While not one of those agencies, the Department of Consumer and Business Services Building Codes Division (BCD) produced and provided 'Directive 3(D) Report' to the Governor's office on that date.

Directive 6(B) of EO 20-04 also states that "*No later than Sept. 15, 2020, BCD should submit a report to the Governor on* [the] *current progress and options for achieving the goals over the next three code cycles. The report should be updated every three years thereafter*." The May and September 2020 reports can be found on BCD's EO 20-04 webpage under the Code progress and updates section.

House Bill (HB) 3409, passed through the 2023 Legislative Session, was signed by Governor Tina Kotek on July 27, 2023 and codified many aspects of EO 20-04 relative to BCD including, but not limited to:

1. Adopt energy efficiency goals for 2030 for new residential and commercial buildings, representing at least a 60% reduction in annual regulated site energy consumption, from the 2006 Oregon energy codes.
2. Agree on metrics in consultation with Oregon Department of Energy (ODOE), based on best practice and academic research, to inform the baseline and reductions.
3. Update the Oregon Reach Code each time the statewide building code is updated. This shall be done through rulemaking, after obtaining approval from the appropriate advisory boards.
4. Report to an interim committee of the Legislative Assembly, not later than Dec. 31 of every third year, beginning with Dec. 31, 2023, an evaluation of progress, a list of options, and an evaluation for feasibility towards achieving the goals set herein.

In response to Directive 6(B), BCD is pleased to submit this report for the 2023 reporting cycle. An update of this report will be presented by Dec. 31, 2023 to an interim committee of the Legislative Assembly.

On Jan. 10, 2023, Governor Kotek signed EO 23-04, *Establishing a Statewide Housing Production Goal and Housing Production Advisory Council (HPAC)*, which added an additional layer to achieving the energy efficiency goals of EO 20-04. BCD provides support to the council as they balance social, environmental, and economic systems from a statewide perspective of resiliency.

Introduction

BCD and its boards have established Oregon as a national leader for energy efficient building codes by using its statutory authority to adopt uniform statewide building codes that are technically and economically feasible. These mandatory statewide codes provide consistency and predictability for all. This approach also helps Oregon achieve extremely high compliance rates, as designers, building officials, contractors and other stakeholders are able to train to one standard, regardless of where in the state the project is located.

BCD, in partnership with its seven advisory boards, has statutory authority to adopt and amend a state building code. To ensure that important construction industry stakeholders' voices are heard, the Oregon statute requires both the appropriate advisory board and BCD to approve any code change. In short, BCD and the appropriate advisory boards are partners in the code change process. This partnership between the boards and BCD has created a national leading energy efficiency code, while providing predictability, reliability, and stability to the building industry.

Historically, BCD has worked with its advisory boards to adopt some of the most energy efficient building codes in the country. Oregon's state codes are based on national model codes and usually incorporate additional energy efficiency measures. In 2019, Oregon was the first state in the country to adopt the "*American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE/IES) Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings*", (ASHRAE 90.1) as a mandatory, statewide, commercial energy code. Oregon has also been, and will continue to be, among the national leaders in energy efficiency for residential construction, having adopted the first mandatory, statewide residential energy code provisions in 1974.

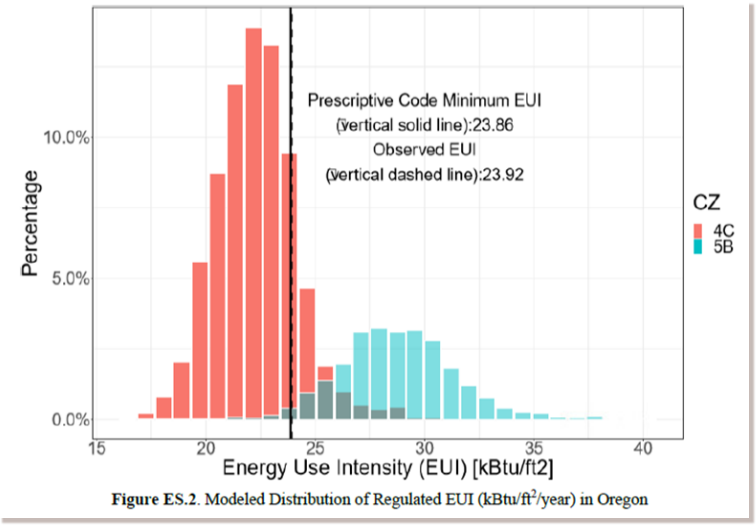


Figure ES.2. Modeled Distribution of Regulated EUI (kBtu/ft^2/year) in Oregon

Having an energy efficient code is only as successful as compliance with that code. Oregon's success is demonstrated in an Energy Code Field Study (ECFS) [1] funded by the Northwest Energy Efficiency Alliance (NEEA) and produced by Pacific Northwest National Laboratory (PNNL). The June 2020 ECFS showed new Oregon homes performed just 0.25% above anticipated annual Energy Use Intensity (EUI) under the previous residential energy code, the 2017 Oregon Residential Specialty Code (ORSC). This is demonstrated in the Figure ES.2. EUI is the measurement of how much energy a home uses annually, expressed in thousands of British Thermal Units (BTU's), divided by the square footage of the home (kBTU/ft^2). The higher the number, the more energy a home consumes per square foot. This ECFS, when compared to other studies in similar climate zones, demonstrates Oregon's position as a leader in energy efficient codes.[2]

All ECFS's use the United States Department of Energy (U.S. DOE) compliance study methodology[3] as closely as possible. An ECFS is not available for Oregon's Commercial buildings. Only Florida, Nebraska, Iowa, and Nevada, in climate zones 2A and 5A, have had a commercial EFCS produced, the first of their kind published in January 2023.

[1] Oregon Residential Energy Code Field Study, June 2020. Funded by NEEA, produced by Pacific Northwest National Laboratory (PNNL), R. Bartlett, M. Halverson, and Y. Xie.

[2] 2019-2020 Washington Residential New Construction Code Study, June 2020. Funded by NEEA, produced by CLEAResult.

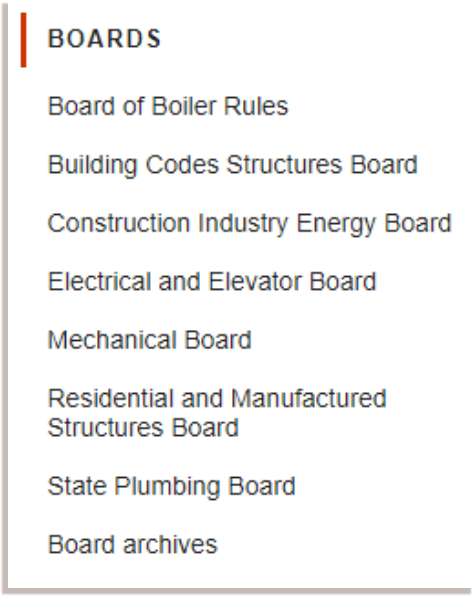
[3] https://www.energy.gov/sites/prod/files/2018/06/f52/bto-Res-Field-Study-Methodology-060618-2.pdf

BCD Principles for Code Adoption

BCD has developed several principles to make sure the building code achieves its mission to create the foundation for safe, efficient, affordable buildings in Oregon. The principles that guide our work when considering building code revisions are listed in Appendix A. Through the continued development and implementation of advanced energy codes, BCD is committed to supporting the reduction of GHG emissions, as it has since BCD's inception in 1974.

Code adoption process

BCD's code adoption process ranges from 12 to 18 months and includes printing of the code. BCD incorporates various opportunities for stakeholders and members of the public to engage in the code change process. Under existing statutory authority, BCD is required to obtain advisory board approval for any code update. This process involves engaging with stakeholder representatives on the advisory boards along with public input at those board meetings. The boards are comprised of members ranging from the design and construction industries, building officials, public utilities, state agencies and the general public. See Appendix B of this report for board composition.



The relevant board generally kicks off the code adoption process by designating the model code that will be used for the code cycle, and by opening up a 45-day public proposal period, where code change proposals are solicited from the public. Additionally, to ensure a thorough review of proposed code amendments, a board may choose to appoint a committee of interested experts. After review, the code committee reports their recommendations back to the board for consideration. This process allows for public comment at the code committee level, the board level, and often, both.

Once a code change has been approved by the appropriate advisory board, BCD undertakes formal rulemaking. The policy is to include at least one public hearing on code adoption rules, providing another opportunity for public feedback. BCD sends out regular updates on code change processes and maintains a website with all code change information. BCD also sends out notifications to its subscriber lists and publishes all opportunities for the public to engage in the process.

In addition to the opportunities for public engagement in the code change process, existing statute provides the opportunity for any member of the public to present a code amendment at any time, at any board meeting. These amendments do not need to be timed with an existing code cycle, and have been successfully used by stakeholders to include revisions into the code before the next scheduled code update.

This open and transparent process, over an extended period of time with numerous opportunities for input, ensures that an effective and efficient code is promulgated which works for all Oregonians whether the building is constructed in an urban center such as Portland, or a rural community such as the City of Burns.

Completed to Date

Commercial

The 2021 Oregon Energy Efficiency Specialty Code (OEESC), Chapter 13 of the Oregon Structural Specialty Code (OSSC), became effective April 1, 2021. ASHRAE 90.1-2019 serves as the construction provisions for the OEESC. Code update training was produced and made available on BCD's Commercial energy code compliance, training, and resources webpage.

Per ODOE's State of Oregon Fact Sheet[4], "*New commercial buildings built to ASHRAE Standard 90.1-2019 save energy and experience lower operational costs, which results in lower utility bills for building owners and businesses. The results shown below are weighted averages for prominent commercial building types across all climate zones in Oregon*".[5]

Metric	Commercial Buildings[6]	
	Public Buildings	Private Buildings
Annual reduction in energy bills ($/ft^2)	$0.04	$0.04
Added construction cost ($/ft^2)	$(1.01)	$(1.01)
Present value of replacement costs ($/ft2)	$(1.93)	$(1.84)
Net present value of LCC savings ($/ft2)	$3.59	$3.14
Simple payback	Immediate	Immediate

BCD is currently working with the Construction Industry Energy Board (CIEB) to adopt the next version of the OEESC. The OEESC adoption process started with the publication of ASHRAE 90.1-2022 published Jan. 25, 2023. The anticipated adoption date is Jan. 1, 2024 with a 6-month phase-in period. The process can be followed on the OEESC adoption webpage.

Residential

The 2023 Oregon Residential Specialty Code (ORSC), which includes Chapter 11 (Energy Efficiency), was approved by the Residential and Manufactured Structures Board (RMSB) on March 8, 2023 with an effective date of Oct. 1, 2023 including a phase-in period of six months ending March 30, 2024, per rule OAR 918-480-0005. The process is documented on the ORSC adoption webpage.

According to the University of Oregon (UO), Energy Studies in Buildings Laboratory (EBSL) the 2023 ORSC improves approximately 19% over the 2021 ORSC and improves approximately 26% over the 2017 ORSC. The EBSL results also confirm that BCD is in compliance with EO 17-20, which requires that "*newly constructed residential buildings achieve equivalent performance as 2017 U.S. DOE Zero Energy Ready Standard (ZERH).*"

Finally, in compliance with Title III of the Energy Conservation and Production Act (ECPA) of 1976, as amended, BCD certified to U.S. DOE that the 2023 ORSC energy efficiency provisions equal, or exceed, those of the 2021 International Energy Conservation Code (IECC) for low-rise residential buildings.

[4] ODOE's State of Oregon Fact Sheet, Energycodes.gov/sites/default/files/2021-07/EED_1365_BROCH_StateEnergyCodes_states_OREGON.pdf
[5] Building Energy Codes Program (BECP). https://www.energycodes.gov/status/states/oregon

Combined

Additionally, the ODOE Fact Sheet[6], "*Adopting the latest model codes in Oregon is estimated to reduce statewide greenhouse gas emissions (CO_2e) by 12,158,089 metric tons (MT) (over 30 years). For perspective, this is the equivalent to 2.6 million passenger vehicles, 3.1 coal power plants, or 1.5 million homes*." These numbers represent the cumulative savings of the 2021 IECC over the 2018 IECC and ASHRAE 90.1-2019 over ASHRAE 90.1-2016.

Metric	Residential Buildings*	Commercial Buildings**
First year statewide CO_2e reduction	18,664 MT	4,233 MT
Cumulative statewide CO_2e reductions (over 30 years)	9,111,207 MT	3,046,882 MT

Metric	Quantity
CO_2	12,116,896 MT
CH_4	651 MT
N_2O	87 MT
TOTAL (CO_2e)	12,158,089 MT

Finally, "*Lower bills leave American families with more discretionary income, which when returned to local economies drives job creation. Jobs are also created through construction-related activities that result from the incremental costs of building more energy efficient buildings. State and local economies benefit from increased discretionary spending, as well as the associated construction activity.*"

Value Stream	Number of Jobs (Over 30 Years)
Lower utility bills	4,959
Construction-related activities	4,691
TOTAL	9,650

Oregon exceeds the GHG emissions reductions and job creation data due to Oregon being one of the earliest states to adopt the newest version of ASHRAE 90.1, as it becomes available, and a home-grown residential code that perpetually exceeds the energy performance of the most current IECC.

[6] ODOE's State of Oregon Fact Sheet, Energycodes.gov/sites/default/files/2021-07/EED_1365_BROCH_StateEnergyCodes_states_OREGON.pdf

Current progress: 2023-24 code cycle

Directive 6(C)

This directive provides that 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 set forth in paragraph 6(B).*"

Directive 6(C) sets the foundation upon which directives 6(A) and 6(B) will be achieved. BCD and ODOE staff regularly collaborate on a variety of issues where there is overlap between BCD's mission to "*create the foundation for safe, efficient, affordable buildings in Oregon*," and ODOE's vision of a safe, equitable, clean, and sustainable energy future. ODOE also has representation on the CIEB, providing guidance and directly affecting the forward trajectory of Oregon energy code provisions. The involvement of ODOE on CIEB is a critical component of that board, and their professional input into the process ensures that BCD maintains a leadership position relative to energy code development. The relationship between BCD and ODOE staff is synergistic and mutually beneficial. Staff from each agency regularly assist one another with programs, share policy information and ideas outside of EO directives, and collaborate on industry conference presentations.

Work between BCD and the ODOE has been ongoing as a result of EO 17-20, signed November 2017. Similar methodologies used for determining the U.S. DOE ZERH program and the ASHRAE equivalent performance levels, as required by EO 17-20, are the foundation of Directive 6(C) baselines for the 2006 Oregon residential and commercial codes.

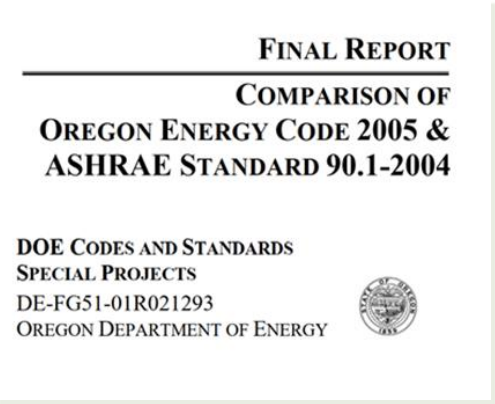
> *In an effort to achieve directives included in Governor Brown's Executive Order 20-04, the Oregon Department of Energy is convening monthly stakeholder meetings to discuss energy code development and code specifications and calculations, and to inform our code consultation to Oregon's Building Codes Division.*

Beginning in June 2020, BCD and ODOE conducted extensive reviews of the codes in place for the 2006 baseline and worked together to agree on the necessary metrics. The residential 2006 baseline was established in the summer of 2020. It is based on a combination of housing market characteristics for new construction and the established methodology which U.S. DOE uses to make their determination that the next energy code will improve energy efficiency in residential buildings from the previous code. This work was presented and vetted through the Oregon Energy Code Stakeholder Panel (OECSP) meetings as further described below.

The OECSP has provided valuable input into baseline and metrics development. OECSP had met a total of 19 times and plans to meet quarterly into the future. The meetings have had between 30 and 40 stakeholders participate, giving substantive opportunities for public input from regional stakeholders. In addition to assisting in establishing the residential 2006 baseline, the OESCP stakeholder meetings have facilitated the beginning of the Reach Code process outlined in ORS 455.500, allowed for affordable housing discussions, legislative updates, training announcements, and other topics relative to energy efficiency in buildings.

In addition to the OECSP meetings, BCD and ODOE conducted monthly meetings with NEEA, to gain feedback on items such as prevailing federal minimum manufacturing standards[7], and appropriate regional and marketplace adjustments to the residential baseline. Further feedback was also solicited from the U.S. DOE and incorporated into the process. For consistency purposes, it was determined that the methodology for EO 20-04 will be identical to the methodology used to determine EO 17-20's prescriptive code requirement equivalencies.

[7] https://www.govinfo.gov/content/pkg/FR-2004-08-17/pdf/04-18533.pdf



The commercial 2006 baseline was determined in the fall of 2020 with input gathered through the OECSP process. In order to determine the 2006 baseline, ODOE researched historical reporting and located a ODOE Report, *Comparison of Oregon Energy Code 2005 & ASHRAE Standard 90.1-2004*. After removing the unregulated loads from the report, ODOE determined that Oregon's 2006 code approximated 4% better than ASHRAE 90.1-2004, the best commercial energy code at that time. This draft baseline determination was presented at the August 2020 OECSP meeting. Further discussions of the commercial 2006 baseline along with a high-level review of ASHRAE 90.1-2019 and its metrics relative to the 2030 goal occurred between BCD and ODOE. Finally, at the October 2020 CIEB meeting the 2005 baseline was introduced, discussed, established, and the adoption of ASHRAE 90.1-2019 formally kicked-off for the next code cycle. BCD has held discussions with PNNL and established the metrics for ASHRAE 90.1-2019 and ASHRAE 90.1-2022 relative to our climate zones, 4C and 5B.

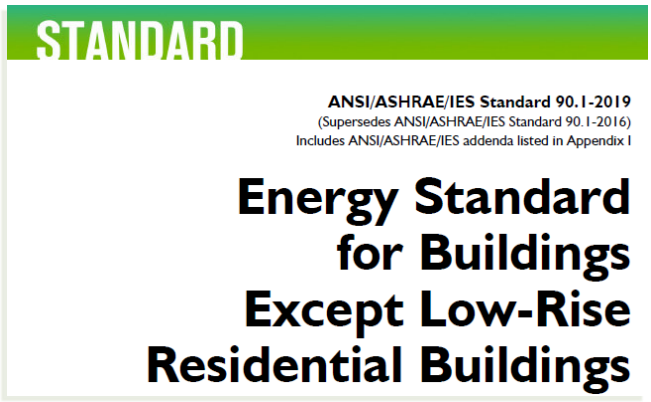
Both the residential and commercial 2030 targets have been set using statewide weighted averages based on construction types, permit activity, or population. The weighting used for the 2006 baseline will remain the same for the 2030 targets. BCD has described and documented the baseline methodologies used and they are available upon request. These baselines will be used to measure reductions for each code adoption under section 6(B), will be captured in the reporting requirements under that same section, and will create a path to reach the performance-based goals of EO 20-04.

Directive 6(A)

This directive provides that BCD "*through its advisory boards and committees, and in cooperation with ODOE, is directed to adopt building energy efficiency goals for 2030 for new residential and commercial construction. That 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 Oregon residential and commercial code*."

Commercial: With the baseline established in the fall of 2020, BCD, through its advisory boards and committees, has officially adopted the 60% reduction goal for annual site consumption energy efficiency for 2030 from the 2005 OEESC. The site energy use determined using best practices and academic research will become a metric of 1.0 for the commercial baseline, and the goal will be established as 0.40, or a 60 percent reduction. This approach has been communicated to the Building Codes Structures Board (BCSB) and the CIEB.

On April 1, 2021 ASHRAE 90.1-2019 became the mandatory, statewide, commercial energy code with a phase in period to October 1, 2021. ASHRAE 90.1 has been a benchmark for commercial building energy codes worldwide and a key basis for codes and standards around the world for more than 35 years.



By adopting this code, the State of Oregon became the first state in the country to adopt ASHRAE 90.1-2019. As stated earlier, BCD anticipates that at the Oct. 17, 2023 CIEB meeting, formal adoption of ASHRAE 90.1-2022 will begin, with an anticipated adoption date of Jan. 1, 2024 and a 6-month phase-in period. Oregon likely will, once again,

become the first state in the country to adopt the most recent ASHRAE Standard.

Residential: With the baseline established in the fall of 2020, BCD, through its advisory boards and committees, has officially adopted the 60% reduction goal for annual site consumption energy efficiency for 2030 from the 2005 ORSC. The metric will be 1.0 for the residential baseline and the goal will be 0.40, or a 60 percent reduction. This approach has been communicated to the RMSB and the CIEB.

BCD and its advisory boards began the process of adopting the 2023 ORSC in June of 2022. A code review committee was established over the summer and met over the fall to review draft energy efficiency provisions. BCD presented the code review committee with an energy package which aligns with Directive 4(C) of EO 17-20, directing the appropriate advisory board(s) and BCD "*to conduct code amendment of the state building code to require newly constructed residential buildings to achieve at least equivalent performance levels with the 2017 U.S. Department of Energy Zero Energy Ready Standard by October 1, 2023*." In the spring of 2023, the RMSB approved the code review committee recommendations, which met the equivalent performance levels of ZERH (Figure A). As mentioned earlier, the code adoption date has been established as Oct. 1, 2023, with a phase-in period to March 30, 2024.

The BCD related directives in EO 17-20 had set out specific deliverables and timelines that generally align with existing BCD statutes, procedures, and processes. By using the prescriptive directives from EO 17-20, model codes, and leveraging this with existing and ongoing work, BCD anticipates that the performance-based goals of EO 20-04 are within reach. Challenges to continued success over the next two code cycles are discussed further down in this report. BCD has integrated the additional performance-based goals from EO 20-04 into the code adoption process while conducting stakeholder and industry outreach in order to overcome challenges and meet the goals set by BCD and EO 20-04.

Directive 6(B)

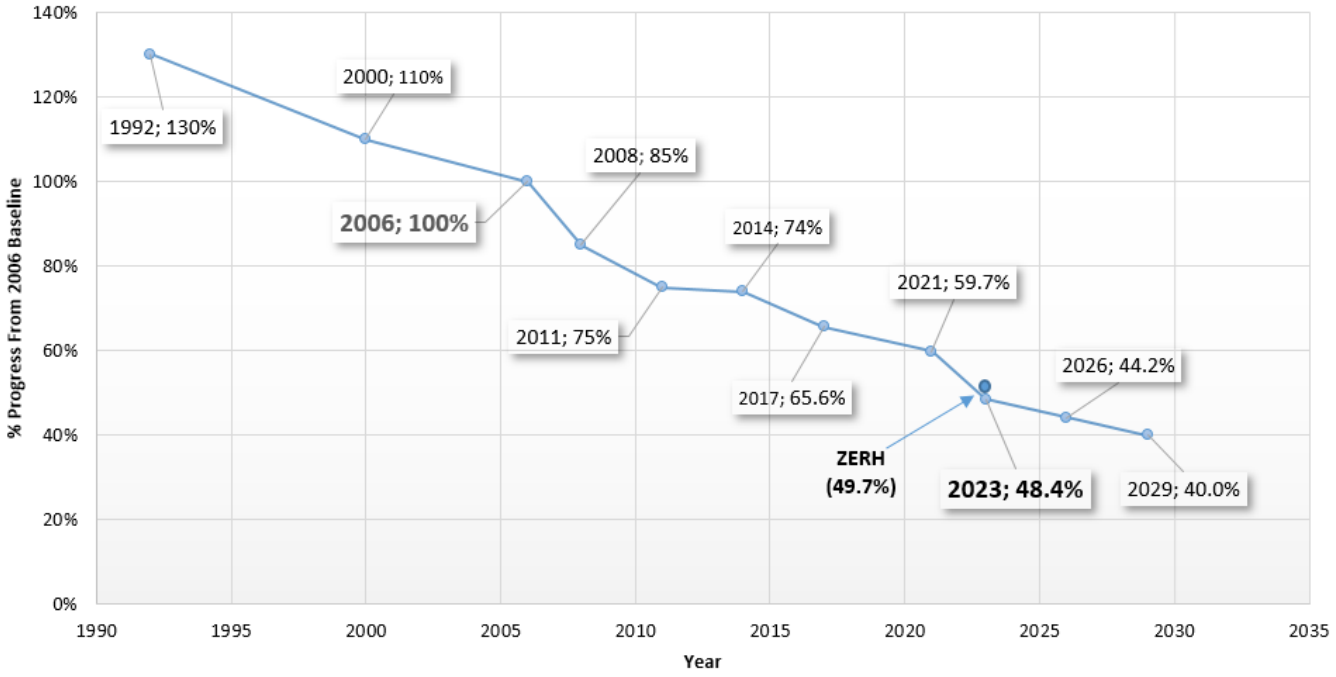
This directive provides that BCD "*through its advisory boards and committees, and in cooperation with ODOE, is directed to evaluate and report on Oregon's current progress toward achieving the goal for new residential and commercial buildings, pursuant to paragraph 6(A) of this Executive Order, and options for achieving steady progress toward the goal over the next three code cycles (2023, 2026, and 2029). Pursuant to its authority under ORS 455.500, BCD also is directed to update the Reach Code on the same timeline. No later than September 15, 2020, BCD should submit a report to the Governor on current progress and options for achieving the goals over the next three code cycles. The report should be updated every three years thereafter*."

BCD through its advisory boards and committees, and in cooperation with ODOE, has evaluated and is hereby reporting on Oregon's current progress toward achieving the goal for new residential and commercial buildings, pursuant to Directive 6(A) above.

The appropriate advisory boards and BCD will also use this data to inform future decisions about code amendments, ensure that any increased costs in construction due to additional code requirements result in meaningful energy savings for Oregonians, while balancing affordability, as well as provide the basis for the Directive 6(B) reporting requirements.

Residential: For the residential aspect of this report, BCD contracted with the EBSL at UO to provide independent third-party verification of residential energy code progression. This also ensures that BCD is meeting its federal verification reporting for compliance with Title III of the Energy Conservation and Production Act (ECPA) of 1976.

FIGURE A: Residential Oregon Energy Code - Regulated Energy in Buiildings
Progress to 2030 Goal from Baseline Year of 2006

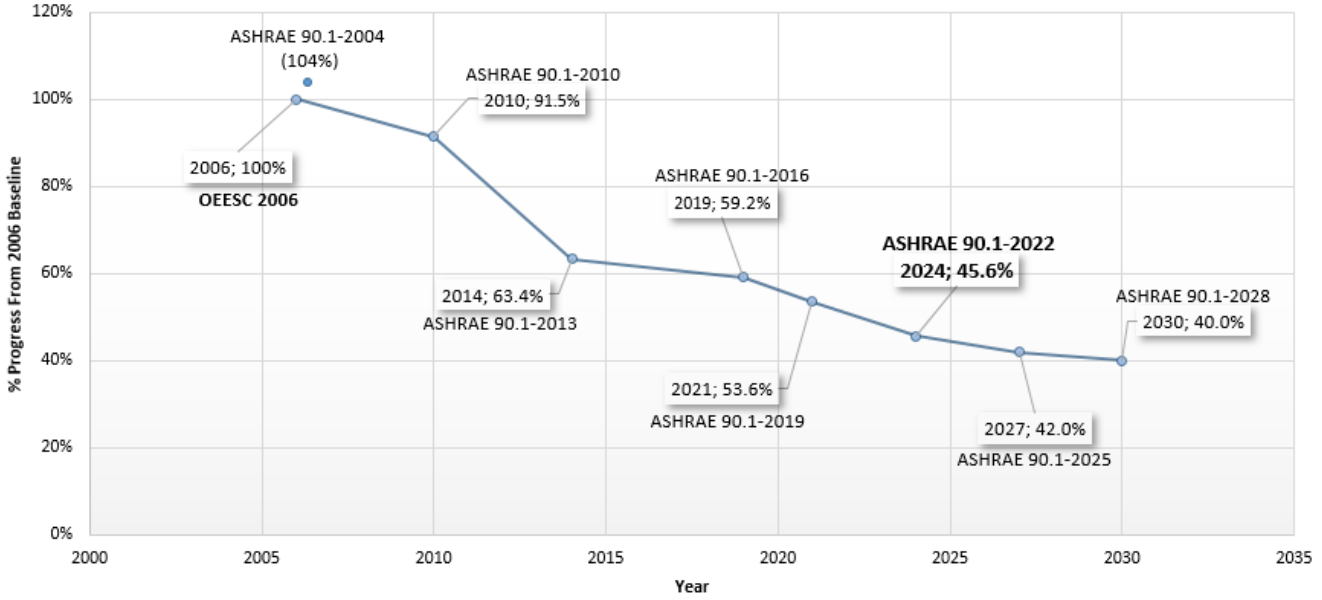


With the equivalent performance levels of ZERH being attained on Oct. 1, 2023, BCD reports the metric to be 0.484 from the baseline metric of 1.0, resulting in an additional 0.116 reduction to be achieved over the next two code cycles or approximately .058 per cycle. This represents an approximate 8.5-9.5% reduction in annual site energy consumption each cycle (2026 and 2029) over each previous cycle (Figure A).

Commercial: For the commercial aspect, BCD worked with PNNL to provide independent third-party verification of energy code progression. PNNL produces the reporting required for ASHRAE and their ECPA compliance needs. BCD will use EBSL and PNNL as the reporting mechanisms to measure progress towards the 60% reduction goal established by Directive 6(A) going forward. With the anticipated adoption of ASHRAE 90.1-2022 in 2024 BCD reports the metric to be 0.456 from the baseline metric of 1.0, resulting in an additional 0.144 to achieve over the next two cycles, or 0.072 per cycle. This represents an approximate 7.5-8.5% reduction in annual site energy consumption each cycle (2027 and 2030) over each previous cycle (Figure B).

BCD intends to continue to update the residential and commercial energy codes on approximately three-year cycles. Options for achieving steady progress toward these goals over the next two residential code cycles (2026 and 2029) and the next two commercial code cycles (2027 and 2030) are highlighted in the next section of this report.

FIGURE B: Commercial Oregon Energy Code - Regulated Energy in Buiildings
Progress to 2030 Goal from Baseline Year of 2006



Reach Code: According to EO 20-04 under "*BCD's authority under ORS 455.500, BCD also is directed to update the Reach Code on the same timeline*." ORS 455.500 requires that the Reach Code be designed to increase energy efficiency, be "*economically and technically feasible*," and use "*published and generally accepted codes and standards*."

By statute, the Reach Code consists of optional construction standards that a builder may choose to use separate from the state building code. BCD initiated the 2021 Oregon Residential Reach Code (ORRC) process on Nov. 2, 2020, including a standardized application form and modeling methodology guidelines for each submittal. Approximately 25 proposals were submitted from a variety of stakeholders. BCD analyzed these proposals, used the OESCP for further discussion in December, then produced a draft 2021 ORRC for consideration at a public meeting in January 2021. BCD then produced a final draft of the ORRC which was presented to the RMSB and CIEB at a combined meeting on March 16, 2021. On Aug. 6, 2021, the 2021 ORRC became effective. Internal modeling shows that utilization of the 2021 ORRC results in a 19-25% improvement over the 2021 ORSC.

On Jan. 10, 2022, BCD initiated the 2022 Oregon Commercial Reach Code (OCRC) process, similar to the 2021 ORRC process above. On May 25, 2022 a public code review meeting was held and the 2022 OCRC was approved for adoption. The 2022 OCRC became effective on July 1, 2022. It is intended to achieve between 5-10% improved performance over the 2021 Oregon Energy Efficiency Specialty Code (OEESC), based on the measurement of regulated energy loads.

The aforementioned HB 3409 requires that BCD "*update the Reach Code … through rulemaking and after obtaining approval from the appropriate advisory boards to reflect incremental progress toward the goals of EO 20-04 each time the Department of Consumer and Business Services updates the statewide building code and applicable specialty codes.*" BCD began rulemaking on September 5, 2023 and anticipates the Reach Code to stagger the base code adoption process by three to six months, since it is best practice to develop a Reach Code after the base code has been established. Thus BCD, after appropriate advisory board approval and rulemaking, intends to update the Reach Code on three-year cycles in alignment with the code adoption cycles.

Directive 7(D)

Third-Party Validation for Cost Savings. This directive provides that 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 forth in paragraph 6(A)-(B) of this Executive Order*".

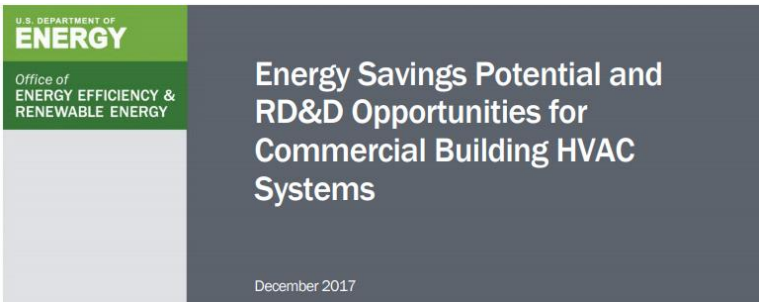
EO 20-04 directed ODOE, in cooperation with BCD, to contract with a third-party consulting firm to assess cost implications, including long-term energy cost savings, of the energy efficiency and building code actions set forth in Directives 6 (A-B).

Currently, when adopting code, the relevant advisory board must make a determination that "*the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources*" (ORS 455.030). In addition, when filing administrative rules to adopt code changes, BCD, with input from the relevant board and code committee, must create a fiscal impact statement and a housing cost impact statement. The boards and BCD take these obligations to evaluate cost seriously, understanding the impact that increased construction costs can have on consumers. These cost considerations must be balanced against the safety and resource conservation considerations built into the board cost finding.

ODOE and BCD have investigated existing reports, assessments, and other documentation, determining that existing resources can be used to fulfill the intent of this section. For example, both NEEA and PNNL assess the energy savings of energy codes. NEEA completed a study of the 2006 residential baseline, the 2021 ORSC, and recommended code changes for the next two code cycles to achieve the goals of EO 20-04. In addition, ASHRAE, with support from U.S. DOE, assesses the commercial code and determines cost effectiveness as it develops each iteration of Standard 90.1, which is now the basis for the Oregon commercial energy code.

However, due to a wide range of incremental cost reporting by stakeholders in the residential code development processes, BCD and ODOE are currently discussing the development of a scope of work and budget to more accurately assess the cost implications of the 2026 and 2029 residential codes, especially as they relate to affordability and the concerns outlined in EO 23-04.

Challenges over the next two code cycles

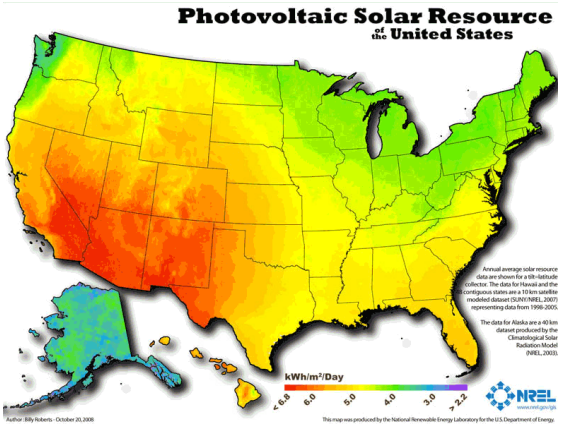


Technology: One variable which is hard to predict, but that could impact our progress towards achieving the goals over the next two code adoption cycles, is the emergence of new technology. For instance, in 2017 the U.S. DOE's Building Technologies Office's (BTO) produced a report titled, "*Energy Savings Potential and RD&D Opportunities for Commercial Building HVAC Systems"*[8] they identified "*18 high priority technology options for further evaluation that could provide significant HVAC energy savings in commercial buildings*" and grouped them into four categories. They also "*developed a detailed profile of each technology that provides an overview of the technology, its current development status and key R&D efforts, projections of performance and energy savings, as well as other attributes that may affect its market uptake*." BCD will use past and future reports such as these to develop cost effective strategies for achieving the EO 20-04 directives.

[8] https://www.energy.gov/sites/prod/files/2017/12/f46/bto-DOE-Comm-HVAC-Report-12-21-17.pdf

Two years prior, a report titled the "*Development of Maximum Technically Achievable Energy Targets for Commercial Buildings*"[9], was produced by GARDAnalytics for ASHRAE. In their report, the maximum efficiency of technology (Max Tech) represents the highest efficiency either currently available or that can be reasonably expected to be available by 2030 by at least two manufacturers. By modeling 30 potential energy efficiency measures across 16 commercial building types, the report indicated that the Max Tech site energy reduction from ASHRAE 90.1-2013 was 45.3% for Oregon's climate zones. This indicates that the 60% goal of EO 20-04 is within reach by 2030 when measured from 2006. However, energy reductions from unregulated loads will remain outside BCD authority. Many measures may also not be feasible or cost effective in every building type as the Max Tech study did not consider cost. While BCD can achieve the goals set by EO 20-04, attaining them may not be cost-effective and is addressed further down in the Affordability, Cost Effectiveness, and Housing Production section.

Renewable Energy: Recognizing that the Max Tech threshold is fast approaching with fewer cost-effective efficiency options for code adoption, model codes are looking to inclusion of on-site Renewable Energy (RE) systems on new buildings as one way to continue improvement of the energy codes. Although the cost of RE has dropped significantly over the last decade, the cost reductions are slowing over time and beginning to flatten. Additionally, cost effectiveness only occurs when incentives, such as rebates and tax credits, are applied. Solar production also varies widely across Oregon, impacting the cost effectiveness of the code in one corner of the state versus another.



Complicating code mandates further are matters which vary from geographical to statutory. Not all building sites have a solar resource, some structures (such as taller buildings), do not have enough roof space for solar to meet increasing code-minimum targets, and current statutes for renewable metering limit the application options for many building types. Another challenge remains, which is creating an equitable, enforceable method for offsetting renewable energy on those buildings which cannot install on-site renewable energy. Renewable Energy Credits (REC's) are one option, but codes can't enforce purchase of off-site REC's after the building is occupied.

Air Quality: National experience with the COVID-19 pandemic, wildfire smoke events, and indoor contaminant concerns have renewed focus on indoor air quality for building occupants. The Oregon building codes already incorporate the most current ventilation standards. Addressing these multiple concerns could require contradictory building code measures. Moving beyond national ventilation standards could represent significant increases in energy use, undoing previous energy code progression. Some air quality solutions present extensive new costs to the consumer for operation and maintenance. BCD and its boards will continue to balance these factors to optimize health and energy outcomes in code.

Preemption: As referenced in a 2017 report titled "*Federal Preemption as a Barrier to Cost Savings and High Performance Buildings in Local Energy Codes*" written by New Buildings Institute, "*When Congress first enacted the National Appliance Energy Conservation Act (NAECA) in 1975 to set national standards, they also disallowed states and other jurisdictions from setting their own more stringent standards on these same products*" and "*The Energy Policy and Conservation Act (EPCA) of 1975 extended preemption to certain HVAC and hot water equipment*."

For example, on July 27, 2023 the U.S. DOE published a proposed rulemaking, EERE-2017-BT-STD-0019-0063, relative to the Energy Conservation Standards for Consumer Water Heaters. If approved as written, Electric Storage Water Heaters would have a minimum Uniform Energy Factor (UEF) of 2.3 where the modeled efficiency of the 2023

[9] RP-1651 -- Development of Maximum Technically Achievable Energy Targets for Commercial Buildings, ASHRAE 2016

ORSC requires a UEF of 0.64. A higher UEF means a water heater is more energy efficient and will cost less to operate. Once the proposed rulemaking is finalized, the effective date will be five years after the publication. This final rule is a critical piece to attaining the goals of EO 20-04.

Given this timeline for water heater efficiency, some states have explored a petition application for a waiver to preemption. U.S. DOE can grant waivers of federal preemption for particular state laws or regulations. Any state with a state regulation regarding energy-use, energy-efficiency, or water-use requirements for products regulated by U.S. DOE may petition for an exemption from federal preemption to apply its own state regulation. However, only California and Massachusetts have undertaken this process and both states were denied.

Affordability, Cost Effectiveness, and Housing Production

Cost effective strategies are essential since affordability will be a critical component to future energy code development cycles. Affordability has seen renewed focus for each code board during their code adoption reviews and has been a noted concern at every OECSP meeting thus far. Developing a more efficient energy code will certainly lead to higher home prices and thus a higher mortgage payment, which must be balanced against the long-term energy savings.

The Oregon Office of Economic Analysis presented a report titled, "*Addressing Oregon's Housing Shortage"*, on March 10, 2023 at the HPAC. The report stated that 54% of Oregon households which rent do not have enough residual income left over after paying for housing. Thus, the majority of Oregonians are unable to save for a down payment on a home.

Further, according to the U.S. Census Bureau, Oregon's Household Area Median Income (AMI), from 2017-2021 is $70,084 (in 2021 dollars). The often-referenced 28% rule notes that a household should not spend more than that percentage of their monthly gross income on their mortgage payment, including property taxes and insurance. This translates to a mortgage payment of $1,635 per month, including PMI. At an interest rate of 6.75%, an average cost of annual insurance of $943, and an Oregon property tax rate of 0.9%, the median household can afford to purchase a home priced at $207,000, with 5% down, equaling a $1,635 monthly payment (Figure C). However, per data provided to BCD by CoreLogic, the average home sold in Oregon is $387,500, a $180,500 disparity for the AMI household. Metropolitan regions face a higher disparity with homes averaging over $500,000.

Figure C

Estimated payment	$1,634 /mo
Loan amount	$196,650
Down payment	$10,350
Interest rate	6.75%
Loan term	30 years
Taxes & insurance included?	Yes
Property tax	0.9%/yr
Homeowner's insurance	$943/yr
Mortgage insurance	$125/mo

A BCD analysis of the proposed changes for the 2023 ORSC indicated an approximate incremental construction cost increase of approximately $1,450, with an approximate annual energy savings of $185, or $15 per month. The final sales price to the homeowner is likely double the construction cost, or $2,900. The additional sales price to the consumer adds approximately $15 a month to a typical 30-year mortgage payment, a breakeven scenario for this code cycle. The 8-9% energy use improvements required in future codes cycles will be more difficult and more expensive to attain, meaning the breakeven scenario which occurred this cycle will be challenging to achieve in future cycles.

It is important to recognize that, after mortgage payments, a home's energy bills are the largest component of home ownership and the cost of decarbonizing the grid will also increase the cost to the consumer. Additionally, the unregulated loads in a home are fixed, so they won't be impacted by energy code advancements. The percentage of unregulated loads has gone from 14% in 2006 to 24% in 2023 and will continue to increase each cycle, thus making cost-effective reductions to the regulated portion of the energy code a perpetual challenge. The same is true for multi-family housing.

As BCD balances increased energy code construction costs versus energy savings to the owner, the building code is generally not the most significant driver of the current affordability crisis. More significant drivers are land (zoning, availability, off-site construction costs) and market (supply versus demand and interest rates) related. Harvard University published the *State of the Nation's Housing 2023*[10] report, finding that single-family homebuilding has declined significantly, causing supply issues, while multi-family construction has remained strong. The report also recognizes that "*more lower-cost housing is clearly needed, but expanding development will require zoning reform to support a broader range of housing types and investments in off-site construction methods that could reduce development costs*."

Nonetheless, it remains critical that BCD strike a balance between the cost of home ownership, federal preemption, technological advances, and air quality, along with the long-term operation of a home, its resiliency, GHG emissions, and marketplace demands of consistency and predictability. Oregon can be proud of its 50 years of national leadership in providing safe, efficient buildings and BCD will continue with a balanced approach to implementing EO 20-04 and compliance with HB 3409.

Options for achieving the goals over the next two code cycles

The performance-based 60% reduction goal will be accomplished via regularly scheduled code updates which take place on approximately three-year cycles. Current statutory authority will allow BCD, with its stakeholder advisory boards, to continue to adopt increasingly energy efficient codes on a predictable timeline. This will maintain Oregon's place as a national leader for both residential and commercial energy efficiency, reduce the built environment's energy consumption, which in turn reduces atmospheric emissions, and establishes a path for Oregon buildings to achieve net-zero energy use.

BCD boards will maintain their role in energy efficiency leadership by continuing to adopt and update energy codes in Oregon on a predictable three-year schedule, based on the most recent published versions of national model codes. The commercial energy code will continue to be based off the most recent published version of ASHRAE 90.1, while the residential energy code will continue to advance the existing Oregon residential energy code provisions, which exceed published national model codes. BCD will continue to work with the boards to make amendments as necessary to meet the goals as outlined in EO 20-04, having met the goal of EO 17-20.

BCD intends to continue the stakeholder process established with ODOE. The OECSP meetings will provide additional opportunities for input from affected stakeholders. This collaboration has been valuable for determining

[10] Harvard Joint Center for Housing Studies. The State of the Nation's Housing 2023 (Page 9). https://www.jchs.harvard.edu/sites/default/files/reports/files/Harvard_JCHS_The_State_of_the_Nations_Housing_2023.pdf

metrics and measurement for Directives 6(A) and 6(B) and led to the establishment of baselines required by Directive 6(C). BCD also intends to independently continue working with all relevant stakeholders, and will continue collaboration with other state agencies through staff communications, board meetings, committees, and workgroups as needed. BCD will continue these practices to execute the directives contained in EO 20-04 and HB 3409.

Conclusion

BCD is excited to be a part of Oregon's leadership on reduction of GHG emissions. While the built environment's impact on GHG emissions is largely indirect, more efficient homes and commercial buildings benefit all Oregonians. BCD and its boards take pride in Oregon's place as national leader in energy efficiency, and intend to continue that leadership with cutting edge, cost effective updates to the codes.

BCD recognizes that we cannot get there alone. It is only with our expert board member volunteers, government partners, and robust public participation that we are going to achieve the ambitious goals laid out in this Executive Order. We are well on our way, and we are up to the challenges we will face going forward.

Appendix A

BCD Principles for Code Adoption

BCD has developed several principles to make sure the building code achieves our mission, which is to work with Oregonians to ensure safe building construction while supporting a positive business climate. Here are some of the principles that guide our work when considering revisions to the building code:

Take a long view. A long-term strategy ensures predictability in the code. Code cycles generally vary from 3-6 years, and different states can be at different stages in the code cycle at a given time. It takes significant time to develop revisions to the code, and it is important to ensure stakeholders, boards, labor, and industry have the time and space to develop the best possible standards.

Coordinated approach. Oregon relies on builders, labor, contractors, and stakeholders to participate in policy work by leading the discussion through the seven advisory boards that assist in directing code adoption. Their expertise results in a better building code. Adopting the building code is not enough, labor and industry have to be trained to follow the code, and inspectors have to be trained to ensure compliance with the code. Rigorous training for labor, industry and inspectors mean that from the beginning of a project to its completion, all parties involved have the tools necessary to ensure the standards that are carefully developed through the code process are followed. BCD doesn't just set policy goals, it achieves them.

Focus on performance and choice. It is important in the building code not to create narrow paths that benefit particular companies or industries, but to instead ensure construction practices are the safest and most efficient for all buildings in Oregon. Proponents of proprietary products, testing, and inspection techniques may have incentives beyond what is safest, most efficient, and most cost effective. BCD's duty to all Oregonians, including labor, industry, and other stakeholder groups is to focus on creating choices to achieve technically feasible, safe, efficient, and cost-effective buildings.

Evidence based. BCD collects evidence and best practices from across the nation and the world to develop codes that best suit Oregonians. Our goal is always to rely on good research to make evidence-based decisions.

Independent verification. BCD uses an independent review process to verify that Oregon is achieving its efficiency goals. First through the University of Idaho, and now through the University of Oregon, BCD submits the commercial and residential energy codes for review to ensure Oregon is on pace to remain a national leader and that BCD is making data driven decisions about efficiency standards.

Consistency across the state. Any building in this state, whether urban, rural, affordable or extravagant, has the benefit of the same minimum efficiency standards. All Oregonians should have the benefit of a safe, affordable, and efficient home. This advantage of consistent, predictable codes, creates extremely high compliance rates and is part of what makes the Oregon model unique. Other states may say they have adopted a particular cutting-edge code, but if local jurisdictions never adopt it, state or local inspectors never enforce it, and labor is not trained to it, it is only as good as the paper it's written on. That's not the case in Oregon.

Appendix B

Board composition

State Plumbing Board ORS 693.115 Seven members	A journeyman plumber with 10 or more years of experience in the trade
	A licensed plumbing contractor
	A local plumbing inspector who is also a journeyman plumber
	A registered professional mechanical engineer
	An officer or employee of the Oregon Health Authority
	A plumbing equipment supplier who otherwise qualifies to sit on the board by industry experience OR a building official
	A member of the general public
Construction Industry Energy Board **(CIEB)** ORS 455.492 Eleven members	Two members of the Electrical and Elevator Board who have electrical experience, to be selected by the Electrical and Elevator Board
	Two members of the RMSB who have practical experience in either the residential structure industry or the manufactured structure industry, to be selected by the RMSB
	Two members of the BCSB with practical experience in construction, to be selected by the BCSB
	Two members of the Plumbing Board with practical experience in construction, to be selected by the Plumbing Board
	Two members of the Mechanical Board with practical experience in construction, to be selected by the Mechanical Board
	An employee or officer of ODOE appointed by the director of the ODOE
Mechanical Board ORS 455.140 Ten members	A representative of the plumbing industry
	A sheet metal and air conditioner installer
	A municipal mechanical inspector with the highest level of certification issued by DCBS
	A Heating Ventilation and Air Conditioning Contractor
	A Heating Ventilation and Air Conditioning Installer
	A Sheet Metal and air conditioner installer
	An insulation craftsperson with experience with heat and frost insulation
	A representative of a natural gas company or other utility
	A member of the general public not receiving a compensation from any interest represented by one of the other represented stakeholders
	At least one member of the board must be an owner or operator of a contracting business with 10 or fewer employees at the time of their appointment
Electrical and Elevator Board ORS 455.138 Fifteen members	A fire and casual underwriter
	A representative of industrial plants regularly employing licensed electricians
	A representative of the power and light industry
	An electrical equipment supplier who otherwise qualifies by experience and training in the industry
	Two journeyman electricians
	An electrical inspector
	Two electrical contractors
	A municipal building official
	A journeyman elevator installer
	An owner or manager of a commercial office building
	A member of the general public not receiving a compensation from any interest represented by one of the other represented stakeholders

Residential and Manufactured Structures Board (RMSB) ORS 455.135 Eleven members	A contractor specializing in the construction of residential structures
	A contractor specializing in remodeling of residential structures
	A contractor specializing in multifamily structures three stories or fewer above grade
	A home designer or architect
	A building official
	A representative of residential building trade subcontractors
	A structural engineer
	A representative of a utility or energy supplier
	A manufacturer of manufactured dwellings
	A seller or distributor of manufactured dwellings
	A member of the general public not receiving a compensation from any interest represented by one of the other represented stakeholders
Building Codes Structures Board (BCSB) ORS 455.132 Nine members	An architect or engineer
	A general contractor specializing in buildings more than three stories above grade A contractor specializing in heavy industry construction
	A representative of the building trade
	A representative of a utility or energy provider A representative of a fire protection agency
	A building official
	An owner or manager of a commercial office building
	A representative selected from a list of individuals recommended by the Oregon Disabilities Commission

FOR MORE INFORMATION CONTACT

Oregon Building Codes Division
P.O. Box 14470
Salem, OR 97309-0404
503-378-4133 (main)
800-442-7457 (toll-free)

https://www.oregon.gov/bcd/codes-stand/Pages/energy-efficiency.aspx

Agenda Item VII.A.

State of Oregon **Board memo**

Building Codes Division **October 4, 2023**

To: Residential and Manufactured Structures Board

From: Ian Paik, policy analyst, Policy and Technical Services

Subject: Proposed Rulemaking Timeline for the 2023 Oregon Residential Reach Code

Action requested:
Board review and determination on the division's proposed process steps and timeline for developing and adopting the 2023 Oregon Residential Reach Code.

Background: The 2023 Oregon Residential Reach Code (ORRC) is an optional set of standards designed to increase energy efficiency above the baseline 2023 Oregon Residential Specialty Code. All municipalities must accept the Reach Code, and it provides an additional efficiency compliance path for builders, consumers, contractors, and others. The Reach Code must be technically feasible and must be more efficient than the baseline building code.

The division's anticipated timeline for this adoption process:

- March 14, 2023: Residential and Manufactured Structures Board reviewed and approved the code review committee's recommendations for the 2023 Oregon Residential Specialty Code to include the energy provisions in Chapter 11 at its scheduled board meeting.
- October 16 – December 18, 2023: Residential Reach Code Proposal Period. The division posts a notice explaining how to submit a Residential Reach code proposal. The notice will also be out through email to all those who have signed up for email updates on the division's website.
- Rulemaking Advisory Committee Meeting. A Rulemaking Advisory Committee meeting will be scheduled to allow for review of the Residential Reach Code proposals and BCD's proposed provisions.
- Residential and Manufactured Structures Board Meeting. The first RMSB meeting of 2024 will review and approve a final recommendation to the division for adoption.
- Construction Industry Energy Board Meeting. The first CIEB meeting of 2024 will review the RMSB recommendations for the Residential Reach Code provisions.

- Public Rulemaking Hearing. The division will hold a public hearing where interested parties can provide testimony about the proposed code provisions.
- Anticipated effective date. The 2023 Oregon Residential Reach Code has an anticipated effective date of July 1, 2024.

Options:

- Approve the division's proposed code adoption process steps and timeline for adopting the 2023 Oregon Residential Reach Code.

- Amend and approve the division's proposed code adoption process steps and timeline for adopting the 2023 Oregon Residential Reach Code.

- Disapprove the division's proposed code adoption process steps and timeline for adopting the 2023 Oregon Residential Reach Code, and provide guidance as to how the board wishes the division to proceed.

2023 Oregon Residential Reach Code adoption

Anticipated timeline

Code development	**March 14, 2023**	**Residential and Manufactured Structures Board meeting** The Residential and Manufactured Structures Board reviewed and approved the code review committee's recommendations for the 2023 Oregon Residential Specialty Code to include the residential energy provisions in Chapter 11, which serves as the base code for the 2023 Oregon Residential Reach Code.
	Oct. 18 – Dec. 18, 2023	**Residential Reach Code proposal period** The division posts a notice explaining how to submit a Residential Reach Code proposal. The notice will also be sent out through email to all those who have signed up for email updates on the division website.
Code review	**January 2024**	**Rulemaking Advisory Committee meeting** A Rulemaking Advisory Committee meeting will be scheduled to allow for the review of the Residential Reach Code proposals and BCD's proposed provisions.
	April 2024	**Residential and Manufactured Structures Board meeting** The Residential and Manufactured Structures Board will review and approve a final recommendation to the division for adoption.
	June 2024	**Construction Industry Energy Board meeting** The Construction Industry Energy Board will review the Residential and Manufactured Structures Board recommendations for the Residential Reach Code provisions.
Rulemaking	**June 2024**	**Public rulemaking hearing** The division will hold a public hearing where interested parties can provide testimony about the proposed code provisions.
	July 1, 2024	**Anticipated effective date** The 2023 Oregon Residential Reach Code will be available for use and posted on the division's website.

Agenda Item VII.B.

State of Oregon **Board memo**

Building Codes Division **October 4, 2023**

To: Residential and Manufactured Structures Board

From: Ian Paik, policy analyst, Policy and Technical Services

Subject: Proposed Changes to the Reach Code Adoption Process

Action requested:
Board review and consultation on the division's proposed timeline and changes to the Reach Code adoption process

Background:
The Residential and Commercial Reach Codes are optional above code pathways that residential and commercial customers may voluntarily elect to build to that local municipalities must allow. During the 2023 legislative session, the legislature passed House Bill 3409 which included a requirement that the Reach Code be adopted by rule with the approval of the appropriate advisory boards.

The division, with the approval of the appropriate advisory boards, adopts and amends the statewide base specialty codes. Generally, this process takes place on approximately a three-year cycle. After the process for the base code is completed, the division will begin the process of adopting an updated Commercial and Residential Reach Code once this rule is implemented. Previously, the division has worked with stakeholders and the appropriate advisory boards to adopt a Reach Code. These proposed rules and adoption process changes are intended to create a predictable process by which the division, with advisory board approval, can adopt future versions of the Reach Code.

The division seeks feedback on the proposed Reach Code adoption process rule. This rulemaking proposal for adopting the Reach Code includes a process that will slightly differ from the base code adoption process that is outlined under OAR 918-008-0020. Under this rulemaking proposal for adopting the Reach Code, the division may provide Reach Code proposal forms that may include, but are not limited to: proposed language, modeling inputs and assumptions, modeled energy savings, cost impact, incentive program alignment, and standard formatting. The full language of the proposed rule is provided today as the amended OAR 918-465-0040.

The division anticipates the following steps for adopting a new Reach Code process:

- September 5, 2023: The division held a rulemaking advisory committee seeking feedback on the Reach Code adoption process.
- December 2023: The division anticipates holding a rulemaking hearing.
- January 1, 2024: The division anticipates concluding the rulemaking process with a January 1, 2024, effective date.

The division welcomes the board's discussion on the proposed Reach Code adoption process changes and invites all feedback on the proposed steps within the rule.

Options:

- Approve the division's proposed Reach Code adoption process rule and proposed rulemaking timeline.

- Amend and approve the division's proposed Reach Code adoption process rule and proposed rulemaking timeline.

- Disapprove the division's proposed Reach Code adoption process rule and proposed rulemaking timeline, and provide guidance as to how the board wishes the division to proceed.

918-465-0040

~~Amendments to the Oregon Reach Code~~ Oregon Reach Code adoption process

~~After consultation with the appropriate advisory board(s), the most recent version of the Oregon Reach Code will be made available on the division's website and distributed to interested parties. The Oregon Reach Code will include an effective date, and will be available for use pursuant to OAR 918-465-0020 until a newer version of the Oregon Reach Code replaces it, indicated by a more recent effective date.~~

(1) The purpose of this rule is to describe the process for adopting the Oregon residential and commercial reach codes.

(2) (a) The division will start the process of adopting an updated residential reach code after a new version of the Oregon Residential Specialty Code is forwarded to the administrator by the appropriate board to begin the rulemaking process.

(b) The division will start the process of adopting an updated commercial reach code after a new version of the Oregon Energy Efficiency Specialty Code is forwarded to the administrator by the appropriate board to begin the rulemaking process.

(c) The division will present the residential and commercial reach codes to the appropriate advisory boards for approval. After the proposed reach code is approved by the appropriate board the division will go into rulemaking to adopt the reach code in rule.

(d) The process for adopting either reach code may include: a notification that the process has begun, solicitation of public proposals, staff review, and a rulemaking advisory committee.

(3) The division will notify interested persons of the anticipated timetable for adopting the reach code when the division begins the process of developing the reach code.

(4) The division may provide reach code proposal forms that can include, but are not limited to: proposed language, modeling inputs and assumptions, modeled energy savings, cost impact, incentive program alignment, and standard formatting for reach code

proposals. If the division provides a reach code proposal form, and a code amendment proposal deviates from the provided form, then the proposal must include the reason for the deviation, along with an explanation of the modeling inputs and assumptions, modeled energy savings, cost impact, and formatting used in the proposal.

Statutory/Other Authority: ORS 183.335, 455.020, 455.500 & 455.496

Statutes/Other Implemented: ORS 183.335, 455.020 & 455.500

Agenda Item VII.C.

State of Oregon **Board memo**

Building Codes Division

To: Residential and Manufactured Structures Board

From: Pierre Sabagh, Policy and Technical Services

Subject: State of Oregon Home Size Data Analysis

Action requested:

Review the enclosed analysis of Oregon home size data and provide recommendations on any future use of home size considerations in the energy efficiency provisions of the Oregon Residential Specialty Code (ORSC)

Discussion:

At the board's meeting on March 16, 2021, board members requested that the division look into the possible consideration of home size in the application of energy performance standards in the ORSC. At the board's next meeting on July 28, 2021, the board approved the formation of a workgroup by the division to obtain additional input on the impact of home size on energy performance standards in the ORSC. Since then the division has updated the board regularly on its progress obtaining historical home size and pricing data.

The division is now bringing its analysis of that data to the board for its review and for any additional recommendations from the board to the division to further pursue incorporation of home sizing considerations into future versions of the ORSC. The full analysis is below, but some key takeaways are:

- The mean average size home sold in Oregon since 2005 was 2,136 square feet. The average cost of this home was $387,500. The median average sized home sold in Oregon since 2005 was 1,932 square feet. The average cost of this home was $340,000.
- Using the area median income for Oregon for the years 2017 to 2021, the affordable home price for the area median income was $207,000.

- Setting alternative energy standards at around 1,300 square feet on the low end and 3,200 square feet at the high end would capture the bottom and top 10% of the housing market for alternative energy standards based on their decreased or increased usage respectively.

The division welcomes any discussion or recommendations from board members on the future incorporation of home size considerations into the ORSC.

State of Oregon **Board memo**

Building Codes Division

To: Residential and Manufactured Structures Board (RMSB)

From: Kelly Thomas, energy policy analyst, Policy and Technical Services

Subject: State of Oregon Home Size Data Analysis

RMSB Members:

As the Building Codes Division (BCD) looks forward to future code cycles, with the intent of meeting the energy target set by Executive Order (EO) 20-04 as well as considering EO 23-04, which addresses Oregon's housing shortage and affordability, the division is furnishing this preliminary home-size analysis for board review and discussion.

One of the main considerations around the home size and affordability discussion is that a 1,200 square foot (SF) home, Oregon's housing cost impact parameter per ORS 183.534, uses less annual energy than Department of Energy's (DOE's) 2,376 SF prototype home. The division, when modeling the annual energy use of code cycles, utilizes the DOE home-size parameter. The division *also* models the annual energy use of the statutory 1,200 SF home. The results are that a family of four living in the statutory 1,200 SF home constructed to the *2023 Oregon Residential Specialty Code (ORSC)*, will use *less annual energy* than the same family living in the 2,376 SF DOE prototype home *constructed to the target 2029 ORSC* home. Thus, under an annual energy consumption framework, smaller homes *already* meet the 2030 target set under EO 20-04.

With that in mind, and given that home size, affordability, and energy consumption are inexorably linked, BCD acquired data for over one million unique parcel numbers from across the State of Oregon from CoreLogic, a property data company which has access to databases that cover more than 99% of all properties in the United States. The data was generated from tax rolls, dating as far back as a 1903 'recorded sale' date in The Dalles. This data is only as accurate as the particular county assessor enters the data, as such, the first step BCD took was cleaning the data to create useful information for the RMSB.

Initially, parcel numbers sold prior to 2005 (for compliance with EO 20-04) and those without a sale amount (in order to determine affordability) were removed. Additionally, only those parcels which contained dwellings built under ORSC R101.2 Scope (detached one- and two-family dwellings and townhouses, not more than three stories above grade plane in height) were retained for analysis. Hence, *small homes* (those under 400SF), manufactured dwellings, multi-family dwellings, commercial, and other non-ORSC buildings on these unique parcels were removed.

Two separate analyses were performed:

1. Homes which listed a 'sale recording' date of January 2005 through October 2022 (approximately 105k homes) and;
2. Homes which listed a 'construction' date of January 2015 through the same (approximately 37k homes).

Similar results were found for both analyses (see Table 1 for details). In summary, the mean (mathematical average) sized home sold in Oregon under analysis #1 was 2,136 SF, had 3.3 bedrooms and costs $387,500 ($181/SF). Via the same analysis, the median (middle data point) sized home sold in Oregon is 1,932 SF, has 3 bedrooms and costs $340,000 ($176/SF). The most common home sold (mode) is similar to the median home. These sales prices reflect the average over time. According Redfin and Zillow the average sale price in August of 2023 is close to $500,000.

ORS 183.534 defines the housing cost impact statement parameters. It defines as "an estimate of the effect of a proposed rule or ordinance on the cost of development of a *6,000 square foot parcel* and the construction of a *1,200 square foot* detached single family dwelling on that parcel". Under analysis #1, only 6.5% of homes are built between 400 and 1,200 SF, they are mean average of 975 SF, containing 2.3 bedrooms, with a recorded average price of $178,600 ($183/SF).

According to the U.S. Census Bureau, Oregon's Household Area Median Income (AMI), from 2017-2021 is $70,084 (in 2021 dollars). The often-referenced 28% rule says that you shouldn't spend more than that percentage of your monthly gross income on your mortgage payment, including property taxes and insurance. This translates to a mortgage payment of $1,635 per month, including PMI. At a mortgage interest rate of 6.75%, an average cost of annual insurance of $943, and an Oregon property tax rate of 0.9%, the median household can afford to purchase a home priced at $207,000 with 5% down to equal a $1,635 monthly payment.

Estimated payment	**$1,634 /mo**
Loan amount	$196,650
Down payment	$10,350
Interest rate	6.75%
Loan term	30 years
Taxes & insurance included?	Yes
Property tax	0.9%/yr
Homeowner's insurance	$943/yr
Mortgage insurance	$125/mo

Comparing the 100% Household AMI to the statutory 1,200 SF home, the median household *can* afford the statutory home, however, 1,200 SF homes (25'x48') are unlikely to be constructed on 6,000 SF (60'x100') lots. The cost of the developed lot alone could exceed the affordability threshold of $207k, especially in urban areas. The 400 to 1,200 SF homes are being built in 34 of 36 counties with the most in Klamath at 42.3%, followed by with Deschutes, Multnomah, Lane and Linn counties at 7.7%, 7.4%,

4.8%, and 4.5% respectively. These 5 counties constitute 2/3rds of the 400-1,200 SF market. Grant and Sherman counties contain no data in the range (see Table 2 for further detail).

However, the median-size home is beyond the reach of median-income families in Oregon. For smaller homes that the average family can afford, the balance between first costs and energy efficiency becomes ever more important to maintain a stock of homes for these buyers. The State of Washington addresses this in their residential energy code. In lieu of Oregon's "pick one" Additional Efficiency Measures Table, WA has a list of additional credits to achieve, each equivalent to about 0.5% improvement in the efficiency of the home. The base home must achieve 6 credits, selected from a list of about 28 options which vary from 0.5 to 3.0 credits. There are 50% fewer extra credits required for homes less than 1,500 SF, and about 16% more credits are required for homes exceeding 5,000 SF.

If the RMSB were to consider recommending home size as a factor during development of the next ORSC, or the Oregon Residential Reach Code (ORRC), using the statutory home size of 1,200 SF is one consideration for the lower end value, which would require less energy efficiency measures for the sake of affordability. Extending that threshold to less than 1,300 SF is also an option, because that would capture 10.1% of homes built in Oregon. If including homes up to 1,300 SF, the mean average square footage of 1,073, contains 2.5 bedrooms, and cost $197,000 ($184/SF), still below the median target of $207,000. A 1,350 SF home is the mean average sized home at the 100% AMI sale price of $207,000, which could be another consideration for the lower end cutoff, representing 12.2% of the market.

In order to set a cutoff for larger homes, which would require more energy efficiency to compensate for the lower end losses, the above affordable housing market cutoff percentages were utilized. The results are as follows:

- Homes 3,500 SF or greater comprise 6.5% of Oregon market with mean averages of:
    - $742,800
    - 4,378 SF ($170/SF); 4.3 Bedrooms

- Homes 3,200 SF or greater comprise 10.1% of Oregon market:
    - $683,500
    - 4,009 SF ($171/SF); 4.2 Bedrooms

- Homes 3,075 SF or greater comprise 12.2% of Oregon market:
    - $663,900
    - 3,860 SF ($171/SF); 4.1 Bedrooms

Utilizing the low and high end of the market seems like a reasonable approach to take for establishing the size based energy code thresholds. Alternately, BCD could analyze the amount of energy lost in the 6.5%, 10.1%, and/or 12.2% affordable homes, then set an appropriate percentage based on savings from the larger homes. The same could be done for carbon. We expect that a smaller percentage of larger homes would establish the upper cutoff, since they would save more energy than the affordable homes would lose.

This preliminary analysis is intended to move the conversation forward. *Is there a path for requiring lower levels of energy efficiency for smaller homes and/or increased energy efficiency levels for larger homes*? The analysis provides a starting point for consideration of when and how varying code compliance strategies might work, when considering square footage and number of bedrooms, in an

effort to addresses Oregon's housing shortage and affordability, while maintaining Oregon's nationwide leadership in developing energy efficient building codes.

While that data is not perfect, with the vast number of data points, BCD has relative confidence that this can inform the board's work. Further analysis by urban and rural zip code will be conducted over the summer. BCD looks forward to any further discussions and recommendations from RMSB.

TABLE 1

	Analysis Years				
	2015-2022		2005-2022		
# of Clean Results	**36,921**		**105,106**		More Townhomes captured in 2005+ analysis. Hence, SF average reduced.
Mean Average SF	2,510		2,136	Mean	
Median Average SF	2,200		1,932	Median	
> 1,250 SF	2,266		1,920	Mode	

SF Range	2015-2022		2005-2022		% Diff
400-1200 SF	**3,116**	**8.4%**	**6,786**	**6.5%**	***-2.0%***
1,200's	**887**	**2.4%**	**3,785**	**3.6%**	***1.2%***
1,300's	**1,104**	**3.0%**	**4,496**	**4.3%**	***1.3%***
1,400's	1,897	5.1%	6,972	6.6%	*1.5%*
1500's	2,454	6.6%	7,892	7.5%	*0.9%*
1600's	2,316	6.3%	7,168	6.8%	*0.5%*
1700's	2,456	6.7%	6,984	6.6%	*0.0%*
1800's	2,197	6.0%	6,574	6.3%	*0.3%*
1900's	1,914	5.2%	5,438	5.2%	*0.0%*
2,000's	2,215	6.0%	5,563	5.3%	*-0.7%*
2,100's	1,614	4.4%	4,212	4.0%	*-0.4%*
2,200's	1,767	4.8%	4,345	4.1%	*-0.7%*
2,300's	1,500	4.1%	3,791	3.6%	*-0.5%*
2,400's	1,438	3.9%	3,478	3.3%	*-0.6%*
2,500's	1,383	3.7%	3,462	3.3%	*-0.5%*
2,600's	1,143	3.1%	2,862	2.7%	*-0.4%*
2,700's	877	2.4%	2,619	2.5%	*0.1%*
2,800's	880	2.4%	2,159	2.1%	*-0.3%*
2,900's	873	2.4%	2,177	2.1%	*-0.3%*
3,000's	739	2.0%	1,992	1.9%	*-0.1%*
3,100's	718	1.9%	1,783	1.7%	*-0.2%*
3,200's	**515**	**1.4%**	**1,437**	**1.4%**	***0.0%***
3,300's	418	1.1%	1,188	1.1%	*0.0%*
3,400's	355	1.0%	1,101	1.0%	*0.1%*
3,500-3,999	**1,164**	**3.2%**	**3,418**	**3.3%**	***0.1%***
4,000-4,499	456	1.2%	1,528	1.5%	*0.2%*
4,500-4,999	239	0.6%	796	0.8%	*0.1%*
5,000+	286	0.8%	1,100	1.0%	*0.3%*

TABLE 2

400-1,200 SF HOMES - BY COUNTY		
COUNTY	# of HOMI	% of HOME
KLAMATH	2870	42.3%
DESCHUTES	521	7.7%
MULTNOMAH	501	7.4%
LANE	329	4.8%
LINN	305	4.5%
JACKSON	270	4.0%
LINCOLN	213	3.1%
MARION	181	2.7%
CLACKAMAS	179	2.6%
WASHINGTON	174	2.6%
JOSEPHINE	124	1.8%
UMATILLA	110	1.6%
WALLOWA	108	1.6%
TILLAMOOK	98	1.4%
DOUGLAS	95	1.4%
COOS	94	1.4%
POLK	83	1.2%
YAMHILL	78	1.1%
HOOD RIVER	57	0.8%
CROOK	56	0.8%
BAKER	52	0.8%
JEFFERSON	50	0.7%
BENTON	44	0.6%
CLATSOP	44	0.6%
LAKE	34	0.5%
MALHEUR	27	0.4%
COLUMBIA	26	0.4%
CURRY	25	0.4%
WASCO	19	0.3%
UNION	9	0.1%
MORROW	6	0.1%
HARNEY	2	0.0%
GILLIAM	1	0.0%
WHEELER	1	0.0%
GRANT	0	0.0%
SHERMAN	0	0.0%

Equity and Home Size Survey Answer Summary

Respondent Data

1. Which industry best summarizes your work in the residential construction marketplace?

Industry	#	%
Banking/Lending	1	0.47%
Builder: Multi-Family Residential	13	6.05%
Builder: Single-Family Residential	46	21.40%
City/State/Federal Government	69	32.09%
Designer (Architect, Engineer, Etc.)	39	18.14%
Energy Efficiency Advocacy	19	8.84%
Laboratory/Research	3	1.40%
Low to Middle Income (LMI) Housing	8	3.72%
Not for Profit (Non-Energy Efficiency)	4	1.86%
Product Development/Manufacturing	6	2.79%
Realtor	3	1.40%
Utility – Rural	1	0.47%
Utility – Urban	3	1.40%
Total	**215**	**100%**

- A little under 1/3rd represented city/state/federal gov
- Builders (SF+MF) were a little over 1/4th
- Designers a little under 1/5th
- Advocacy was less than 10%

2. What is your role?

Role	#	%
Analyst/Associate	20	9.30%
Director/Board Member	15	6.98%
Owner	71	33.02%
Program/Project Manager	50	23.26%
Inspection/Permit Services	38	17.67%
Other	21	9.77%
Totals	**215**	**100%**

- Almost a 1/3rd were Owners
- About a 1/4th were PM's
- Of 'Other' responses the majority were Inspector/Permitting (almost a 1/5th of the total)

Cost of homes, energy, and financing

1. When new energy code measures are proposed, should the simple payback of monthly energy savings offset the monthly increase in mortgage payment* equally or better? (i.e. A $25 increase in the mortgage payment equals a $25 savings in monthly energy bills or greater) * Monthly payment includes principal, interest, taxes, insurance (including mortgage insurance)

Should Savings and Mortgage Offset?		**#**	**%**
Yes		132	61.40%
No Answer		3	1.40%
No		80	37.21%
	$20-24	6	7.50%
	$12-$20	9	11.25%
	$6-$11	8	10.00%
	$1-$5	11	13.75%
	Other	46	57.50%
	Total		**100.00%**
Total		**215**	**100%**

   - About a 60-40 split

2. If not, what is an acceptable range relative to energy savings versus mortgage increases? Assuming an increase in the monthly mortgage of $25, an acceptable amount of saved energy costs per month would be:

   - A little over 40% of the 'No' answer choose a value, balanced across the 4 options.
   - Almost 60% of the 'No' answers provided a written response.

A sample of those 46 “Other” responses are as follows:

Builders

Energy savings go beyond just financial. There are health, safety, resiliency, social and comfort aspects that are of value to low income people that go beyond just the dollars saved. I don't believe that a 1:1 cost of energy efficiency upgrades to monthly savings is a fully accurate picture of the benefits to efficiency. This is all before mentioning the benefits to the climate which is where all of our homes are located.
It should be substantially more than $25. That $6000 increase in cost should pay back in three years or less. $165/month in energy savings.
Shouldn't be an across the board thing. Entry level housing is already way too expensive. How about making homes over 1500sf or so do more energy measures as they are more likely to be able to bear the burden of the increases. We have a housing crisis. We need to leave energy upgrades where they are till we get housing volume up.

Government

Energy saving should not result in greater individual long term debt.
Greenhouse gas and emissions reductions should be considered. Hard to put a number to this. Indoor air quality improvements, environmental health and comfort hard to capture in dollar amounts.
Should be $50 or more, since mortgage costs are essential up front investment and energy savings need to reflect investment in equity. Investor $1 and expect to get $1 in return there is no profit so its a bad investment.
We need to find the right balance and where the best benefit to the environment can be achieved. Currently, housing prices are so high, no increased costs should be inflicted by mandated energy codes in Oregon.

Designers

It is hard to understand the final result of these tradeoffs. In my opinion, the energy code needs to move quickly, even if it comes at a nominal cost to the homeowner. We have to pay for this stuff sooner or later, and we should pay now and potentially offset much larger and more negative costs and risks that come with environmental change.
Size of house changes proportion of cost difference. Cost of energy changes with time and provider.
The savings should outweigh the cost since energy costs are always going up over time.

Energy Efficiency Advocates

Simple payback considering just energy bill savings only captures a fraction of the value of EE improvements and is not an appropriate metric for basing public policy decisions on. This metric ignores significant benefits to the home owner/occupant, including improved health and comfort over the building lifetime as well as avoiding hardship due to increased resiliency during storm events. Furthermore, looking at such a simple metric ignores that other parts of government (e.g., public health, disaster relief) are saddled with higher costs when EE elements are not adopted into code. Value streams beyond simple payback on energy bills should be considered in this process.
The issue is carbon, not energy savings

Others

Simple incremental energy savings is very much an imperfect way to determine the effectiveness of an energy code measure. The methodology needs to be expanded to include non-energy benefits such as the health impact associated with energy code proposals.
Savings within the first year is ideal however the first question states simple payback method which is inappropriate. The appropriate metric is Life Cycle Cost. Simple payback only analyzes benefits to the builder. Life Cycle Cost analyzes benefits to the consumer.
What's the point if to saving energy if it costs me additional in another area budget area

3. Should equipment-based energy code improvements, such as a furnace or water heater, payback the homeowner during the average ownership period for the home (12 years), the life of the equipment, the life of a 30-year mortgage, or the 50+ year life of a home?

Equip-based Code Improvements?	**#**	**%**
Average ownership period (12 years)	88	40.93%
Life of equipment/system	90	41.86%
Life of a 30-year mortgage	13	6.05%
Life of home (50+ years)	17	7.91%
No Answer	7	3.26%
Total	**215**	**100%**

- 12 years and life of equipment essentially tied with over 40% each

4. Financing of homes, including down payment, is integral to the analysis of cost efficiency of energy improvements. What would you expect the down payment Low and Middle-Income (LMI) homeowners should have when financing a home?

Down Payment Expectation?	**#**	**%**
Less than 5%	97	45.12%
5-10%	70	32.56%
10-20%	31	14.42%
Greater than 20%	6	2.79%
No Answer	11	5.12%
Total	**215**	**100%**

- Almost half felt the Down Payment should be 5% or less
- Followed by 1/3 at 5-10%
- Combined: Over 75% feel the Down Payment should be 10% or less.

5. For a *new* 1,500 square foot home, what would you expect the homeowner to pay each month (on average in Oregon) for electricity and gas combined?

Monthly Bill for 1,500SF Home?	**#**	**%**
Less than $60 per month	27	12.56%
$61-$90 per month	70	32.56%
$91-$125 per month	73	33.95%
Over $125 per month	37	17.21%
No Answer	8	3.72%
Total	**215**	**100%**

- About 1/3 selected 61-90 ($0.49 to $0.72 per/sf annually)
- About 1/3 selected 91-120 ($0.73 to $1.00 per/sf annually)

The 2021 ORSC weighted average is approximately $0.83 per/sf annually.

Home Size

Background: The 2018 Washington State Energy Code (WSEC) allows smaller homes, below 1,500 square feet, to install fewer energy upgrades than homes above 1,500 square feet.

1. Is it equitable for low-income homebuyers in smaller homes to have fewer energy saving features than buyers in averaged sized homes or larger? Fewer energy saving features means there will be a higher monthly utility cost, but a lower home price. Or, should *all* Oregonians have the same level of energy saving features regardless of the price impact?

Equitable = Less Energy Savings?	**#**	**%**
Yes, it IS equitable	77	35.81%
No Answer	26	12.09%
No, it ISN'T equitable	112	52.09%
Total	**215**	**100%**

- About 1/3 say is IS equitable
- Over 1/2 say it isn't

2. If 'a' above, would you support small-home-specific code changes allowing fewer energy saving features for low-income home buyers, if it reduces the home's selling price and subsequent monthly mortgage payment?

If YES Above, Support Code Change?	**#**	**%**
Yes	66	85.71%
No Answer	1	1.30%
No	10	12.99%
Total	**77**	**100%**

- Over 85% of the Yes say they support a code change

3. How do you see technology helping to provide affordable housing options to Oregonians?

Builders

Heat pump technology, renewable technology, home batteries, electric cars and home electrification coupled with advancements in envelope technology (air tightness, managing vapor, and advanced insulation strategies) benefit not only the month to month energy payments for low income folks through zero energy homes, but it also has the positive effect of resilience, indoor air quality, comfort, quiet, security and health that keep people able to retain jobs, not lose time to ill health effects, make their families safe and other benefits beyond just the first cost financial benefits. Low income people tend to support climate action just as much or more than those in higher income brackets and this is of large value to these demographics, too.
It's not! rather it is pricing Oregonians out.

I don't. Affordable housing is based on availability. Choked down UGB's and lack of buildable land needs improved. Better designed and built envelopes are the smartest money. Putting a focus on better envelopes (more insulation, more airtightness, better windows) before a focus on better equipment (heating, cooling, electrical, water heating), since the envelope is with the home for its life, the equipment gets changed out over time and better equipment can always be installed at the time of renewal.

Government

3D printing and modular home construction using standard or new technology (concrete advances).
It doesn't. The never ending elements added to today's homes are difficult to include and enforce adequately, cost more than will be returned over a long time, and are raising prices of materials and labor for building houses beyond 'affordable' prices. Technology can assist in energy efficiency measures, assist in 'set it and forget it' behaviors, allow for participation in demand response, cost saving programs, and allow for home connectivity. If technology can provide better home building products at lower cost, that would reduce the initial cost of the home, and provide savings over time with decreased repair costs. If the new efficient equipment becomes more widely used, I would expect the costs to lower.

Designers

Thoughtful building design (for better energy-efficient buildings), heat pump tech., Solar PV tech, LED tech, etc. combined with renewables like solar energy and wind energy would increase the likelihood for much lower energy costs for Oregonians. Lower energy costs could help offset housing costs. In other words, lower energy bills might provide individuals the ability to use these savings to meet their mortgage needs. Not to mention, this seems to be the only route for saving this planet.
Unfortunately I do not see it offering a path to affordable housing for any Oregonian. It seems that the more the push is to incorporate higher technology the more expensive a home becomes. This does nothing more than create a trail leading to a point where it will become difficult for many to own homes at all. So, I see why your earlier questions asked if since technology or higher energy efficiency makes the home more expensive then should the smaller houses be assumed for lower income people and not be required to meet some of the new requirements. I for one do not want to have to start looking at income inequity as a line or way that I am required to design a home for my clients. Technology can be great, but should not be dependent upon an internet connection. Not everyone wants all of their information tracked and recorded by big brother. "An equity adjusted demand response system could help people in affordable housing manage their energy use to their advantage, and a demand response arrangement with the utility(s) could allow of rother subsidies and incentives.

Energy Efficiency Advocates

First, your assumptions above about smaller homes is not fair or accurate. Smaller homes use less utilities based on size and features, not features alone! Technology in construction such as 3D printing, panelized/modular construction, and use of phase change materials may all reduce either first or operational costs or both. Technology in homes, such as advanced heat pumps and controls can help lower energy use but only if proper education is included for homeowners.
I'm not sure what you mean by technology? Very few new homes in Oregon are built for low- to mid-income buyers. So the technology used in new homes is only tenuously related to affordable housing. Part of that is the relatively high price of land which is caused by a variety of factors. When it comes to affordable home ownership of any kind, probably the number one piece of technology that has helped lower income US citizens (including Oregonians) buy a house affordably is the emergence of online mortgage lenders. From the data, it appears online lending has reduced bias by lenders. 70-80 % of people of color and low-income households conduct their mortgage business with online lenders. This is much higher than the overall population which uses online lenders about 50% of the time. energy efficiency technology provides stability for affordable housing. Less energy burden = more financial stability. Net zero homes are excellent for truly affordable housing. "Affordable" should be based on life cycle, not first cost or simple payback.

Low to Middle Income (LMI) Housing

3D printed homes, solar energy.
Smart efficient energy equipment measuring outside air temp, durations, timing controls for active use; energy storage, etc.
Technology could provide lower utility costs for residents, further decreasing barriers to home ownership and increasing the ability to create gains in local property taxes.
Very little because technology tries to alleviate the costs of government intervention technology will always respond to the industry needs

Other

I don't. To help further the conversation we need to get away from the word affordable. The cost of the lot, SDC charges and final permits are huge ..... before you even start building the house.
Smart policy coupled with smart building design and construction lead to least-cost housing. Maintaining energy source flexibility helps keep design options open, so designers can choose the most cost-effective technology for space conditioning and water heating - the largest energy loads in most homes. Encouraging and mandating ever-higher-efficiency equipment keeps operating costs down while spurring manufacturing innovation. The trick for affordable housing is to manage or offset the costs of advancing equipment efficiency.

4. How do you see financing and lending strategies, such as energy-efficient mortgages or low income housing tax credits, helping to provide affordable housing options to Oregonians?

Builders

These are a critical piece of the puzzle and need to be simplified in use and expanded. External financial support from government or grants to create a loan/loss reserve is critical as many low to moderate income people have difficulty accessing existing financing mechanisms.
As a scam Can be useful when not limited to a low-income threshold. This creates missing rungs of the affordability ladder where the low-income households end up with better homes that mid-income households, if the mid-income households can afford to get into a house at all. I have built a lot of affordable housing and have experienced this.

Government

These programs are needed to help the low-income get into homes. But they need to be run efficiently with a minimum of red tape.
Seems like the government never learns. Our last housing crisis was primarily due to lowering the criteria to qualify first time home buyers who wouldn't, and shouldn't, have qualified in the first place. We all paid the price for it. And you want to do it all over again!? Keeping incentives for replacement of inefficient equipment, solar panel, window upgrades, insulation upgrades to homes over a certain age. Creating a incentive for sellers of older homes where the upgrades need to be made. Creating an incentive for home buyers of older homes to get a break on making upgrades within a time-frame to bring the older home up to current standards.

Designers

As simply ways to justify creating codes that make homes unaffordable so that they can be subsidized by the general public and my tax dollars, not cool.
Oregonians seeking affordable housing should have access to energy-efficient mortgages, low-income housing tax credits, and other mechanisms that allow them to participate in the energy transition without having to have their energy costs be an undue burden. this can be done with PUC-approved incentives, subsidies, and special programs through the Energy Trust. Oregonians seeking affordable housing should have access to energy-efficient mortgages, low-income housing tax credits, and other mechanisms that allow them to participate in the energy transition without having to have their energy costs be an undue burden. this can be done with PUC-approved incentives, subsidies, and special programs through the Energy Trust. Providing affordable housing is very important. But more importantly, these strategies could be designed to help provide energy efficiency to everyone, making energy saving technology prosper and thus cheaper for Oregonians. Value of homes seen by financing and lending companies are misdirected to scale and location. Value should be seen from a longevity & energy saving perspective.

Energy Efficiency Advocates

Mortgages can factor in lower utility costs and thus affordability of home ownership if the energy code narrows the possibilities of building inefficient homes. Right now it is still possible to build affordable homes that have high utility bills.
I would love to see better financing packages that are easy enough to use that they actually are mass adopted to pay for efficiency and renewables. I also think an easy way to do this is for the mortgage industry to use Home energy scores and anticipated energy bills in their PITI calculations to include PITIE for energy costs. Absolutely essential as is renting/leasing of major EE appliances such as water heaters and heat pumps. That is, equipment is owned by the local utility, repaired, replaced and upgraded when needed all paid through ongoing charge on the utility bill. This absolutely insures that equipment is operating at optimal efficiency and performance and there is no lost opportunities such as installing cheap, low efficiency equipment to be installed which then remains in place for 20-30 years.

Low to Middle Income (LMI) Housing

Create incentives for implementing new construction technology related to energy efficiency and sustainability.
most homes low income can afford is likely not going to be energy efficient, many times lenders won't lend with energy inefficiency, its a catch 22. Low-income tax credits, usually when trying to purchase, its then the funds are needed, not on the next years tax. maybe a front based off their last years taxes to go towards down payment. The MH Advantage loan actually being offered at financial institutions.
calculated and proven energy savings in multi family housing operations allows for lower operations costs, increased net operating income that in turn allows for larger mortgage amount to include energy efficiency equipment/cost measures. IF, big if, the monthly savings are alignment with the delta in the monthly mortgage payment.
Oregon energy prices are relatively low. The biggest strategy will be to ensure fair loans are available with 3-5% down payments for median and lower priced homes.

Other

interest discounts for affordable housing.
A broad approach is needed. Energy-efficient mortgages seems a bit much unless ROI can be established-the more energy you save simply means the more tech you purchase which leads to more money you need to barrow. Tax credits probably make more sense. Interest rates are extremely low but maybe there is a little room for subsidy. Property taxes, permit fees and location could certianly be key areas to review for cost savings. There are several federal rebates and credits being considered at this time. I would love to see mortgage affordability analysis to include more than just PITI but rather PITIE meaning that the energy costs of the home are considered. the problem is the ridiculous cost of permits coupled with a byzantine and incredibly slow permit process.

5. Outside of technology and finance, but within the scope of energy code authority, please add any ideas, issues, or comments relative to increasing the affordability of homes via Oregon's next energy code adoption cycle(s).

Builders

Consider creating a tax incentive for the builders that step up and incorporate energy saving features in their affordable housing projects. Make it progressive. The more features, the larger the incentive. Use Energy Trust of Oregon to create the benchmarks /metrics that will qualify a project for each progressively higher incentive.
Getting as many people into homes as possible is the real issue and it all comes down to the cost of the house. Additional energy code requirements will only increase the price of housing. Homes built under the current energy code are vastly more energy efficient then homes built 20 or more years ago. Focus should on retrofitting the existing housing stock that are much less energy efficient. Maybe try not to fix other issues through housing. If too many toxins exist in the home, shunt that issue to the agency that should be controlling the toxins in products that are brought into the home instead of requiring that everyone add more mechanicals to vent out the toxic air, including those who maintain healthy households. Maybe reward those who build smaller and smarter and allow them to stay more simple and more cost-effective. The pursuit of "net-zero" is not cost effective because the last few percent getting there will be very expensive. Better to use those dollars to offset costs the bureaucracy passes along to builders and buyers.

Government

One of the most impactful tools that we can consider is a statewide mandatory home energy score policy, modeled on those in Portland, Milwaukie and here in Hillsboro. Our research is clear on this, we urge you to consider a statewide scoring mandate. We at the City of Hillsboro are more than willing to be a resource to you if you choose to research or contemplate it.
Regulations invariably are a burden to the private sector. "Burdens" raise the cost of the product and the cost is passed on to the buyer or spread among citizens in general thru taxes. As a government official - we are JUST NOW coming to grips with the changes in the energy code: ASHRAE 90.1 and the OEESC/Zero code. Let code officials catch their breath. Let it alone for awhile.
The size of the home should be considered into the energy requirements. Smaller tiny homes are just going to be more efficient because of its size and would not need to have the same requirements of larger homes.
My opinion is that affordable housing and building codes requirements aren't in the same lane. We have a minimum building code standard with amazing energy codes to increase efficiencies. That we have authority over. But, when the builder sells the home, there aren't any "affordable" requirements on them. They will sell at a price driven by the market - not affordability. I think that needs to be a bigger part of the conversation.

Designers

1. Weatherization services (both analysis and installation) and other energy efficiency strategies should be made available to people in affordable housing at low/no cost on a sliding scale. 2. The PUC and the ETO need to collaborate on strategies to make it cost-effective for people in affordable housing to go all electric, and not be last people to electrify. This will have to be done by creating phased systems to allow fuel-switching and to put an ever-increasing cost onto the gas utility as it is designed out of the system.
With the penchant for the current government regime to prematurely mandate a change in energy systems there will be no relief available that can make homes more affordable. Planning and Zoning needs to align with energy effiency. Thick walls that perform well do not play well with zoning codes and financial performas. Sun control overhangs and shading devices affect development area. Overhauling the way planners see bulk and livable space would really make a huge dent in the ability to provide low cost, low tech, easily maintained solutions. Increase the energy code standards to meet the Passive House Standards. Once there is more demand for the improved building components associated with Passive House buildings the cost will drop quicker for those components, the education of tradespeople will increase and Net Zero will become commonplace. The solution is here and being achieved all over the globe. There is nothing that needs to invented, just action needed. Let's protect our public health and intact better building codes!

Energy Efficiency Advocates

Allow for expedited code approvals, and/or reduced permit fees to encourage affordable, energy-efficient home construction. Allow reach-codes and previews of upcoming code changes, to let builders adapt to code changes.
I did not answer the question about equity because I think the question does not address the complexity of the issue. Smaller homes will inherently use less energy than larger homes. Small size as a design feature is probably the biggest energy saving feature that can be included in any home for sale. There have been studies conducted in the past that showed increasing house sizes over time in some markets erased the energy saving gains of energy code some periods of time. Size matters for affordability, and size matters for energy use. In my opinion, efficient use of space is energy efficiency. Ensure there are no unintended impediments to smaller, more affordable housing options (e.g., micro-housing, tiny homes). (I am not familiar with OR's status with respect to these issues, but other states I have worked in have had minimum bedroom size and other archaic statutory impediments that kept builders and developers from being able to build small, dense units the market was demanding).

Low to Middle Income (LMI) Housing

Solar energy, furnace/heating units. Like the smart car program but to apply to these implementations, maybe if the home to be purchased with these units, maybe a credit towards closing costs...which increases the borrowers ability and makes them a stronger borrower

Other

How is finance within the scope of energy code authority? Increase the affordability of homes by focusing on increases to envelope first, and incrementally (each code cycle) increase additional measures. Choosing to focus on ,for example, water heaters first before improving envelope requirements, doesn't help a house which may be a hundred year structure. So for a hundred years you have a house who's envelope isn't as good as it could be, and traded that for a higher efficency water heater that might last 12 years.
Understanding the tech that's available today and planning the energy code based off that would be helpful. I have seen codes driving massive over kill in a specific area. Tiny homes need tiny products. In some cases, perhaps the code standard could be adjusted to reflect a specific product that fits the; space, total cost and need better. Where energy codes increase the cost of housing significantly, the beneficial agency (Power company, gas company, insulation company) should be encouraged to contribute toward grant funding. They are businesses and should receive tax credits. Home owners should also receive tax credits for increasing their home's energy efficiency. ALL HOMEOWNERS. That would be equitable. Or renters being given rent credits based upon their increase of their rental home's energy efficiency.