



Resilient Efficient Buildings Task Force

3:00 – 5:00 pm
August 23, 2022

Policy Options Identified for New Buildings

- ▶ Assess and disclose material-related emissions
- ▶ Focus on refrigerants with low global warming potentials
- ▶ Limit allowable total carbon of buildings
- ▶ Establish workforce development requirements
- ▶ Decarbonize institutional/public buildings
- ▶ Study and expand grid system/sources
- ▶ Modify Building Codes Division advisory boards
- ▶ Modify agency operations and code development process
- ▶ Enact energy-efficient building codes
- ▶ Use a points-based residential code
- ▶ Maintain the status quo
- ▶ Permit local adoption of the reach code

Reflection Questions

- ▶ How could this policy be applied in Oregon?
- ▶ Could this policy complement current Oregon programs?
- ▶ What aspects of this policy are the most/least important to you?
- ▶ Could this be paired with another policy to increase its effectiveness?

Categorization of Policy Suggestions

Building Type	New or Existing Buildings
Sector	Residential, Commercial, or Institutional/Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables, Consumer Products, or Other
Additional Benefits* *As categorized by Senate Bill 1518, 2022	Energy Efficiency; Resilience Against Climate Change; Public Health and Air Quality; Reducing Percentage of Household Income that goes Toward Energy Costs; and Mitigating Displacement and Other Impacts that Result from Wildfires, Heat Waves and Other Climate Change Events

Assess and disclose material-related emissions

Task Force Member Policy Suggestions

▶ **Assess and Disclose**

- Examine and Report on Concrete Procurement
- Greenhouse gas emissions from the manufacture, transport, installation, and disposal/recovery of construction materials
- Require Material Carbon Emissions disclosure (and ultimately limits), similar as described by Passive Buildings Canada Emissions of Materials Benchmark Assessment for Residential Construction
- Emissions and material carbon emissions (EMCE) and BPBs (from DEQ) can be reported on and tallied up by amounts in buildings
- Help guide builders/designers towards the lowest-cost low-carbon new construction

▶ **Reuse/Recycle**

- Incentivize reuse of concrete and steel

Assess and disclose material-related emissions

The production of building-sector materials such as iron, steel, and cement, which are used extensively as key materials for construction and paving, is associated with high carbon dioxide (CO₂) emissions.

Building Type	New Buildings
Sector	Residential, Commercial, Industrial, Multifamily, Public Buildings
Policy Subcategory	Envelope
Additional Benefits	Cost and Waste Reduction; Jobs Creation

Assess and disclose material-related emissions

- ▶ Key categories of material production:
 - ▶ material efficiency (where you can reduce or reuse in the production processes)
 - ▶ energy efficiency of materials production (which can include recycling of materials - you're essentially minimizing energy expenditure on your inputs).
- ▶ Oregon
 - ▶ Opportunity to Recycle Act
 - ▶ DEQ voluntary program for concrete producers to create environmental product declarations
 - ▶ Low Carbon Concrete Sidewalk Pilot
- ▶ Examples:
 - ▶ Texas SB 649 (study of feedstocks, market assessment)
 - ▶ NY SB S542A concrete procurement must be low embodied carbon concrete
- ▶ Task Force discussion of Assess and disclose material-related emissions

Focus on refrigerants with low global warming potentials

Task Force Member Policy Suggestions

▶ **Maximum Allowable Global Warming Potential (GWP)**

- Target reductions in refrigerants. A/C and heat pumps' use will grow, but they have refrigerants in them that can be reduced (750 is a number used in CA).
- Low-Carbon Refrigerants: California, Washington, Vermont, and New Jersey have adopted the 750 GWP limit and it is proposed in Colorado, and Hawaii. The codes mandate that refrigerants used in new air conditioning equipment must have a GWP no higher than 750, and refrigerants used in new refrigeration systems with more than 50 lb. (20.68 kg) of refrigerant must have a GWP no more than 150.

▶ **Sector-Specific Management**

- Require refrigerant management for specific sectors (e.g., grocers).

▶ **Disposal and Recovery**

- More regulatory control over refrigerant recovery/disposal operations for appliances.

Focus on refrigerants with low global warming potentials

Hydrofluorocarbons (HFCs) are components of many refrigerants and propellants. HFCs were introduced as alternative refrigerant due to their low ozone depletion potential (ODP) but have since been identified as having high global warming potential (GWP).

Building Type	New Buildings
Sector	Residential, Commercial, Industrial, Multifamily, Public Buildings
Policy Subcategory	Heating/Cooling
Additional Benefits	Economic

Focus on refrigerants with low global warming potentials

- ▶ Federal and state governments have enacted other phasedowns, replacements, and/or phaseouts of various refrigerants. [American Innovation and Manufacturing \(AIM\) Act](#) mandates the phasedown of domestic production and consumption of HFCs in the United States by 85 percent over the next 15 years.
- ▶ Oregon - [House Bill 3227](#) (2021)
- ▶ Examples
 - CARB study to assess alternative refrigerants.
 - [New Jersey Bill S3919](#) (2020) SNAP Rules 20&21
 - Washington [HB 1112](#) and [HB 1050](#) (2019 and 2021, respectively) SNAP Rules and procurement
- ▶ Task Force discussion of Focus on refrigerants with low global warming potentials

Limit allowable total carbon of buildings

Task Force Member Policy Suggestions

► Emissions Relative to Building Size

- Limit size of new homes to mitigate amount of embodied carbon, as well as related transportation emissions, in communities
- Operational energy and embodied carbon in buildings could limit GHGs by building square foot.
- Addresses GHG emissions by setting a limit to the calculated emissions of buildings by area (i.e., per square foot).
- Similar to [Zero Emissions Building Plan of the City of Vancouver, BC](#). Vancouver set their goal to be ratcheted down over time, locked in, without having to unbundling policies. They are following a performance path (prescriptive path). BCD could be directed to follow a certain path. GHG emissions reductions path is fuel agnostic; any lay person can follow the goals and if they're going to be achieved.

Limit allowable total carbon of buildings

Using low-carbon, low-embodied energy, and energy-efficient building materials may reduce greenhouse gas emission from new construction and existing buildings. There are two components included in total carbon calculations for buildings: 1) embodied carbon and 2) operating carbon.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Industrial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling
Additional Benefits	Cost Efficiency

Limit allowable total carbon of buildings

Building material selection can reduce energy expenditure and carbon production when using:

1. low embodied energy building materials to reduce energy in the construction process and
2. energy-efficient building materials to reduce operating energy.

▶ Oregon

- State Energy Efficiency Design (SEED)

▶ Examples

- [Colorado SB22-051 \(2022\)](#)

▶ Task Force discussion of Limit allowable total carbon of buildings

Establish workforce development requirements

Task Force Member Policy Suggestions

▶ Labor Agreements

- Require Community Benefit Agreements on all Rebuild projects to ensure workers a fair wage & benefits. (Prevailing wage, pension, full family employer paid medical).
- Mandate a single project labor agreement with Oregon Building and Construction Trades for utilization on all Rebuild projects
- Require Oregon prevailing wage rates on all Rebuild projects

▶ Apprenticeship Programs

- Require 15 percent apprenticeship utilization on all Rebuild projects.
- Keep HECC out of construction apprenticeship programs
- Advance apprenticeship opportunities for underserved communities by increasing demand for skilled workers to implement Rebuild projects

Establish workforce development requirements

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Industrial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables
Additional Benefits	

Establish workforce development requirements

- ▶ Project Labor Agreement
 - ▶ Community Workforce/Benefit Agreement
 - ▶ Agency Roles
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- ▶ Task Force discussion of establishing workforce development requirements

Decarbonize institutional/public buildings

Task Force Member Policy Suggestions

- ▶ Ensure public buildings "walk the talk" on climate goals and are upgraded and are constructed to meet climate and energy targets going forward.

Decarbonize institutional/public buildings

Programs and policies for public facilities and equipment that could include things like energy data management and evaluation, enacting building performance standards, retrofit programs, procurement policies, and establishing energy efficiency operations and maintenance procedures.

Building Type	New or Existing Buildings
Sector	Institutional, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables
Additional Benefits	

Decarbonize institutional/public buildings

- ▶ State Energy Efficient Design Program
- ▶ Executive Order 17-20
- ▶ 1.5% for Green Energy Technology

- ▶ Task Force discussion of decarbonizing institutional/public buildings

Study and expand grid system/sources

Task Force Member Policy Suggestions

- ▶ Energy Sources
 - ▶ Producing green hydrogen and bioenergy that can become part of the electrical grid may help cities or states become less reliant on imported fossil fuels and diversify its fuel sources. We need to further incentive these technologies.
- ▶ Resource Adequacy
 - ▶ Studies/projections of the actual electricity grid going forward. This includes projected demand and current supply in conjunction with the projected supply and demand due to proposed policy mandates.

Study and expand grid system/sources

The mix of resources generating electricity used in Oregon in 2020 included in and out of state generation. Most of the mix came from hydropower, coal and natural gas. In 2020, Oregon used 53.7 million MWh of electricity.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Multifamily, Institutional, Public Buildings
Policy Subcategory	Heating/Cooling, Renewables
Additional Benefits	

Study and expand grid system/sources

- ▶ Hydrogen
 - ▶ Bioenergy
 - ▶ Resource Adequacy
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- ▶ Task Force discussion of studying and expanding grid system/sources

Modify Building Codes Division advisory boards

Task Force Member Policy Suggestions

- ▶ Make changes to make-up of Building Codes board to diversify representation to include energy, material carbon expertise, and human health.
- ▶ I suggest changing the makeup of the BCD advisory boards in ORS 455 to include people who represent the interests of groups who occupy, own, and study buildings—as well as those the design and build them. This includes renters, community service organizations, public health officials, city sustainability offices, embodied carbon specialists, facility managers, affordable housing developers, and affordable housing advocates to name a few.

Modify Building Codes Division advisory boards

Department of Consumer and Business Services (DCBS) works with seven governor-appointed, senate-confirmed advisory boards to adopt specialty codes and delegates administration and enforcement of some specialty codes to local government.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Consumer Products
Additional Benefits	

Modify Building Codes Division advisory boards

ORS chapter 455 outlines the number of members, their duties, and the required expertise they must have to serve. The 7 advisory boards are:

- ▶ Board of Boiler Rules;
 - ▶ Building Codes Structures Board;
 - ▶ Construction Industry Energy Board;
 - ▶ Electrical and Elevator Board;
 - ▶ Mechanical Board;
 - ▶ Residential and Manufactured Structures Board;
 - ▶ and State Plumbing Board.
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- ▶ Task Force discussion of modifying Building Codes Division advisory boards

Modify agency operations and code development process

Task Force Member Policy Suggestions related to

- ▶ Enforcement and Compliance
- ▶ Code Development Process
- ▶ Climate Considerations

Modify agency operations and code development process

The Building Codes Division's (BCD) staff members work with others to adopt new codes and standards, approve new methods and materials, and maintain a uniform building code throughout the state.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Consumer Products
Additional Benefits	Co-benefits may vary based on how the boards or code development process are modified.

Modify agency operations and code development process

- ▶ Examples
 - ▶ [House Bill 2180 \(2021\)](#) required the Director of DCBS to amend the state building code to require that new construction of certain buildings include provisions for electrical service capacity for at least 20 percent of parking spaces.
 - ▶ [Executive Order 17-20 \(2017\)](#)
 - ▶ [Executive Order 17-21 \(2017\)](#)
 - ▶ [Executive Order 20-04 \(2020\)](#)
- ▶ Task Force discussion of modifying agency operations and code development process

Enact energy-efficient building codes

Task Force Member Policy Suggestions

- ▶ Building Size
- ▶ Parking/Transportation
- ▶ Stairs
- ▶ Sprinklers
- ▶ Envelope
- ▶ Heating and Cooling
- ▶ HVAC

Enact energy-efficient building codes

Building energy codes can require new construction and major renovations in existing buildings to meet minimum energy efficiency requirements, which can reduce energy consumption while saving costs for occupants and owners.

Building Type	New or Existing Buildings
Sector	Commercial, Residential, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Consumer Products
Additional Benefits	Economic; Job creation; Reduced air pollution

Enact energy-efficient building codes

- ▶ Examples
 - ▶ Oregon's [Executive Order 20-04](#) (2020)
 - ▶ Colorado's [HB22-1218](#) (2022)
 - ▶ Colorado's [HB 22-1362](#) (2022)
 - ▶ Washington [Clean Buildings – Early Adopter Incentive Program](#) (RCW 19.27A.220)
- ▶ Task Force discussion of enacting energy-efficient building codes

Use a points-based residential code

Task Force Member Policy Suggestions

- ▶ Points-Based Residential Code
- ▶ Incentives

Use a points-based residential code



Transition to using a point system rather than a package.

Building Type	New or Existing Buildings
Sector	Residential Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables
Additional Benefits	

Use a points-based residential code

- ▶ Oregon, Chapter 11 of the 2021 Oregon Residential Specialty Code
- ▶ Washington, Chapter 4 of the 2018 Washington State Energy Code
- ▶ Task Force discussion of using a points-based residential code

Maintain the status quo

Task Force Member Policy Suggestions

- ▶ Maintain Oregon's tradition of prescriptive and performance paths to achieve energy goals. Keep those paths clear and simple to maintain our history of high code compliance and enforceability.

Maintain the status quo

The state building code is composed of a series of specialty codes, each of which addresses a specific area of construction, including the Oregon Residential Specialty Code and Oregon Structural Specialty Code.

Codes are coordinated to work together, avoiding conflicts between specialty codes.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables, Consumer Products, Other
Additional Benefits	

Maintain the status quo

Examples

- ▶ [2021 Oregon Residential Specialty Code \(ORSC\)](#)
 - ▶ Construction standards: Effective April 1, 2021, and Mandatory Oct. 1, 2021
 - ▶ Based on the 2018 International Residential Code (IRC)
- ▶ [2019 Oregon Structural Specialty Code \(OSSC\)](#)
 - ▶ Effective Oct. 1, 2019
 - ▶ Based on the 2018 International Building Code (IBC) and International Existing Building Code (IEBC)
- ▶ Reach Code: an optional set of construction standards and methods designed to increase energy efficiency in buildings that are newly constructed, reconstructed, altered, or repaired ([ORS 455.500](#)).

Task Force discussion of maintaining the status quo

Permit local adoption of the reach code

Task Force Member Policy Suggestions

▶ **Local Adoption**

- ▶ Allow jurisdictions within Oregon where a high percentage of construction is happening to adopt building codes that go further than the state building codes. It would have to be passed through city council, with public comment period.
- ▶ Allow cities and counties to adopt the state Reach Code as the mandatory base code for buildings in their jurisdiction.

▶ **Structure of Reach Code**

- ▶ A reach code must ensure a logical progression of building codes that consider market readiness and enforceability.
- ▶ To ensure accuracy, consistency and enforceability, any building reach code development focused on emissions shall be based on the ASHRAE 105 standard for building energy performance and greenhouse gas emissions.

▶ **Incentives**

- ▶ Offer incentives to builders in each jurisdiction with reach code.

Permit local adoption of the reach code

Allow cities and counties to adopt the state Reach Code as the mandatory base code for buildings in their jurisdiction.

Building Type	New or Existing Buildings
Sector	Residential, Commercial, Industrial, Multifamily, Public Buildings
Policy Subcategory	Envelope, Heating/Cooling, Renewables
Additional Benefits	Co-benefits would be dependent on local government enacting the reach code as mandatory.

Permit local adoption of the reach code



- ▶ Process for Enacting Reach Codes
- ▶ Current Reach Codes

- ▶ Task Force discussion of permitting local adoption of the reach code



Questions?