



# MEMORANDUM

Prepared for: Joint Task Force on Resilient Efficient  
Buildings Members

Date: August 22, 2022

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Re: New Buildings Policy Options

**LPRO: LEGISLATIVE POLICY AND RESEARCH OFFICE**

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## SUMMARY

The Joint Task Force on Resilient Efficient Buildings is a legislatively appointed body that is tasked with recommending policy solutions for the building sector. The Task Force work, reflected in this document, is compiled by the Legislative Policy and

Research Office (LPRO). LPRO is a nonpartisan, objective public policy research office, currently staffing the Task Force.

The Task Force on Resilient Efficient Buildings (Task Force) has developed a list of policy options to address its statutory charge. The policy options have been organized into two categories: existing buildings and new buildings. Within each category, there are policies that relate to the following sectors: residential (including single and multifamily residences), commercial, public, and industrial. Policy options are labeled as belonging to one or more subcategories, depending on which part of a building it is targeting: envelope, heating/cooling, renewables, consumer products, or other. This memo only focuses on policies identified by Task Force members that relate to new buildings.

The memo provides background, examples where a policy concept has been enacted, identifies potential co-benefits, and offers source information for each policy proposal. LPRO staff did not analyze or evaluate the policy proposals suggested by Task Force members. The background information and co-benefits research is cursory and is not intended to be comprehensive.

## **TASK FORCE STATUTORY CHARGE**

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The Task Force shall:

- Identify and evaluate policies related to building codes and building decarbonization for new and existing buildings that would enable this state to meet the greenhouse gas emissions reduction goals while maximizing additional benefits;
- Consider, in developing the Task Force's recommendations, costs, savings, and benefits of policies that relate to residential, commercial, and industrial buildings;
- Receive testimony, perform research, consult experts, review appropriate literature, solicit feedback from disproportionately impacted communities around this state, and otherwise undertake activities to inform Task Force members with respect to the scope of the Task Force's duties; and
- Make policy recommendations for legislation to interim committees of the Legislative Assembly related to the environment before the 2023 regular session of the Legislative Assembly ([Senate Bill 1518 \[2022\]](#)).

## **TASK FORCE CONSIDERATIONS**

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The purpose of the document is to inform Task Force members of the policy options that have been discussed and proposed by individual Task Force members and to assist in facilitating a Task Force discussion, and eventual prioritization, of each individual policy.

The following reflection questions may be useful to consider when reviewing the document and discussing the policies in the Task Force meeting on August 23, 2022:

- 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?

Blank space is provided in each table for Task Force members to make notes on their own reflections as they review this memo.

## POLICY OPTIONS IDENTIFIED FOR NEW BUILDINGS

### Assess and disclose material-related emissions

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| <b>Building Type</b>  | New Buildings   |
| <b>Sector</b>   | Residential, Commercial, Industrial, Multifamily, Public Buildings  |
| <b>Policy Subcategory</b>   | Envelope  |
| <b>Policy Suggestions Submitted by Task Force Members*</b><br><br><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small> | <p>Assess and Disclose</p> <ul style="list-style-type: none"> <li>• Examine and Report on Concrete Procurement</li> <li>• Greenhouse gas emissions from the manufacture, transport, installation, and disposal/recovery of construction materials</li> <li>• Require Material Carbon Emissions disclosure (and ultimately limits), similar as described by <a href="#">Passive Buildings Canada Emissions of Materials Benchmark Assessment for Residential Construction</a></li> <li>• Emissions and material carbon emissions (EMCE) and BPBs (from DEQ) can be reported on and tallied up by amounts in buildings</li> <li>• Help guide builders/designers towards the lowest-cost low-carbon new construction</li> </ul> <p>Reuse/Recycle</p> <ul style="list-style-type: none"> <li>• Incentivize reuse of concrete and steel</li> </ul> |
| <b>Policy Background</b>  | <p>The production of building-sector materials is a significant source of greenhouse gases.<sup>1</sup> There are two categories of efficiency that are concerned with material production: material efficiency and energy efficiency.</p> <ul style="list-style-type: none"> <li>• Material efficiency strategies aim to yield materials with less production and processing. These strategies generally include material reduction or reuse of a material as well as extending the life of or improving the design of a product. Effective reuse, particularly in construction, is considered an effective emissions abatement strategy but may be</li> </ul>   |

<sup>1</sup> Organization for Economic Cooperation and Development, *Low and Zero Emissions in the Steel and Cement Industries*, (2019), available at <[https://www.oecd.org/greengrowth/GGSD2019\\_IssuePaper\\_CementSteel.pdf](https://www.oecd.org/greengrowth/GGSD2019_IssuePaper_CementSteel.pdf)> (last visited August 18, 2022).

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|  | <p>challenging due to product recertification requirements, an undeveloped supply chain, or design costs.<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Energy efficiency of materials production may be found through altering production processes such as redesign of a supply chain or process chain. Recycling, also considered to be a strategy for energy efficiency, is an alternative that involves breaking down a material so it can be used as a feedstock in conventional production processes. Challenges in recycling include ease of deconstruction, logistics of collection and sorting, availability of supply, and product purity.<sup>3</sup></li> </ul> <p>Material efficiency and energy efficiency strategies may be combined but may also conflict (e.g., reuse may reduce the supply available for recycling).</p> <p>The production of iron, steel, and cement, which are used extensively as key materials for construction and paving, is associated with high carbon dioxide (CO<sub>2</sub>) emissions. The Organisation for Economic Cooperation and Development estimates that achieving net-zero CO<sub>2</sub> emissions for these sectors will require<sup>4</sup>:</p> <ul style="list-style-type: none"> <li>• increasing material efficiency to decrease demand of materials,</li> <li>• improved and increased recycling, and</li> <li>• decarbonizing production and recycling operations.</li> </ul> <p><b>Related Existing Oregon Policy</b></p> <p>The <a href="#">Opportunity to Recycle Act</a> (ORS 459A) requires the Department of Environmental Quality (DEQ) to provide local governments with technical and planning assistance with developing recycling programs. ORS 459A requires communities with over 4,000 people to choose program elements to provide (e.g., commercial food waste or commercial recycling). Thus, construction waste recycling may only be available in some municipalities.</p> <p>Additionally, DEQ has a voluntary program available to concrete producers to help them produce environmental product declarations (EPDs) for concrete mixes. These are third-party verified consumer</p> |
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<sup>2</sup> Julian M. Allwood, et al., *Material Efficiency: A White Paper* 55 RC&R (362-381), available at <[https://web.mit.edu/ebm/www/Publications/MEWP\\_Res\\_Cons\\_Recycl\\_2011.pdf](https://web.mit.edu/ebm/www/Publications/MEWP_Res_Cons_Recycl_2011.pdf)> (last visited August 18, 2022).

<sup>3</sup> *Id.*

<sup>4</sup> Organization for Economic Cooperation and Development, *Low and Zero Emissions in the Steel and Cement Industries*, (2019), available at <[https://www.oecd.org/greengrowth/GGSD2019\\_IssuePaper\\_CementSteel.pdf](https://www.oecd.org/greengrowth/GGSD2019_IssuePaper_CementSteel.pdf)> (last visited August 18, 2022).

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|                        | <p>labels that involve measurement and disclosure of a selection of environmental impacts related to material production.</p> <p><a href="#">The Low Carbon Concrete Sidewalk Pilot</a> (2020) is a pilot project designed to study the performance of low-carbon concrete mixes in sidewalk ramp projects in Portland.</p>   |
| <b>Co-Benefits</b>     | <p>Cost and waste reduction</p> <ul style="list-style-type: none"> <li>Scrap metal and iron recycling reduces the environmental load on landfill disposal facilities and prevents the accumulation of abandoned steel.<sup>5</sup></li> <li>Reducing the amount of construction and demolition material that is disposed may reduce project costs through avoided purchase/disposal costs.<sup>6</sup></li> <li>In the Low Carbon Concrete Sidewalk Pilot, low-carbon concrete mixes were found to be cost-neutral or reduce costs, while reducing the carbon footprint of sidewalk ramps.</li> </ul> <p>Economic</p> <ul style="list-style-type: none"> <li>Recycling industries may create jobs and promote economic activities, particularly when deconstruction and selective demolition methods are used.<sup>7</sup></li> </ul> |
| <b>Examples</b>        | <p><a href="#">Texas SB 649</a> (2019) required a study be conducted of recyclable materials to be used as industrial feedstocks. The Recycling Market Development Plan, which is the product of the study, included assessment of feedstock recyclable materials in Texas, identified potential consumers, and provided recommendations for state and local governments.</p> <p><a href="#">New York State SB S542A</a> (2021) mandates that any state-funded project require contracts for low embodied carbon concrete—concrete that has been evaluated as having relatively low carbon based on its entire life cycle. Contractors must provide certifications that the procured concrete meet minimum standards established by the New York Office of General Services.</p>  |
| <b>Source Material</b> | <p><a href="#">Concrete: Production and Design</a>, Oregon Department of Environmental Quality</p> <p><a href="#">Recyclable Materials Feedstock Study</a>, Texas Commission on Environmental Quality</p>   |

<sup>5</sup> National Minerals Information Center, United States Geological Survey, *Iron and Steel Scrap Statistics and Information*, < <https://www.usgs.gov/centers/national-minerals-information-center/iron-and-steel-scrap-statistics-and-information> > (last visited August 18, 2022).

<sup>6</sup> *Id.*

<sup>7</sup> United States Environmental Protection Agency, *Sustainable Management of Construction and Demolition Materials*, < <https://www.epa.gov/smm/sustainable-management-construction-and-demolition-materials> > (last visited August 18, 2022).

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|                             | NY State Senate Bill S542A, New York State Senate |
| <a href="#">Reflections</a> |   |

## Focus on refrigerants with low global warming potentials

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| <b>Building Type</b>   | New Buildings   |
| <b>Sector</b>  | Residential, Commercial, Industrial, Multifamily, Public Buildings  |
| <b>Policy Subcategory</b>  | Heating/Cooling   |
| <b>Policy Suggestions Submitted by Task Force Members*</b> <p>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</p> | <p>Maximum Allowable Global Warming Potential (GWP)</p> <ul style="list-style-type: none"> <li>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).</li> <li>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.</li> </ul> <p>Sector-Specific Management</p> <ul style="list-style-type: none"> <li>Require refrigerant management for specific sectors (e.g., grocers).</li> </ul> <p>Disposal and Recovery</p> <ul style="list-style-type: none"> <li>More regulatory control over refrigerant recovery/disposal operations for appliances.</li> </ul> |
| <b>Policy Background</b>   | <p>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)—a metric that is reported relative to the warming potential of carbon dioxide.</p> <p>Alternatives to HFCs are evaluated through the <a href="#">Significant New Alternatives Policy</a> (SNAP) Regulations, which amended the Clean Air Act of 1990. The EPA-implemented SNAP program provides lists of acceptable and unacceptable alternatives to HFCs. After a 2017 U.S. Court of Appeals ruling, the EPA vacated SNAP regulations, interpreting that it did not have the authority to phasedown HFCs. As a result, some states moved forward</p>   |

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|                    | <p>legislation to codify SNAP Rules 20 &amp; 21. In 2021, a final U.S. Court of Appeals ruling stated that hydrofluorocarbon-containing refrigerants may be phased out due to their global warming potential under the authority of the EPA. Thus, the EPA reinstated the SNAP program.</p> <p>Federal and state governments have enacted other phasedowns, replacements, and/or phaseouts of various refrigerants. As of 2021, the federal <a href="#">American Innovation and Manufacturing (AIM) Act</a> (42 USC sect. 7675) mandates the phasedown of domestic production and consumption of HFCs in the United States by 85 percent over the next 15 years.</p> <p>Some “natural refrigerants”—so named because they occur in nature (e.g., CO<sub>2</sub>, ammonia, and hydrocarbons)—have lower GWPs and ODPs than many refrigerants and have been found to have substantial energy efficiency benefits compared to HFCs.<sup>8</sup> For instance, waste heat from CO<sub>2</sub>-based commercial refrigerators may be recovered for space heating, resulting in energy and cost savings.<sup>9</sup></p> <p><b>Related Existing Oregon Policy</b></p> <p><a href="#">House Bill 3027</a> (2021, <i>not enacted</i>) would have codified federal SNAP Rules 20 &amp; 21 for phasing out certain products and equipment containing HFCs. The bill would have also established a state procurement preference for products that are not manufactured with HFCs and do not use HFCs.</p> <p><a href="#">House Bill 4024 B</a> (2020, <i>not enacted</i>) would have prohibited certain HFCs from commerce in Oregon if produced after a certain date.</p> <p><a href="#">House Bill 3227</a> (2021) prohibits the Department of Consumer and Business Services from excluding the use of refrigerants that are considered safe alternatives to CFCs and HFCs.</p> |
| <b>Co-Benefits</b> | <p>Economic</p> <ul style="list-style-type: none"> <li>• The market share of natural refrigerants, particularly of CO<sub>2</sub> systems, is expanding rapidly.<sup>10</sup></li> </ul>  |

<sup>8</sup> California Air Resources Board, *Choosing a New System?*, <<https://ww2.arb.ca.gov/resources/documents/choosing-new-system>> (last visited August 18, 2022).

<sup>9</sup> Brian Fricke, Oak Ridge National Laboratory, *Waste Heat Recapture from Supermarket Refrigeration Systems*, (2011), available at <<https://info.ornl.gov/sites/publications/files/pub31294.pdf>> (last visited August 18, 2022).

<sup>10</sup> California Air Resources Board, *Choosing a New System?*, <<https://ww2.arb.ca.gov/resources/documents/choosing-new-system>> (last visited August 18, 2022).



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|                           | <ul style="list-style-type: none"> <li>Some refrigerant industry representatives view HFC phaseouts as a potential opportunity to produce and export refrigerants.<sup>11</sup></li> </ul>   |
| <b>Examples</b>           | <p>The <a href="#">California Air Resources Board's Refrigerant Management Program</a> has contracted a study to assess alternative refrigerants.</p> <p><a href="#">New Jersey Bill S3919</a> (2020) formally adopts the EPA's accelerated phaseout policies included in the Significant New Alternatives Policy (SNAP) Rules 20 &amp; 21. The rules expand the list of safer substitutes and prohibit high-GWP HFCs as alternatives.</p> <p>Washington <a href="#">HB 1112</a> and <a href="#">HB 1050</a> (2019 and 2021, respectively) formally adopt the EPA's SNAP Rules 20 &amp; 21, establish a state procurement preference for non-HFC products, and set a maximum GWP for HFCs used in refrigeration and air conditioning systems. HB 1050 requires the State Building Code Council to adopt rules that allow the use of low-GWP substitutes to the maximum extent practicable.</p> |
| <b>Source Material</b>    | <p><a href="#">Hydrofluorocarbons</a>, National Conference of State Legislatures</p> <p><a href="#">House Bill 3227</a>, Oregon Legislative Assembly</p> <p><a href="#">Choosing a New System?</a>, California Air Resources Board</p> <p><a href="#">Hydrofluorocarbons</a>, Washington Department of Ecology</p>   |
| <b><u>Reflections</u></b> |  |

## Limit allowable total carbon of buildings

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| <b>Building Type</b>                                       | New or Existing Buildings  |
| <b>Sector</b>  | Commercial, Residential, Public Buildings  |
| <b>Policy subcategory</b>                                  | Envelope, Heating/Cooling  |
| <b>Policy Suggestions Submitted by Task Force Members*</b> | <p>Emissions Relative to Building Size</p> <ul style="list-style-type: none"> <li>Limit size of new homes to mitigate amount of embodied carbon, as well as related transportation emissions, in communities</li> <li>Operational energy and embodied carbon in buildings could limit GHGs by building square foot.</li> </ul> |

\*these suggestions were provided by Task Force members via

<sup>11</sup> Jeff Brady, NPR, *Latest Pandemic Relief Contains Includes Important Climate Change Measures*, <<https://www.npr.org/2020/12/25/950314871/latest-pandemic-relief-contains-includes-important-climate-change-measures>> (last visited August 18, 2022).



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| <p>email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</p> | <ul style="list-style-type: none"> <li>Addresses GHG emissions by setting a limit to the calculated emissions of buildings by area (i.e., per square foot).</li> </ul> <p>Similar to <a href="#">Zero Emissions Building Plan of the City of Vancouver, BC</a>. 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.</p>   |
| <p><b>Policy Background</b></p>  | <p>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:</p> <ol style="list-style-type: none"> <li>1) Embodied carbon values attempt to capture energy aspects of the entire life of a material or building including production, transport, use, and disposal. It includes carbon required for all processes from raw materials through the finished project.</li> <li>2) Operating carbon accounts for energy expended in maintaining the inside environment of the building (e.g., heating and cooling, lighting, and appliance operation).<sup>12</sup> The energy use of a building—in particular, water heating and space heating and cooling—is strongly related to its square footage.</li> </ol> <p>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. Likewise, changes that reduce or reuse energy expended during operation may also decrease the total carbon of a building.</p> <p><b>Related Existing Oregon Policy</b></p> <p>Oregon Department of Energy (ODOE) implements the State Energy Efficient Design (SEED) program which was established to increase the energy efficiency of state agency buildings. State agencies are required to build new or renovate existing buildings using energy efficient design methods. Energy efficiency measures in public buildings can include high-efficiency windows, building envelope improvements, efficient heating and cooling systems, and LED lighting. State agencies must also comply with <a href="#">1.5 percent for Green Energy Technology requirements</a>, spending 1.5 percent of public building construction costs on green energy improvements, such as use of battery storage, photovoltaic, or solar thermal systems.</p> |

<sup>12</sup> Luisa F. Cabeza, et al., *Low Carbon and Low Embodied Energy Materials in Buildings: A Review*, 23 R&SER, (536-542), (2013) (meta-study of building energy materials).

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| <b>Co-Benefits</b>        | <p>Cost efficiency</p> <ul style="list-style-type: none"> <li>Case studies using three common building types found that solutions to reduce embodied carbon during the design and construction phase of a project resulted in a carbon savings potential of 19 to 49 percent at cost premiums less than 1 percent.<sup>13</sup></li> </ul>  |
| <b>Examples</b>           | <p><a href="#">Colorado SB22-051 (2022)</a> exempts all sales, storage, and use of eligible decarbonizing building materials from state sales and use tax. In this legislation, "eligible decarbonizing building materials" are defined as building materials that have a maximum acceptable global warming potential as determined by the Office of the State Architect.</p> <ul style="list-style-type: none"> <li>A list of eligible materials is compiled and maintained by the Office of the State Architect based on information voluntarily submitted by manufacturers.</li> <li>Manufacturers may submit the environmental product declaration of an eligible material to the office for review.</li> </ul> |
| <b>Source Material</b>    | <a href="#">State Energy Efficient Design Program</a> , Oregon Department of Energy   |
| <b><u>Reflections</u></b> |   |

## Establish workforce development requirements

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|--|--|
| <b>Building Type</b>   | New or Existing Buildings  |
| <b>Sector</b>  | Residential, Commercial, Industrial, Multifamily, Public Buildings   |
| <b>Policy Subcategory</b>  | Envelope, Heating/Cooling, Renewables  |
| <p><b>Policy Suggestions Submitted by Task Force Members*</b></p> <p><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small></p> | <p><b>Labor Agreements</b></p> <ul style="list-style-type: none"> <li>Require Community Benefit Agreements on all Rebuild projects to ensure workers a fair wage and benefits. (Prevailing wage, pension, full family employer paid medical).</li> <li>Mandate a single project labor agreement with Oregon Building and Construction Trades for utilization on all Rebuild projects</li> <li>Require Oregon prevailing wage rates on all Rebuild projects</li> </ul> <p><b>Apprenticeship Programs</b></p> <ul style="list-style-type: none"> <li>Require 15 percent apprenticeship utilization on all Rebuild projects.</li> <li>Keep the HECC out of construction apprenticeship programs.</li> </ul> |

<sup>13</sup> Rebecca Esau, et al., RMI, *Reducing Embodied Carbon in Buildings: Low-Cost, High-Value Opportunities*, (2021), available at <<https://rmi.org/insight/reducing-embodied-carbon-in-buildings/>> (last visited August 18, 2022).

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|                          | <ul style="list-style-type: none"> <li>• Advance apprenticeship opportunities for underserved communities by increasing demand for skilled workers to implement Rebuild projects.</li> </ul>  |
| <b>Policy Background</b> | <p>A project labor agreement, or PLA, is a pre-hire collective bargaining agreement between building trade unions and contractors that governs the terms and conditions of employment. It often includes worksite conditions, project execution, and protocols to resolve labor disputes.<sup>14</sup></p> <p>A community workforce agreement (CWA) or community benefit agreement is an agreement between project owners, contractors, workforce, labor, and community benefit groups that outlines and stipulates how each will improve the project outcome for the communities. Benefits can include “commitments to hire directly from a community, contributions to economic trust funds, local workforce training guarantees and more.”<sup>15</sup></p> <p><b>Related Existing Oregon Policy</b></p> <p>The Oregon Department of Transportation is considering incorporating CWAs into their contracting and project delivery packages for larger projects.<sup>16</sup></p> <p>Multiple state agencies, including the Bureau of Labor and Industries, Oregon State Apprenticeship and Training Council, Oregon Employment Department, Oregon Department of Education, and Higher Education Coordinating Commission (HECC), have a role in advancing workforce and apprenticeship activities. “The HECC is responsible for advising the Governor, Chief Education Officer, and State Legislature on higher education and related workforce policy as well as coordinating higher education and workforce activities. The Office of Workforce Investments (OWI) and the Office of Community Colleges and Workforce Development (CCWD) support HECC’s mission in aligning workforce and education policies at the postsecondary level.”<sup>17</sup></p> <p>Registered apprenticeship in Oregon is overseen by Oregon Labor and Industries’ Apprenticeship and Training Division (ATD) and</p> |

<sup>14</sup>City of Seattle, *What is a Project Labor Agreement?*, <<https://www.seattle.gov/Documents/Departments/FAS/PurchasingAndContracting/Labor/LaborAgreement.pdf>> (last visited 8/15/2022).

<sup>15</sup> Office of Impact and Diversity, *Community Benefit Agreement Toolkit*, <<https://www.energy.gov/diversity/community-benefit-agreement-cba-toolkit>> (last visited 8/11/2022).

<sup>16</sup> Oregon Department of Transportation, *Community Workforce Agreements*, <<https://www.oregon.gov/odot/equity/Pages/CBA.aspx>> (last visited 8/11/2022).

<sup>17</sup> Higher Education Coordinating Commission, *Oregon Registered Apprenticeship Partnership*, <<https://www.oregon.gov/highered/institutions-programs/ccwd/Documents/Academic%20Approval/Oregon%20Apprenticeship%20Partnership%20System.pdf>> (last visited 8/11/2022).

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|                    | <p>Oregon State Apprenticeship and Training Council (OSATC), which is governed by ORS Chapter 660. OSATC is the governing body that approves new registered apprenticeship committees, programs, and policies. It also makes decisions about individual apprentices' registration, discipline, and placement.<sup>18</sup></p> <p>A registered apprenticeship program is a training model that “combines structured on-the-job learning experiences with related classroom instruction to train individuals” to an industry-recognized standard.<sup>19</sup> Registered apprenticeships are programs that are structured, well-defined, meet industry standards, and are approved by the OSATC.<sup>20</sup> Registered “Apprenticeship programs have five core components:</p> <ul style="list-style-type: none"> <li>• Industry control – all apprentices are created and controlled by companies, employees working in the occupation, and/or industry partners;</li> <li>• Structured on-the-job-training (OJT) with mentoring (minimum of 2,000 hours);</li> <li>• Related classroom instruction, also known as Related Training (classroom or virtual, a minimum of 144 hours per year);</li> <li>• Structured wage increases as apprentices gain knowledge and skills; and</li> <li>• A nationally recognized occupational credential awarded to apprentices at the completion of an apprenticeship program.”<sup>21</sup></li> </ul> |
| <b>Co-Benefits</b> |   |
| <b>Examples</b>    | <p>The City of Portland created a Community Benefits Agreement (CBA) to increase minority and female participation in construction trades. The city’s CBA applies when it 1) solicits a public improvement contract that does not use the low-bid method and 2) the contract is for \$25 million or more. The CBA requires that 1) minorities perform at least 22 percent and women perform at least nine percent of total apprentice hours and 2) minorities perform at least 22 percent and women perform at least six percent of the total journey level hours.<sup>22</sup></p> <p>The Oregon Legislative Assembly passed <a href="#">Senate Bill 420 (2021)</a> permitting local contract review boards or local contracting agencies</p>  |

<sup>18</sup> Bureau of Labor and Industries, *Start and Apprenticeship Program in Oregon*, <[https://www.oregon.gov/boli/apprenticeship/Documents/RegisteringGuide\\_2020\\_08.pdf](https://www.oregon.gov/boli/apprenticeship/Documents/RegisteringGuide_2020_08.pdf) > (last visited 8/15/2022).

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> City of Portland, *Equity, Diversity and Inclusion in Contracting*, <https://www.portland.gov/businessopportunities/equity-contracting> (last visited 8/11/2022).

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|                           | to enact or adopt measures to designate certain public improvement contracts as community benefit contracts. The Act amended the public contracting code to allow local government contracting agencies to adopt by ordinance the authority to designate a public improvement contract as a "community benefit contract." Community benefit contracts must include terms and conditions that require the contractor to qualify as an apprentice training agent, employ apprentices to perform a specified percentage of work hours in apprenticeable occupations, provide employer-paid family health benefits for each worker, and meet any other requirements established by the contracting agency. Advertisements and solicitations for bids must clearly state that the procurement is for a community benefit project, and contracting agencies may require bidders to prequalify for public improvement contracts. |
| <b>Source Material</b>    | <a href="#">Community Benefit Agreement Toolkit</a> , U.S. Department of Energy Office of Economic Impact and Diversity<br><br><a href="#">What is a Project Labor Agreement?</a> , City of Seattle<br><br><a href="#">Start and Apprenticeship Program in Oregon</a> , Oregon Bureau of Labor and Industries   |
| <b><u>Reflections</u></b> |   |

## Decarbonize institutional/public buildings

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| <b>Building Type</b>  | New or Existing Buildings   |
| <b>Sector</b>   | Institutional, Public Buildings   |
| <b>Policy Subcategory</b>   | Envelope, Heating/Cooling, Renewables   |
| <b>Policy Suggestions Submitted by Task Force Members*</b><br><br><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small> | <ul style="list-style-type: none"> <li>Ensure public buildings "walk the talk" on climate goals and are upgraded and are constructed to meet climate and energy targets going forward.</li> </ul>   |
| <b>Policy Background</b>  | According to the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy, "state and local governments can lead-by-example by promoting energy efficiency programs and policies for public facilities, equipment, and government operations through energy data management and evaluation, energy efficiency |

building standards for public buildings, enacting retrofit programs for existing public buildings, procuring energy-efficient appliances and equipment (including vehicles), and establishing energy efficiency operations and maintenance procedures.”<sup>23</sup>

### **Related Existing Oregon Policy**

In 1991, Oregon enacted the State Energy Efficient Design (SEED) program within the Oregon Department of Energy (ODOE). The SEED program requires state agencies that are building or renovating existing buildings to use energy efficient design methods. All construction or renovation projects of a state facility are subject to SEED requirements unless the facility has no energy-using system. There are two classes of buildings in the SEED program; each must be built or renovated to a standard that is 20 percent better than the established energy code. Class 1 buildings are generally over 10,000 square feet and require the use of an energy analyst. Class 2 buildings are smaller than 10,000 square feet and can be self-administered.<sup>24</sup> For existing state buildings, the SEED program also requires that state agencies benchmark energy performance using Energy Star Portfolio Manager. State agencies currently benchmark and set energy performance targets for more than 300 state-owned buildings.<sup>25</sup>

State agencies are also required to follow [Executive Order 17-20, section 3\(b\)](#), which directs the Department of Administrative Services (DAS) and ODOE “to work with state agencies to ensure that new state-owned buildings permitted after January 1, 2022 and used primarily for office and other commercial workspace are designed to be able to operate as carbon-neutral buildings.”<sup>26</sup> A July 2022 memo from DAS expressed that the agency is working with ODOE and the Department of Environmental Quality to evaluate “options to develop sustainable design guidelines for state buildings.”<sup>27</sup>

In addition, public entities that are undertaking a new construction project of \$5 million or more, or a major renovation project for \$5 million or greater, with certain limitations, are required to spend 1.5 percent of the total contract price on green energy technology (GET).

<sup>23</sup> Office of Energy Efficiency & Renewable Energy, *Energy Efficiency Policies and Programs – State and Local Solutions Center*, <<https://www.energy.gov/eere/slsc/energy-efficiency-policies-and-programs>> (last visited August 11, 2022).

<sup>24</sup> Oregon Department of Energy, *SEED Program Guidelines*, <<https://www.oregon.gov/energy/energy-oregon/Pages/SEED-Program-Guidelines.aspx#Anchor2>> (last visited August 10, 2022).

<sup>25</sup> Email from Blake Shelide, ODOE to Beth Reiley, LPRO (August 15, 2022, 7:20 AM PST)

<sup>26</sup> Oregon State Executive Order No. 17-20 (November 6, 2017) <<https://www.oregon.gov/bcd/Documents/eo-energy-17-20.pdf>>

<sup>27</sup> Department of Administrative Services, *Guidance to Agencies to Comply with Executive Order 17-20, Section 3(B) Directives*, <<https://www.oregon.gov/energy/energy-oregon/Documents/EO17-20-CNGuidance.pdf>> (last visited August 9, 2022).



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|                           | Public entities include, but are not limited to, state agencies, community colleges, school districts and education service districts, and local governments. There is a process and reporting process for a local government to follow if they determine GET is inappropriate for the project. <sup>28</sup>   |
| <b>Co-Benefits</b>        |   |
| <b>Examples</b>           |   |
| <b>Source Material</b>    | <p><a href="#">Energy Efficiency Policies and Programs</a>, Office of Energy Efficiency &amp; Renewable Energy,</p> <p><a href="#">State Energy Efficient Design Program</a>, Oregon Department of Energy<sup>29</sup></p> <p><a href="#">1.5% for Green Energy Technology</a>, Oregon Department of Energy</p> <p><a href="#">Executive Order No. 17-20</a></p> <p><a href="#">2021 SEED Report to the Legislature</a>, Oregon Department of Energy<sup>30</sup></p> |
| <b><u>Reflections</u></b> |   |

## Study and expand grid system/sources

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|--|---|
| <b>Building Type</b>   | New or Existing Buildings   |
| <b>Sector</b>  | Residential, Commercial, Multifamily, Institutional, Public Buildings   |
| <b>Policy Subcategory</b>  | Heating/Cooling, Renewables   |
| <b>Policy Suggestions Submitted by Task Force Members*</b><br><br><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard,</small> | <p>Energy Sources</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>Resource Adequacy</p> |

<sup>28</sup> Oregon Department of Energy, *1.5% for Green Energy Technology*, <<https://www.oregon.gov/energy/energy-oregon/Pages/GET.aspx>> (last visited August 10, 2022).

<sup>29</sup> Oregon Department of Energy, *State Energy Efficient Design Program*, <<https://www.oregon.gov/energy/energy-oregon/pages/seed.aspx>> (last visited August 10, 2022).

<sup>30</sup> Oregon Department of Energy, 2020 State Energy Efficient Design Biennial Report, <<https://www.oregon.gov/energy/Data-and-Reports/Documents/2021-SEED-Report.pdf>> last visited (August 15, 2022).



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| etc. and have not been verified or analyzed by staff | <ul style="list-style-type: none"> <li>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.</li> </ul>  |
| <b>Policy Background</b>                             | <p>Hydrogen is the most abundant element in the universe, but on earth it rarely occurs naturally in its pure state. Instead, hydrogen is usually combined with other elements such as oxygen or carbon. When produced from wind or other renewable resources, hydrogen can store carbon-free energy that can later be used to generate electricity or power vehicles. Currently, most hydrogen is produced from fossil fuels, specifically natural gas. Electricity—from the grid or from renewable sources such as wind, solar, geothermal, or biomass—is also currently used to produce hydrogen. According to the United States Department of Energy's Office of Energy Efficiency and Renewable Energy, in the longer term, solar energy and biomass can be used more directly to generate hydrogen.</p> <p>Bioenergy or biomass energy is defined by the energy from plants and plant-derived materials. According to ODOE, “wood is still the largest biomass energy resource today, but other sources of biomass can also be used. These include food crops, grassy and woody plants, residues from agriculture or forestry, oil-rich algae, and organic municipal and industrial wastes, fumes from landfills—methane, the main component in natural gas—can be used as a biomass energy source.”<sup>31</sup></p> <p>Resource adequacy planning “looks forward to match electricity needs with electricity resources to determine whether the system can meet electricity needs in every hour of every season—even during extreme conditions such as extended heat wave or drought.”<sup>32</sup> The Northwest Power Act requires the Northwest Power and Conservation Council (Council) to plan a power system that is adequate. According to the Council, for their planning, “adequacy is balancing the potential for stressful system events with the cost of mitigating those events.”<sup>33</sup> The Council’s Power Plan informs Bonneville Power’s resource decision-making processes.</p> |

<sup>31</sup> Oregon Department of Energy, *Bioenergy in Oregon*, <<https://www.oregon.gov/energy/energy-oregon/pages/bioenergy.aspx>> (last visited August 17, 2022).

<sup>32</sup> Oregon Public Utility Commission, *Resource Adequacy*, <<https://www.oregon.gov/puc/utilities/Pages/ResourceAdequacy.aspx>> (last visited August 16, 2022)

<sup>33</sup> Northwest Power and Conservation Council, *2021 Power Plan Resource Adequacy Overview*, <[https://www.nwcouncil.org/2021powerplan\\_2021-power-plan-resource-adequacy-overview/](https://www.nwcouncil.org/2021powerplan_2021-power-plan-resource-adequacy-overview/)> (last visited August 16, 2022).

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|                           | <p>The Oregon Public Utility Commission (PUC) analyzes resource adequacy plans submitted by utilities as a part of the integrated resource planning process. The PUC is focused on the following:</p> <ul style="list-style-type: none"> <li>• “Integrated resource planning and procurement processes, which the PUC uses to oversee resource adequacy on a utility-by-utility basis.</li> <li>• Updating the PUC’s approach to measuring and valuing the capacity contribution of all resources.</li> <li>• Engaging constructively as the Northwest Power Pool (NWPP) develops a Resource Adequacy (RA) program, which may be able to deliver better reliability outcomes, more cost-effectively, than utility-by-utility planning alone.</li> <li>• Developing a state framework to complement the NWPP RA program and set a consistent baseline for reliability contributions from all electricity providers.”<sup>34</sup></li> </ul> |
| <b>Co-Benefits</b>        |   |
| <b>Examples</b>           |   |
| <b>Source Material</b>    | <a href="#">2020 Biennial Energy Report, Oregon Department of Energy</a> <sup>35</sup>  |
| <b><u>Reflections</u></b> |   |

## Modify Building Codes Division advisory boards

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| <b>Building Type</b>   | New or Existing Buildings  |
| <b>Sector</b>  | Residential, Commercial, Multifamily, Public Buildings   |
| <b>Policy Subcategory</b>  | Envelope, Heating/Cooling, Consumer Products   |
| <p><b>Policy Suggestions Submitted by Task Force Members*</b></p> <p><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small></p> | <ul style="list-style-type: none"> <li>• Make changes to make-up of Building Codes board to diversify representation to include energy, material carbon expertise, and human health.</li> <li>• 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.</li> </ul> |

<sup>34</sup> Oregon Public Utility Commission, *Resource Adequacy*, <<https://www.oregon.gov/puc/utilities/Pages/ResourceAdequacy.aspx>> (last visited August 16, 2022).

<sup>35</sup> Oregon Department of Energy, *2020 Biennial Energy Report*, <https://www.oregon.gov/energy/Data-and-Reports/Documents/2020-BER-Policy-Briefs.pdf#page=98> (last visited August 16, 2022).

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| <b>Policy Background</b>  | <p>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. The advisory boards include: 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.<sup>36</sup></p> <p>ORS <a href="#">Chapter 455</a> outlines the number of members, their duties, and the required expertise they must have to serve.</p> |
| <b>Co-Benefits</b>        |  |
| <b>Examples</b>           |  |
| <b>Source Material</b>    | <p><a href="#">Boards</a>, Department of Consumer and Business Services Building Codes Division</p> <p><a href="#">Codes and standards</a>, Department of Consumer and Business Services Building Codes Division</p>   |
| <b><u>Reflections</u></b> |  |

## Modify agency operations and code development process

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| <b>Building Type</b>  | New or Existing Buildings   |
| <b>Sector</b>   | Residential, Commercial, Multifamily, Public Buildings  |
| <b>Policy Subcategory</b>   | Envelope, Heating/Cooling, Consumer Products  |
| <b>Policy Suggestions Submitted by Task Force Members*</b> <p><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small></p> | <p>Enforcement and Compliance</p> <ul style="list-style-type: none"> <li>Fully fund BCD for compliance and enforcement on all Rebuild projects.</li> <li>Where building codes impact the development and functioning of energy grid infrastructure, require Public Utility Commission oversight and direct engagement and input from energy utilities, the Oregon Department of Energy and the Northwest Power and Conservation Council as primary stakeholders and energy system experts.</li> </ul> <p>Code Development Process</p> |

<sup>36</sup> Department of Consumer and Business Services Building Codes Division, *Boards*, <<https://www.oregon.gov/bcd/boards/Pages/index.aspx>> (last visited August 5, 2022).

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|                                 | <ul style="list-style-type: none"> <li>• To ensure accuracy, consistency, and enforceability, any building code development focused on emissions shall be based on the ASHRAE 105 standard for building energy performance and greenhouse gas emissions.</li> <li>• Direct state building codes to consider other standards, including health considerations and emissions impact.</li> <li>• The impact of code changes on the resource adequacy of the regional electric grid should be a key consideration.</li> </ul> <p>Climate Considerations</p> <ul style="list-style-type: none"> <li>• Integrate greenhouse gas reduction, climate mitigation, and resilience considerations into BCD Process.</li> <li>• Emissions from buildings in the residential sector are predominantly from electric power. Because of this, insulation, windows, and other durable shell measures should be prioritized in the code.</li> <li>• Give BCD clear direction to incorporate GHG emissions as part of building codes, formally making GHG reduction a mandate for Building Codes Division. Moreover, because building codes are the most. I recommend that this Task Group support revising ORS 455 to broaden the scope of BCD and the Boards' considerations by replacing the mention of "energy" and "energy efficiency" with "Greenhouse Gases (GHG)" and "GHG reductions" that point back to achieving the carbon reduction goals of ORS468A(1)(c).</li> <li>• Modernize code to integrate greenhouse gas emissions reduction/climate mitigation, and resilience considerations into code updates.</li> <li>• Evaluate scope of building codes process for new construction to be based on carbon emissions rather than just energy.</li> </ul> |
| <p><b>Policy Background</b></p> | <p>The Oregon Department of Consumer and Business Services (DCBS) works with the advisory boards to adopt, administer, and enforce a uniform, statewide building code to govern construction in Oregon.<sup>37</sup> The state building code is composed of a series of specialty codes, each of which addresses a specific area of construction.<sup>38</sup> Codes apply to new construction, alteration, and repair and are not retroactive.</p> <p>The Building Codes Division (BCD) administers each code through specialized code programs. Program staff members work with local building officials, industry professionals, advisory boards, and the</p>   |

<sup>37</sup> ORS 455.020(1) (2021).

<sup>38</sup> ORS 455.010(7)(8) (2021).

public to adopt new codes and standards, approve new methods and materials, and maintain a uniform building code throughout the state.<sup>39</sup>

According to DCBS, codes are adopted on three-year cycles, with residential, electrical, and plumbing codes adopted together, and commercial and mechanical codes adopted together. Commercial energy codes are adopted on a schedule based on ASHRAE's adoption schedule. Codes are phased in over time to transition from the old to the new code; during this time, either code can be used. The entire code adoption process takes twelve to eighteen months from kick-off to adoption.<sup>40</sup>

### **Related Existing Oregon Policy**

[House Bill 2180 \(2021\)](#) requires the Director of DCBS to amend the state building code to require that new construction of certain commercial, residential, and mixed-use buildings include provisions for electrical service capacity for at least 20 percent of parking spaces. The bill allows municipalities to adopt a local percentage of parking space requirements higher than state building code requirements.

The Governor issued several executive orders that specified goals for energy efficiency standards and a schedule for their inclusion in the state building code.

- In [Executive Order 17-20 \(2017\)](#), BCD and the appropriate advisory boards were directed to conduct code amendments of the state building code to require installation of solar panels, electric vehicle (EV) charging infrastructure, achieve zero-energy performance standards, and increase energy efficiency in commercial construction, among other requirements relating to energy efficiency.
- [Executive Order 17-21 \(2017\)](#) directed BCD advisory boards and BCD to amend the state building code to require that parking structures for all newly constructed residential and commercial buildings are ready to support the installation of EV chargers.
- [Executive Order 20-04 \(2020\)](#) required BCD to adopt energy efficiency goals in new residential and commercial construction, update the code process, and cooperate with

<sup>39</sup> Department of Consumer and Business Services Building Codes Division, *Codes and standards*, <<https://www.oregon.gov/bcd/codes-stand/Pages/index.aspx>> (last visited August 5, 2022).

<sup>40</sup> Alana Cox, Department of Consumer and Business Services Building Codes Division, *Resilient Efficient Buildings Task Force Presentation*, (April 5, 2022), <<https://olis.oregonlegislature.gov/liz/202111/Downloads/CommitteeMeetingDocument/255019>> (last visited August 4, 2022).

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|                           | ODOE to agree on metrics to inform the baseline and reductions associated with the required code updates.  |
| <b>Co-Benefits</b>        | Co-benefits may vary based on how the boards or code development process are modified.   |
| <b>Examples</b>           | See policy background section.   |
| <b>Source Material</b>    | <a href="#">ORS 455.020(1)</a> .<br><br><a href="#">ORS 455.010(7)(8)</a> .<br><br><a href="#">Codes and standards</a> , Department of Consumer and Business Services Building Codes Division.<br><br><a href="#">Resilient Efficient Buildings Task Force Presentation</a> , Alana Cox, Department of Consumer and Business Services Building Codes Division. |
| <b><u>Reflections</u></b> |  |

## Enact energy-efficient building codes

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| <b>Building Type</b>  | New or Existing Buildings  |
| <b>Sector</b>   | Commercial, Residential, Multifamily, Public Buildings   |
| <b>Policy subcategory</b>   | Envelope, Heating/Cooling, Consumer Products   |
| <b>Policy Suggestions Submitted by Task Force Members*</b><br><br><small>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</small> | <p><b>Building Size</b></p> <ul style="list-style-type: none"> <li>Policy solutions to encourage and allow for smaller dwelling units which meet the energy related and embodied carbon related emissions.</li> <li>Allow ORSC to be used for up to four-unit buildings rather than one- to two-unit structures.</li> <li>Seek out any code changes that would both decrease GHG and decrease construction costs.</li> </ul> <p><b>Parking/Transportation</b></p> <ul style="list-style-type: none"> <li>Codify the reduced parking requirements that are a part of DLCDS Climate Friendly and Equitable Communities Rule making.</li> </ul> <p><b>Stairs</b></p> <ul style="list-style-type: none"> <li>Allow a single stair to meet egress requirements in taller buildings, subject to caps on units per floor and distance from each unit to stairwell.</li> </ul> |



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|                          | <ul style="list-style-type: none"> <li>• Follow Seattle’s lead by allowing taller one-stair buildings, subject to height limits and caps on how many apartments are allowed per floor.</li> </ul> <p>Sprinklers</p> <ul style="list-style-type: none"> <li>• Oregon could follow the lead of Texas, Montana, and Memphis, TN, to provide an alternative to sprinklers for small multifamily buildings (up to four, maybe six, units).</li> <li>• Allow buildings with up to four or six units to be constructed under the Oregon Residential Specialty Code <u>or</u> continue to apply the commercial code to three+ unit buildings, but don’t require sprinklers until they exceed four or six units (likely coupled with a requirement to build with 1-hr construction).</li> </ul> <p>Envelope</p> <ul style="list-style-type: none"> <li>• Start with a tight building envelope, optimizing the heating and cooling system to insulate and air seal as much as possible.</li> </ul> <p>Heating and Cooling</p> <ul style="list-style-type: none"> <li>• Ban the use of resistance heat in new construction.</li> <li>• Eliminate masonry wood-burning fireplaces in new construction and in their place require gas fireplaces for power outage backup and air quality benefits.</li> </ul> <p>HVAC</p> <ul style="list-style-type: none"> <li>• Properly size equipment and ductwork based on SMACNA standards.</li> <li>• Focus on ductwork design for heating and cooling system efficiency.</li> <li>• Minimize the length of flexible duct runs, use 45 degree take offs as required by SMACNA standards, along with turn veins, and full radius elbows.</li> <li>• Be sure that HVAC contractors properly seal and pressure test ductwork to avoid dust and dirt contamination into the air supply from attic and ceiling spaces.</li> <li>• Make Rebuild standards match ASHRAE 90.1 standards.</li> <li>• Tie into National Standards. As the state moves forward and continues to strive for new and efficient systems, tying into National Standards such as ASHRAE is critical to stay ahead of the curve and in line with the latest tech.</li> </ul> |
| <b>Policy Background</b> | <p>Building energy codes can require new construction and major renovations in existing buildings to meet minimum energy efficiency requirements, which reduces energy consumption while saving costs for occupants and owners.</p>  |



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|--------------------|---|
|                    | <p>The Department of Consumer and Business Services (DCBS) works with the appropriate advisory boards to develop a schedule for the periodic review of energy efficiency standards and establish goals for increasing the level of energy conservation achieved by the use of energy efficiency standards contained in the state building code and the Reach Code.<sup>41</sup></p> <p><a href="#">Executive Order 20-04 (2020)</a> required BCD's advisory boards and committees to adopt energy efficiency goals in new residential and commercial construction for 2030. The requirement represents at least a 60 percent reduction in new building annual site consumption of energy from the 2006 Oregon residential and commercial codes.</p>   |
| <b>Co-Benefits</b> | <p>Economic:</p> <ul style="list-style-type: none"> <li>• An analysis of these codes for Oregon estimates that new homes built to the 2021 International Energy Conservation Code (IECC) will produce a net life-cycle cost (LCC) savings with most households seeing cashflow immediately.<sup>42</sup> Lower utility bills increase discretionary income.</li> <li>• Well-designed and enforced energy codes can result in building life-cycle cost reductions and as well as lower total costs for residential and commercial occupants and owners.<sup>43</sup></li> </ul> <p>Jobs:</p> <ul style="list-style-type: none"> <li>• Job creation through construction.<sup>44</sup></li> </ul> <p>Reduced air pollution:</p> <ul style="list-style-type: none"> <li>• According to the Environmental Protection Agency (EPA), building energy code requirements can help reduce peak energy demand, as well as greenhouse gas (GHG) emissions, and other air pollutants.<sup>45</sup></li> </ul> |
| <b>Examples</b>    | <ul style="list-style-type: none"> <li>• Colorado's <a href="#">HB22-1218 (2022)</a> requires new and renovated commercial and multifamily buildings to be EV-ready.</li> <li>• Colorado's <a href="#">HB 22-1362 (2022)</a> requires the energy code board to develop two model codes and requires local</li> </ul>  |

<sup>41</sup> ORS 455.511(3) (2021).

<sup>42</sup> U.S. DOE, *Building Energy Codes Program: Oregon Analysis* (2021), <[https://www.energycodes.gov/sites/default/files/2021-07/EED\\_1365\\_BROCH\\_StateEnergyCodes\\_states\\_OREGON.pdf](https://www.energycodes.gov/sites/default/files/2021-07/EED_1365_BROCH_StateEnergyCodes_states_OREGON.pdf)> (last visited June 28, 2022).

<sup>43</sup> Environmental Protection Agency, *Energy and Environment Guide to Action - Chapter 4.3: Building Codes for Energy Efficiency*, <<https://www.epa.gov/statelocalenergy/energy-and-environment-guide-action-chapter-43-building-codes-energy-efficiency>> (last accessed August 17, 2022).

<sup>44</sup> *Id.*

<sup>45</sup> Environmental Protection Agency, *Energy and Environment Guide to Action - Chapter 4.3: Building Codes for Energy Efficiency*, <<https://www.epa.gov/statelocalenergy/energy-and-environment-guide-action-chapter-43-building-codes-energy-efficiency>> (last accessed August 17, 2022).

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|                           | <p>governments and certain state agencies to adopt and enforce codes consistent with model codes.</p> <ul style="list-style-type: none"> <li>The Washington <a href="#">Clean Buildings – Early Adopter Incentive Program</a> promotes early adoption of updated energy performance standards. An eligible tier 1 or multifamily building owner who demonstrates early compliance with Washington State’s energy performance standard may receive a one-time base incentive payment of \$0.85 per gross square foot of floor area, excluding parking, unconditioned, or semi-conditioned spaces (Revised Code of Washington [RCW] <a href="#">19.27A.220</a>). Incentive funds are limited to \$75 million.</li> </ul> |
| <b>Source Material</b>    | <p><a href="#">ORS 455.511(3) (2021)</a>.</p> <p><a href="#">Executive Order 20-04 (2020)</a>.</p> <p><a href="#">Building Energy Codes</a>, U.S. Department of Energy.</p> <p>Revised Code of Washington (RCW) <a href="#">19.27A.220</a></p>   |
| <b><u>Reflections</u></b> |  |

## Use a points-based residential code

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| Building Type  | New or Existing Buildings  |
| Sector   | Residential Buildings  |
| Policy Subcategory   | Envelope, Heating/Cooling, Renewables  |
| <b>Policy Suggestions Submitted by Task Force Members*</b> <p>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</p> | <p>Points-Based Residential Code</p> <ul style="list-style-type: none"> <li>Residential codes would have created a points-based system rather than bundles, you can have carbon be part of the measurement.</li> <li>For residential construction, allow builders to have more flexibility in meeting energy-related requirements. One example would be to change the ORSC table 1101.1(2) so that it is based on points for individual measures, instead of bundles of units.</li> <li>Through our current system of boards, appropriate “levels” of improvement or “points” could be assigned to work that reflect the value to our decarbonization efforts of the voluntary improvements being made. Those levels or points could be created using either prescriptive terms like adding prescribed amounts of additional insulation, replacing windows and/or doors with those of higher efficiency, upgrading appliances, etc.</li> </ul> |

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|                                 | <ul style="list-style-type: none"> <li>• Levels of improved calculated performance could also be included in those lists.</li> <li>• Need to have clear incentives that would go along with the point system so the higher tier you reach, the more incentives you can get.</li> </ul> <p>Incentives</p> <ul style="list-style-type: none"> <li>• Explore an easy to navigate and understand statewide uniform Incentive “code” or “program” for providing incentives to retrofits or new construction for work focused on reducing energy use and/or carbon at levels above code or otherwise mandated.</li> <li>• Provide a list of easy choices tied to predictable and timely incentive levels to contractors and building owners for either updating existing buildings or constructing new ones to levels greater than currently mandated.</li> <li>• Administer through the existing code enforcement resources or even potentially flow the incentive dollars through those existing local frameworks.</li> </ul>  |
| <p><b>Policy Background</b></p> | <p>Oregon residential code requires builders/owners to pick an additional energy efficiency measure package from a “menu.” Washington state also has an “additional” measures requirement, but it is structured differently to include a list of individual energy efficiency measures that are worth “points.” Builders/owners need to achieve a certain number of points based on the size of the residence. Oregon’s code is independent of home size for new construction.</p> <p>Oregon<br/> <a href="#">Chapter 11</a> of the 2021 Oregon Residential Specialty Code requires residential structures to be built to a set of prescriptive requirements and an additional measure from (Table N1101.1(1)) or achieve equivalent simulated energy performance (NA 1109). Residential structures must also demonstrate compliance with one of eight prescribed efficiency measures (Table N1101.1(2)).<sup>46</sup></p> <p>Washington<br/> Chapter 4 of the <a href="#">2018 Washington State Energy Code</a> requires new structures be built to a set of prescriptive requirements (R401 to R404) or achieve equivalent simulated energy performance (R405). Residential structures must also comply with enough energy efficient options to meet the minimum number of credits</p> |

<sup>46</sup> ICC Digital Codes, 2021 Oregon Residential Specialty Code, Chapter 11 Energy Efficiency, <<https://codes.iccsafe.org/content/ORRSC2021P1/chapter-11-energy-efficiency>> (last visited August 15, 2022).

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|                           | <p>required based on the size of the dwelling unit (R406). Below are the points/credits required based on the square footage of the residential structure:</p> <ol style="list-style-type: none"> <li>1. 3.0 credits for a small dwelling unit that is less than 1500 square feet in conditioned floor area with less than 300 square feet of fenestration area. Additions to existing building greater than 500 square feet of heated floor area but less than 1500 square feet.</li> <li>2. 6.0 credits for a medium dwelling unit which is all dwelling units that are not included in #1, #3 or #4.</li> <li>3. 7.0 credits for a large dwelling unit that exceeds 5000 square feet of conditioned floor area.</li> <li>4. 4.5 credits for dwelling units serving R-2 occupancies.</li> <li>5. 1.5 credits for additions less than or equal to 500 square feet.</li> </ol> <p>Alternatively, a residential structure can comply by receiving certification as a Passive Home under the PHIUS+ 2018 Passive Building Standard (R407).<sup>47</sup></p> |
| <b>Co-Benefits</b>        |   |
| <b>Examples</b>           | See policy background section.  |
| <b>Source Material</b>    | <p><a href="#">2021 Oregon Residential Specialty Code, Chapter 11 Energy Efficiency</a></p> <p><a href="#">2018 Washington State Energy Code</a></p>  |
| <b><u>Reflections</u></b> |   |

## Maintain the status quo

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| <b>Building Type</b>                                       | New or Existing Buildings  |
| <b>Sector</b>  | Residential, Commercial, Multifamily, Public Buildings   |
| <b>Policy Subcategory</b>                                  | Envelope, Heating/Cooling, Renewables, Consumer Products, Other  |
| <b>Policy Suggestions Submitted by Task Force Members*</b> | <ul style="list-style-type: none"> <li>• 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.</li> </ul> |

<sup>47</sup> Washington State, Energy Code - Residential, 2018 Edition, <[https://www.sbccc.wa.gov/sites/default/files/2021-02/2018%20WSEC\\_R%20Final%20package2a.pdf](https://www.sbccc.wa.gov/sites/default/files/2021-02/2018%20WSEC_R%20Final%20package2a.pdf)> (last visited August 15, 2022).

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| <p>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</p> |   |
| <p><b>Policy Background</b></p>   | <p>The Department of Consumer and Business Services (DCBS) adopts, administers, and enforces a uniform, statewide building code to govern construction in Oregon (<a href="#">ORS 455.020(1)</a>). The state building code is composed of a series of specialty codes, each of which addresses a specific area of construction (ORS 455.010(7)(8)), including the Oregon Residential Specialty Code (one- and two-family dwellings and low-rise apartments) and Oregon Structural Specialty Code (commercial buildings, including multifamily buildings, schools, factories, office buildings, mixed use, etc.). Codes are coordinated to work together, avoiding conflicts between specialty codes.<sup>48</sup></p> <p>DCBS works with advisory boards to adopt the specialty codes and delegates administration and enforcement of some specialty codes to local government.</p> <p>Most specialty codes are adopted through a public process that includes public advisory board and code review committee meetings and the administrative rulemaking process. Interested parties can participate at any point in the process and may also seek appointment to an advisory board through the Governor’s Office.</p> <p><b>2021 Oregon Residential Specialty Code (ORSC)<sup>49</sup></b></p> <ul style="list-style-type: none"> <li>• <b>Chapter 1:</b> Effective and mandatory April 1, 2021</li> <li>• Construction standards: Effective April 1, 2021, and Mandatory October 1, 2021</li> <li>• Based on the 2018 International Residential Code (IRC)</li> </ul> <p><b>2019 Oregon Structural Specialty Code (OSSC)<sup>50</sup></b></p> <ul style="list-style-type: none"> <li>• Effective October 1, 2019</li> <li>• Based on the 2018 International Building Code (IBC) and International Existing Building Code (IEBC)</li> </ul> |

<sup>48</sup> Alana Cox, Department of Consumer and Business Services Building Codes Division, *Resilient Efficient Buildings Task Force Presentation*, (April 5, 2022), <<https://olis.oregonlegislature.gov/liz/202111/Downloads/CommitteeMeetingDocument/255019>> (last visited August 4, 2022).

<sup>49</sup> Department of Consumer and Business Services Building Codes Division, *Adopted codes online*, <<https://www.oregon.gov/bcd/codes-stand/Pages/adopted-codes.aspx>> (accessed August 5, 2022).

<sup>50</sup> *Id.*

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|                                    | <p>The specialty code adoption cycle generally occurs every three years for most specialty codes.<sup>51</sup> DCBS coordinates, interprets, and generally supervises the code adoption and amendment process, ensuring the proposed specialty codes:<sup>52</sup></p> <ul style="list-style-type: none"> <li>• are based on the application of scientific principles, approved tests, and professional judgment;</li> <li>• focus on desired results instead of the means of achieving such results;</li> <li>• avoid the incorporation of particular methods or materials;</li> <li>• encourage the use of new methods and materials; and</li> <li>• encourage maximum energy conservation.</li> </ul> <p>Reach Code: DCBS consults with the appropriate advisory boards to adopt, amend, and administer the 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 (<a href="#">ORS 455.500 (2021)</a>).</p> |
| <b>Co-Benefits</b>                 |  |
| <b>Examples</b>                    |  |
| <b>Source Material</b>             | <p><a href="#">Resilient Efficient Buildings Task Force Presentation</a>, (April 5, 2022), Alana Cox, Department of Consumer and Business Services Building Codes Division.</p> <p><a href="#">Adopted codes online</a>, Department of Consumer and Business Services Building Codes Division,</p>   |
| <b><a href="#">Reflections</a></b> |  |

### Permit local adoption of the reach code

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| <b>Building Type</b>                                       | New and Existing Buildings   |
| <b>Sector</b>  | Residential, Commercial, Industrial, Multifamily, Public Buildings   |
| <b>Policy Subcategory</b>                                  | Envelope, Heating/Cooling, Renewables  |
| <b>Policy Suggestions Submitted by Task Force Members*</b> | <p>Local Adoption</p> <ul style="list-style-type: none"> <li>• Allow jurisdictions within Oregon where a high percentage of construction is happening to adopt building codes that go</li> </ul> |

<sup>51</sup> Senate Bill 73 (1973); OAR 918-008-0070.

<sup>52</sup> *Id.*



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| <p>*these suggestions were provided by Task Force members via email, in meetings, from the Jamboard, etc. and have not been verified or analyzed by staff</p> | <p>further than the state building codes. It would have to be passed through city council, with public comment period.</p> <ul style="list-style-type: none"> <li>• Allow cities and counties to adopt the state Reach Code as the mandatory base code for buildings in their jurisdiction.</li> </ul> <p>Structure of Reach Code</p> <ul style="list-style-type: none"> <li>• A reach code must ensure a logical progression of building codes that consider market readiness and enforceability.</li> <li>• 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.</li> </ul> <p>Incentives</p> <ul style="list-style-type: none"> <li>• Offer incentives to builders in each jurisdiction with reach code.</li> </ul>   |
| <p><b>Policy Background</b></p>   | <p>The Department of Consumer and Business Services (DCBS) adopts, administers, and enforces a uniform, statewide building code to govern construction in Oregon (ORS 455.020(1)). The state building code is composed of a series of specialty codes, each of which addresses a specific area of construction (ORS 455.010(7)(8)). Energy codes are a subset of building codes that establish minimum efficiency requirements for new and renovated buildings. DCBS works with advisory boards to adopt specialty codes and delegates administration and enforcement of some specialty codes to local government.</p> <p>Under existing statute, ORS 455.500, the Director of DCBS, in consultation with the appropriate advisory boards, is required to adopt, amend, and administer a reach code designed to increase energy efficiency in buildings that are newly constructed, reconstructed, altered, or repaired. The Reach Code is an aspirational efficiency code that builders can choose to use, and local governments are required to accept the projects that are built to the Reach Code. There is both a residential and commercial Reach Code. The current residential Reach Code was adopted in August 2021 and the commercial Reach Code was adopted in July 2022.</p> |
| <p><b>Co-Benefits</b></p>   | <p>Co-benefits would be dependent on local government enacting the Reach Code as mandatory.</p>  |
| <p><b>Examples</b></p>  | <p>In 2021, Massachusetts enacted legislation requiring the State's Department of Energy Resources to create a municipal opt-in specialized stretch energy code.<sup>53</sup></p>  |

<sup>53</sup> [Climate Law Blog » Blog Archive » Net-Zero Stretch Code: A New Model for Municipal Building Decarbonization in Massachusetts \(columbia.edu\)](#)



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|                           | <p>New York State Energy Research and Development Authority (NYSERDA) enacted NYStretch Energy Code – 2020, which is available as a voluntary locally adopted energy code. NYSEDA estimates that the stretch code improves the efficacy of the state’s energy codes by roughly 10 percent. Adopting the NYStretch Code is one of 13 high-impact actions available to local governments. If a local government completes four high-impact actions, they can earn the Clean Energy Community designation and are eligible for grant funding for clean energy projects.<sup>54</sup></p> |
| <b>Source Material</b>    | <p><a href="#">Oregon Residential Reach Code 2021 Edition</a><sup>55</sup></p> <p><a href="#">Oregon Commercial Reach Code 2022 Edition</a><sup>56</sup></p> <p><a href="#">NYStretch Energy Code: 2020 Outreach, Training and Resources</a></p>  |
| <b><u>Reflections</u></b> |   |

<sup>54</sup> New York State Energy Research and Development Authority, *NYStretch Energy Code: 2020 Outreach, Training and Resources*, available at <[NYStretch Energy Code: 2020 Outreach, Training and Resources - NYSEDA](#)> (last visited August 10, 2022).

<sup>55</sup> Department of Consumer and Business Services, *Oregon Residential Reach Code 2021 Edition*, <<https://www.oregon.gov/bcd/codes-stand/Documents/2021-residential-reach-code.pdf>> (last visited August 15, 2022).

<sup>56</sup> Department of Consumer and Business Services, *Oregon Commercial Reach Code 2022 Edition*, <<https://www.oregon.gov/bcd/codes-stand/Documents/2022ocrc.pdf>> (last visited August 15, 2022).