Executive Order 20-04 Directive 6(B) Report

Oregon Building Codes Division

DCBS | Consumer and Business Services

State of Oregon
Building Codes Division
Better Buildings for Oregon

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Background

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

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

1. The agency's plans for implementation of the specific directives, including articulation of clear deliverables, outcomes, timelines, and identification of lead staff.
2. Description of anticipated processes for advancing the work and engaging stakeholders; for example, workshops, rulemakings, etc.
3. Description of the anticipated process for collaborating with ODOE and other relevant agencies as indicated by EO 20-04.
4. Description of how work on EO 20-04 builds on and complements EO 17-20.

Directive 6(B) of EO 20-04 states that "*No later than September 15, 2020, BCD should submit a report to the Governor on current progress and options for achieving the goals over the next three code cycles. The report should be updated every three years thereafter.*" In response to Directive 6(B), BCD is pleased to submit this report.

Introduction

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

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

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

Having an energy efficient code is only as successful as compliance with that code. Oregon's success is demonstrated in a recent Energy Code Field Study (ECFS)[1] funded by the Northwest Energy Efficiency Alliance (NEEA). The June 2020 ECFS showed new Oregon homes performed just 0.25% above anticipated annual Energy Use Intensity (EUI) under the current code; the 2017 Oregon Residential Specialty Code

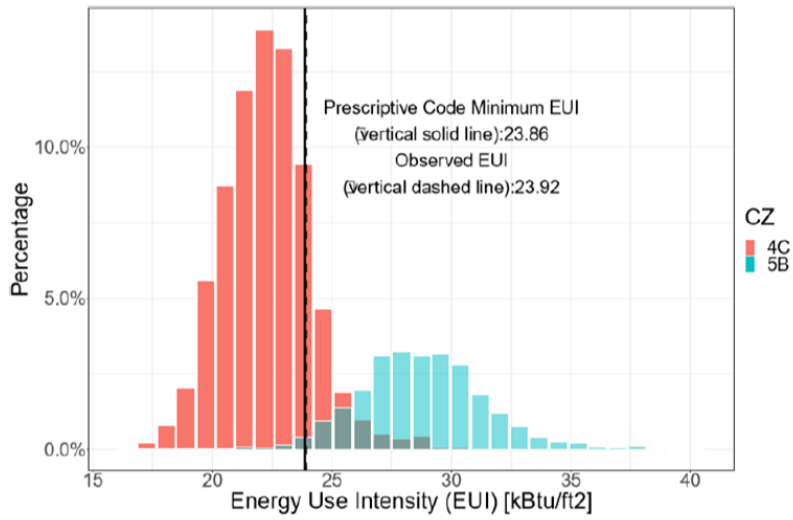

Figure ES.2. Modeled Distribution of Regulated EUI (kBtu/ft^2/year) in Oregon

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

(ORSC). This is demonstrated in the Figure ES.2. EUI is the measurement of how much energy a home uses annually, expressed in thousands of British Thermal Units (BTU's), divided by the square footage of the home (kBTU/ft^2). The higher the number, the more energy a home consumes per square foot. This ECFS, when compared to other studies in similar climate zones, demonstrate Oregon's position as a leader in energy efficient codes.[2] All ECFS's utilize the United States Department of Energy (U.S. DOE) compliance study methodology[3] as closely as possible.

BCD has developed several principles to make sure the building code achieves the Division's mission to work with Oregonians to ensure safe building construction while supporting a positive business climate. The principles that guide our work when considering building code revisions are listed in Appendix A. Through the continued development and implementation of advanced energy codes, BCD is committed to supporting the reduction of GHG emissions, as it has since BCD's inception in 1974.

BCD Code adoption process

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

BOARDS

- Board of Boiler Rules
- Building Codes Structures Board
- Construction Industry Energy Board
- Electrical and Elevator Board
- Mechanical Board
- Residential and Manufactured Structures Board
- State Plumbing Board
- Board archives

Additionally, to ensure a thorough review of proposed code amendments, a board may choose to appoint a committee of interested experts. After review, the code committee reports their recommendations back to the board for consideration. This process allows for public comment at the code committee level, the board level, and often, both.

Once a code change has been approved by the appropriate advisory board, BCD undertakes formal rulemaking. BCD policy is to include at least one public hearing on code adoption rules, providing another opportunity for public feedback. BCD sends out

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

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

regular updates on code change processes and maintains a website with all code change information. BCD also sends out notifications to its subscriber lists and publishes all opportunities for the public to engage in the process. This process is outlined for the public on the "BCD Code review and adoption updates" webpage.

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

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

Current progress

Current code cycle (2020-2021)

Work between BCD and the Oregon Department of Energy (ODOE) has been ongoing as a result of EO 17-20, signed November of 2017. Similar methodologies used for determining the U.S. Department of Energy Zero Energy Ready Home (ZERH) program and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) equivalent performance levels, as required by EO 17-20, are the foundation of the Directive 6(C) baselines for the 2006 Oregon residential and commercial codes.

Directive 6(C)

This directive provides that BCD "in cooperation with ODOE, is directed to agree on metrics, based on best practice and academic research, to inform the baseline and reductions associated with the code updates set forth in paragraph 6(B)."

Directive 6(C) sets the foundation upon which directives 6(A) and 6(B) will be achieved. BCD and ODOE staff regularly collaborate on a variety of issues where there is overlap between BCD's mission to ensure safe building construction while supporting a positive business climate, and ODOE's Vision of a safe, equitable, clean, and sustainable energy future. ODOE also has representation on the Construction Industry Energy Board (CIEB), providing guidance and directly affecting the forward trajectory of Oregon energy code provisions. The involvement of ODOE on CIEB is a critical component of that board, and their professional input into the process ensures that BCD maintains a

leadership position relative to energy code development. The relationship between BCD and ODOE staff is very positive. Staff from each agency regularly collaborate on industry conference presentations and share information and ideas on a recurring basis outside of EO directives.

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

Since June of 2020, BCD and ODOE have conducted extensive reviews of the codes in place for the 2006 baseline[4] and have worked together to agree on the necessary metrics. The residential 2006 baseline was established in August of 2020. It is based on a combination of housing market characteristics for new construction[5] and the established methodology[6] which U.S. DOE utilizes to make their determination that the next energy code will improve energy efficiency in residential buildings from the previous code. This work was presented and vetted through the Oregon Energy Code Stakeholder Panel (OECSP) meetings as further described below.

The OECSP has provided valuable input into baseline and metrics development. At the time of report submission, the OECSP had met a total of three times and there are three remaining meetings scheduled in 2020. Thus far, the meetings have had between 30 and 40 stakeholders participate, giving substantive opportunities for public input from regional stakeholders. In addition to assisting in establishing the residential 2006 baseline, the OESCP stakeholder meetings allowed for NEEA to present prototype energy models which result in 60 percent energy reduction, described the Reach Code process outlined in ORS 455.500, and reviewed the basic content required in this report.

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

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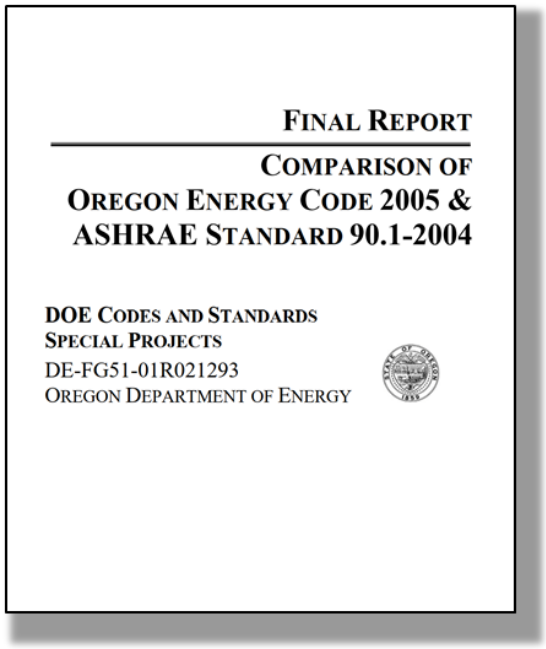
[4] Baselines codes are the 2004 Oregon Structural Specialty Code (2004 OSSC) for Commercial and the 2005 Oregon Residential Specialty Code (2005 ORSC) for Residential.

[5] https://neea.org/resources/single-family-residential-new-construction-characteristics-and-practices-study

[6] https://www.energycodes.gov/sites/default/files/documents/residential_methodology_2015.pdf

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


FINAL REPORT

COMPARISON OF
OREGON ENERGY CODE 2005 &
ASHRAE STANDARD 90.1-2004

DOE CODES AND STANDARDS
SPECIAL PROJECTS
DE-FG51-01R021293
OREGON DEPARTMENT OF ENERGY

The commercial 2006 baseline is underway, and will be established by BCD and ODOE in the fall with input gathered through the OECSP process. In order to determine the 2006 baseline, ODOE researched historical reporting and located a DOE Report "*Comparison of Oregon Energy Code 2005 & ASHRAE Standard 90.1-2004*."[8] After removing the unregulated loads from the report, ODOE determined that Oregon's 2006 code approximated 4% better than ASHRAE 90.1-2004, the best commercial energy code at that time. This baseline determination was presented at the August OECSP meeting.

Final discussion of the commercial 2006 baseline along with a high level review of ASHRAE 90.1-2019 and its metrics relative to the 2030 goal will occur at one of the future OECSP meetings. During one of these OECSP meetings it is anticipated that discussion around the commercial prototype energy models with performance expectations for 2023 and 2026 code cycles may occur as they are available. Finally, BCD anticipates that at the October 20th CIEB meeting an introduction of the adoption of ASHRAE 90.1-2019 will formally kick-off.

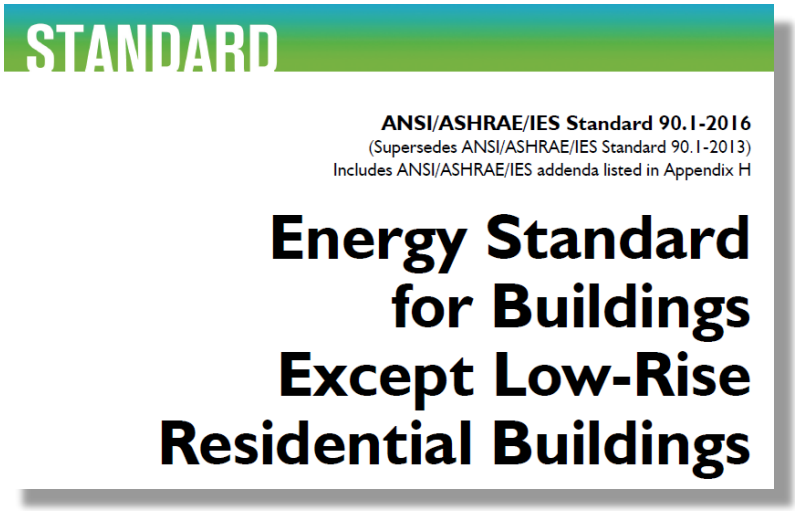
Both the residential commercial 2030 targets will be set using statewide weighted averages based on construction types, permit activity, or population. The weighting used for the 2006 baseline will remain the same for the 2030 targets. BCD will describe and document the baseline methodologies in memo format which will be available on the Division's EO 20-04 page. These baselines will be used to measure reductions for each code adoption under section 6(B), will be captured in the reporting requirements under that same section, and will create a path to reach the performance-based goals of EO 20-04.

Directive 6(A)

This directive provides that BCD "*through its advisory boards and committees, and in cooperation with ODOE, is directed to adopt building energy efficiency goals for 2030 for new residential and commercial construction. That goal shall represent at least a 60 percent reduction in new building annual site consumption of energy, excluding electricity used for transportation or appliances, from the 2006 Oregon residential and commercial code*".

[8] Oregon Department of Energy. "Final Report, Comparison of Oregon Energy Code 2005 & ASHRAE Standard 90.1-2004." Prepared under DOE Codes and Standards, Special Projects, DE-FG51-01R021293.

Commercial: With the baseline established in the fall of 2020, BCD, through its advisory boards and committees, will have officially adopted the 60% reduction goal for annual site consumption energy efficiency for 2030 from the 2004 OSSC. The site energy use determined using best practices and academic research will become a metric of 1.0 for the commercial baseline, and the goal will be established as 0.40, or a 60 percent reduction. This approach will be communicated to the Building Codes Structures Board (BCSB,) and the CIEB.


STANDARD

ANSI/ASHRAE/IES Standard 90.1-2016
(Supersedes ANSI/ASHRAE/IES Standard 90.1-2013)
Includes ANSI/ASHRAE/IES addenda listed in Appendix H

Energy Standard for Buildings Except Low-Rise Residential Buildings

In October of 2019, ASHRAE 90.1-2016 became the mandatory, statewide, commercial energy code. Standard 90.1 has been a benchmark for commercial building energy codes in the United States and a key basis for codes and standards around the world for more than 35 years. By adopting this code the State of Oregon became the first state in the country to adopt ASHRAE 90.1-2016 with no amendments to the energy efficiency portions, Chapters 5 thru 10. As stated earlier, BCD anticipates that at the October 20th CIEB meeting, formal adoption of ASHRAE 90.1-2019 will begin.

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

BCD and its advisory boards began the process of revising the 2017 ORSC in June 2020. The division presented the board with an energy package intended to align with Directive 4(C) of EO 17-20, which directs the appropriate advisory board(s) and BCD "*to conduct code amendment of the state building code to require newly constructed residential buildings to achieve at least equivalent performance levels with the 2017 U.S. Department of Energy Zero Energy Ready Standard by October 1, 2023.*" If the RMSB approves equivalent performance levels of ZERH in this code cycle, it will place BCD and the RMSB ahead of the requirements outlined in EO 17-20, and will set BCD on a solid course to achieve the requirements outlined in EO 20-04. The anticipated code adoption date is April 1, 2021.

The BCD related directives in EO 17-20 set out specific deliverables and timelines that generally align with existing BCD statutes, procedures, and processes. By using the prescriptive directives from EO 17-20, model codes, and leveraging this with existing and ongoing work, BCD anticipates that the

performance-based goals of EO 20-04 are within reach. BCD plans on integrating the additional performance based goals from EO 20-04 into the code adoption process while conducting stakeholder and industry outreach. Through this approach, BCD anticipates that it will be able to meet the performance reductions in EO 20-04 by 2030.

Directive 6(B)

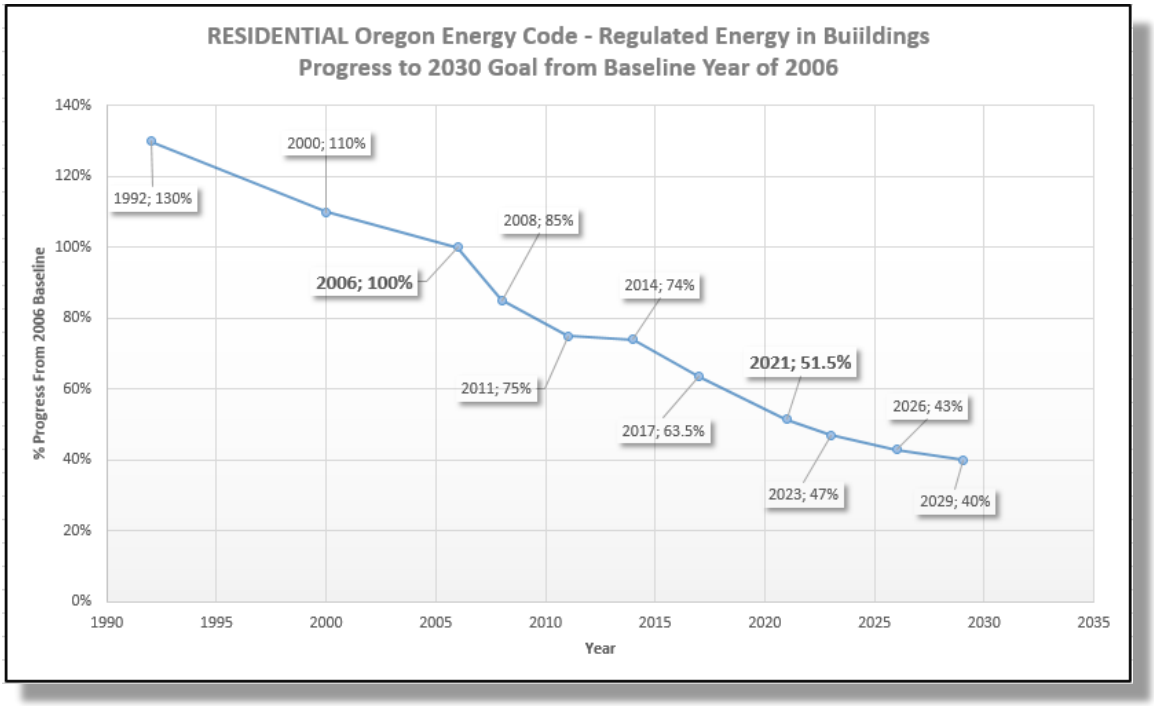
This directive provides that BCD "*through its advisory boards and committees, and in cooperation with ODOE, is directed to evaluate and report on Oregon's current progress toward achieving the goal for new residential and commercial buildings, pursuant to paragraph 6(A) of this Executive Order, and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

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

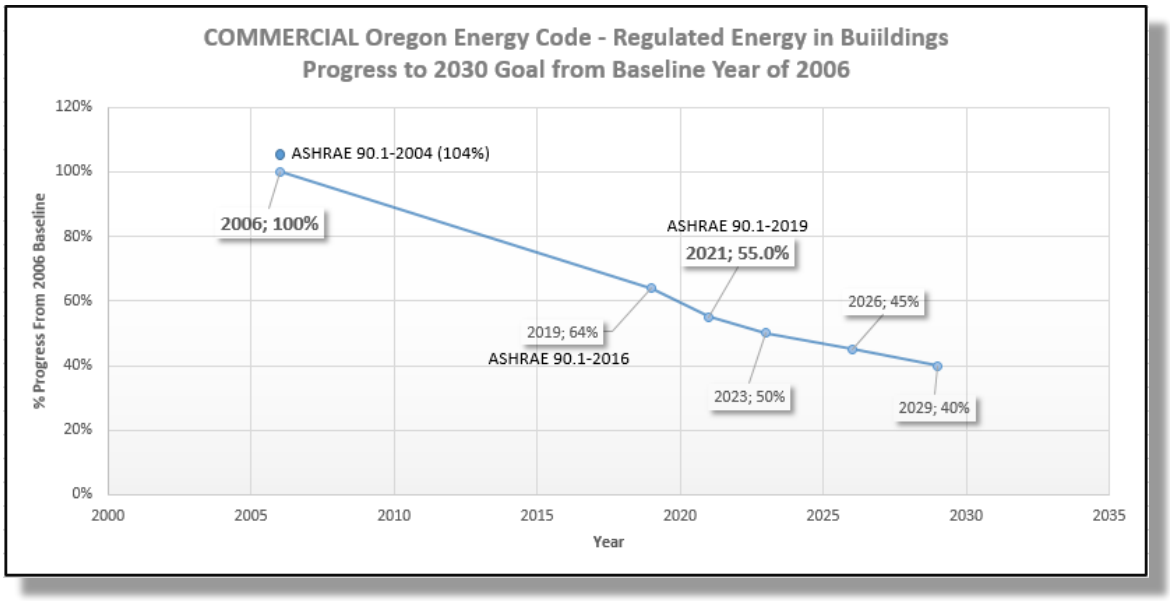
In future reports, and to ensure that BCD is meeting its residential and commercial energy code goals and for federal verification processes, BCD will contract with the University of Oregon (UO) to provide an independent third-party verification of its code adoption progress. BCD will use UO as the reporting mechanism to measure progress towards the 60% reduction goal established by Directive 6(A) going forward. The appropriate advisory boards and BCD will also use this data to inform future decisions about code amendments, ensure that any increased costs in construction due to additional code requirements result in meaningful energy savings for Oregonians, as well as provide the basis for the Directive 6(B) reporting requirements.

BCD intends to continue to update the residential and commercial energy codes on approximately three-year cycles. Options for achieving steady progress toward these goals over the next three code cycles (2023, 2026, and 2029) are highlighted in the next section of this report.

Residential: With the assumption that the equivalent performance levels ZERH will be attained by April 2021, BCD expects the metric to be between 0.53 and 0.50 from the baseline metric of 1.0, resulting in an additional 0.13 to 0.10 to achieve over the next three cycles or between 0.043 and 0.033 per cycle. This represents a 7-9% reduction in annual site consumption of energy improvement each cycle over the previous cycle.



Commercial: With adoption of ASHRAE 90.1-2019 BCD expects the metric to be approximately 0.55 from the baseline metric of 1.0, resulting in an additional 0.15 to achieve over the next three cycles, or 0.05 per cycle. This represents a 10% annual site consumption of energy improvement each cycle over the previous cycle.



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

By statute, the Reach Code consists of optional provisions that a builder may choose to utilize, separate from the state building code. BCD established a website where individuals may sign up to participate in implementation of EO 20-04, including development of the Reach Code. While developing a Reach Code this cycle is not required by EO 20-04, the division intends to kick off a public Reach Code process for a residential reach code once the content of the 2021 ORSC has been established.

BCD anticipates the Reach Code to stagger the base code adoption process by three to six months, since it is best practice to develop a Reach Code after the base code has been established. Thus BCD, in consultation with the appropriate advisory boards, intends to update the Reach Code on three-year cycles in alignment with the code adoption cycles.

Directive 7(D)

Third-Party Validation for Cost Savings. This directive provides that ODOE, "*in cooperation with BCD, is directed to contract with a third party consulting firm to assess cost implications, including long-term energy cost savings, of the energy efficiency and building code actions set forth in paragraph 6(A)-(B) of this Executive Order*".

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

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

Initially, ODOE and BCD "*will look first to existing assessments to determine if existing resources can be used to fulfill the intent of this section. For example, the NEEA and PNNL assess the energy savings of energy codes, and NEEA is undertaking a study of the 2006 residential baseline, current code and steps between now and 2030. In addition, ASHRAE assesses the commercial code and determines cost effectiveness as it develops each iteration of Standard 90.1, which is now the basis for Oregon commercial code. If these assessments of the codes are not adequate, BCD and ODOE will develop a scope of work and budget prior to issuing a Request for Proposals.*".[9]

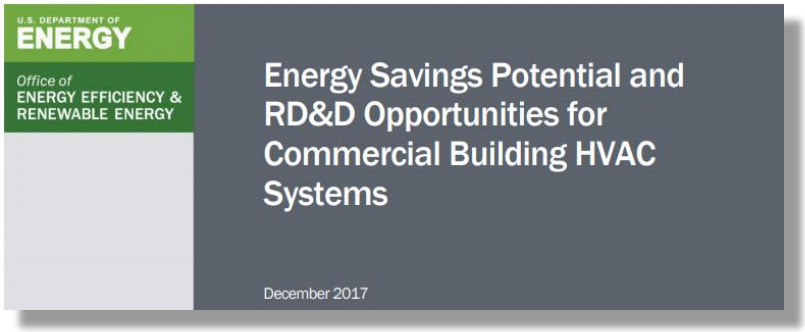
[9] https://www.oregon.gov/gov/Documents/2020%20ODOE%20EO%2020-04%20Implementation%20Report.pdf

Options for achieving the goals over the next three code cycles

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

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

BCD intends to continue the stakeholder process established with ODOE. The OECSP meetings will provide additional opportunities for input from affected stakeholders. This collaboration has been valuable for determining metrics and measurement for Directives 6(A) and 6(B) and led to the establishment of baselines required by Directive 6(C). BCD also intends to independently continue working with all relevant stakeholders, and will continue collaboration with other state agencies through staff communications, board meetings, committees, and workgroups as needed. BCD will continue these practices to execute the directives contained in EO 20-04, as these are practice that BCD has implemented and executed before



One variable that is hard to predict but that could impact our progress towards achieving the goals over the next three code adoption cycles is the emergence of new technology. For instance, in DOE's Building Technologies Office's (BTO) report "*Energy Savings Potential and RD&D Opportunities for Commercial Building HVAC Systems*"[10] they identified "18 high priority technology options for further evaluation that could provide significant HVAC energy savings in commercial buildings" and grouped them into four categories. They also "developed

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

a detailed profile of each technology that provides an overview of the technology, its current development status and key R&D efforts, projections of performance and energy savings, as well as other attributes that may affect its market uptake." BCD will utilize past and future reports such as these to develop cost effective strategies for achieving the EO 20-04 directives.

Affordability and Future Energy Codes

Cost effective strategies are essential since affordability will be a critical component to future energy code development cycles. Affordability has been a noted concern relative to the residential code at every OECSP meeting thus far. Developing a more efficient energy code will certainly lead to higher home prices and thus a higher mortgage payment, which must be balanced against the long term energy savings.

A preliminary BCD analysis of the proposed changes for the forthcoming 2021 ORSC estimated this cost to be minimum of $1,500 to $4,500 in the two Oregon climate zones, for each new single-family home of average size. This adds about $8 to $23 a month to a typical 30-year mortgage payment. However after mortgage payments, a home's energy bills are the largest component of home ownership. Striking a balance between the cost of entry into home ownership with the long term operation of a home will be a critical component of BCD' s approach to implementing EO 20-04.

Conclusion

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

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

Appendix A

BCD Principles for Code Adoption

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

- **Take a long view.** A long term strategy ensures predictability in the code. Code cycles generally vary from 3-6 years, and different states can be at different stages in the code cycle at a given time. It takes significant time to develop revisions to the code, and it is important to ensure stakeholders, boards, labor, and industry have the time and space to develop the best possible standards.
- **Coordinated approach.** Oregon relies on builders, labor, contractors, and stakeholders to participate in policy work by leading the discussion through the seven advisory boards that assist in directing code adoption. Their expertise results in a better building code. Adopting the building code is not enough, labor and industry have to be trained to follow the code, and inspectors have to be trained to ensure compliance with the code. Rigorous training for labor, industry and inspectors mean that from the beginning of a project to its completion, all parties involved have the tools necessary to ensure the standards that are carefully developed through the code process are followed. BCD doesn't just set policy goals, it achieves them.
- **Focus on performance and choice.** It is important in the building code not to create narrow paths that benefit particular companies or industries, but to instead ensure construction practices are the safest and most efficient for all buildings in Oregon. Proponents of proprietary products, testing, and inspection techniques may have incentives beyond what is safest, most efficient, and most cost effective. BCD's duty to all Oregonians, including labor, industry, and other stakeholder groups is to focus on creating choices to achieve technically feasible, safe, efficient, and cost effective buildings.
- **Evidence based.** BCD collects evidence and best practices from across the nation and the world to develop codes that best suit Oregonians. Our goal is always to rely on good research to make evidence-based decisions.
- **Independent verification.** BCD utilizes an independent review process to verify that Oregon is achieving its efficiency goals. First through the University of Idaho, and now through the University of Oregon, BCD submits the commercial and residential energy codes for review to ensure Oregon is on pace to remain a national leader and that BCD is making data driven decisions about efficiency standards.
- **Consistency across the state.** Any building in this state, whether urban, rural, affordable or extravagant, has the benefit of the same minimum efficiency standards. All Oregonians should have the benefit of a safe, affordable, and efficient home. This advantage of consistent, predictable codes, creates extremely high compliance rates and is part of what makes the Oregon model unique. Other states may say they have adopted a particular cutting-edge code, but if local jurisdictions never adopt it, state or local inspectors never enforce it, and labor is not trained to it, it is only as good as the paper it's written on. That's not the case in Oregon.

Appendix B

Board composition

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

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

FOR MORE INFORMATION CONTACT

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

OR VISIT

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

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