

EBC



Energy in Buildings and
Communities Programme

EBC Building Energy Codes Working Group

David Nemetzow (U.S. Department of Energy and
BECWG Chair) and BECWG Team

IEA EBC Technology Collaboration
Programme Webinar in “Virtual Japan”

9 November 2021

1

Contents



1. BECWG overview and opportunities to collaborate
2. Webinars and reports
3. Release of report on practices for codes compliance
4. Highlights from BECWG Annual Symposium
 - National roadmaps that incorporate building energy codes
 - Codes to reduce carbon emissions

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2

BECWG overview and opportunities to collaborate



Energy in Buildings and
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- ✓ **Chairs:** David Nemetzow, U.S. Department of Energy, and Michael Donn, Victoria University of Wellington, N.Z.
- ✓ **Operating Agent:** Meredydd Evans, U.S. Pacific Northwest National Laboratory. Team: Alison Delgado, PNNL; Jack Mayernik, NREL; Jeremy Williams, US DOE
- ✓ 15 member countries – AU, BR, CA, CN, IN, IE, IT, JP, NZ, PT, SG, SE, TR, GB, US – as well as ASHRAE and International Code Council.

We welcome new members! Feel free to participate in our webinars and get latest news. We would also love to **learn about codes in your country.** To join our mailing list e-mail: Alison.Delgado@pnnl.gov

Activity 1: Exchange on building energy code practices

- Webinars (~4/year), meetings, annual building energy code symposium

Activity 2: Comparative Analysis

- Reports on topics of shared interest (2 papers/year):
 - Codes to reduce carbon (embodied carbon)
 - New technology integration in codes (e.g., DER technologies)
 - Codes and climate resilience (e.g., extreme weather events and how buildings cope with these events)
 - Codes and regulations for data centers

Activity 3: Dissemination

- Newsletters, publishing results and lessons, outreach and dialog (Annex 80 resilient cooling, new EE Hub) feedback on IPCC WGIII Buildings Chapter, posting key information on the website

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3

BECWG Webinars and Reports



- 2 Reports this year:
 - Building Energy Codes in Existing Buildings
 - Codes Compliance Best Practices
- Recent Webinars (To date, 9 total):
 - “Balancing Costs and Benefits of Building Energy Codes: An Evaluation of Methodologies for Assessing Cost-Effectiveness” (April 2021)
 - “Building Energy Codes and Other Mandatory Policies Applied to Existing Buildings” (June 2021)
 - “Codes Around the Globe: A Cross-national Comparison of Building Energy Codes,” 2021 National Energy Codes Conference Summer Seminar Series

Past Webinar and Technical Presentations:

1. “Defining Future Direction” (May 2019)
2. “Cross National Comparison” (July 2019)
3. “Building Codes Implementation Practices” (September 2019)
4. “Building Energy Issues and the COVID-19 Response” (May 2020)
5. “Towards Net or Nearly Zero Energy Buildings” (May 2020)
6. “Energy Codes for Existing Buildings” (June 2020)
7. “Changing Business-as-usual: Building Code Virtual Diagnostics & Inspections” (September 2020)

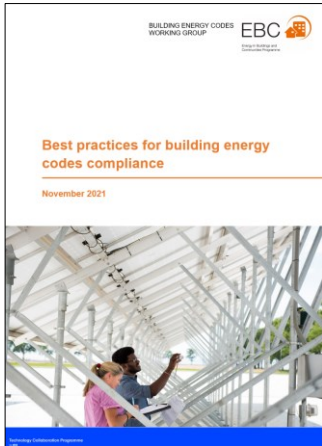
* First Annual Symposium (Sept. 2020):

- 1) Integrating Research and Technology Breakthroughs in Codes, and 2) Adapting/Expanding Code Coverage in Places with Hot Climates

4

4

Report on Practices for Codes Compliance (Released 3 Nov.)



Report link: <http://www.globalchange.umd.edu/technology-and-policy/building-energy-codes/iea-ebc-working-group/>

- Based on a survey of 38 respondents across 11 countries
- Commonly faced issues related to enforcing code compliance centered around capacity building and training
- Report drew examples of notable practices from different jurisdictions. Major themes include:
 1. Pooling resources to minimize redundant efforts and maximize resources
 2. Requiring accreditations and trainings of inspectors and official government endorsement of third parties
 3. Utilizing a data driven approach to improve code implementation
 4. Utilizing remote inspections to check compliance when beneficial

BECWG @ EBC Webinar 5

5

BECWG Annual Symposium, 3 Nov.



- Some business (new work plan, lots of activity this year)
- 2 technical panels:
 - Codes to Achieve Carbon Reductions
 - Presentations from China, Japan, and the United States
 - National Roadmaps that Incorporate Building Energy Codes
 - Presentations from Brazil, Canada, and a global roadmap for buildings and construction
- Some highlights of the Symposium follow in next 4 slides

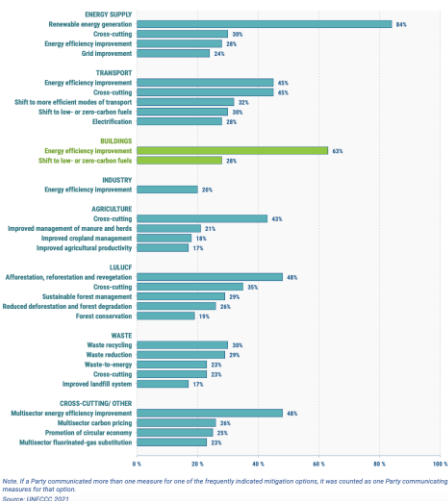
BECWG @ EBC Webinar 6

6

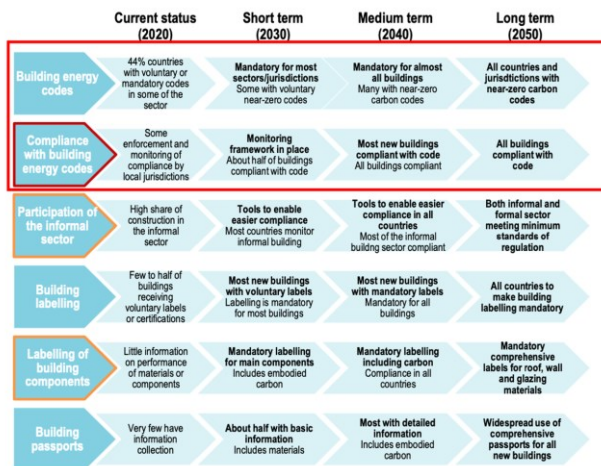
Global assessment: Key actions for new buildings



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Speaker/source:
Prof. Ian Hamilton, Univ. College London Energy Institute



Building codes as critical action for new buildings
Source: IEA

Canada

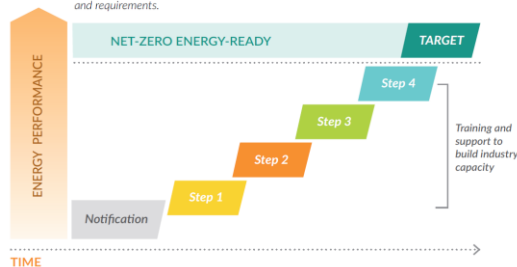


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- Growing emphasis on harmonization
 - “Adapt and Adopt” framework has created a patchwork of energy efficiency requirements
- Four major national research topics:
 - Carbon reductions
 - EU vs. % better approaches
 - Embodied carbon
 - Existing buildings

BACKCASTING APPROACH

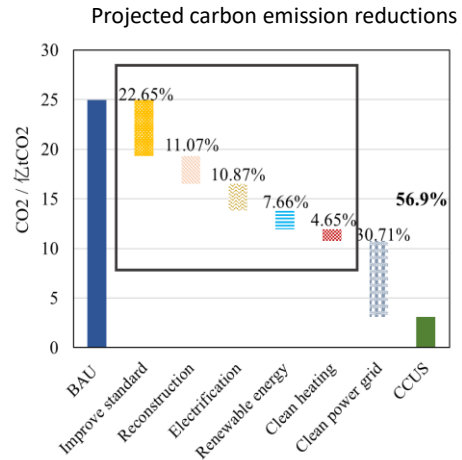
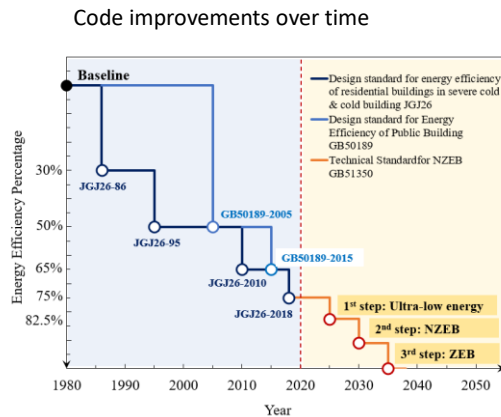
Define a target, and work backwards with fixed interim deadlines and requirements.



Speaker/source:
Alex Ferguson, Natural Resources Canada

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China: Analysis of mid- to long-term energy savings and carbon reduction potential



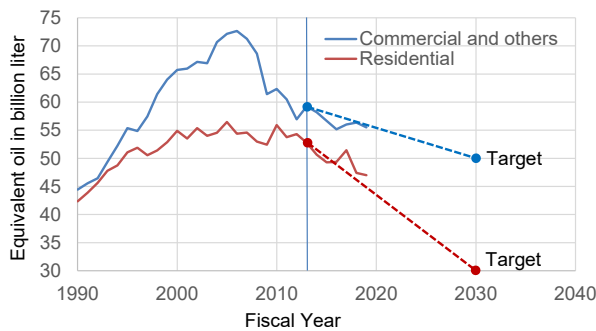
Speaker/source: Prof. Shicong Zhang, China
Academy of Building Research

Zhang et al, Building Science, 2020. DOI:10.13614/j.cnki.11-1962/tu.2021.08.25

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9

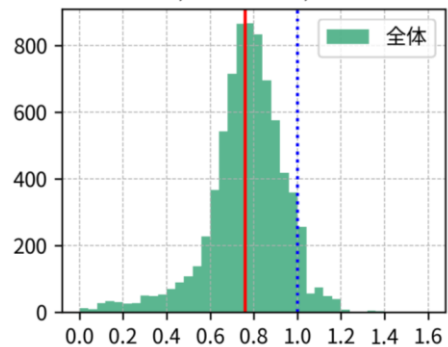
Japan: End-use energy targets in 2030 and distribution of Building Energy Index for total energy use



Transition of end-use energy and targets in FY2030

Speaker/source:
Dr. Takao Sawachi, Building Technology Research Institute

件数=7699, 平均値=0.76, 中央値=0.77



Building Energy Index,
Climate Region 6 in FY19

Sources: [FY2019 Energy Supply and Demand Report \(Revised Report\) \(meti.go.jp\)](https://www.meti.go.jp/press/2020/04/2020042801stj001.pdf)
[国土技術政策総合研究所 研究資料 \(nilm.go.jp\)](https://www.nilm.go.jp/)

10

10

Thank you!



Link to Symposium presentations:

www.globalchange.umd.edu/technology-and-policy/building-energy-codes/ebc-symposium-2021/

Building Energy Codes Working Group:

www.iea-ebc.org/working-group/building-energy-codes

For more information:

Alison.Delgado@pnnl.gov

Mark your calendars:

IEA's new Energy Efficiency Hub will have a launch event 1 Dec.

www.energyefficiencyhub.org/launch-event

All are welcome!

11



Additional Slides

BECWG @ EBC Webinar 12

12

United States: Growing emphasis on deep decarbonization and net-zero codes



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- No single approach to codes nationally
- Multiple states and cities have deep decarbonization goals
- Building Performance Standards in 6 Northeast states (e.g., 50% by 2030)
- Stretch codes in 10 states
- Net-zero codes or carbon neutrality zoning growing

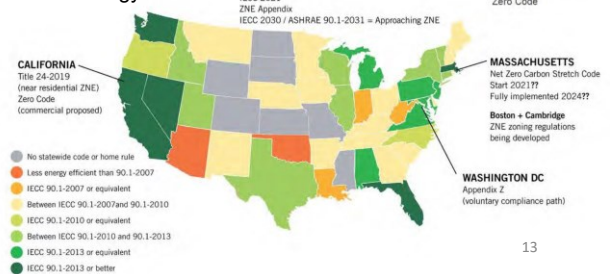


Energy efficiency – prescriptive or performance path with prescriptive backstop

Electrification – no combustion (with exceptions), EV and demand response requirements

Renewable energy – achieve net zero, renewables demonstrating additionality, no weighting factors, on-site solar requirements

Zero Energy Codes



Source/speaker: Mr. Darren Port, Northeast Energy Efficiency Partnerships

13

13

Brazil: Transition from voluntary to mandatory performance standards



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- Carrying out a regulatory impact analysis to make Brazil's energy performance labeling mandatory
- Building performance standards expected to also have a major role as they are adopted by the building industry
- Growing attention on embodied energy and CO2 in building materials with plans to be incorporated in the asset labeling in the future



New label incorporating renewable energy: Local energy generation from renewable energy sources. The system must be installed in the assessed building, or in the same area in which it is located. The systems also must be connected to the building's energy meter, or part of the building they serve.

Source/speaker: Prof. Roberto Lamberts, Federal University of Santa Catarina

14

14