

BECWG NEWS

EBC Building Energy Codes Working Group E-Newsletter

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Welcome to the e-newsletter of the EBC BECWG!

Hello EBC Family! This newsletter is published on a quarterly basis to communicate items of general interest and is part of a broader working group goal to encourage improvements and innovation in practices in building energy codes worldwide. In this issue, we highlight recent working group activities, emerging research, and opportunities to contribute.

Building Energy Codes Working Group Annual Symposium!

9 November 2020

21:30 (Tokyo), 7:30 (Washington, D.C.), 9:30 (Brasilia), 13:30 (Copenhagen), 4:30 (Seattle)

12:30—14:00 UTC/GMT: EBC BECWG Business Meeting (WG members only)

14:00—15:05 UTC/GMT: Technical Presentations and Live Discussion

(open to the public, agenda: <http://www.globalchange.umd.edu/technology-and-policy/building-energy-codes/ebc-symposium-2020/>)

Please register before the meeting, following this link:

https://umd.zoom.us/meeting/register/tJApf-GprjkuH9KKSv1AJ_L1LkIKO9QXMoj1

Additional Symposium Event, 24 November: In addition, as part of the symposium, we will hold a webinar in collaboration with the U.S. National Energy Codes Conference on 24 November at 15:00 – 16:45 UTC/GMT. To register in advance for this webinar, please go to: https://umd.zoom.us/meeting/register/tJAlcuGqrTgrGNBYyhM8c0V8wnuC6K_i0Xys

For questions, please e-mail the Pacific Northwest National Laboratory:

Meredydd Evans at m.evans@pnnl.gov

Alison Delgado at alison.delgado@pnnl.gov

BECWG Webpage and New Members

In April 2020, the BECWG launched its webpage on the EBC website:

<https://www.iea-ebc.org/working-group/building-energy-codes>

In addition to general information on the Working Group, visitors can find information on upcoming meetings and webinars, as well as slides and recordings from previous webinars, and Working Group published reports. We invite you to check out the webpage regularly for updated information.

Welcome New Members: India and Turkey!

Welcome Rajan Rawal from CEPT University (India) and Gülsu Ulukavak Harputlugil from Çankaya University (Turkey). We are excited to collaborate with you!

Recent BECWG Activities

Webinar Topic: “Changing Business-as-Usual: Building Code Virtual Diagnostics & Inspections”

The COVID-19 pandemic disrupted many traditional approaches to building construction and building energy management, resulting in the need for virtual inspection methods. Longer term virtual inspections and audits also help address common constraints, such as the time and cost burdens of in-person verifications. This webinar explored opportunities for increasing

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virtual code inspections and energy audits in response to the pandemic, including potential cost savings and additional impact of remote inspections worldwide. Presenters included Mr. Jeremy Williams (US DOE), Mr. Carlos Flores from National Australian Built Environment Rating System (NABERS), Ms. Valarie Evans (City of North Las Vegas), and Mr. Bassem Khalil (Jensen Hughes Consulting Canada, Ltd).

Participants learned different country approaches to pandemic responses. For example, the NABERS energy-efficiency program used its stakeholder taskforce to rapidly respond to COVID-issues. The taskforce made quick decisions to create flexibility where needed (e.g. virtual audits), and leveraged the direct line of communication with industry. Carlos Flores explained how the pandemic revealed that building operations are often wasteful operating at part load, and there's a need for flexibility in operating systems (Figure 1).

Many remote programs across the featured countries already existed, but COVID-19 accelerated the demand. Remote inspections are constantly improving, using virtual platforms and reporting frameworks. Working with the customer and being flexible is really important for success.

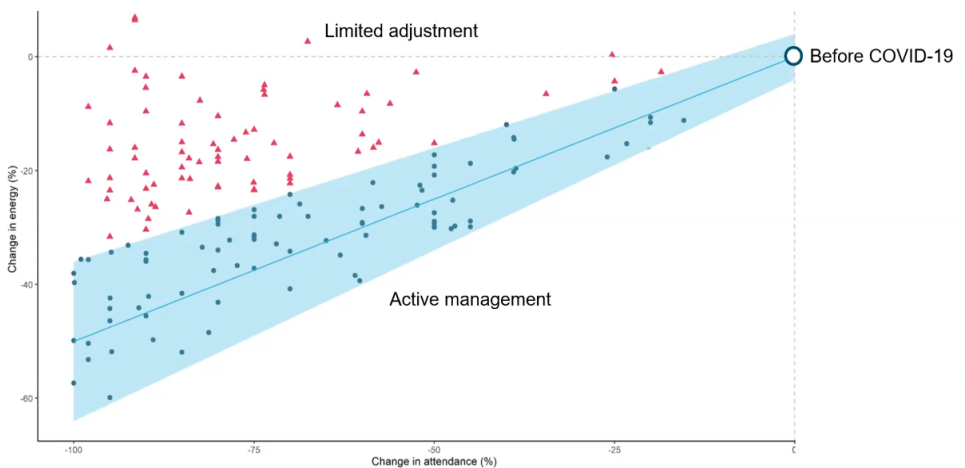


Figure 1: Active management is important to reduce energy use in offices when operating at limited capacity. Source: Mr. Carlos Flores' presentation on NABERS, taken from www.buildingsalive.com/

If you would like to learn more about any of these webinars, you can access the webinar slides and listen to the full recordings on the EBC BECWG webpage at www.iea-ebc.org/working-group/building-energy-codes.

ACEEE Summer Study Paper on “Codes Around the Globe: A Cross-National Comparison of Building Energy Codes”

The American Council for an Energy-Efficient Economy (ACEEE) held its 21st biennial Summer Study on Energy Efficiency in Buildings on 17-21 August 2020 with a theme on *Efficiency: The Core of a Clean Energy Future*. As part of this, the BECWG developed a proceedings paper on “Codes Around the Globe: A Cross-National Comparison of Building Energy Codes” which further explores some of the emerging issues in building energy codes highlighted earlier in this newsletter, in addition to other areas such as code compliance best practices, adapting codes for hot and warm climates, and integration of new technologies in codes. The paper was published and presented by Meredydd Evans and Alison Delgado under the Summer Study panel on *New Construction: From Codes to Net Zero*.

Link for details: <https://aceee2020.conferencespot.org/event-data>

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On-going/Planned BECWG Activities

Energy Codes for Existing Buildings

It is estimated that in Organisation for Economic Co-operation and Development (OECD) countries, roughly 65% of the 2060 building stock already exists today. Many of these buildings were constructed and perform at significantly lower levels than assumed by codes and standards currently in force for new construction.

Building on the BECWG [Codes for Existing Buildings](#) hosted by Canada on 8 June 2020, a report on energy codes for existing buildings is underway. Led by Australia in collaboration with other countries, the report will draw on examples of energy codes or standards for existing buildings in selected countries.

Topical Report: Compliance Best Practices

Building energy code compliance is essential to achieving energy savings but requires resources and capacity to ensure effective implementation. As would be expected, current approaches to code compliance can vary greatly across jurisdictions in terms of institutional set up and criteria for demonstrating compliance. Led by the United States, this report will explore compliance best practices, especially analyzing differences in institutional setup and compliance enforcement mechanisms. This paper will also explore the challenge of rapid development in many countries and more streamlined methods to verify a buildings' compliance with codes. While codes across nations vary in format and approach, many nations face the same compliance issues, such as requiring faster and easier methods to verify codes.

This paper launches this fall and will be completed September 2021.

Research Highlights

International Review of the Occupant-related Features of Building Energy Codes and Standards

Building occupants play an increasingly recognized role in building performance. While building energy codes have traditionally focused on building envelopes and mechanical and electrical systems, occupants have typically been treated as a static boundary condition. For example, occupants are often specified using schedules in the performance path – an approach that neglects the two-way interaction between occupants and buildings. That is, it is incorrectly assumed that building design does not influence occupants' energy-related behaviors.

The International Energy Agency – Energy Buildings and Communities Annex 79 (Occupant-Centric Building Design and Operation) led an international review. 23 regions' building energy codes and standards – spanning five continents– were systematically reviewed to identify commonalities, differences, and unique and inspirational features. First, a quantitative comparison was performed whereby occupant-related densities (e.g., floor area per occupant) and schedules were compared. Occupant and lighting and plug load power densities were found to vary by as much as a factor of three or more between countries. A qualitative comparison was used to explore issues like requirements for occupancy-based lighting, as well as whether the language surrounding occupants sees them as energy saving or energy wasting. Based on the paper findings, Annex 79 made recommendations for how building codes and standards could be improved regarding occupant aspects.

The study was led by Liam O'Brien (BECWG member) and Prof. Farhang Tahmasebi of UCL. Dr. O'Brien provided this highlight for the newsletter.

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Building Energy Code Resources

ICC Global Building Codes Tool. The International Code Council (ICC) recently released a tool called the *Global Building Codes Tool*. The tool provides information about the building codes and standards used in countries around the world but is still being populated with data. The tool found at <https://global.iccsafe.org/global-codes/> provides users an opportunity to provide additional information on their country codes or suggested changes to the tool.

Call for Papers | Special Issue of *Atmosphere* on “Building Energy Codes and Greenhouse Gas Mitigation”

Meredydd Evans (BECWG Operating Agent / Pacific Northwest National Laboratory) and Michael Donn (EBC BECWG Co-Chair / Victoria University of Wellington) are serving as Guest Editors for the special issue of the journal *Atmosphere* on “Building Energy Codes and Greenhouse Gas Mitigation.” They invite researchers to contribute original research articles, as well as review articles, dealing with building energy codes and how they can help to mitigate greenhouse gas emissions. Topics of interest include but are not limited to:

- Modeling to assess the impact of building energy codes on greenhouse gas mitigation;
- Analysis of what makes codes effective in mitigation, including assessments of code impacts post-construction;
- Implementation and compliance case studies and analysis;
- Nearly zero carbon and similar aggressive “stretch” codes;
- Building energy codes for existing buildings

“Countries around the world are increasingly adopting and implementing comprehensive building energy codes to improve the energy efficiency of buildings and reduce greenhouse gas emissions. Their reasoning is that buildings account for some 39% of global CO₂ emissions and are typically in place for decades, if not centuries. Building codes are seen as key tools for achieving a reduction in this total. We are interested in contributions from multiple disciplines and parts of the world.”

—Meredydd Evans, EBC BECWG
Operating Agent

**Deadline for manuscript submissions:
15 January 2021**

For more information, including how to submit a manuscript, please visit:
https://www.mdpi.com/journal/atmosphere/special_issues/building_energy_GHG

Working Group Leadership |

David Nemetzow, U.S Department of Energy, United States (Chair)
Michael Donn, Victoria University of Wellington, New Zealand (Co-Chair)
Meredydd Evans, U.S. Pacific Northwest National Lab, US (Operating Agent)

Participating Countries |

Australia, Brazil, Canada, China, India, Ireland, Italy, Japan, New Zealand, Portugal, Singapore, Sweden, Turkey, United Kingdom, United States

Further information | <https://www.iea-ebc.org/working-group/building-energy-codes>