June 2021

In this issue:

This newsletter is published on a quarterly basis to communicate items of general interest and is part of a broader BECWG 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.

Upcoming and Ongoing Activities

Working Group Report and Upcoming Webinar: Energy Codes for Existing Buildings

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

Building on the BECWG *Codes for Existing Buildings* webinar hosted by Canada on 8 June 2020, a report about energy codes for existing buildings will be released in advance of the EBC ExCo meeting held on 17 June 2021. Led by Australia in collaboration with other countries, the report provides a review of building energy codes and other mandatory regulatory instruments applied to existing buildings. The report addresses topics such as applying building energy codes to renovation and refurbishment, greenhouse gas (GHG) emissions or energy-based requirements, time horizons for targets, and prohibition of sale or lease below certain performance thresholds. The report also includes implementation topics such as national and local government roles and policies, enforcement challenges, and needs for supporting policies. The report findings will be featured in a subsequent webinar on 30 June 2021. Please stay tuned for webinar announcements.

Planned Webinar: Roadmaps for Building Energy Savings & Building Energy Codes

Building efficiency has the potential to significantly reduce energy demand and associated emissions of GHGs and other pollutants and building energy codes are a key policy instrument used to achieve these reductions. Yet, codes are most effective when developed within a policy package of mandatory regulations and standards, financing programs, and incentives that encourage actors to go beyond the minimum performance requirements. While there has been a lot of

discussion about how energy codes compare across countries and jurisdictions, where countries are is often very different from where they want to go.

To explore different out-year trajectories for building technologies (for example, those that reach beyond the current market) and consider building energy codes as a market transformation mechanism, the BECWG, led by the United Kingdom (UK), will hold a webinar about this topic in September 2021. The webinar will draw from the experiences of different countries and discuss the goals, challenges, and successes of road mapping strategies that use codes to accelerate building efficiency, as well as considerations for future enhancements.

Topical Report: Virtual Inspections

Building inspections determine if a building's design and construction comply with the building code. Traditionally, design and construction plans are evaluated in person. However, the COVID-19 pandemic accelerated the rise of virtual inspections around the world because several jurisdictions went on lockdown. To explore the viability of virtual inspections in the longer term, the BECWG is developing a paper to better assess and understand the benefits and drawbacks of virtual inspections from the perspective of early adopters. Led by the United States (U.S.), the associated report will draw lessons from case studies around the world related to various parameters, including the time and financial implications of virtual inspections, scope of inspections, and benefits of virtual inspections to consumers.

Topical Report: Compliance Best Practices

Building energy code compliance is essential to achieving energy savings but requires resources and capacity to ensure effective implementation. While building energy codes vary in format and approach across nations, many face

the same compliance issues, such as requiring faster and easier methods to verify codes.

The BECWG is exploring this topic in a paper. Collaborators on the paper include the United States (lead), Australia, Brazil, Canada, India, Japan, New Zealand, Singapore, South Korea, Turkey and the UK. In a recent meeting, they discussed some of the different strategies used in their countries and will begin drafting the paper over the next few weeks. The anticipated completion date is early fall 2021.

Recent BECWG Activities

Balancing Costs and Benefits of Building Energy Codes: An Evaluation of Methodologies for Assessing Cost-Effectiveness (Webinar)

The cost-effectiveness of building energy codes is a primary factor considered by adopting jurisdictions and is also critical to obtaining stakeholder buy-in and for effectively implementing codes. Approaches to determining their cost-effectiveness can vary considerably across a variety of criteria and economic thresholds, commonly ranging from life-cycle cost methods to simple payback perspectives. Some methods also focus only on initial costs or first-year savings, while others more comprehensively account for costs experienced by the building owner over the many decades a building will be in service.

On 28 April, Canada hosted a webinar to explore differences in methodologies worldwide. One presenter, Dr. Shicong Zhang (China Academy of Building Research), explained how China's building energy codes are striving for zero

energy use and emphasizing the importance of high efficiency to reduce energy costs over a building's lifetime. Mr. Pau Garcia Audí (European Commission) described guidance from the European Union's Energy Performance of Building Directive (EPBD), which is a stepped approach to setting minimum energy performance standards that are cost optimal. The EPBD's cost-optimal methodology helps set performance standards for entire buildings, as well as for individual building elements (e.g., insulation and boilers). Mr. Chris Kirney from CanmetENERGY (Natural Resources Canada) discussed the Building Technology Assessment Platform (BTAP), which models the energy performance and related capital costs across several building archetypes. Mr. Michael Tillou (Pacific Northwest National Laboratory) discussed the cost-effectiveness analysis of energy codes in the U.S., pointing to ASHRAE and IECC standards and calculations. He also discussed efforts to incorporate carbon emission savings and the social cost of carbon into the energy codes.

To learn more and access the presentations, please visit www.iea-ebc.org/working-group/building-energy-codes.

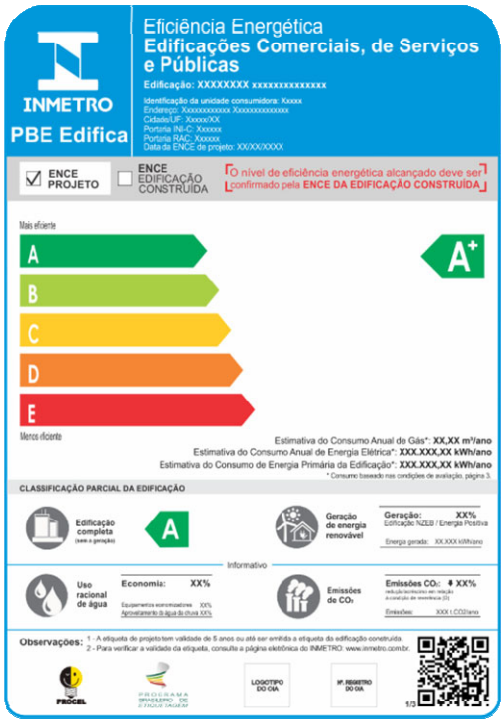
Research Highlights

Building Energy Efficiency in Brazil

The Brazilian Building Energy Labelling Program (PBE Edifica) is currently adopted on a voluntary basis for residential and non-residential buildings, but mandatory for federal buildings. However, a new initiative aims to establish a mandatory program in the residential, nonresidential, and public sectors. The new initiative builds on the Ministry of Mines and Energy's approach to advancing the establishment of minimum levels of energy efficiency. The project was initiated in 2020; the initial steps included discussing the legal basis of the

program and international experiences around this topic. A Stakeholder Committee was formed, bringing together governmental institutions, academia, the building sector, and representatives of civil society. The regulatory problems that affect energy efficiency and mitigation strategies were identified in planning scenarios. The project is also hosting five workshops to help define the Regulatory Impact Analysis and the Plan for the Implementation of the Mandatory Policy. The project is expected to be completed in 2022.

In addition, the PBE Edifica is updating their rating methodology this year for non-residential and residential buildings. The previous labelling system was established in 2008 for commercial and 2010 for residential. This new method is based on primary energy consumption, which allows both electrical and thermal energy from different sources to be accounted for. The system provides an energy efficiency rating from A to E for buildings and individual systems including envelope, HVAC systems, lighting and water heating. The label also includes information on expected annual electricity and natural gas consumption in kWh and cubic meters.



Low energy consumption strategies such as using natural ventilation and daylighting can be assessed using a simplified method, without relying on building simulation.

The Brazilian Government is developing the Ten-year Plan for Energy Efficiency (PDEf). For the first time, Brazil will develop a planning instrument to assess energy efficiency potential in various sectors and to define the main actions in each sector to help tap these potential energy savings. Subsidies provided under the Procel Program will guide the development of the PDEf, which is being developed in partnership with Eletrobras and the Energy Research Office (EPE) and coordinated by the Ministry of Mines and Energy. In 2021, Brazil will hold stakeholder consultations on the plan development, and, by the end of the year, the draft PDEf will be released for public comment. The expectation is to publish the final version in early 2022.

This research highlight was provided by Dr. Roberto Lamberts (LabEEE Federal University of Santa Catrina), Alexandra Maciel (Ministry of Mines and Energy), and Estefânia Melo (PROCEL Eletrobras).

Building Energy Codes Resources

ICC Global Building Codes Tool. The International Code Council (ICC) 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 and is still being populated with data. The tool, available at https://global.iccsafe.org/global-codes/, the tool gives users an opportunity to provide additional information about their country codes or suggest changes to the tool.

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Working Group Leadership |

David Nemtzow, 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)

Participant 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

Pacific Northwest National Laboratory, 902 Battelle Blvd, Richland, WA 99354, USA