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IEA EBC TCP

Building Energy Codes Working Group

The way forward

Meli Stylianou
ExCo Chair and Member for Canada

Outline

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- What is a Working Group (in the context of the IEA EBC TCP)?
- What is the Building Energy Codes Working Group (BECWG)?
- BECWG products to date.
- Proposed BECWG structure.
- Responsibilities of the Advisory Committee and Secretariat.
- Proposed range of issues (to be discussed and modified).
- Round table discussion.
- Next steps.

What is a Working Group?

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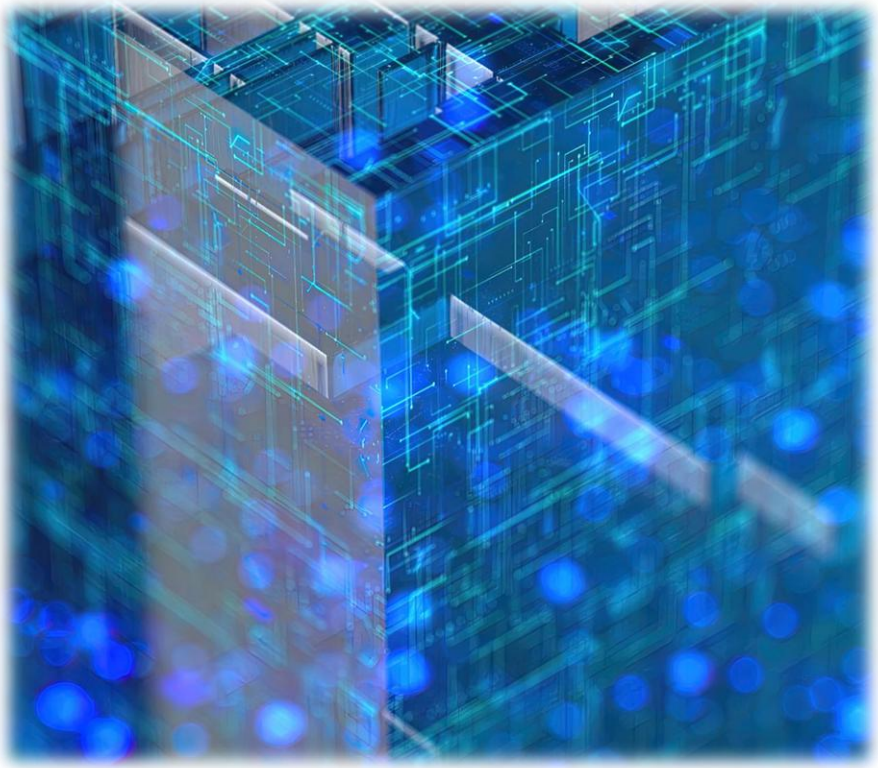
- Working Group (WG):
  - Focused, international team of experts from different countries collaborating on specific energy efficiency topics (like codes, cities, or new tech)
  - Shares knowledge, conduct research, develops methods, and create policy recommendations



What is the BECWG?

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- Launched in June 2019 by Meredydd Evans supported by the US DOE and dedicated to the consideration of building energy codes to foster stronger collaboration to address:
  - The need for faster, easier and reliable methods to check the building code compliance
  - The substantial amount of time it takes for building codes to integrate new technologies
  - The challenge of incorporating energy efficiency into major retrofits of existing buildings
  - The need to meet ambitious policy objectives such as zero net energy construction standards, embodied carbon and resilience
  - The challenge of integrating renewable, distributed energy resources, electric vehicles, and grid-interactive building technologies

BECWG products to date:

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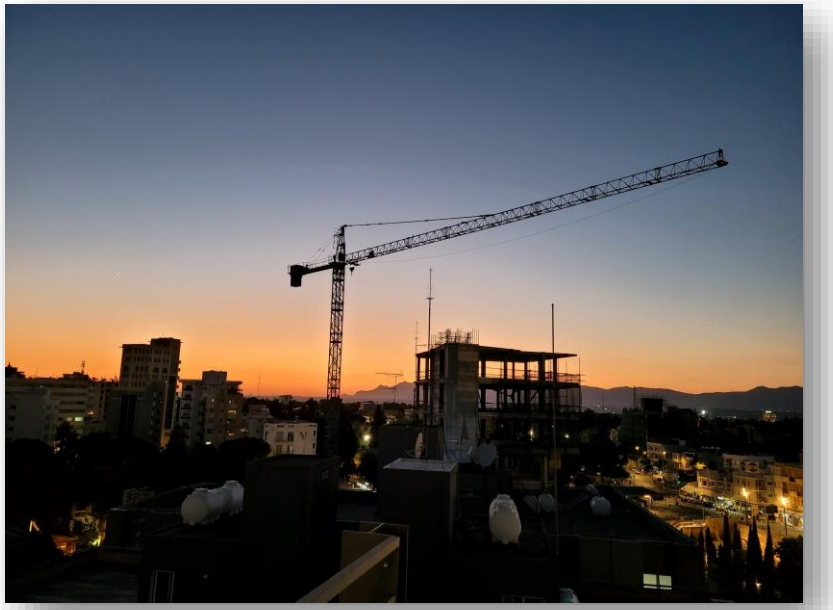
- Annual Symposia
- ~Semi-annual Webinars
- ~Quarterly Newsletters
- ~Quarterly Reports
- Code issues addressed (and selected publications):
  - Codes for existing buildings (June 2021)
  - Best practices for codes compliance (November2021)
  - Energy efficiency in Data Centres (March 2022)
  - Virtual building codes inspections (December 2022)
  - Code requirements for Greenhouse gas emissions (June 2023)
  - Resilience (August 2023)
  - New technology integration in codes(January 2024)
  - Embodied Carbon requirements (June 2025)
  - Protecting occupants from overheating (October2025)



Proposed BECWG structure:

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- Co-Leads:
  - Michael Donn, Stanford Harrison
- Operating Agent:
  - Meli Stylianou
- Secretariat:
  - Brodie Hobson, Matt Young

- Advisory Committee (as of January 5)*:

Michael Dodd	Australia
Danielle Krauel	Canada
Iain MacDonald	Canada
Zhang Shicong	China
Jens Henning Lausten	Denmark
Louis Bourru	France
Vincenzo Corrado	Italy
Takao Sawachi	Japan
Cheol-Soo Park	Korea
Richard London	New Zealand
Sarah Petersson	Sweden
Joerg Dietrich	Switzerland
Sally Semple	UK
Ryan Colker	US
Meredydd Evans	US
Ellen Franconi	US
Tristan Grant	US
Ben Rabe	US

** The advisory committee represents experts from interested countries, rather than representatives of the countries*

Responsibilities of the Advisory Committee and the Secretariat

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Advisory Committee

- Identify important codes-related issues
- Act as liaison between the BECWG secretariat and codes researchers, specialists etc. to invite them to:
  - Present results from their projects and
  - Provide reports that can be posted on our website
- Act as ambassadors for the BECWG to expand our network of collaborators

Secretariat

- Organise AC meetings
- Coordinate collaboration among experts
- Organize dissemination of knowledge
- Organize annual, on-line symposium
- Interact with IEA EBC ExCo as required

Proposed issues
to be discussed and modified

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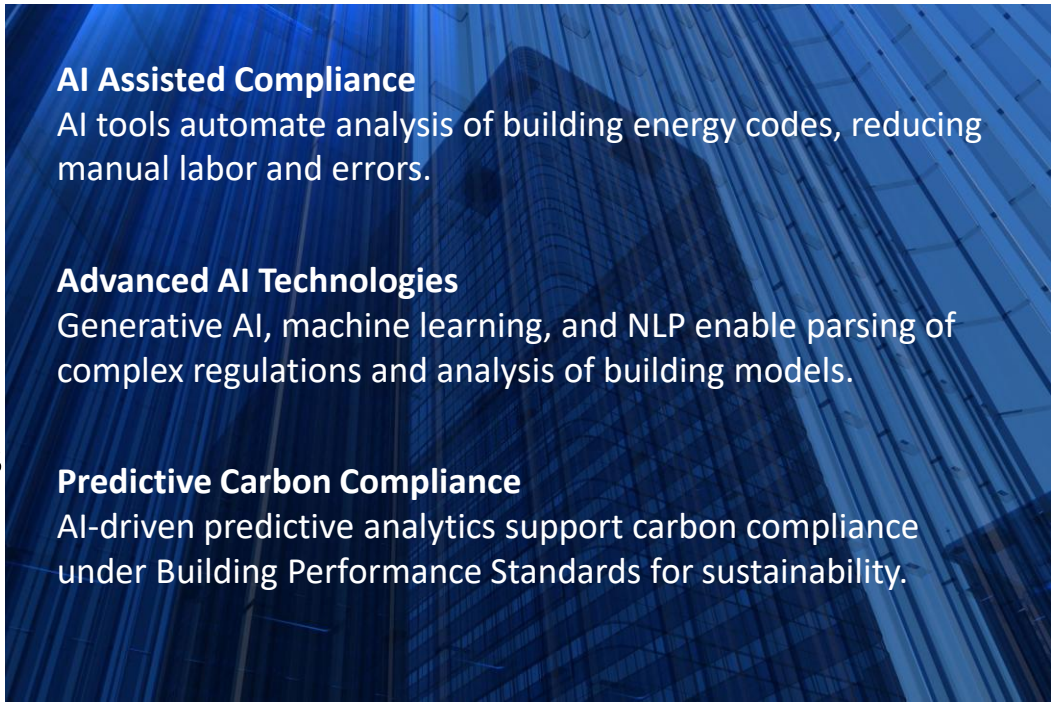
- How to best integrate indoor environment quality in codes (occupant-centric codes?)
- Better address controls, including fault detection and diagnosis, grid-integration functionality and flexibility
- Considerations for cost-benefit analysis
  - Tools for cost-benefit analysis
- Considerations for whole life carbon assessment
  - Tools for WLCA to assist designers
- Updates to:
  - Existing building considerations in code
  - Effective integration of new technologies and processes
  - Addressing code compliance
    - Tools to assist with code compliance
  - Resilience considerations in code
    - Tools to help implement resilience requirements



Introductions and interests

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- Name and affiliation
- Top three codes priorities in your organization/government

- Advisory Committee:
  - Michael Dodd — Australia
  - Danielle Krauel — Canada
  - Iain MacDonald — Canada
  - Zhang Shicong — China
  - Jens Henning Lausten — Denmark
  - Louis Bourru — France
  - Vincenzo Corrado — Italy
  - Takao Sawachi — Japan
  - Cheol-Soo Park — Korea
  - Richard London — New Zealand
  - Sarah Petersson — Sweden
  - Joerg Dietrich — Switzerland
  - Sally Semple — UK
  - Ryan Colker — US
  - Meredydd Evans — US
  - Ellen Franconi — US
  - Tristan Grant — US
  - Ben Rabe — US

Next Steps

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Background information on EBC TCP

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International Energy Agency

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Technology Collaboration Programme

What are the IEA Technology Collaboration Programmes?

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- The IEA Technology Collaboration Programmes (TCPs) support the work of independent, international groups of experts that enable governments and industries from around the world to lead programs and projects on a wide range of energy technologies
  - The experts in the TCPs work to advance the research, development and commercialization of energy technologies.
  - The scope and strategy of each TCP is in keeping with the IEA Shared Goals of energy security, environmental protection and economic growth, as well as engagement worldwide.
  - These collaborations involve over 6 000 experts worldwide who represent nearly 300 public and private organisations located in 55 countries, including many from IEA Association countries such as China, India and Brazil.

EBC TCP Mission Statement

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- The IEA Energy in Buildings and Communities TCP was formally created in 1977. Our current mission is:

  - To support the acceleration of the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge, technologies and processes and other solutions through international collaborative research and open innovation.

EBC - Executive Committee

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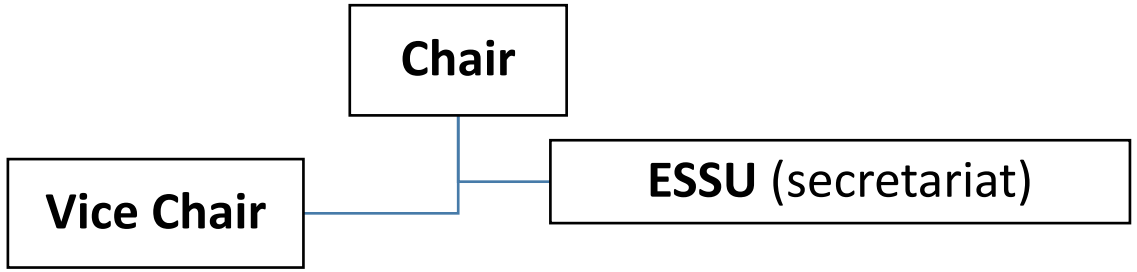
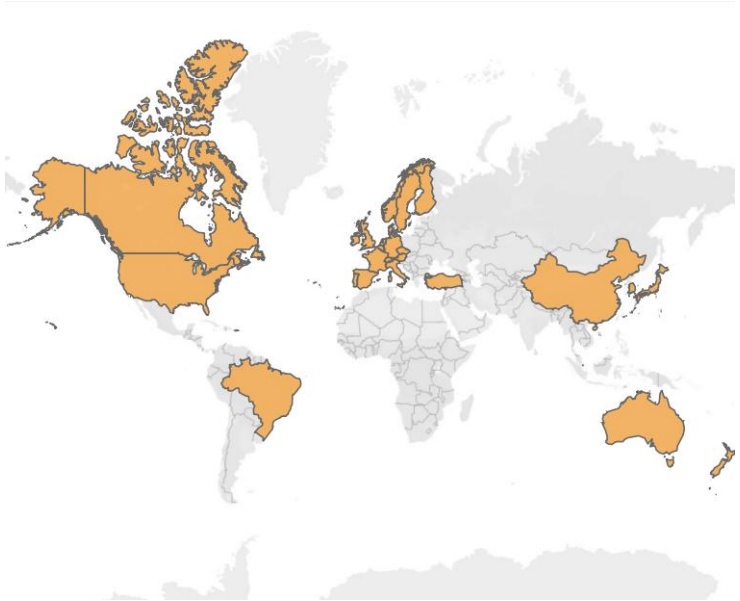


Executive Committee: Australia, Austria, Belgium, Brazil, Canada, China, Czechia, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Republic of Korea, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, The Netherlands, Türkiye, United Kingdom, United States of America



Activities overview

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Over 500 teams from 26 countries are working to:

- Address the retrofit of the existing building stock
- Deliver net-zero new buildings
- Address embodied carbon in new construction and retrofit
- Address electrification of the built environment
- Address digitalisation and responsiveness to the grids (electrical and thermal)
- Ensure that energy efficiency / decarbonisation measures for buildings and the built environment are future-proof and take account of adaptation to a changing climate

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Creating collaborative projects

- Process:
  1. A researcher from a member country, has an idea of a project related to his research funded by their home country
  2. Through their knowledge of the academic work, they contact several other researchers interested in his project
  3. They put together a “project concept” describing the project at a high level
  4. They present the project to the EBC Exco, and if the committee finds merit in the project, it gives the go-ahead for the development of a full “Annex” proposal, and assigns an Annex Advisor to help
  5. They convene an international workshop to develop the content of the Annex
  6. Based on the results of the workshop they prepare a draft Annex text with detailed project plan and deliverables and present it to the EBC Exco for approval.
  7. Approval of the text signifies the initiation of the work

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On going Annexes 1/2

Decarbonising building sector through innovative design of new and retrofit of existing buildings

92 Smart Materials for Energy-Efficient Heating, Cooling and IAQ Control in Residential Buildings
91 Open BIM for Energy Efficient Buildings
90 EBC Annex 90 / SHC Task 70 Low Carbon, High Comfort Integrated Lighting
89 Ways to Implement Net-zero Whole Life Carbon Buildings
85 Indirect Evaporative Cooling

Decarbonising building sector through flexible operation and integration with energy systems

96 Grid Integrated Control of Buildings
94 Validation and Verification of In-situ Building Energy Performance Measurement Techniques
88 Evaluation and Demonstration of Actual Energy Efficiency of Heat Pump Systems in Buildings
84 Demand Management of Buildings in Thermal Networks
83 Positive Energy Districts
82 Energy Flexible Buildings Towards Resilient Low Carbon Energy Systems

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On going Annexes 2/2

Addressing resilience in buildings by putting occupants first

95 Human-centric Building Design and Operation for a Changing Climate (Jointly with Users TCP)
93 Energy Resilience of the Buildings in Remote Cold Regions
79 Occupant-Centric Building Design and Operation

Creating healthy and productive indoor environments

87 Energy and Indoor Environmental Quality Performance of Personalised Environmental Control Systems
86 Energy Efficient Indoor Air Quality Management in Residential Buildings
78 Supplementing Ventilation with Gas-phase Air Cleaning, Implementation and Energy Implications
05 Air Infiltration and Ventilation Centre

…and the Building Energy Codes Working Group

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Project results

- Peer-reviewed journal papers
- Full scientific reports
- Handbooks
- Design guidelines
- Summary reports
- Factsheets
- Software tools

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Dissemination and outreach

- Website (430,000 downloads of Annex reports over 12 months to September 2024)
- Newsletters, Annual Report
- Support to the IEA Secretariat
- Collaboration with standards organizations such as ASHRAE
- Transfer of research results to policy and program organizations

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In conclusion…

- Emphasis of the EBC TCP is on a holistic view of buildings, as systems, and their role in the electricity grids and thermal networks to which they are connected

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For more information:

- Let me know:
  - meli.stylianou@nrcan-rncan.gc.ca

Or

- https://www.iea-ebc.org