BUILDING ENERGY CODES
WORKING GROUP

EBC
Energy in Buildings and Communities Programme

Meeting Recap: Fourth meeting of the Building Energy Codes Working Group – Exploring Overheating and the Codes Part II

IEA-EBC Working Group on Building Energy Codes

April 29, 2026

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Table of content

1 Summary

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- **Dropping "Advisory Committee" from Name:** The Building Energy Codes Working Group Advisory Committee will now be known simply as the Building Energy Codes Working Group.
- **Brazil's Overheating and Energy Efficiency Regulations:** Alexandra Maciel and Roberto Lamberts presented Brazil's evolving regulatory framework for building energy efficiency and overheating, detailing the transition from voluntary labelling to mandatory standards, the use of climate data in simulations, and the challenges of adapting to future climate projections.
    - **Regulatory Timeline and Labelling:** Alexandra explained that Brazil's energy efficiency labelling for buildings began as a voluntary program in 2009-2010, but a new regulation published in 2025 will make compliance mandatory, using the label as the main instrument for both new and retrofitted buildings. The DEO program is being developed for existing buildings in operation.
    - **Minimum Standards and Climate Diversity:** The new regulations set different minimum standards for public and private buildings, with public buildings required to meet higher standards by 2035, including 50% of primary energy demand from renewables. Alexandra highlighted Brazil's diverse climates, widespread use of natural ventilation, and the prevalence of non-insulated envelopes, especially in low-income housing.
    - **Thermal Performance and Simulation Methods:** The national standard for residential buildings includes minimum performance requirements and a dedicated chapter on thermal performance. Simulations use reference buildings and climate data, focusing on occupant behaviour and hybrid strategies, with thermal loads counted only when natural ventilation is insufficient.
    - **Challenges with Climate Data and Future Projections:** Current simulations use historical climate data, not accounting for climate change. Alexandra presented case studies comparing results using current and projected future climates, showing significant differences and underscoring the need to update regulations to consider future conditions.
    - **Q&A on Ventilation, Construction Systems, and Comfort Limits:** Vincenzo Corrado asked about ventilation rates and cooling strategies, with Roberto explaining the use of EnergyPlus simulations based on temperature. Karine Jan inquired about comparing construction systems, and Roberto discussed the impact of roof insulation and the potential for system mixing. Richard London asked about sources of thermal gain, and Roberto clarified both solar and radiant heat are significant. Sally Semple questioned temperature targets, with Roberto noting the same limits are used day and night, and higher temperatures are common in practice.
- **French Regulations for Overheating in New and Existing Buildings:** Louis Bourru and Karine Jan outlined France's regulatory approach to overheating in new and existing buildings, describing the use of degree hours as a metric, adaptive comfort thresholds, prescriptive measures, and the challenges of applying and monitoring these standards.
    - **Degree Hours Metric and Adaptive Comfort:** Louis described the use of degree hours (DH) as the primary metric for overheating, calculated as the difference between indoor operative temperature and an adaptive comfort threshold. Regulatory thresholds are set at 350 and 1250 DH, with penalties for exceeding the lower threshold and non-compliance above the upper threshold. The metric is based on comfort, not health, and uses adaptive limits for day and fixed limits for night.
    - **Simulation and Prescriptive Measures:** Simulations are required for compliance, using official software and a heat wave climate file. Prescriptive measures include maximum solar factors for windows, requirements for window operability, and consideration of passive and semi-active systems. Air conditioning is assumed off during simulations, and passive systems like sunshades and Canadian wells are included.
    - **Regulations for Existing Buildings:** Karine explained that regulations for existing buildings are less advanced, focusing on energy performance certificates, global renovation requirements, and element-by-element upgrades. Obligations include minimum performance for renovated elements, mandatory insulation

during major works, and requirements for summer comfort, though enforcement is weaker than for new buildings.

- **Climate Zones and Occupancy Schedules:** France is divided into eight climate zones, with simulations using a heat wave period. The same DH thresholds apply nationwide, but higher thresholds are accepted in the south due to climate and occupancy patterns. Standardized occupancy schedules are used, with variations for weekends and afternoons.
- **Q&A on Humidity, Passive Solutions, and Simulation Tools:** Questions addressed the lack of humidity consideration in ground cooling, the limited role of green roofs and cool roofs due to winter insulation needs, and the use of archetypes in simplified simulation tools. The software for energy and overheating simulations is the same, and efforts are underway to develop simplified and AI-assisted tools for property owners.

- **Australian Building Code and Overheating Research:** Michael Dodd and Mahsan Sadeghi presented Australia's current building code provisions related to overheating, the absence of explicit overheating requirements, and ongoing research to develop adaptive overheating models for residential buildings, with collaborative field studies and literature reviews.
  - **Current Regulatory Framework:** Michael explained that Australia's building code does not currently include explicit overheating requirements. Energy efficiency standards, differentiated by eight climate zones, serve as a proxy for overheating mitigation. Compliance is demonstrated through elemental or whole-of-home energy benchmarks, with prescriptive requirements for insulation, windows, and ceiling fans.
  - **Commercial Buildings and Future Provisions:** For commercial buildings, energy efficiency is also used as a proxy for overheating, with additional requirements for night purge and economy cycles. New provisions, effective from 2027, will use future climate files and require demonstration of comfort standards, such as predicted mean vote or dry bulb temperature limits.
  - **CSIRO Research on Overheating Metrics:** Mahsan described CSIRO's research to develop a residential overheating model for Australia, involving a comprehensive literature review of international standards, identification of gaps, and the development of an adaptive model using the SET index and degree hours as the metric. The model incorporates six parameters, including air temperature, mean radiant temperature, humidity, air speed, clothing, and metabolic rate.
  - **Field Studies and Data Collection:** Five Australian universities collected field data across seven climate zones, measuring environmental parameters and conducting occupant surveys to assess thermal comfort and adaptive behaviours. The resulting model provides an overheating threshold based on mean monthly outdoor air temperature, with regression equations for practical application.
  - **Q&A on Comfort vs. Load-Based Metrics:** Roberto asked about the difference between comfort-based and load-based metrics, particularly for naturally ventilated buildings. Mahsan clarified that the new criteria focus on free-running buildings and aim to address the limitations of using energy loads as a proxy for comfort, while Michael emphasized the need for separate measures for energy efficiency and overheating in future regulations.
  - **Support for New Zealand's Overheating Research:** Richard and Mahsan acknowledged the collaboration between CSIRO and New Zealand's Ministry of Business, Innovation and Employment, with data and expertise being shared to develop an overheating assessment methodology for New Zealand.

- **UK Overheating Standards and Compliance Methods:** Sally Semple presented the UK's overheating standards introduced in 2021, detailing the simplified and dynamic compliance routes, the use of TM59 metrics, challenges in monitoring and enforcement, and ongoing research and review efforts.
  - **Regulatory Background and Compliance Routes:** Sally explained that the UK's building regulations for England and Wales now require reasonable provision to limit unwanted solar gains and provide adequate heat removal. Compliance can be achieved via a simplified method (limiting glazing and ensuring purge ventilation) or a dynamic simulation method based on TM59, with strict overnight temperature limits for bedrooms.
  - **Metrics, Monitoring, and Data Challenges:** The dynamic method requires that less than 1% of overnight hours exceed 26°C in bedrooms. Monitoring compliance is challenging, with efforts to use energy performance certificates and academic studies to gather data on actual building performance and occupant experiences. The English Housing Survey provides some subjective data on overheating.

- **Interactions with Other Regulations:** There are interactions between overheating, ventilation, energy efficiency, and security requirements. For example, windows used for overnight ventilation must have high guarding levels, and highly sealed buildings require mechanical background ventilation. Security and noise considerations also affect assumptions about window use.
- **Ongoing Research and Future Review:** The Building Safety Regulator is conducting research projects and a major review of overheating guidance, with anticipated recommendations for improvements by late 2027. The review will consider the impact of new climate data and the effectiveness of current compliance methods.
- **Q&A on Simulation Tools and Metrics:** Questions addressed the use of third-party dynamic simulation software based on TM59, the lack of a prescribed calculation engine, and the difficulties in tracking real-time data and ensuring proper installation of ventilation systems. Sally noted that the simplified method may be replaced in future revisions due to its limited applicability in high-risk areas like London.

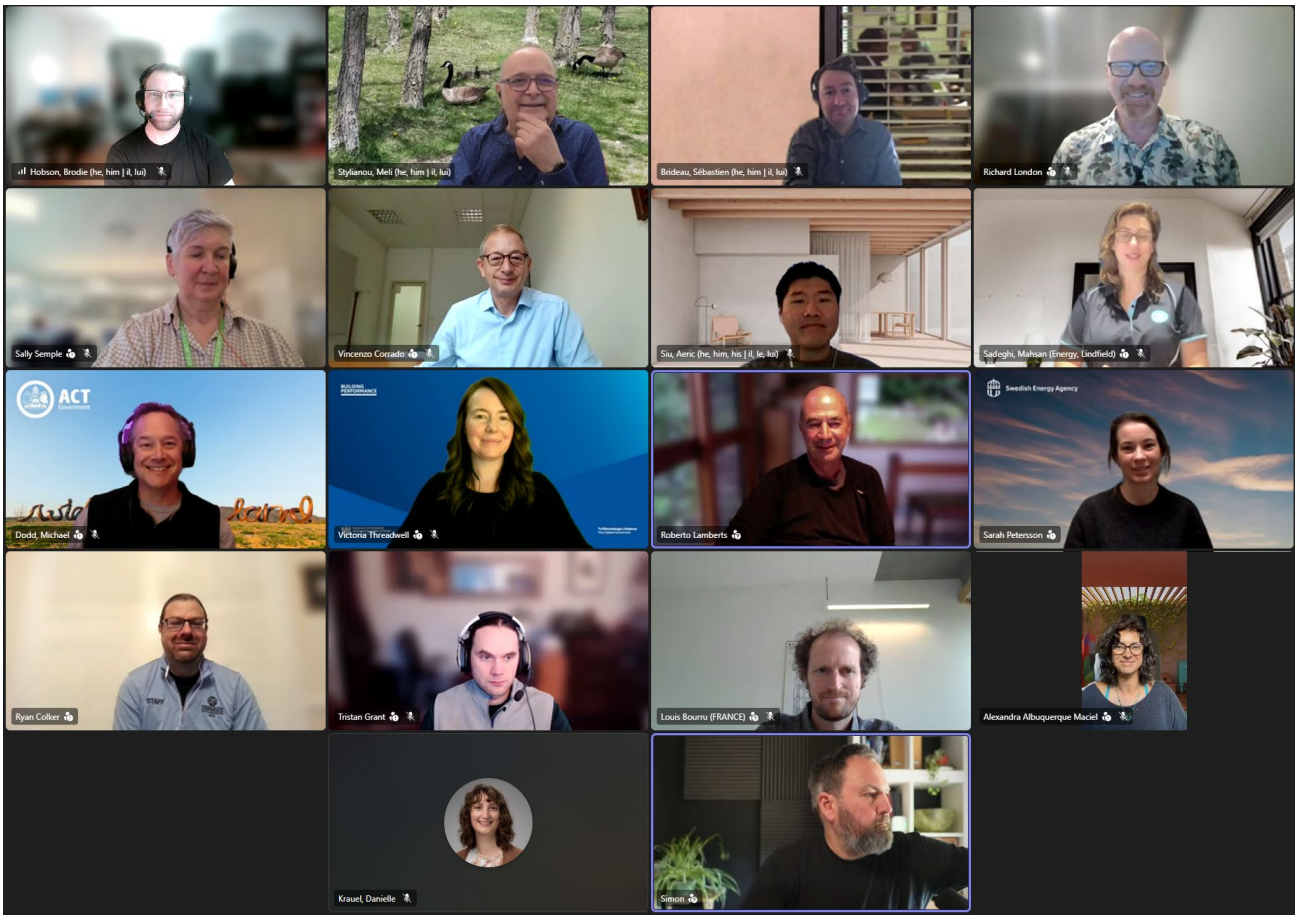
- **International Collaboration and Next Steps:** Meli Stylianou, Richard London, and other participants discussed ongoing international collaboration, the scheduling of future meetings, and the sharing of presentations and research to support the development of overheating regulations and methodologies in various countries.
- **Meeting Scheduling and Agenda:** Meli confirmed that the next meeting is scheduled for May 11th, with plans to limit sessions to two hours and to continue with additional meetings as needed to accommodate all presentations and discussions.

2 Action items

- **Sharing Presentations and Research:** Participants were asked to send their presentations to Meli for inclusion on the EBC website, facilitating knowledge sharing and transparency among the international group (Alexandra, Roberto, Louis, Karine, Michael, Mahsan, Sally).
- **Next meeting:** Send out the invitation for the next meeting, including any new agenda items that may arise. (Meli)

3 Attendees

Name	Affiliation	Country
Louis Bourru	Cerema	France
Sébastien Brideau	Natural Resources Canada	Canada
Ryan Colker	International Code Council	USA
Vincenzo Corrado	Polytechnic University of Turin	Italy
Michael Dodd	Australia Capital Territorial Government	Australia
Tristan Grant	New Buildings Institute	USA
Stanford Harrison	Department of Climate Change, Energy, the Environnement & Water	Australia
Brodie Hobson	Natural Resources Canada	Canada
Karine Jan	Cerema	France
Simon Jones	EBC Secretariat	Belgium
Danielle Krauel	Natural Resources Canada	Canada
Roberto Lamberts	Federal University of Santa Catarina	Brazil
Richard London	Ministry of Business, Innovation & Employment	New Zealand
Alexandra Maciel	Ministry of Mines & Energy	Brazil
Sarah Petersson	Swedish Energy Agency	Sweden
Mahsan Sadeghi	CSIRO	Australia
Sally Semple	Health and Safety Executive	UK
Aeric Siu	Natural Resources Canada	Canada
Meli Stylianou	Natural Resources Canada	Canada
Victoria Threadwell	Ministry of Business, Innovation & Employment	New Zealand


Hobson, Brodie (he, him | il, lui)
Styliianou, Meli (he, him | il, lui)
Brideau, Sébastien (he, him | il, lui)
Richard London
Sally Semple
Vincenzo Corrado
Siu, Aeric (he, him, his | il, le, lui)
Sadeghi, Mahsan (Energy, Lindfield)
ACT
Dodd, Michael
Victoria Threadwell
Roberto Lamberts
Swedish Energy Agency
Sarah Petersson
Ryan Colker
Tristan Grant
Louis Bourru (FRANCE)
Alexandra Albuquerque Maciel
Krauel, Danielle
Simon