



Shaping Tomorrow's
Built Environment Today

ASHRAE Building Code Assessment Tool (BCAT)

FACILITATION GUIDE

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Background

The ASHRAE Building Codes Assessment Tool (BCAT) was developed by the ASHRAE Center of Excellence for Building Decarbonization (CEBD) as part of the Flexible Building Codes Framework project.

The tool is designed to support collaborative, multi-stakeholder needs and capabilities assessment workshops as an initial step in developing and implementing new or enhanced building energy codes and policies aligned with achieving long-term building sector decarbonization. While the tool was primarily developed for use in emerging economies without mandatory building energy codes, it is flexible enough to be used in all national and local jurisdictions to help update existing building codes and improve building code development and implementation practices.

The BCAT project team included Clay Nesler, Ghina Annan and Amr Suliman with support from the ASHRAE Global Technology Integration Council and Global Government Affairs Committee. International collaboration partners included the World Bank/IFC, World Resources Institute, C40 Cities, and the Pacific Northwest National Laboratory.

Overview

Slide 2 - The presentation starts with the agenda for the workshop which includes sections describing the background, framework, assessment tool and process, and recommended next steps. References, glossary and an appendix on building code design elements are also included in the presentation.

Slide 3 - The ASHRAE Building Codes Assessment Tool (BCAT) presentation starts by providing background on the importance of international building energy codes, including their role in addressing building decarbonization challenges.

Slide 4 - The presentation summarizes the global challenge in meeting building decarbonization goals, especially in emerging economies where there is a lack of mandatory building codes and most of the population growth is occurring.

Slide 5 - ASHRAE’s commitment to transition from energy codes to address operational and embodied carbon and helping Global South countries develop and improve consensus-based building codes.

Slide 6 - The ASHRAE Flexible Building Code Development Framework is introduced which provides the technical basis for the building code assessment tool. The framework includes six major elements: building code needs, building code measures, building code development, building code implementation, building code training and education, and building code stakeholder engagement.

Slide 7 - The building code assessment process consists of four sections:

- **Building Code Needs** assesses and prioritizes building code objectives, answering the “why” national, state and local governments need updated, modern building energy codes.
- **Building Code Measures** assesses and prioritizes the technical building construction and operational measures required to meet building code stakeholder needs and objectives.
- **Building Policies and Code Capabilities** assesses and prioritizes government building policies and evaluates government capabilities and capacity for developing, implementing and improving building codes over time.
- **Stakeholder Engagement** assesses and prioritizes which individuals and entities should be involved in building code development, implementation, training and education.

These four sections are organized into 20 categories (listed on the slide) and include 100 individual needs, measures, policies, capabilities and stakeholders for workshop participant assessment based on relative importance and priority.

Slide 8 - The assessment process includes an introduction to each of the four sections and an assessment of the relative importance for each need, measure, policy, capability and stakeholder as well as selection of the highest priority items. The highest priority items from all the workshop participants are then totaled by a “show of hands” on a large wall-mounted section table. The participant importance ratings and priority selections are analyzed after the workshop and included in the summary report.

The assessment process also includes a gamification element where each individual workshop participant’s high priority selections are compared to global consensus results from initial pilot workshops in North America, Kenya and Lebanon. The participant(s) with the most consensus high priority matches is named the winner, adding a fun, competitive element to the workshop.

Slide 9 – This slide provides instructions on using the participant scoring sheets for each assessment category and topic. A copy of an example scoring sheet is included as an appendix in this facilitator’s guide.

- Step 1: Participants rate each topic’s relative importance on the scoring sheet with an “X”
- Step 2: Participants then select the highest priorities on scoring sheet with an “X”

After the scoring sheets are completed, the facilitator asks how many participants rated each topic a high priority by a “show of hands” and then writes the number of “votes” on a section table printed on a large wall-mounted sheet of paper. Alternatively, the participants can add “sticky dots” to the wall mounted tables based on their individual selections. This is an interesting, interactive exercise that gives the

participants a chance to stand up, mingle a bit and discuss the results. It does take more time than the “show of hands” exercise but is recommended.

The workshop facilitator then reveals the global consensus high priorities summary slide

Step 3: Participants mark the consensus matching priorities with an “X”

Step 4: Participants add up the total consensus matching priorities

Step 5: Participants indicate their building sector role with an “X”

Slides 10 to 13 – Building Code Needs Assessment Section

Slide 14 - The global consensus priorities from pilot workshops in North America, Kenya and Lebanon are shown in the graphic with green shading for high priority and yellow shading for medium priority. The high priority needs are also listed next to the table. These are the priorities which receive points towards the game if the participant also selected those as highest priority needs.

Slides 15 to 22 - Building Code Measures Assessment Section

Slides 23 to 30 - Building Policies and Code Capability Assessment Section

Slides 31 to 36 - Stakeholder Engagement Assessment Section

Slide 37 – The workshop participants total their scores from all four sections, or from each section included in an abbreviated workshop. The facilitator then slowly starts counting down from 32 (the maximum possible score) until one (or more) of the participants raise their hands. They are the “winners” with the closest match to the global consensus priority results. The facilitator should continue counting down to see what other workshop participants scored. Providing a small buildings-related prize (like a small doll house heat pump) to the winner(s) is an appreciated gesture.

Slide 38 – Time should be reserved to review the key insights from the workshop using questions such as the following:

- What were the consensus priorities for each section?
- Where did today’s workshop participants disagree on priorities?
- Where did today’s workshop participants disagree with global consensus priorities?
- Were there significant differences in priorities based on participant roles?
- What additional training and education is needed?
- Were any important stakeholders missing from the workshop? How can they be involved in future activities?

Given sufficient time in the workshop agenda, the participants could start to create a plan for developing, implementing and improving their building codes based on information, findings and guidance from the workshop. This plan should leverage and further develop the code capabilities and best practices identified during the workshop as well as the presentation technical references. The action plan should describe who will do what, when and where and how development and implementation should be managed.

A summary and detailed analysis of participant data should be provided in the summary report.

Slide 39 - This slide includes links to international model building codes and standards that provide useful global references for building energy code development for both commercial and residential buildings.

Slides 40 to 41 – These slides include key technical references used in developing the flexible building code framework and the BCAT assessment tool. They are useful references to support on-going code development, implementation, improvement, training and education activities.

Slide 42 – This is a glossary of building industry acronyms used in the presentation.

After the section is completed, collect the scoring sheets so that the participant importance ratings and priority selections can be analyzed after the workshop and included in the summary report. Participants do not need to put their name on the scoring sheets, only their building industry role.

Slides 43 to 47 - The presentation includes an optional Appendix which includes a list of common building code design elements. The design elements include building code types, building code metrics, building code applicability and build type coverage. The next four slides can be used to prompt discussion of next steps in building code development, can be evaluated based on coverage in current building codes, and/or assessed as a group based on the magnitude of impact, and difficulty of implementation. They also provide a useful reference for stakeholder education after the BCAT assessments either during or after the workshop.

Slide 48 – Thank the workshop organizers and participants for a successful event. Commit to providing a summary report which includes key workshop insights, findings and an analysis of participant data.

PLEASE provide the CEBD project team with copies/photos of all of the scoring sheets and priority tables from the workshop. Also provide photos of the workshop participants, especially when gathered around the large wall-size table charts for the dot prioritization exercise. The data will be used to update the global consensus priority data as well as guide future ASHRAE training, education and standardization activities for international building code development.

Workshop Facilitation and Analysis Support

Clay Nesler, the ASHRAE CEBD project leader and developer of the BCAT presentation and assessment tool, can be contacted by workshop organizers and facilitators who have questions about the BCAT assessment process or tool. The CEBD project team members are available to support workshop preparation, facilitation, data analysis and the presentation of results.

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IMPORTANT – DO NOT DISTRIBUTE COPIES OF THE PRESENTATION to the workshop participants prior to the workshop as the slides include the “answers” for the gamification element of the BCAT assessment.

APPENDIX - EXAMPLE PARTICIPANT SCORING SHEET

ASHRAE Building Codes Assessment Tool Needs Assessment - Section One		Step 1					Step 2 Top 7 Priority Selections (X)	Step 3 Group Consensus Matches (X)		
		Importance Rating (X)								
		Not at all Important	Somewhat Important	Important	Very Important	Extremely Important				
Environmental Needs										
N1	Reduce building operational greenhouse gas emissions									
N2	Reduce embodied carbon in building materials and equipment									
N3	Reduce fossil fuel use in buildings for heating									
N4	Increase use of zero carbon renewable energy									
N5	Increase facility resilience to climate change impacts									
Public Infrastructure Needs										
N6	Decrease water consumption and demand									
N7	Protect and enhance natural systems and habitats									
N8	Decrease transportation-related emissions									
N9	Reduce waste from building construction and renovation									
N10	Decrease electrical grid capacity requirements									
Building Owner and Occupant Needs										
N11	Maintain building occupant comfort, health and safety									
N12	Increase building owner and tenant affordability									
N13	Increase building asset value									
N14	Support sustainability goals and commitments									
N15	Maintain compliance with government regulations									
Policy and Regulatory Needs										
N16	Align building policies with public goals and commitments									
N17	Assure high levels of stakeholder engagement in policy development and implementation									
N18	Reduce the cost/complexity of policy development and implementation									
N19	Accurately estimate the costs and benefits of proposed building policies and regulations									
N20	Assure high levels of compliance for building policies and regulations									
Participant Role: National Government (), State/Local Government (), Buildings Owners/Managers (), Buildings Industry (), Research/Academia (), International Organizations/Non-Profit (), Financial Sector ()							Total Score			

ASHRAE Building Codes Assessment Tool
Needs Assessment - Section One

Step 1					Step 2	Step 3
Importance Rating (X)					Top 7 Priority Selections (X)	Group Consensus Matches (X)
Not at all Important	Somewhat Important	Important	Very Important	Extremely Important		

Environmental Needs

N1	Reduce building operational greenhouse gas emissions
N2	Reduce embodied carbon in building materials and equipment
N3	Reduce fossil fuel use in buildings for heating
N4	Increase use of zero carbon renewable energy
N5	Increase facility resilience to climate change impacts

Public Infrastructure Needs

N6	Decrease water consumption and demand
N7	Protect and enhance natural systems and habitats
N8	Decrease transportation-related emissions
N9	Reduce waste from building construction and renovation
N10	Decrease electrical grid capacity requirements

Building Owner and Occupant Needs

N11	Maintain building occupant comfort, health and safety
N12	Increase building owner and tenant affordability
N13	Increase building asset value
N14	Support sustainability goals and commitments
N15	Maintain compliance with government regulations

Policy and Regulatory Needs

N16	Align building policies with public goals and commitments
N17	Assure high levels of stakeholder engagement in policy development and implementation
N18	Reduce the cost/complexity of policy development and implementation
N19	Accurately estimate the costs and benefits of proposed building policies and regulations
N20	Assure high levels of compliance for building policies and regulations

Participant Role: National Government (), State/Local Government (), Buildings Owners/Managers (), Buildings Industry (), Research/Academia (), International Organizations/Non-Profit (), Financial Sector ()

Total Score