

BESTfest: How the Building Enclosure Science and Technology Field Changed with COVID-19

April 28, 2021 | Session Overview

SPEAKERS

Vincent Martinez, Chief Operating Officer, Architecture 2030
Ivan Lee, Building Science Consultant, Morrison Hershfield
Ralph DiNola, Chief Executive Officer, New Buildings Institute (NBI)
Andrea Del Giudice, Associate Principal and Unit Manager, WJE
John Burningham, Principal of Performance Programs, UNVC
Will Babbington, Facade Design Director, Studio NYL, N-BECs Chair
Stephen Shanks, Principal, ECS Mid-Atlantic, BETEC Chair

HOW THE BUILDING ENCLOSURE SCIENCE AND TECH FIELD CHANGED WITH COVID-19 OVERVIEW

Since the beginning of the pandemic, building enclosures have received closer scrutiny, with everyone from consumers to building professionals to local and federal government, wanting to know more about their technologies and performance.

This BESTfest seminar brought together industry leaders and experts to discuss how the building enclosure science and technology field has changed since COVID-19 shook the world.

More than 150 registrants signed up for the four-hour virtual program, which was sponsored by the National Institute of Building Sciences Building Enclosure Technology and Environment Council (BETEC), alongside the Building Enclosure Council (BEC) chapter networks.

Building enclosures are expected to be durable and provide a degree of environmental separation. They increasingly must focus on energy efficiency, daylighting, indoor air quality, fire safety, thermal comfort, and carbon footprint. Now, there's a need to explicitly ensure these performance objectives are fully defined in the planning and design stage and efficiently executed through construction and

operations.

As construction technology has become more complex and standards are more demanding, now is the time to hold a broader conversation on innovations in the field. The panel discussed changes in materials and methods that have resulted from the latest technology advancements.

WHAT IT WILL TAKE TO ACHIEVE ZERO CARBON

Rapid and major emissions reductions in the building sector will establish a powerful force for global action and business development.

Vincent Martinez, Chief Operating Officer with Architecture 2030, said that through practice and policy, the design, planning, and building community must rapidly transform urban development and the built environment from being the major contributor of greenhouse gas emissions to a central part of the solution to the climate crisis.

"We are in a climate emergency," Martinez said, mentioning that a global carbon budget of 340 gigatons gives a 67 percent probability of meeting the 1.5-degree Celsius warming target.

According to the International Energy Agency, the building

industry, which includes infrastructure, building structure, substructure, enclosure, finishes, equipment and systems, contributes 43 percent of global carbon dioxide emissions. Building operations contributes 28 percent, and transportation takes 23 percent of the pie.

Martinez said for new buildings to be zero emissions, they must come in with a high level of efficiency.

“We need to make sure the energy that is coming to the building is renewable,” he said.

Energy efficiency brings a whole host of benefits, including occupant comfort and this requires less power. He discussed the new 2021 International Energy Conservation Code (IECC), which addresses energy efficiency on several fronts, including cost, energy usage, use of natural resources, and the impact of energy usage on the environment.

THE BENEFITS OF ALIGNING POLICY REQUIREMENTS WITH INTERVENTION POINTS

When it comes to existing buildings, becoming zero carbon requires updates to systems, namely space heating, water heating, and upgrading to renewable power sources.

A policy mechanism needs to be put in place that requires compliance, Martinez said. It can look something like: Big emitters must be zero carbon by 2030; small emitters must be zero carbon by 2040.

Intervention points – where planned capital improvements may take place or when a building is not currently being leased or when it’s time to renovate or replace equipment – provide great opportunities to upgrade existing buildings.

The benefits of aligning policy requirements with intervention points include: It reduces upgrade costs, reduces disruption to occupants, and financing options are increased.

“Energy efficiency has been a really hard nut to crack across the globe, and it provides so many benefits,” he said. “But if you package it with decarbonization and intervention points ... it could drive deeper levels of efficiency.”

TRENDS FOR HEALTHY, HIGH-PERFORMANCE BUILDINGS IN THE POST-COVID AGE

With the U.S. rejoining the Paris Agreement, portions of the country recovering from natural disasters and the building sector re-emerging from a global pandemic, now is the time for us to fundamentally shift how we design, build, operate and renovate buildings.

In this “decade of decarbonization,” we must accelerate the adoption of carbon neutral building policies and operating practices, said Ralph DiNola, Chief Executive Officer, New Buildings Institute (NBI).

DiNola reviewed the Five Foundations for Zero Carbon Building Policies, discussing items like energy efficiency, renewable energy, and life cycle impacts.

“We know the building sector can play a key role in slashing U.S. emissions 50-52 percent by 2030,” he said, mentioning the 2021 IECC Building Decarbonization Code – a groundbreaking tool aimed at delivering carbon neutral performance.

DiNola talked about building enclosure’s role in energy efficiency using “passive house principles” – enhanced envelope + ERV = low HVAC loads.

Grid-friendly buildings also are an important next step toward resilience, as we saw in places like Texas, in recent months. Other things to consider: heat pump technologies and keeping an eye on renovations and new construction, embodied carbon/low GWP refrigerants, and building materials (concrete, steel, aluminum, etc.).

THE DIVINE IS IN THE DETAILS

The other speakers in the program highlighted more detailed aspects of working within the building enclosure arena. Ivan Lee, Building Science Consultant from Morrison Hershfield, presented an overview of changes, including those that relate to low Thermal Energy Demand Intensity (TEDI) buildings, within the latest edition of the Building Envelope Thermal Bridging Guide. Lee also demonstrated a new thermal bridging website to allow for quick searches and calculations regarding thermal bridging.

Andrea Delgiudice, Associate Principal and Unit Manager, WJE, presented the latest changes to ASTM E2813 Standard Practice for Building Enclosure Commissioning (BECx), which establishes minimum levels of BECx, and its companion guide, ASTM E2947 Standard Guide for Building Enclosure Commissioning, which was updated just this year. She explained how many of the changes, including terminology and definitions, were effected to bring the standard and its companion guide into closer alignment. Also within the standards arena, John Burningham, Principal of Performance Programs, UNVC, told the development history and shared lessons learned from Utah's Ultra-High Building Performance Standards Program, which adopted a stringent standard and testing protocol that has resulting in a high degree of success in building energy efficiency.

To round out BESTfest, Will Babbington, Facade Design Director, Studio NYL and Chair of the National-Building Enclosure Councils, moderated an assembly of BEC champions: Greta Eckhardt (BEC-Boston), Mike Smalley and Curt Rafferty (BEC-St. Louis), Darrell Smith (BEC-Iowa), and Dave Young (BEC-Portland) explaining how their councils were adapting and thriving through the Age of COVID. Stephen Shanks, Principal, ECS Mid-Atlantic and BETEC Chair, concluded the program with a description of BETEC's plans for the upcoming year and an invitation for all to take part in the BETEC/BECs meeting on the following day.

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