
Innovation in the Built Environment

Washington, D.C. – May 16, 2019

Background

According to Architecture 2030, [buildings generate nearly 40%](#) annual global GHG emissions, changing the trajectory is essential to preventing climate change. This, however, is not an easy task. Approximately two-thirds of the building area that exists today will still exist in 2050. Renovations affect less than 1% of building stock annually. Global building stock will double in area by 2060. In fact, the world is currently undergoing the largest wave of urban growth in human history – more than half of the global population is now concentrated in urban centers and by 2060 two thirds of the expected population will live in cities. It was also recognized the built environment affects health in several ways.

Leading companies, non-profit organizations and academic leaders gathered in Washington, D.C. to discuss current global and local trends and best practices.

Participants

Hosts and Sponsors

- Scott Tew, Ingersoll-Rand
- Lori Michelin, World Environment Center

Speakers and Moderators

- Myrrh Caplan, Skanska
- Erik Foley, Smeal Center for the Business of Sustainability, Penn State University
- Jim Freihaut, Penn State University
- Anthony Kane, Institute for Sustainable Infrastructure
- Jennifer Layke, WRI

Speakers and Moderators

- Stanley Merritt, Chemours
- Jeff Moe, Ingersoll-Rand
- John Mogge, Jacobs
- Michael Sanio, American Society of Civil Engineers
- Emilio Tenuta, Ecolab
- Mark Schentzta, Trane
- Sheryl Telford, Chemours
- Dennis Wilson, Saint-Gobain

Participants

The event was also attended by representatives from: Environmental Law Institute, Boeing, US Department of State, Bristol-Myers Squibb, Drucker Strategies, Ricoh, Korngold Consulting, Veolia, Clean Harbors, ERM, SC Johnson, Fresnillo, F Hoffman La Roche and Boland.

Key Points

- (1) Aging infrastructure is an opportunity.** The American Society of Civil Engineers (ASCE) [Infrastructure Report Card](#) rates the infrastructure in the United States as a D+. There is a true opportunity for innovation in the built environment as upgrades/replacements are implemented.

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ASCE is encouraging utilization of new approaches, materials, and technologies to ensure our infrastructure is more resilient – to more quickly recover from significant weather and other hazard events – and sustainable – improving the “triple bottom line” with clear economic, social, and environmental benefits.

- (2) **Don’t talk about rockets talk about where you live.** One often associates Science, Technology, Engineering and Mathematics (STEM) education with rockets, robotics, airplanes or automotive design. The average college student is aware of the electronic controls and miles per gallon (MPG) of their car, yet they have no knowledge of the building characteristics and controls in the apartment they are renting. There is an opportunity to educate and engage consumers to use their buying power to raise expectations in the built environment.
- (3) **Government standards for improved performance can accelerate integrated building design and improvement in the built environment.** Government standards improved the performance of the automotive industry. There is a similar opportunity to accelerate transformation in the built environment – government standards level the playing field for industry and increase innovation in upgrade of existing buildings, design of new buildings and communities.
- (4) **Embedded carbon should be recognized when choosing building materials.** Embedded or embodied carbon is the CO₂ emitted during the manufacture, transport and construction of building materials, together with end of life emissions. While practices to reduce operating impacts are well known, consideration of embedded carbon in design and retrofit is a less practiced discipline that can have high impact. Skanska and Microsoft created the [Embodied Carbon Calculator for Construction \(EC3\)](#), a tool which allows architects, designers, engineers, manufacturers and auditors to search the most commonly used building materials performance (e.g., gypsum, concrete, steel).
- (5) **Sustainable design costs 7% less to build, lowers operating costs and improves resilience.** Sustainable design lowers both construction and ongoing operating costs, along with improving building resiliency, when it is considered at the project outset. Often however, project teams fail to consider this upfront and are faced with making changes late in the design and construction process in order to secure a sustainable building certification. Changes made late in the design and construction process are typically not cost effective, as a result, creating the perception that sustainable design is not cost effective. Notably, however, 70% of new buildings achieve a sustainable building certification.
- (6) **Metering, sub-metering and controls are key enablers to performance.** It is well known that metering, sub-metering and controls help to optimize performance. For example, a car may have over 100 electronic controls to optimize performance. On the other hand, a building may only meter incoming electricity and water. Sub-metering remains an opportunity in the built environment. It presents the opportunity to reduce consumption by 15 to 25 percent. Innovation

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around connected solutions are reducing costs of obtaining additional data making it increasingly cost effective.

- (7) **Contextual water targets consider impact at the water basin level.** A contextual water target sets a specific-time bound goal that considers both the company's performance and the water basin's conditions. Click [here](#) to learn more about contextual water targets.
- (8) **The Ecolab Smart-Water Navigator enables companies to build facility level roadmaps that will help mitigate water risk.** The Ecolab Smart Water Navigator is a practical roadmap to better water management in an era of ever-scarcer water resources. The new online tool is free-of-charge and publicly available at www.smartwaternavigator.com. It can be used by any company, regardless of industry, whether it manages one site or hundreds, and will help corporations save water and money. Additional information on water stewardship can be found in WEC's recent [Executive Roundtable Summary: Propelling Water Stewardship in a Water Stressed World](#).
- (9) **Companies have the opportunity to create impact across their value chain.** Ingersoll-Rand, our event sponsor, released [2030 Sustainability Commitments](#) the day of Innovation in the Built Environment. One of the commitments was to reduce customer carbon footprint by 1 gigaton (or 1 billion metric tons of CO₂e) while achieving carbon neutral operations, effectively becoming a positive net contributor to society.

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