
Decarbonizing Value Chains: The Build Environment
1st of four events focusing on decarbonizing scope 3 emissions in major industry sectors
Executive Roundtable Summary
Virtual Conference – September 8-9, 2021

Background

Eliminating greenhouse gas emissions in a company's supply chain and among its customers—so-called Scope 3 emissions—is the biggest challenge in decarbonizing most businesses. Effective solutions are needed that companies can implement to decarbonize their value chains. Globally, buildings account for 40 percent of greenhouse gas emissions. Fortunately, decades of experience with green buildings support a bold vision for net-zero buildings. In this Roundtable, senior business leaders and technical experts discussed practical solutions to eliminate emissions from buildings in corporate value chains. The event was held under the Chatham House Rule and brought together 36 senior sustainability and buildings experts from seven countries, of which 61% came from global companies, and 39% from Think Tanks/NGOs and service providers.

Participants

Hosts

Scott Tew – VP Sustainability & Managing Director,
Center for Energy Efficiency & Sustainability, Trane T.
Sheryl Telford - CSO & VP EHS, Chemours



Speakers

Moderators

- Amy Cortese, New Buildings Institute
- Zoe Haseman, Jacobs
- Glenn Prickett, World Environment Center
- Sheryl Telford, Chemours

- **Gensler:** Gail Napell
- **Johnson Controls:** Mark Reinbold
- **Marriott:** Denise Naguib
- **Morgan Stanley:** Thomas Kamei
- **PACENation,** Colin Bishopp
- **Trane Technologies:** Scott Tew
- **ULI Center for Sustainability & Economic Performance:** Billy Grayson
- **WBCSD:** Luca de Giovanetti
- **World Resources Institute:** Clay Nesler

Key Points

(1) As an introductory poll revealed, 37% of company experts stated that their organizations are in the process of retrofitting most existing buildings with energy efficient technology and plan their new buildings with the smartest concepts and technology. However, 63% are retrofitting existing buildings on a limited scale and not always use the smartest concepts and technology when they build new.

A second poll revealed that 37% of companies work on a global scale with suppliers that build with low carbon materials and apply concepts/technology for low energy use. 13% are active on this issue in certain markets while 50% have either just started that conversation with suppliers, or not even that.

The polls show that part of the attendee group has significant experience, but they many need ideas to get things going. This corresponds with an opening statement prior to the polls pointing at the fact that the technology is available, but progress is slow because many practitioners still think this challenge is too complicated, too big, and sometimes too lofty to take on.

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- (2) There is a common understanding among experts that the Built Environment can be decarbonized through system-wide collaboration**, with goals to halve emissions by 2030 (e.g. by then all new buildings must be fit to operate with net-zero emissions) and to completely eliminate carbon emissions by 2050 (this means no embedded emissions in new buildings and net zero operating emissions from any buildings globally). The task is huge: every five days a surface of the size of Paris is built on planet Earth. However, it also shows the opportunity when action is taken: currently, 40% of all global emissions can be attributed to the built environment (split into 30% embedded in building materials and 70% accounting for energy emissions to operate the buildings, according to UNEP, 2020).

System-wide collaboration means that key actors must be involved – architects and engineers, property developers, private investors, financial institutions who serve those investors, owners of buildings, the occupants, the construction and deconstruction companies. They must collaborate to reach thousands and thousands of small businesses, owners, and construction companies to build differently than they’ve done over the last decades. They must apply new concepts, new materials and integrate those into their budgets.

- (3) Empowering actors in the building industry and stakeholders to transform the system towards decarbonization is key:** It consists of three drivers: (a) enable a common language and vision for the system, (b) support companies to implement the carbon mitigation action required, and (c) multi-stakeholder engagement to enable a conducive policy and business environment. This all requires tools to understand the carbon life cycle in a building and where exactly in the building the carbon is generated. WBCSD’s [Building System Carbon Framework](#) is a practical tool for exactly that purpose.

A call to action now should be to conduct whole life carbon assessments in all new buildings and publish results (e.g. by using the building system carbon framework) to create a body of evidence and foster shared learning and collaboration. Furthermore, building users – among those the companies participating in this Roundtable – should request the change while outstanding architects, engineers and construction companies who achieved low carbon buildings should be recognized and widely promoted. Investors’ and developers’ roles are also critical. WBCSD’s practical guidance [“Decarbonizing Construction”](#) helps set requirements to reduce embodied carbon in projects they finance.

Throughout the U.S. local, state, and federal legislation is increasingly mandating reduced emissions of large commercial buildings and is especially incentivising full electrification. The NGO [PACENation](#) (Property Assessed Clean Energy) is one important enabler of low-cost, long-term funding for energy efficiency and renewable energy projects anywhere in the U.S. More financial enablers are available in the U.S. and similar programs exist in other parts of the world, although not discussed in this particular event.

The investor community can also play an active role, as was demonstrated during the event. On their search for long-term investments the built environment has always been a major opportunity and finding investments that are resilient towards the challenges of climate change increasingly catch their interest – as they know that ambitious efforts to decarbonize the building stock are part of it. A means how these investors actively support decarbonization efforts is that they can calculate the effects of a potential carbon price on the stock and hold more of those stocks that perform best under this scenario. As companies benefit from being held by the investor, they have additional justification as well as

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resources to further invest in decarbonization. At the same time a potential carbon tax will not hurt the investment – in fact, a carbon tax would lead to divestments from high carbon intensity stocks to those with low carbon intensity.

- (4) Net zero carbon buildings** ①prioritize passive methods to reduce energy consumption; ②maximize on-site renewable energy generation, as well as native vegetation; ③are oriented to minimize or maximize solar heat gain based on the local climate; ④organize the massing to self-shade; ⑤minimize lifecycle impacts of materials and refrigerants; ⑥and are grid responsive. They are also: ⑦built with the fewest, most appropriate materials and ⑧ with as many re-used materials as possible, including materials that can be re-used again. ⑨The embodied-carbon footprint of interior design elements, which are often replaced after ten years, must also be considered.

Operational GHG emissions can strongly be reduced or completely removed with existing technology already. This includes electrifying heating, transitioning the cooling of houses to low-GWP refrigerants, and optimizing electricity demand and consumption, while generating on-site renewable electricity. Such investments quickly reduce energy bills and can be complemented by other next generation solutions like thermal storage and virtual power purchase agreements.

- (5) Building developers should not make the mistake of only fulfilling current mandates of energy efficiency.** Roundtable participants shared knowledge that buildings that have been constructed in the U.S. 15 years ago under applicable energy efficiency standards are now sometimes already subject to fines for not meeting current requirements. With that in mind, it is highly recommended not to make half-hearted efforts to meet current energy efficiency regulation, but to immediately aim for what is now obviously needed – the Net Zero carbon new building construction (embodied net zero carbon) in addition to zero operational carbon emissions in those buildings.
- (6) Materials that help to reduce the embodied carbon are increasingly available.** However, information is hardly standardized and not easy to find, especially as many manufacturers still don't see a need to provide those details, according to experts. The open source [EC 3 toolkit](#) is now available to help how to address embodied carbon in a building. Companies using it find it much easier to live up to growing demands from their customers to track embodied carbon in the cement, steel, and other materials they use. Additional ways to reduce embodied carbon in a building are e.g., using less cement in the concrete, less concrete or steel in the structure of the building, and reusing old existing structures.
- (7) Working with customers/tenants to reduce the operating emissions from buildings can be achieved through smart solutions.** One of the two most effective ideas brought forward is "[green leases](#)": the cost recovering clause ensures that the owner of the building can charge the tenant low monthly amounts of the investment cost he bears, up to an amount that still makes the tenant benefit from the reduced energy costs of the building over the lifetime of the lease. Another recently developed toolkit for use if tenants want to drive the process is the "[Tenant Energy Optimization Program](#)", which helps tenants, owners and other stakeholders work together to integrate energy efficiency into tenant space design and generate cost savings.

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Interestingly, the cost incentive has become less important recently. Many customers are keen on reducing their carbon footprint for other reasons, so building owners invest as they want to be attractive to those customers. At the same time customers are increasingly willing to bear an extra cost if it helps reduce their carbon footprint. This is good news for technology suppliers and for ambitious building owners, as not every investment has to pay off very quickly as long as the broader goal of decarbonization can be achieved.

Building as a service can be part of the solution as it improves the overall performance of the building and helps the owner to stretch investment costs. The customers get the guarantee that they will always have a high standard-building because good maintenance is part of the deal. This affects both operational carbon and cost saving, as well as savings in embedded carbon since professional maintenance significantly increases the time that equipment is in use.

- (8) Promising policy levers to pull for decarbonisation:** (a) More stringent Building Codes and Performance Standards *: they encourage an application of advanced technology, they raise an understanding of available technology as well as an understanding that decarbonization is the goal, not just energy efficiency. They also encourage investments that meet more ambitious goals than currently expected as market players know the demands get tighter over the years. (b) Several state governments in the U.S., e.g. Colorado, have started to require the use of low carbon materials in the state's new buildings to reduce embedded carbon. That way policy generates interest in the [EC 3 toolkit](#) mentioned before, and it markets its use, and starts the system to evolve, which the private sector can take up.

During the conversation several experts mentioned that unless there are regulations it is hard to imagine that embedded carbon in buildings can be reduced on a larger scale. Here is how companies can support policy: ①be practical and apply solutions that work, ②be public and support policy when you like it, ③be professional and look at the system instead of the largest piece of the cake for your company, ④be patient and supportive, even when policy is slower than you want.

**Definition: Building codes are a set of rules that set the minimum standard to which a new home or building can be constructed. The main purpose of building codes is to protect public health and safety, and to ensure that homes and buildings meet efficiency standards in relation to energy and water use. A code is a model, a set of rules that experts recommend for others to follow. It is not a law, but can be adopted into law. A *Building Code* tells you what you need to do, while a *Building Performance Standard* tells you how to do it. The code may say that a building must have a fire-alarm system. The standard will spell out what kind of system and how it must work.*

Note: WEC Executive Roundtables are conducted under the Chatham House Rule.