IIGCC Real Estate Roundtable

Driving net zero real estate through the value chain

02 November 2022
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>5 mins</td>
<td>Welcome and introduction</td>
<td>Aleksandra Njagulj, DWS &amp; IIGCC Real Estate</td>
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<td>Working Group Co-lead</td>
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<tr>
<td>15 mins</td>
<td>Advances in reducing embodied carbon in buildings – the developer perspective</td>
<td>Walid Goudiard, JLL</td>
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<tr>
<td>20 mins</td>
<td>Opportunities and barriers for construction materials</td>
<td>Nicola Davidson, Arcelor Mittal</td>
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<tr>
<td>45 mins</td>
<td>Panel discussion:</td>
<td>Emmanuel Normant, Saint-Gobain,</td>
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<td>Alexander Neumann, Hochtief</td>
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<td>Katerina Papavasileiou, Federated Hermes</td>
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<td>Victoria Burrow, World Green Building Council</td>
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<td>5 mins</td>
<td>Close</td>
<td>Hugh Garnett, IIGCC</td>
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Advances in reducing embodied carbon in buildings – the developer perspective

Walid Goudiard, JLL
Road to NZC: a new value paradigm

Walid Goudiard | Head of EMEA Project & Development Services, JLL
Your world-class development partner in value creation

PDS is your global partner for projects and development services from the smallest space to the most complex and iconic scheme to future proof real estate vs. trends at work: ESG, people and future of work, future cities.

PDS EMEA in figures 2022

- Development Advisory
- Building Consultancy
- Project Management
- Cost Management
- Engineering Design & Sustainability

20+ countries
1300 people
1000+ projects/year
75 years of experience
4 forces are driving changes in Real Estate value chain

- Stakeholders
- Global warming
- Regulation
- Financial

NEED TO CHANGE THE WAY WE DESIGN AND BUILD PROJECTS
Sustainable asset development roadmap

LOW CARBON CONSTRUCTION

- Embodied carbon (kg CO₂ eq./sqm)
- Whole life carbon (kg CO₂ eq./sqm)
- Circular economy (kg CO₂ eq./sqm)

OPERATIONS & ENERGY

- Energy (kWh/EF/sqm.yr)
- Operational Carbon (kg CO₂ eq./sqm)
- Water (m³/sqm.yr)

RISK & RESILIENCY

- Biodiversity
  - Ecological potential
- Climate
  - < 2°C
- Adaptability
  - Against heavy rain, storm wind, rising sea level, soil movement, etc.

SOCIAL VALUE

- Well-being
- User consumption (kg CO₂ eq./sqm)
- Communities

Define metrics
Sustainable asset development roadmap

LOW CARBON CONSTRUCTION
- Carbon smart monitoring (embodied)
- Construction waste management
- Reuse, recycle & local distribution channels

OPERATIONS & ENERGY
- Carbon smart monitoring (operational)
- Efficient isolation systems & MEP equipment
- Operational waste reduction
Net Zero Carbon = Decarbonize + Offset

- Maximize operational efficiency and optimize development design choices
- Retrofit & CapEx
- Decarbonisation of energy supplies
- Generate on-site green energy
- Buy off-site green energy

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Decarbonization
Experience feedbacks rising from the projects we develop

EMBODIED CARBON
kgCO2eq / sqm

OPERATIONAL CARBON
kgCO2eq / sqm

WHOLE LIFE CARBON
kgCO2eq / sqm
Embodied carbon
Retrofit is the new normal

- Limited demolitions
- Low Carbon construction materials (timber, low-carbon concrete, etc.)
- Frugal interior design
- Onsite + Offsite reuse & recycle
- Biobased & local materials

NZC refurbishment
>25% footprint reduction vs. traditional refurbishment
>50% footprint reduction vs. demolish and new build
Operational carbon: asset + energy grid

2050 horizon = CRREM Curve, still lot to do (embodied and energy mix)
Whole life carbon

Unamortized carbon

Sourcing & supply chain of works

Embodied carbon

Operational carbon

WHOLE LIFE CARBON
NZC projects development challenges

REGULATION  EMBODIED VS. OPERATIONAL  SELECT THE RIGHT TEAM  FUTURE OF WORK
Going Beyond
NZC Offset: New World, New Market

Design & Construction Stage

- Embodied carbon
- Unamortized carbon
- Construction works carbon

Project Occupation Stage

- Operational carbon

CARBON “BALANCE SHEET”
One-off

CARBON “P&L”
Annually
Green Premium or Brown Discount?

VALUE DRIVERS
- Reduce carbon emissions
- Reduce waste
- Reduce water
- Lower operating costs
- Improve occupancy rates
- Increase tenant satisfaction
- Reduce financing costs
- Reduce risk / increase resilience

BUILDING ATTRIBUTES
- Building Quality
- Maintenance Status
- Surround & Accessibility
- Certifications
- Environmental
- Governance
- Social
- Tenant

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Opportunities for shared value

**INVESTOR VALUE DRIVERS**
- Reduce carbon emissions
- Reduce waste
- Reduce water
- Lower operating costs
- Improve occupancy rates
- Increase tenant satisfaction
- Reduce financing costs
- Reduce risk/increase resilience

**OCCUPIER VALUE DRIVERS**
- Reduce carbon emissions
- Reduce waste
- Reduce water
- Lower operating costs
- Employee retention
- Improve productivity, engagement, collaboration & well-being
- Reduce risk/increase resilience

Climate commitments and human experiences increasingly lend themselves to shared incentives between investors and occupiers
Thank you
Opportunities and barriers for construction materials - Steel

Nicola Davidson, Arcelor Mittal
Decarbonization challenge for steel: the value chain perspective.

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Smarter steels for people and planet
Leading the global steel sector on decarbonisation
ArcelorMittal has adopted an ambitious set of carbon targets* that will lead the sector in reaching net-zero by 2050.

Steel has the potential to be the backbone of the net-zero economy.

To capture this opportunity steel must also decarbonize, achieving net zero by 2050 and offering low-carbon and ultimately near-zero products to its customers.

Commitment to reaching net zero across our value chain by 2050

* Group target of a 25% reduction in CO₂e emissions intensity (per tonne crude steel) by 2030. Europe target increased to 35% (from 30%) reduction in CO₂e emissions intensity (per tonne crude steel) by 2030. Targets refer to scopes 1+2 CO₂e emissions, steel + mining.
The built environment is responsible for approximately 40% of global carbon emissions.
Designing a building in the right way can already decrease its carbon content by 35-40%.
Steligence® - driving material efficiency and longevity with innovative steel solutions

Steligence® offers our customers solutions to enhance their contribution to a low carbon and circular economy

- Steligence® is an innovative and science-based concept developed to help architects, engineers and property developers to collaborate to build more sustainable, cost-effective buildings.

- It enables solutions that minimise material use while maximising space, flexibility and end of life recyclability.

- As a result, buildings can become more modular and quicker to construct, leading to significant efficiencies, cost savings and carbon reductions, while also creating the potential for reuse and recycling.

- Amid rising global prices of construction materials, customers have expressed greater interest in using Steligence® to reduce costs and optimise the carbon footprint of buildings.
ArcelorMittal Grade 80 steel columns reduce structural steel use, enhance floor space
First ever use in the US at Chicago’s Union Station Tower, 2020

Union Station Tower, Chicago, US

- Grade 80ksi* steels developed by Global R&D and Long Products, and produced at Differdange, Luxembourg
- Superior strength of Grade 80 steel enables building design to use nearly 20% less structural steel, reducing costs and embodied CO₂ of the building

CO₂ ↓ 38%
Due to 20% reduction in structural steel as well as strong CO2 performance

ArcelorMittal solutions bringing cost and sustainability value to the construction industry

* ksi – kilogrammes per square inch
Customers from a range of segments are showing appetite for low-carbon steel products today…
So we launched XCarb™

XCarb™ brings together all of ArcelorMittal’s reduced, low and zero-carbon projects and steelmaking activities, as well as wider initiatives and green innovation projects, into a single effort focussed on achieving carbon-neutral steel.

As part of the new XCarb™ brand, ArcelorMittal has launched XCarb™ green steel certificates for our customers.

We also offer certified XCarb™ ‘recycled and renewably produced’ steel products
XCarb™ brings together all of ArcelorMittal’s reduced CO₂ products into a single effort focused on achieving demonstrable progress towards low carbon emissions steel

**XCarb™: credibility is our highest priority**

- **Legitimate and tangible** – Claims are substantiated by actualised CO₂ reductions, as a result of investment efforts in our sites
- **Transparent** – Fully transparent about the benefits, and limitations, of each XCarb™ solution
- **Science-based** – Applies life-cycle assessment principles by considering the direct and indirect CO₂ emissions
- **Third-party verified** – Involves rigorous third-party audit and verification process, instead of relying on self-declarations
- **Stakeholder involvement** – External stakeholders are consulted and involved in the development of every XCarb™ solution

**ArcelorMittal aims to be the most trusted supplier of low-carbon emissions steel solutions**
• Adding in XCarb® recycled and renewably produced steel products can further increase embedded carbon in the building up to 55%.
Customers see the value in XCarb® recycled and renewably produced – this low CO₂ emissions structure in Switzerland is just one of many examples

Quote
“We discovered XCarb® recycled and renewably produced, ArcelorMittal’s low-carbon emissions offer, a little over a year ago,” explains Jean-François Suchet, Managing Director of Morand Constructions Métalliques. “Offering it to our customers was an obvious choice and is part of our environmental and sustainable development policy. Indeed, even if it has a slight extra cost of 2 to 4%, we want to introduce this product which has the same properties as traditional steel but is made from 100% of steel scrap, using 100% renewable electricity.”

Project:
The future Dimab car dealership will be the biggest BMW and MINI showroom in Switzerland and the country’s first steel structure to use low CO₂ emissions steel.
The real estate investor has the power to drive and accelerate progress.

- On average an office building uses 50kg/m² of steel.
- By selling low carbon steel with a premium of, for example, €100/tonne, the total cost increase is only €5/m².
- In other words, that’s a cost of only €5/m² for a 50% reduction in CO2.
- So many actors are included in the construction process the standards must be set at the start by the investor.
Regulation can help drive progress

- Beginning this year, French regulations require a CO2/m² budget for all new buildings, including the private sector
- The budget dramatically increases every year up to 2030
- This means that by 2026, the design approach to buildings will have to change
Low carbon steel needs renewable electricity – and a lot of it!

- Two thirds of the investment required for near-zero steel is in the enabling infrastructure
- Transforming 100 million tonnes of primary steel-making to near-zero would require half of Europe’s current installed renewable capacity
Opportunities and barriers for construction materials

Emmanuel Normant, Saint-Gobain
SAINT-GOBAIN CLIMATE STRATEGY

IIGCC ROUNDTABLE – NOVEMBER 2\textsuperscript{ND} 2022

Emmanuel NORMANT
VP Sustainable Development
MAKING THE WORLD A BETTER HOME
BE THE WORLDWIDE LEADER IN LIGHT & SUSTAINABLE CONSTRUCTION

GROW & IMPACT 2021-2025

Making the World a Better Home
MAXIMIZE OUR IMPACT & MINIMIZE OUR FOOTPRINT

Build a decarbonated home

Drive circularity into our markets

Pioneer the highest standards

Climate change

Circular economy

Health & safety across the value chain

Empower our local ecosystems

Foster an open & engaging work environment

Act without any compromise

Inclusive growth

Employee engagement & diversity

Business ethics
Maximize our impact & Minimize our footprint

Avoided emissions: 40x our footprint¹

from our solutions sold in 1 year

1. ~ 1,300 Mt all 3 scopes, >100x on scope 1 & 2

NET ZERO CARBON 2050
SAINT-GOBAIN SOLUTIONS CAN DECARBONIZE 2/3 OF BUILDING-RELATED EMISSIONS

Building-related CO₂ emissions

- **CONSTRUCTION**: 12%
- **USAGE**: 28%
- **Renovation & building envelope**: 40%

Sources: World Green Building Council, UNEP, CDP, Material Economics, ADEME

Available decarbonization levers

- **Light construction** (including manufacturing & distribution)
- **Renovation & building envelope**
- **Carbon neutral resource & production**
- **Energy mix decarbonization**
- **Smart Home**

**CONSTRUCTION**

**USAGE**

**LIGHT CONSTRUCTION**

**Smart Home**
CARBON NEUTRALITY? WHAT DOES IT MEAN?

**DIRECT EMISSIONS**

<table>
<thead>
<tr>
<th>SCOPE 1</th>
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<tr>
<td>8.4 Mt</td>
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**INDIRECT EMISSIONS**

<table>
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<tr>
<th>SCOPE 2</th>
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<tbody>
<tr>
<td>1.9 Mt</td>
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**VALUE CHAIN**

<table>
<thead>
<tr>
<th>SCOPE 3</th>
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<tbody>
<tr>
<td>&gt;23 Mt</td>
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**DIRECT ACTIONS**

1. Reduce as much as possible our emissions
2. Capture, use and storage of our residual emissions

<table>
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<tr>
<th>ACTIONS IN RELATION WITH OUR SUPPLIERS</th>
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<tr>
<td>9 Mt</td>
</tr>
<tr>
<td>&gt;5 Mt</td>
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<tr>
<td>&gt;9 Mt</td>
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* Sc1+2 : 2021 numbers, sc3 : 2017 numbers
* Relevant categories within the scope of our SBT targets
ON OUR WAY TO CARBON NEUTRALITY, 2030 IS OUR NEXT MILESTONE

<table>
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<th>2050</th>
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<tr>
<td>Science-Based Targets</td>
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<tr>
<td>Scope 1 + 2 (Direct + Indirect)</td>
<td>-33%</td>
</tr>
<tr>
<td>Scope 3 (Value chain)</td>
<td>-16%</td>
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Objective 2050
ZERO CARBON

**In our processes**

- Offer the best low-\(\text{CO}_2\) and sustainable solutions in our markets
- Enable our customers to decarbonize their processes

**Science-Based Targets**

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Absolute emission reduction vs. 2017

**A roadmap for each BU – a dynamic approach**
WE HAVE ALL LEVERS NEEDED TO ACHIEVE -33% SCOPE 1+2 EMISSIONS BY 2030

- Lighter products
- Industry 4.0 Performance Roadmap
- Green investment\(^1\), recycling
- Green energy
- Power Purchase Agreements

1. Enhanced by our 75€/t internal CO2 price for CapEx, 150€/t for R&D
First Net-Zero Carbon gypsum plasterboard factory in Norway: 2023

Advanced industrial trials with biomass and hydrogen in flat glass factories
SUPPLIERS & LOGISTICS: TACKLE EMISSIONS IN SUPPLIERS & TRANSPORT

**Scope 3**

**Engage all our suppliers**

- Responsible purchasing charter
- SBT approach adoption
- Data transparency
- Benchmarking, selection criteria

**Reduce emissions from transport**

- Optimize logistics
- Improve fuel efficiency
- Use decarbonized fuels
- Replace road by rail & water

**Levers**

**Key actions**

- Benchmark suppliers, select them taking into account CO₂ emissions
- Gather detailed CO₂ emissions and other sustainability data (questionnaires, common approach + testing)
- Engage large emitters to adopt SBT approach (focus on cement, soda ash, paper, distribution suppliers)

- **Examples of key actions**
  - **Fret21**: part of COP21, to push carriers to cut CO₂ emissions
  - **Evoluvert**: NGV¹-fueled trucks in Point.P distribution centers
  - **Control Tower**: truck filling rate monitor, route optimization in LATAM

**Leverage our impact on the value chain**

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1. Natural Gas Vehicle
**LEADERSHIP & ACCOUNTABILITY ACROSS SAINT-GOBAIN ON ESG**

**Embed ESG into management processes**
- ESG = 10% in STI\(^1\) for all executives, 20% for all 2,300 beneficiaries of LTI\(^2\)
- ESG part of all capex validation
- Board + ExCo ESG Committees

**Orchestrate the Local ESG roadmaps acceleration**
- >22K employees in 41 ESG-linked communities
- 75€/t CO\(_2\) price in capex, 150€/t in R&D decisions
- €100m annual capex & R&D budget on CO\(_2\)

**Shape the Industry's ESG agenda**
- Collaborate with governmental organizations and NGOs
- Partner with the ecosystem
- Nurture & exchange with start-ups

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1. Short Term incentives  
2. Long Term Incentives
Panel discussion

Moderated by Peter Sweatman, Climate Strategy and Partners

- Walid Goudiard, JLL
- Nicola Davidson, Arcelor Mittal
- Emmanuel Normant, Saint-Gobain
- Alexander Neumann, Hochtief
- Katerina Papavasileiou, Federated Hermes
- Victoria Burrow, World Green Building Council
Thank you

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