The Materials Movement
Creating Value with Better Building Materials

ULI Webinar
December 1, 2023
Today’s Speakers

Victoria Oestreich
Senior Manager
Randall Lewis Center for Sustainability in Real Estate
Urban Land Institute

Sydney Mainster
Vice President of Sustainability and Design Management
The Durst Organization

Suzanne Fallender
Vice President
Global ESG
Prologis

Heidi Creighton
Vice President
Sustainability
Skanska USA
Commercial Development
Randall Lewis Center for Sustainability in Real Estate

Leads the real estate industry in creating buildings and places where people and the environment thrive.
Today’s Agenda

1. Audience poll
2. Overview of *The Materials Movement* report
3. Panelist perspectives on better building materials
4. Discussion and Q&A

Housekeeping:
- Please submit questions through the Q&A feature, and upvote the questions you want to see asked
- This presentation will be recorded and distributed
- We hope you’ll share your feedback about this webinar in our email survey
Audience Poll
Quick Definitions

**Embodied carbon:** The greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials.

**Material health:** The impact of material components or ingredients on human health. Encompasses the health impacts across the entire lifecycle of a product, including extraction, manufacture, installation, maintenance, and disposal.
Drivers of the Movement Towards Better Materials

- Regulations
- Green Building Certifications
- Occupier Demand
- Enhanced Building Value
- ESG Investing Requirements
Material Impacts

How do our building material choices impact people and the environment?

**Climate**

11% of global carbon emissions are from the manufacture, transportation, and disposal of building materials.

**Human Health**

Humans spend about 90 percent of their lives inside buildings.

**Equity**

People of color and those with low incomes are disproportionately impacted by toxic chemicals, air pollution, and climate change.

**Ecosystems**

Ecosystems around the world are impacted by the extraction, manufacture, and disposal of materials.

**Circularity**

The built environment is one of the largest producers of solid waste, and only a small fraction of construction and demolition material is reused in other buildings.
## Actions at Every Stage

<table>
<thead>
<tr>
<th>Project Kick-Off and Visioning</th>
<th>Pre-design</th>
<th>Schematic Design</th>
<th>Design Development</th>
<th>Construction Documents</th>
<th>Bidding/Pricing</th>
<th>Construction Administration</th>
<th>Operations / Maintenance</th>
<th>End-of-life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start early.</strong></td>
<td>Identify partners and champions.</td>
<td>Do not overlook MEP systems.</td>
<td>Limit or optimize high-impact materials.</td>
<td></td>
<td></td>
<td>Minimize construction waste.</td>
<td></td>
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</tr>
<tr>
<td><strong>Reuse and repurpose.</strong></td>
<td>Pursue green building certifications with a focus on materials.</td>
<td>Design for adaptability, reuse, and disassembly.</td>
<td>Select reclaimed, salvaged, or recycled materials.</td>
<td></td>
<td></td>
<td>Reduce construction site emissions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use whole-building modeling tools.</td>
<td>Use whole-building modeling tools.</td>
<td>Specify bio-based, low-carbon, non-toxic materials.</td>
<td></td>
<td></td>
<td>Work with local partners to funnel construction and demolition waste out of landfills.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engage with manufacturers and suppliers.</td>
<td>Engage with manufacturers and suppliers.</td>
<td>Request product certifications (such as EPDs and HPDs).</td>
<td></td>
<td></td>
<td>Document the as-built embodied carbon and health of the building.</td>
<td></td>
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</table>
The Materials Movement
Creating Value with Better Building Materials

COMING SOON!
NEW ULI REPORT

- Articulates the business case for prioritizing better materials in projects and portfolios.
- Outlines the science behind the lifecycle impacts of materials on humans and the environment.
- Highlights high-level strategies for incorporating better materials.
- Shares innovative projects that successfully integrate healthy and sustainable materials to achieve positive outcomes.

uli.org/materialsmovement
Sydney Mainster
Vice President of Sustainability and Design Management
The Durst Organization
- **Location:** Long Island City, New York
- **Developer:** The Durst Organization
- **Architect:** Handel Architects (Design); Selldorf Architects (Interior & Amenity)
- **Size:** 978,000 sq ft
  - 71 stories
  - 958 residential units total
  - 288 affordable units
- **Status:** opened in 2022
- **Certifications:** LEEDv4 BD+C: New Construction, Certified Platinum
We build, own, and operate many of the world’s most innovative and efficient buildings. We create value for our tenants by developing sustainable residential and commercial properties in which people live, work, and thrive.
RESIDENTIAL PROPERTIES

VIA 57 WEST

HELENA 57 WEST

FRANK 57 WEST

10 HALLETTS POINT

EOS

SVEN
Sustainability Focus Areas

WATER CONSERVATION & QUALITY
Conservation is prioritized for Water’s Diminishing Supply, Increasing Cost, and CSO Concerns

ENERGY EFFICIENCY
Optimized Efficiency for Whole Building Source CO2 Emissions Reduction

MATERIAL STREAM OPTIMIZATION
Enhanced Resident Wellness and Minimized Environmental Impact from Smart Materials Streams

INDOOR ENVIRONMENTAL QUALITY
Thermal, IAQ, Acoustic, and Lighting Satisfaction via Careful System Design and Resident Engagement
Design Team Member selects Building Product

- Prior team experience using product?
  - NO: Proceed, find precedent, need mock-up
  - YES: Re-assess

- Durability and performance requirements met?
  - NO: Reselect
  - YES: Re-utilized?
    - NO: Manufactured locally?
      - NO: Responsible extraction?
        - NO: VOC emissions tested?
          - NO: Sustainable certifications?
            - NO: Transparent documentation?
              - NO: Review requirements
                - NO: No additional training to maintain?
                  - NO: Non-toxic cleaning products?
                    - NO: Take-back and recycling program?
                      - NO: Review requirements
                        - NO: Research and suggest alternative products. If none are available which meet criteria, discuss best options with ownership.
                          - YES: Strong candidate for use on project
                        - NO: NO
                      - YES: YES
                    - YES: YES
                  - YES: YES
                - YES: YES
              - YES: YES
            - YES: YES
          - YES: YES
        - YES: YES
    - YES: YES
  - YES: YES
- Maintenance and Operations understood?
  - NO: Review requirements
  - YES: YES

- TDO Operations Consulted?
  - NO: Review requirements
  - YES: YES

- Contains chemicals harmful to human and environmental health?
  - NO: Re-utilized?
    - NO: Manufactured locally?
      - NO: Responsible extraction?
        - NO: VOC emissions tested?
          - NO: Sustainable certifications?
            - NO: Transparent documentation?
              - NO: Review requirements
                - NO: No additional training to maintain?
                  - NO: Non-toxic cleaning products?
                    - NO: Take-back and recycling program?
                      - NO: Research and suggest alternative products. If none are available which meet criteria, discuss best options with ownership.
                        - YES: Strong candidate for use on project
                      - NO: NO
                    - YES: YES
                  - YES: YES
                - YES: YES
              - YES: YES
            - YES: YES
          - YES: YES
        - YES: YES
      - YES: YES
    - YES: YES
  - YES: YES

- Readily available? No cost impacts?
  - NO: NO
  - YES: YES
Cabinetry – Criteria, Testing Process, and Project Implementation
Lower-Embodied Concrete
### LEED NC v4: Sven – Building Overview – Final LEED Scorecard

<table>
<thead>
<tr>
<th>Total Project Score</th>
<th>Platinum Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available Pts.</strong></td>
<td><strong>Earned</strong></td>
</tr>
<tr>
<td>16</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Indoor Environmental Quality
16 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Integration & Process
1 Possible Point

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Energy and Atmosphere
33 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
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<tbody>
<tr>
<td>33</td>
<td>27</td>
<td>6</td>
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</table>

#### Location and Transportation
18 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
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<tbody>
<tr>
<td>18</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Materials & Resources
13 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Sustainable Sites
10 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>8</td>
<td>2</td>
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</tbody>
</table>

#### Water Efficiency
11 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>10</td>
<td>1</td>
</tr>
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</table>

#### Regional Priorities
4 Possible Points

<table>
<thead>
<tr>
<th>Available Pts.</th>
<th>Earned</th>
<th>Not Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
Suzanne Fallender
Vice President, Global ESG
Prologis
Prologis At-A-Glance

- **1983**
  - Founded

- **19**
  - Countries

- **5,563**
  - Buildings

- **6,700**
  - Customers

- **$209B**
  - Assets under management

- **1.2B**
  - Square feet on 4 continents

- **U.S.**
  - 797 MSF
  - 3,858 Buildings
  - 8,020 Acres

- **Europe**
  - 241 MSF
  - 1,094 Buildings
  - 2,213 Acres

- **Asia**
  - 111 MSF
  - 274 Buildings
  - 98 Acres

- **Other Americas**
  - 81 MSF
  - 333 Buildings
  - 1,769 Acres

- **A3/A**
  - Credit rating

- **#2 in Solar**
  - Rank in U.S. for onsite solar installations, SEIA

- **As of 9/30/2023**
Global Economic Impact

$2.7T
Economic value of goods flowing through Prologis’ distribution centers each year, representing...

4.0%
of GDP for the 19 countries where Prologis does business, and...

2.8%
of the World’s GDP

1.1M
Employees under Prologis’ roofs

Source: Oxford Economics, IMF, Prologis Research as of December 31, 2022
Achieving Net Zero At Prologis

We will be net zero for operations by 2030 and value chain by 2040, a decade ahead of the required commitment.

“Our deep dive on the level of ambition for science-based targets suggests PLD’s goal will set it on the path to be the most ambitious across all ~170 public REITs.”

– Morgan Stanley Research; Review of PLD ESG Report
LEVERAGING SCALE TO BUILD SUSTAINABLE LOGISTICS

1. Scope 3 = Indirect emissions from our value chain including customers’ operations and building construction

99.9% of Prologis emissions footprint sits in scope 3

Customer Energy Use

- 55% heating and cooling
- 20% building operations

Construction + Development

- 17% concrete / asphalt
- 3% roof / insulation
- 2% steel
- 3% other

75% 25%
New construction standards for net zero

Constructing energy-ready buildings to expand distributed energy generation onsite and optimize low carbon solutions

- **Solar-ready roofing**
  Ensure all new builds are ready for rooftop solar installation

- **Amenity charging ready**
  Charging for workforce and fleets to electrify transportation

- **Expandable switch gear**
  Switch gear solutions for a microgrid approach for distributed energy solutions

- **Smart metering**
  Increase control of resource use and ensure greater efficiency

- **High-efficiency HVAC**
  Implement high-efficiency HVAC with plans to electrify all heating and cooling

- **Lifecycle assessments**
  Increase data collection to gauge performance and identify opportunities
Addressing embodied carbon in construction

Currently testing and piloting all technologies available to reduce embodied carbon in our concrete and steel.

**PILOTING**

- **Paving Fibers**
  - Dramatically lower global warming potential.

- **Tilt Panels**
  - Potential concrete reduction of 50%.

- **Nexii Panels**
  - Reduces embodied carbon by 36%.

**TESTING**

- **Mass Timber**
  - Reduces embodied carbon by 62%.

- **Pozzotive**
  - Glass concrete, potential cement reduction up to 50%.

- **Low-carbon steel**

Of the 140+ technologies in Prologis development innovation pipeline, 85% are specifically addressing embodied carbon.
Building 3
5525 Countryside Drive, Brampton
(245,000 square foot industrial warehouse)

Sustainable Materials
Mass timber structure and Nexii wall panel system

Carbon Reduction
~1,480 tons reduced in the shell building

Sustainable Certification
Targeting LEED Silver

329 gasoline-powered passenger vehicles driven for one year
288 homes’ electricity use for one year

Optimized slab on grade with metal fibers
Clerestory windows
Low emission paints and sealants
LED lighting

Solar ready structure and electrical switch
Natural ventilation
EV ready conduits
Cool roof
Heidi Creighton
Vice President, Sustainability
Skanska USA Commercial Development
Skanska CDUS Markets

Started in 2009 in D.C., Skanska CDUS is an office and multi-family developer now present in 5 regional markets across the U.S.

Washington, D.C.
Opened: 2009
Projects completed: 6
Projects in progress: 6

Boston, MA
Opened: 2009
Projects completed: 6
Projects in progress: 3

Houston, TX
Opened: 2011
Projects completed: 3
Projects in progress: 2

Seattle, WA
Opened: 2011
Projects completed: 4
Projects in progress: 3

Los Angeles, CA
Opened: 2019
Projects completed: 1
Projects in progress: 2
Net-zero Carbon Emissions by 2045

- Climate target validated as Science Based
- Climate plan ACT launched
  - Awareness
  - Customer success
  - Transformation
- 70% reduction Scope 1&2
- 50% reduction Scope 3 by 2030
- Material Production
- Transportation
- Use Phase
- Innovation
- Demolition + Recycling
- Construction
EC3 Tool

www.buildingtransparency.org
THE MOST SUSTAINABLE BUILDING IN HOUSTON

32% less energy use
District Cooling
Demand Control Ventilation
Energy Recovery Unit
Regenerative elevators
48,000 gallon rainwater collection tank
Daylight harvesting and motion detection in garage

CERTIFIED AT THE HIGHEST LEVEL

LEED Platinum V4
WELL Building Standard Platinum
Wired Score Platinum
Fitwel 3-Star Rating
Energy Star Rated
EMBODIED CARBON AT
1550 ON THE GREEN

Reduced our carbon footprint by 45% from the baseline
Possibility for higher as the documentation and EPDs continue to come in
Scope of materials includes the foundations, basement construction, superstructure, exterior enclosure, roofing and the Core & Shell interior construction

MATERIALS

- Low carbon concrete
- Rebar
- Cold-formed metal framing
- Aluminum fins
- Gypsum board
- Acoustic ceilings
- Carpet tile
- Concrete in the foundations (55% of the cement was replaced with a lower carbon-intensive cement)
Connect With Us

Ben Llana
Vice President - Development

Shannon Emerson
Manager - Development

Brandon Hendricks
Manager - Development

QR Code Links