



DID YOU KNOW?

- **Embodied Carbon** is expected to account for nearly **50%** of the carbon footprint of new construction.
- **Concrete** is typically the largest contributor to embodied carbon on a project.

© Baker Construction Enterprises | 4

SUSTAINABILITY DRIVERS

- Global Regulatory Landscape
- Changing Investor Expectations
- Influence of Global Collaborations
- ESG Reporting & Increased Transparency
- Younger, Educated Consumers with Elevated Expectations
- Climate Change Impacts and Heightened Visibility

Sustainable Development Goals



© Baker Construction Enterprises | 5



Ways to Reduce the Carbon Footprint Relative to Concrete Materials and Concrete Construction

EMBODIED CARBON

A Clearer View of Carbon Emissions

1) Embodied Carbon Milestones

2) Why Embodied Carbon Matters

- Measuring Embodied Carbon
- Addressing Data Uncertainty
- Role of Grid Decarbonization
- The Impact of Shipping Beyond the Regional Radius
- Building Ruse: Transformation for a Purpose
- Salvaged Materials
- Timber and Carbon
- Emerging Concrete Technologies
- The Carbon Cost of Water

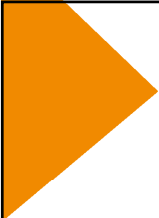
EMBODIED CARBON

A Clearer View of Carbon Emissions

3) Decarbonization in Practice

- Putting It All Together: Net Zero Operations and Reduced Embodied Carbon
 - Houston Advanced Research Center
- Shaping the System: Lessons from Bats Testing to Improve LEED
 - Bank of America Tower
- Leveraging What We Have: The Importance of Serving Our Existing Buildings
 - Mickey Leland Federal Building
- What You Don't See Matters: The Impact of Found System Selection
 - Toyota Motor North America Research and Development Center

4) How Do We Get to Zero?



LESS CEMENT = LESS CARBON

Carbon reductions can be made by reducing the amount of cement per unit volume of concrete

Supplementary cementitious materials (SCMs) are often added to concrete to make mixes more economical, reduce permeability, increase strength, or influence other concrete properties,

Used in addition to or as partial replacement for Portland cement

- Fly Ash***
(from coal burning power plants)
- Slag Cement**
(ground granulated blast furnace slag)
- Silica Fume**
(or micro silica)
- Calcium Carbonate**
- Pressed Clay**
(natural pozzolan)

*most common


CONFIDENTIAL | FOR INTERNAL USE ONLY

CONSIDER 56 OR LATER DAY STRENGTH

Comprehensive Strength

Specify design compressive strengths greater than 28 days whenever possible to allow maximum use of SCMs.

Strength conformity at 56, 90, 120, or more days rather than the conventional 28 days could enable an increase in the amount of SCMs replacing cement.

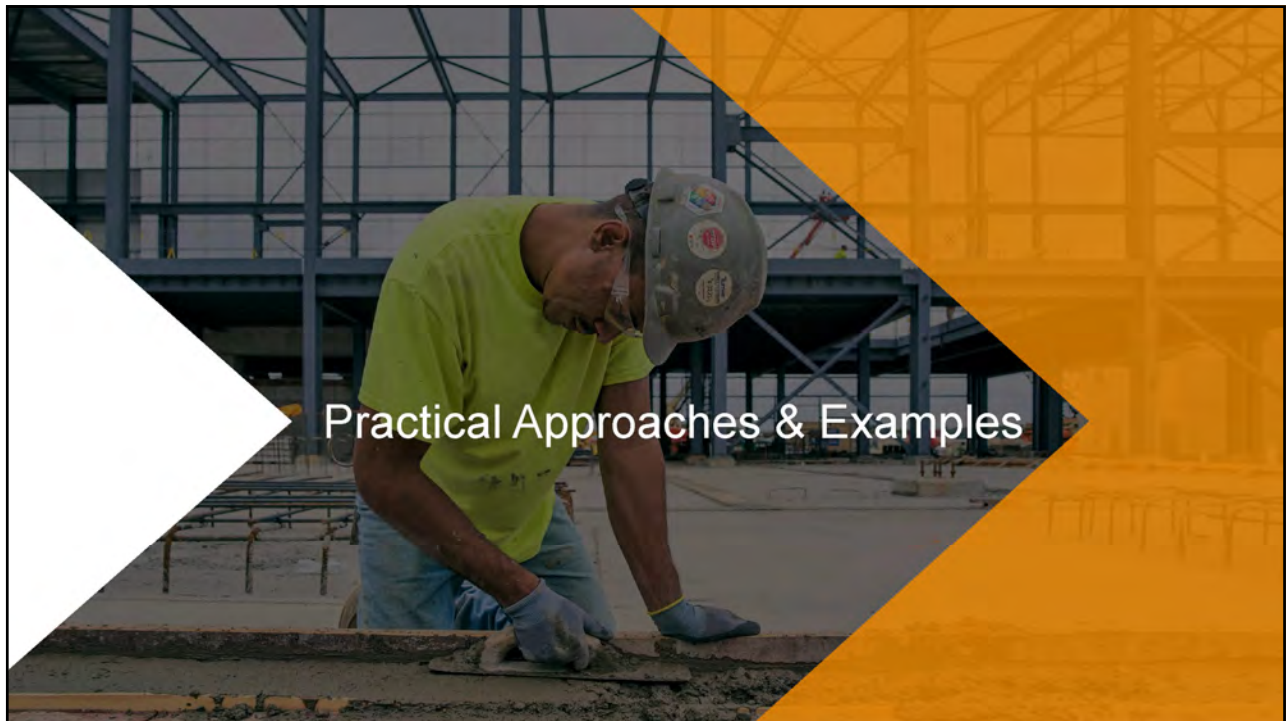


CONFIDENTIAL | FOR INTERNAL USE ONLY

ADDITIONAL CONSIDERATION FOR REDUCTION IN CARBON EMISSIONS

- Performance Mix Designs
- Alternative Structural Engineering Designs
- More Efficient Formwork Designs
- More Efficient Reinforcing Designs
- Less Ready-Mix Concrete Waste
- More Efficient Transportation Routing Logistics + Traffic
- Jobsite Electrification
- Craft + Jobsite Personnel Commute
- Improved Carbon Capture + Sequestration Logical

© Baker Construction Enterprises | 11



Concrete Process Management

The screenshot displays the 'connex' software interface. On the left, there's a 'Tickets' section with a table listing various concrete jobs. The main area shows 'Vehicle details' for a specific job, including dates and times. On the right, there are 'Sustainability Graphs' showing 'Volume', 'CO2e', and 'MJ' over a 28-day period. A magnifying glass icon is overlaid on the bottom right of the screenshot.

Ticket #	Vehicle	Date	Time	Customer	Product	Product Description	Material Code	Batch	Age	Temp	Temp	Batch	Location	Plant	Concrete	Status	
2	263	8/31/2022	11:53 PM	2222	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	CEMENT 9.5 TYPE 100.00	1.0	52.14	5.80	87.7	1.26	26	At Plant	FC	Approved
2	272	8/31/2022	11:54 PM	2222	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	CEMENT 9.5 TYPE 100.00	1.0	52.52	5.60	87.6	1.26	26	At Plant	FC	Approved
2	231	8/31/2022	11:49 PM	3233	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	TYPE 100.00	1.0	81.36	5.31	78.8	1.06	21	At Plant	FC	Approved
5	388	8/31/2022	11:54 PM	5838	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	TYPE 100.00	1.0	5.67	87.2	2.26	26	At Plant	FC	Approved	
3	335	8/31/2022	10:54 PM	3233	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	TYPE 100.00	1.0	52.40	5.54	88.5	0.52	26	At Plant	FC	Approved
5	283	8/31/2022	10:54 PM	3233	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	CEMENT 9.5 TYPE 100.00	1.0	51.47	5.37	85.2	2.63	26	At Plant	FC	Approved
3	172	8/31/2022	10:49 PM	3233	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	TYPE 100.00	1.0	81.26	7.06	79.6	2.31	26	At Plant	FC	Approved
2	279	8/31/2022	10:24 PM	2222	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	TYPE 100.00	1.0	51.44	5.82	88.1	2.18	26	At Plant	FC	Approved
3	195	8/31/2022	10:14 PM	3233	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	CEMENT 9.5 TYPE 100.00	1.0	81.55	6.36	75.6	0.95	26	At Plant	FC	Approved
6	668	8/31/2022	09:54 PM	881	XXXXXXXXXXXX	CCOMM	XXXXXXXXXXXX	CEMENT 9.5 TYPE 100.00	1.0	54.0	79.6	5.71	26	At Plant	FC	Approved	

CONFIDENTIAL | FOR INTERNAL USE ONLY

NEU: An ACI Center of Excellence for Carbon Neutral Concrete



NEU Envisions a concrete industry where all stakeholders have access to technologies and the knowledge needed to effectively and safely produce and place carbon neutral concrete and concrete products in the built environment.



38800 Country Club Drive
Farmington Hills, MI 48331-3439

+1.248.848.3170
www.neuconcrete.org
info@neuconcrete.org



HEIDELBERG CEMENT'S SUSTAINABILITY STRATEGY


- Driving **economic strength** and **innovation** by using all resources as **efficiently** as possible and through **investing** towards innovative low-carbon production technologies
- Achieving excellence in **occupational health** and **safety** by achieving **zero fatalities**, **zero lost time injuries**, and by implementing the **WASH Pledge**
- Ensuring **compliance** and creating **transparency** through internal control and risk management systems, EOE, and suppliers complying with our **Supplier Code of Conduct**



HEIDELBERG CEMENT'S SUSTAINABILITY STRATEGY

- Enabling the **circular economy** by continuously increasing the use of **recycled** aggregates in our portfolio and **substituting** natural raw materials with **recycled** materials
- Being a good neighbor by **improving** living conditions in neighboring communities, corporately **volunteering**, and maintaining **open and transparent communication** about our activities and performance
- Reducing our environmental footprint through **decreasing emissions** and **water** use as well as **enhancing biodiversity** through a biodiversity management plan.





HOW CAN YOU HELP REDUCE CONCRETE'S CARBON IMPACT?

- ✓ **Communicate** your commitment to embodied carbon reduction throughout the supply chain *early* and *often*
- ✓ **Remove** unnecessary prescriptive concrete specs such as minimum cement content
- ✓ **Specify** and/or approve **CO₂ mineralized** concrete
- ✓ **Design** strengths for what you need
- ✓ **Consider performance-based** concrete specs
- ✓ **Use supplementary cementitious materials** and/or **low-carbon cement**



Questions?

SOURCES



© Baker Construction Enterprises | 34



Robert Nussmeier
BCCI Vice President
of Strategic Clients

Baker Concrete Construction is a full-service civil contractor and the nation's leading specialty concrete contractor, focusing on all types of cast-in-place concrete construction, including pile driving, structural shoring, dewatering and structural concrete and repair.

Want to learn how Baker can bring more value to your project?

Contact me at NussmeierR@BakerConcrete.com or (713) 208-1883

»» PEOPLE . HONOR . GRIT .
BAKER

