



How do we accelerate implementation of innovations that reduce carbon footprint of the concrete industry? Three proposed strategies

ACEEE Detroit, MI

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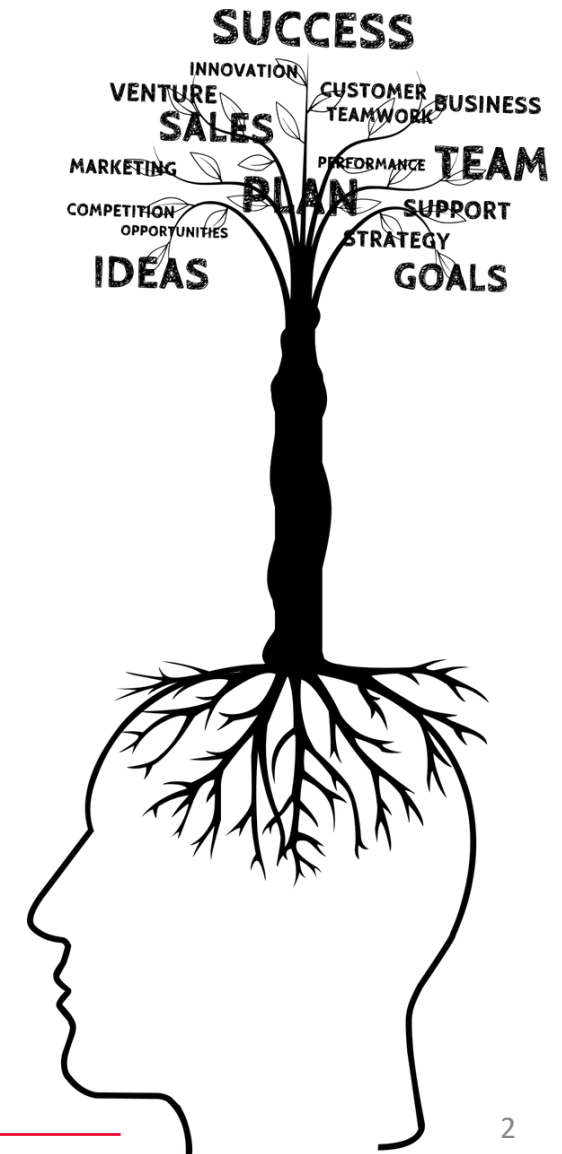
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Why doesn't the industry decarbonize faster?

We do not have a lack of good ideas...

...but our industry is one of the hardest in which to translate from lab to practice.



Strategy 1: Look beyond cement and EPDs

- Require use of conjoint structural/material design optimization software
- Rethink reinforcement
- Remember transportation
- No silver bullet

Example of Environmental Product Declaration

This Environmental Product Declaration (EPD) reports the impacts for 1 m³ of ready mixed concrete mix, meeting the following specifications:

- ASTM C94: Ready-Mixed Concrete
- UNSPSC Code 30111505: Ready Mix Concrete
- CSI Section 03 30 00: Cast-in-Place Concrete

COMPANY
[Redacted]

PLANT
[Redacted]

EPD PROGRAM OPERATOR
[Redacted]

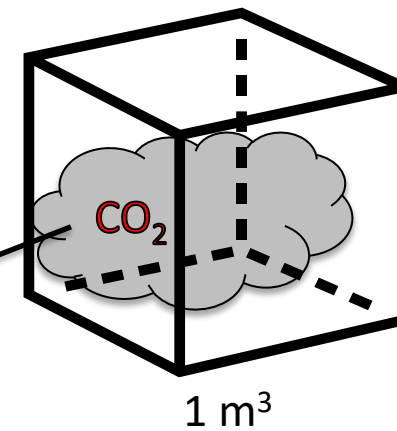
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ENVIRONMENTAL IMPACTS
Declared Product: [Redacted]
Description: Exterior 3000 PSI
Compressive strength: 3000 PSI at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ -eq)	290
Ozone Depletion Potential (kg CFC-11 eq)	7.16E-6
Acidification Potential (kg SO ₂ -eq)	0.84
Eutrophication Potential (kg N-eq)	0.35
Photochemical Smog Creation Potential (kg O ₃ -eq)	17.5
Total Primary Energy Consumption (MJ)	1,936
Nonrenewable (MJ)	1,851
Renewable (MJ)	85.0
Total Concrete Water Consumption (m³)	1.78
Batching Water (m ³)	0.16
Washing Water (m ³)	0.12
Nonrenewable Material Resource Consumption (kg)	2,340
Renewable Material Resource Consumption (kg)	1.96
Hazardous Waste Production (kg)	0.01
Nonhazardous Waste Production (kg)	2.59

Product Components: natural aggregate (ASTM C33), Portland cement (ASTM C150), fly ash (ASTM C618), batch water (ASTM C1602), admixture (ASTM C494)



Strategy 2: Invest \$\$\$ in prototyping



- Risk averse industry
- Tough to get investment without a contract... tough to get a contract without prove-out
- “I’d love to be second to try this out”

Strategy 3: Remove disincentives

- Move to performance specifications
- Provide options to LCTA – empower folks to use judgment
- Reward government decision-makers (DOTs, USACE, etc.) for informed risk-taking

