



SOLUTIONS FOR THE BUILT WORLD

# Decarbonization Plans and Strategies in the Cement and Lime Industries - Barriers



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Wiss, Janney, Elstner Associates, Inc.

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# Brief Introduction

- Principal at Wiss, Janney, Elstner Associates, Inc.
  - 800+ employees
  - Engineers, architects, material scientists, and technical support staff
  - World-class laboratories
- I have 35+ years working with concrete materials, focused on durability and sustainability
  - Given hundreds of presentations and written over 100 papers
  - Working with Caltrans, FHWA, Breakthrough Energy Foundation, and ClimateWorks Foundation to reduce carbon footprint of concrete

# Challenges to Entry for New Materials

- Report Available: *Removing Barriers to Rapid Adoption of Carbon Reduction in Concrete*
  - *Completed for Breakthrough Energy Foundation early this year*
  - *Article coming out in Concrete International*
- Two general approaches are discussed to reduce portland cement clinker in concrete
  - Avoidance – Reducing total cementitious content in concrete
  - Substitution – Partial or full replacement of Portland cement with alternative material(s)

# Challenges to Entry for New Materials

- Policy Support – Policymakers play a vital role in creating demand
  - Policies can be ineffective, obstructive, and even resisted if not developed with technical understanding of industry
- Technical Education – Those working in the industry must be equipped with technical know-how to understand and implement low-carbon practices
  - Includes all stakeholders (e.g., engineers, architects, contractors, suppliers, and others)
  - Associations, trade organizations, institutes, and academic institutions should collaborate

# Challenges to Entry for New Materials

- Specifications and Code Development
  - Prescriptive specifications and codes can be barriers to innovation
  - Developing performance-based specifications will facilitate adoption of alternative materials
- Technology Validation – Needed to minimize the potential for false or misleading claims regarding carbon reduction
  - Effort underway by ACI Center of Excellence for Carbon Neutral Concrete (NEU)

# Challenges to Entry for New Materials

- Demonstration Projects – New materials should be demonstrated to reduce risks associated with being an early adopter
  - Credible demonstration project must be significant, use existing equipment and facilities, and be on real project
  - Data should be collected and disseminated
- Onboarding New Technologies – Disruptive technologies often funded by those not familiar with the cement and concrete industry
  - Need to work with independent experts to guide integration

# And Some Additional Thoughts...

- Unfortunately, the issue is politicized, meaning the barriers are more than just technical
  - Must find common ground and win-win-win solutions
- The use of EPDs in procurement requires direct linkage to the mixture submittal and placed
  - Current EPDs are not sufficiently tied to concrete mixture constituents
  - EPD must be stamped as part of concrete approval process and validated during production

# Thanks

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