The U.S. Department of Energy

Industrial Efficiency and Decarbonization Office (IEDO)

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ACEEE: Embodied Carbon Roundtable workshop
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The five top manufacturing subsectors are responsible for 51% of energy-related industrial CO₂ emissions.
Tech Development Pathway: Cost, Impact, Risk, Time-to-Launch

- **Impact Potential**
  - $$ Alternative Binders
  - $$ Alt. OPC Process Routes/ low-carbon feedstocks
  - $ SCMs
  - $ CO$_2$ Use
  - $$$ CCS
  - $$ LC Fuels/Process Electrification
  - $ Efficiency
  - $ Building/Const
  - $$ Alt. non hydraulic binders

- **Risk Level**
  - HIGH
  - MED
  - LOW

- **Time**
  - 2020
  - 2030
  - 2040
  - 2050

- Time includes tech, testing, code acceptance.
- Low-risk applications (pavers/sidewalks/highways) have shorter timelines.
Cement & Concrete Decarbonization

FY22 IEDO Industrial Decarbonization FOA:
- 36 applications received; 5 awarded ($16.4M)
- OPC with lower firing temperature
- Concrete with high-volume SCMs and CNTs

FY23 IEDO Multi-topic FOA:
- 107 concept papers received; 37 encouraged to submit full proposals and 31 proposals received ($21.5M available)
- Biochar concrete
- Industrial/recycled concrete/plastic/mining waste as feedstock for cement production, or as SCMs
- Calcined clay cement
- Electrolytic cement production

FY23 IEDO-AMMTO-BTO TCF Lab Call
- Topic 1: Greener Buildings and Building Materials with Reduced Embodied Carbon (Up to $2.4M available)

FY24-25 priorities
- Alternative binders, alternative SCMs
- Process innovation for deep & economical emissions reduction
- Cement and concrete circularity
- CO2 mineralization (waste materials)
- Advances design of concrete systems for carbon reduction
- Multimodal decarbonization strategies for low-emissions cement production (Low carbon solutions that incorporate 2 or more strategies)

Black boxes represent generic, conventional or non-conventional processes.
Thank you