Regional Carbon Conversion Procurement Grant Program Workshop

September 13, 2022
Blue Planet’s process permanently converts CO₂ emissions into high value building materials

1. A Geomimetic® “closed loop” technology that sequesters and permanently stores CO₂ in aggregate
2. CO₂ source agnostic: combustion flue gas, DAC(1), etc., at any concentration
3. Wide range of Geomass feedstock in a circular system, such as demolished / returned concrete, cement kiln dust, steel slag, and fly ash
4. Patented technology of over 50 patent families with 15 issued US patents, 5 global analogs and counting

Product and aggregate market

5. Produces 2 core aggregate products:
   - 1) CaCO₃ Aggregate (Synthetic Limestone)
   - 2) Upcycled RCA(2) Aggregate / Sands
6. Blue Planet aggregate is 44% CO₂ content by weight
7. A market large enough for significant CO₂ sequestration: global aggregate market is ~55Gt p/a; expected to grow from $429bn to $603bn p/a in 2027 (CAGR 3.3%)
8. Blue Planet’s aggregates reduce CO₂ emissions in concrete by more than 4x vs. a low CO₂ concrete mix that exclusively uses SCM(3, 4) to reduce CO₂

Sources: Blue Planet Systems, Note: (1) Direct Air Capture; (2) Recycled Concrete Aggregate; (3) SCM: Supplementary Cementitious Materials; (4) While cement accounts for over 95% of CO₂ embodied in concrete using Ordinary Portland Cement (OPC), aggregates account for 80% of concrete’s volume, therefore represent a greater opportunity to mitigate CO₂ emissions. Approximately 35% of concrete’s volume can comprise embedded CO₂ using Blue Planet aggregate. This compares to using a low carbon concrete mix that substitutes out OPC with SCMs which only reduces concrete’s embodied CO₂ by the equivalent of 8-10% of concrete’s volume
Blue Planet’s Pittsburg, CA commercial demo facility

**Level-1:** 15kt-20ktCO₂

**Level-2:** 150kt-200ktCO₂

**R&D (Lab Pilot):**
- Lab: 10’s kgCO₂

**Demonstration Plant (CM1):**
- CM1: 100’s tCO₂

**Future Plans:**
- 2023
- 2024

**Today**
Decarbonizing the Built Environment via Carbon Capture & Conversion (Key Trends in California)

**Market Mechanisms**

- New focus on embodied carbon (vs. operating carbon) in the built environment.
- Capacity to store CO2 in public infrastructure – help meet GHG reduction targets
- Capturing the value of sequestered CO2 in building materials (vs. paying for offsets)

**Policy/Regulatory**

- Legislation targeting embodied carbon (AB 2554) & SB 905 - creating a framework for CCUS – Passed & awaiting Governor’s signature
- IRA: increased tax credit for utilization & $ billions for procurement of low-embodied carbon materials
- Building code reform: CEC IEPR
- Industrial Decarbonization (roadmap issued DOE)
The embodied carbon footprint of a building includes all carbon emissions connected with the manufacture, transport, and installation of construction materials.
IRA Provisions for low-embodied carbon construction

- $250 MM for EPD Assistance
- $100 MM for Low-Embodied Carbon Labeling for Construction Materials
- $2.15 BB for Use of Low Carbon Buildings (GSA-owned)
- $2 BB for Low-Carbon Transportation Grants (FHA)
- $4 BB for Improving Climate Resilience of Affordable Housing
Challenges in Scaling Carbon Conversion Technologies

- Offtake agreements
- Bias toward geologic sequestration
- Buy Clean for concrete
- Price premium
- Absence of measurement tool for carbon sequestration in building materials
- Carbon capture is controversial (esp. California)
Proposed Solutions

- Update CARB CCS protocols to include mineralization in aggregate/concrete
- Develop accounting methodology/LCA to include carbon sequestered in building materials
- Legislation: Buy clean for concrete; low carbon concrete standard
- Incentivize and prioritize sequestering carbon in the built environment
- Accelerate testing of low carbon materials at public agencies (GSA/CALTRANS)
- Continued industry collaborations for education, advocacy (CCC)