U.S. DEPARTMENT OF ENERGY | Fossil Energy and Carbon Management

CO_2 Mineralization Workshop Agenda

May 3-4, 2023

University of Minnesota Twin Cities

Walter Library, 402 Seminar Room

The purpose of this workshop is to discuss opportunities for advancing in-situ and ex-situ CO_2 mineralization processes for both permanent storage and potential manufacture of durable products. The outcome of this workshop will help inform FECM on priority pathways for basic and applied CO_2 mineralization R&D in support of the Administration's efforts to meeting CO_2 emissions reduction targets. The workshop will have three sessions to address the following objectives:

1) Identify applied research challenges that might be resolved through a better understanding of the fundamental science behind CO_2 mineralization chemistry in reactive environments

2) Identify priorities and potential pathways for a national CO_2 mineralization resource assessment that considers both technical and social challenges

3) Identify resource assessment requirements for evaluating product manufacturing opportunities

Day 1 – CO_2 Mineralization Workshop

7:30 – 8:00 AM	Check in
8:00 – 8:10 AM	Industry Perspectives and Why the Workshop Outcome Matters – Mike Moore, USEA
8:10 – 8:20 AM	FECM's Vision for Carbon Management – US Department of Energy FECM – Noah Deich (confirmed)
8:20 – 8:30 AM	Welcome to UMinn; Overview of the University of Minnesota Energy Frontiers Research Center for Interacting Geo-Processes in Mineral Carbon Storage – Emmanuel Detournay (confirmed)
Session 1	**Bridging the Gap between Basic and Applied Science R&D** [Moderator: M. Moore]
8:35 – 8:50 AM	**CO_2 Demo of Ex-Situ Mineralization in Ultramafics** Greg Dipple, Arca Climate (confirmed)
8:50 – 9:10 AM	**Overview of Carbfix** Martin Voigt – Carbfix (confirmed)
9:10 – 9:25 AM	**Reflections on Basic Science Directions for In-Situ Storage** Speaker: Todd Schaef – PNNL (confirmed)
9:25 – 9:35 AM	**MentiMeter Instructions and demonstration**

9:35 – 10:15 AM	**Menti breakout discussion –** (30-minute group discussion; 20-minute report out from each group). Question to address: **Where are the key gaps in applied CO_2 mineralization science that basin science R&D can help address**? Two groups with one addressing in-situ and the other ex-situ.
10:15 – 10:35 AM	**Break**
Session 2	**National Resource Assessment Priorities/Pathways** [Moderator M. Moore]
10:40 – 10:50 AM	**CO_2 Mineralization Feasibility in the United States** Speaker: Madalyn Blondes (confirmed)
10:50 – 11:00 AM	**In-situ/Ex-situ Storage: FECM CO_2 Mineralization Resource Assessment Projects** Speaker: Darin Damiani, FECM
11:00 – 11:30 AM	**CO_2 Mineralization Characterization Projects** (4 projects – 7 minutes each) • Ocean CO_2 capture from air - Guenther Glatz, Ebb Carbon (confirmed) • Carbon to Stone: A Carbon Management and Resource Recovery Startup – Greeshma Gadikota (confirmed) • Tamarack Mine, MN – Robert Rush (invited) • Storage in Volcanic Basalts – Don DePaolo, LBL (confirmed)
11:30 – 11:45 AM	**Applied CO_2 Mineralization Opportunities and Challenges** Speaker: Todd Schaef – PNNL (confirmed)
11:45 – 12:30 PM	**Menti breakout discussion –** (20-minute group discussion; 25-minute report out from each group). **Question to address: What are National Resource Assessment Priorities/Pathways?** Two groups with one addressing in-situ and the other ex-situ
12:30 – 1:30 PM	**Lunch**
Session 3	**Resource Assessment Requirements for Evaluating Product Manufacturing Opportunities** [Moderator M. Moore]
1:30 – 1:50 PM	**Value Added Opportunities.** Speaker: Doug Wicks (confirmed)
1:50 – 2:50 PM	**Carbon Dioxide Removal and Conversion** (4 projects – 15 minutes each) Moderator: James Egbu • Achieving Unprecedented CO_2 Utilization in CO_2Concrete (Dr. Gaurav N. Sant – UCLA) (confirmed) • Synthetic $CaCO_3$ Production by CO_2 Mineralization (Dr. Bu Wang – Uni. of Wisconsin) (confirmed) • Rapid Electrochemical Mineralization to Form Dolomite (Dr. Kerry Rippy – NREL) (confirmed)

- Pathways for Producing CO_2-Negative Building Composites (Dr. David J. Heldebrant – PNNL) (confirmed)

2:50 – 3:30 PM	**Menti breakout discussion –** (20-minute group discussion; 20-minute report out from each group). **Question to address: What are resource assessment requirements for evaluating product manufacturing opportunities?** Two groups with one addressing in-situ and the other ex-situ
3:30 – 3:45 PM	**Break**
Session 4	**Wrap up**
3:45 – 4:15 PM	**Summary, Final Thoughts and Questions** (Technical Moderator: Todd Schaef)
4:15 PM	**Adjourn**

Day 2 —

Site visit to Tamarack Mine – details to be provided separately.