Office of Fossil Energy and Carbon Management

Technology Assessment Modeler's Workshop

Technoeconomic and Life Cycle Analysis for Carbon Management, Hydrogen, and Natural Gas Pathways

April 10-11, 2024

National Energy Technology Laboratory
Morgantown, WV

The goal of this workshop is to improve coordination and communication across analysis efforts in support of the Office of Fossil Energy and Carbon Management (FECM) and to harmonize methods and assumptions across studies. Participants will share accomplishments and plans across analysis efforts and address new methods and emerging issues affecting analysis to foster comparability across studies and to accelerate incorporation of improvements across the analysis portfolio. Discussions amongst participants will help identify research needs and gaps in the analysis portfolio for consideration in the planning process.

Wednesday, April 10th

8:15 – 9:00 AM **Arrive, coffee**

9:00 – 9:20 AM **Introduction**

- Welcome
  Peter Balash, NETL
- Goal and structure of the workshop
  Troy Hawkins, FECM/ANL

9:20 – 10:50 AM **Point Source Capture**, *Alicia Dalton-Tingler (facilitator)*

- NETL Point Source Capture Analyses
  Alex Zoelle and Amanda Harker-Steele, NETL
- NETL Carbon Capture Retrofit Databases (CCRD)
  Greg Hackett and Eric Grol, NETL
- Carbon Capture Simulation of Industry Impact (CCSI2)
  Ben Omell and Mike Matuszewski, NETL

10:50 – 11:05 AM **Break**

11:05 – 11:30 AM **Point Source Capture (continued)**, *Alicia Dalton-Tingler (facilitator)*

- Characterization of potential co-benefits from capture-air quality modeling and removal of co-pollutants
  Greg Cooney and Jeff Hoffmann, FE-261

11:30 AM – 12:30 PM **CO2 Transport and Storage,** *Justin Adder (facilitator)*

- NETL CO2 Transport and Storage Analyses
  Dave Morgan and John Brewer, NETL
- CO2 Transport Analysis
  Corey Myers, LLNL

12:30 – 1:30 PM **Lunch**

1:30 – 3:00 PM **FECM Partnerships for Technology Scale Up,** *Jeff Hoffmann (facilitator)*

- 45Q Life Cycle Assessment
  Michelle Krynock, NETL
- Carbon Management Liftoff Updates and Financial Analysis for Carbon Management Projects
  Andrew Gilbert, OCED
- LPO Analysis
  Michelle Mutchek, LPO

3:00 – 3:15 PM **Break**

3:15 – 5:00 PM **Methane Mitigation and Natural Gas Supply Chain Analysis,**
Tom Curry (facilitator)

- Characterizing Emissions from Natural Gas Supply Chains (MMRV Framework)
  Tim Skone, FE-341
- NETL Natural Gas Infrastructure Analyses
  Matt Jamieson, NETL
- NETL NG Decarbonization and H2 Technologies Analyses
  Eric Lewis, NETL
- General Discussion of Natural Gas Supply Chain Needs

Thursday, April 11th

8:00 – 8:30 AM **Arrive, coffee**

8:30 – 8:45 AM **Introduction to Day 2**

8:45 – 9:15 AM **NETL Baseline Studies**
Travis Shultz, NETL

9:15 – 10:45 AM **Hydrogen with Carbon Capture,** *Peter Balash (facilitator)*

- NETL Gasification Analyses
  Eric Lewis, NETL
- Hydrogen Modeling in GREET, 45V H2 GREET, HD-SAM
  Amgad Elgowainy, ANL
- NETL Simulation-Based Engineering – IDAES & supported projects
  Tony Burgard, Tom Tarka and Tim Bartholomew, NETL

10:45 – 11:00 AM **Break**

11:00 AM – 12:30 PM **Carbon Dioxide Conversion,** *John Wimer (facilitator)*

- Carbon Dioxide Conversion Analyses
  Michelle Krynock, NETL
- CO2 Utilization Consortium: Technoeconomic Analysis
  Ling Tao, NREL and Amgad Elgowainy, ANL
- CO2 Utilization Consortium: Life Cycle Analysis
  Michael Wang, ANL

12:30 – 1:15 PM **Lunch**

1:15 – 3:45 PM **Carbon Dioxide Removal,** *Greg Cooney (facilitator)*

- Direct Air Capture Analysis (30 min)
  Ben Omell and Sally Homsy, NETL
- Roads to Removal Report and Follow-On Analysis (30 min)
  Wenqin Li, LLNL
- CDR LCA Best Practices and Development of an Annual Technology Baseline (30 min)
  Greg Cooney and Jeff Hoffmann, FE-261
- CDR Siting and Parameter Harmonization (30 min)
  Patrick Lamers, NREL
- MMRV and LCA for DACS & BiCRS (15 min)
  Patrick Lamers, NREL, [Sarah Baker LLNL, Yimin Zhang, NREL]
- MMRV and LCA for Mineralization (15 min)
  Corey Myers, LLNL

3:45 – 4:30 PM **Discussion of Future Directions –** Identifying key research needs and analysis gaps; opportunities for improved harmonization; improving lines of communication.
Peter Balash and Troy Hawkins (facilitators)

Technical and Organizing Committee:

Peter Balash, NETL
Greg Cooney, FE-20
Tom Curry, FE-30
Alicia Dalton-Tingler, NETL
Troy Hawkins, FECM/ANL
Jeff Hoffmann, FE-20
Travis Shultz, NETL
Tim Skone, FE-30
John Wimer, FE-20/NETL