Direct Air Capture Recovery of Energy for CCUS Partnership (DAC RECO$_2$UP)
Project Number: DE-FE0031961

Southern States Energy Board (SSEB): Kenneth J. Nemeth (PI), Kimberly Gray (Co-PI)

AirCapture LLC (AC): Matt Attwood, Bran Raskovic

U.S. Department of Energy
National Energy Technology Laboratory
Direct Air Capture Kickoff Meeting
February 24-25, 2021

Acknowledgement

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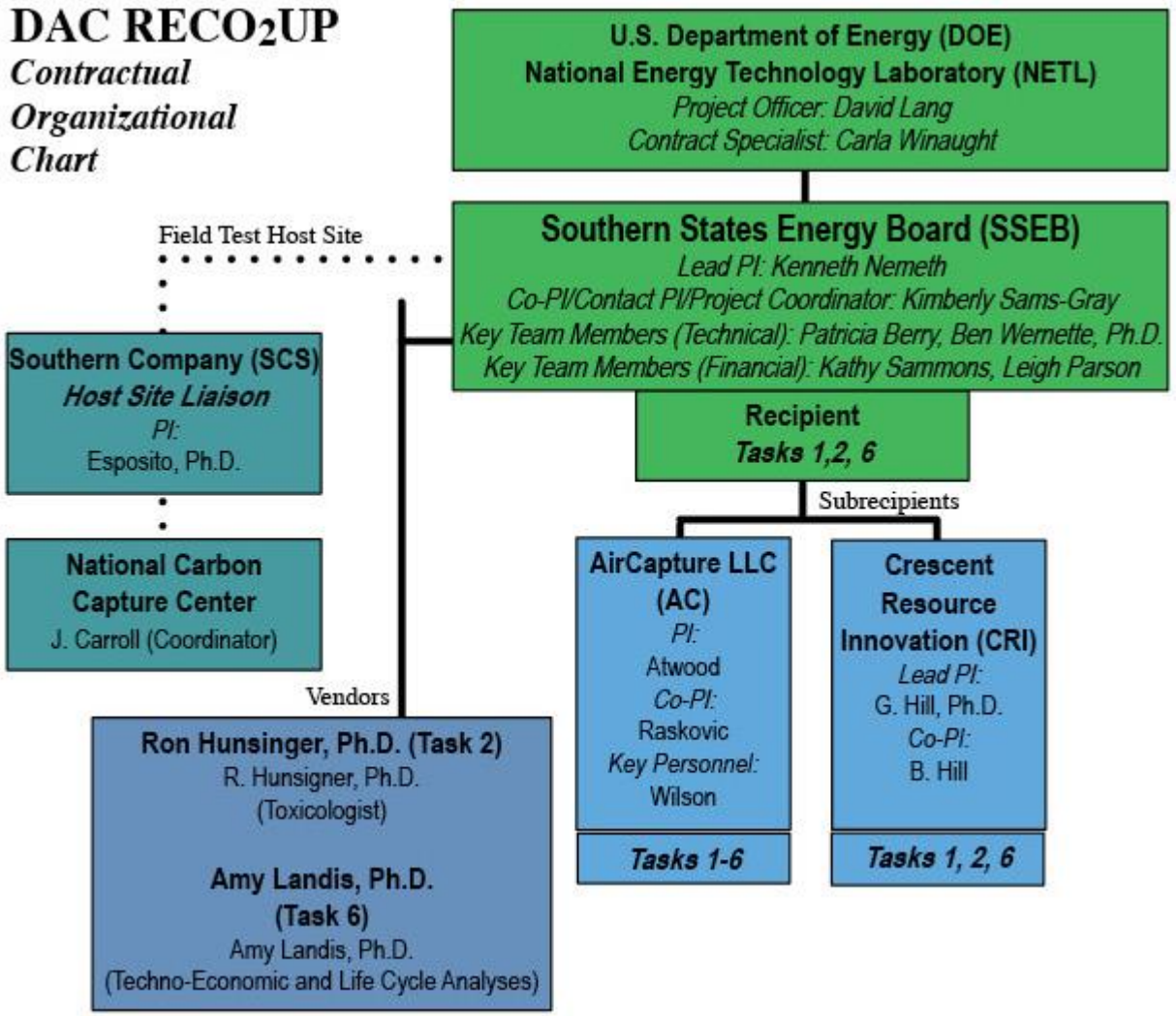
Program Overview

Funding: DOE: $2,500,000, Cost Share: $635,805
Overall Project Performance Dates: 10/1/20 to 1/31/24

- **Objective 1.** Conduct applied research and development to decrease the cost of DAC from atmospheric air and mixtures of air and simulated industrial gases available in a test bay at the National Carbon Capture Center (NCCC).
- **Objective 2.** Develop and scale-up an integrated system utilizing energy recovery at the NCCC.
- **Objective 3.** Increase the integrated system's fidelity by validating and demonstrating operations in a simulated commercial environment by maximizing capital efficiency, energy efficiency.
- **Objective 4.** Identify and address key technical barriers, within a representative operating environment, in support of DAC technology commercialization.
- **Objective 5.** Perform a pre-screening techno-economic analysis (TEA) and life cycle analysis (LCA) to determine the environmental sustainability (amount of carbon negativity) and economic viability (cost impacts) of the integrated DAC system.



Team and Facilities

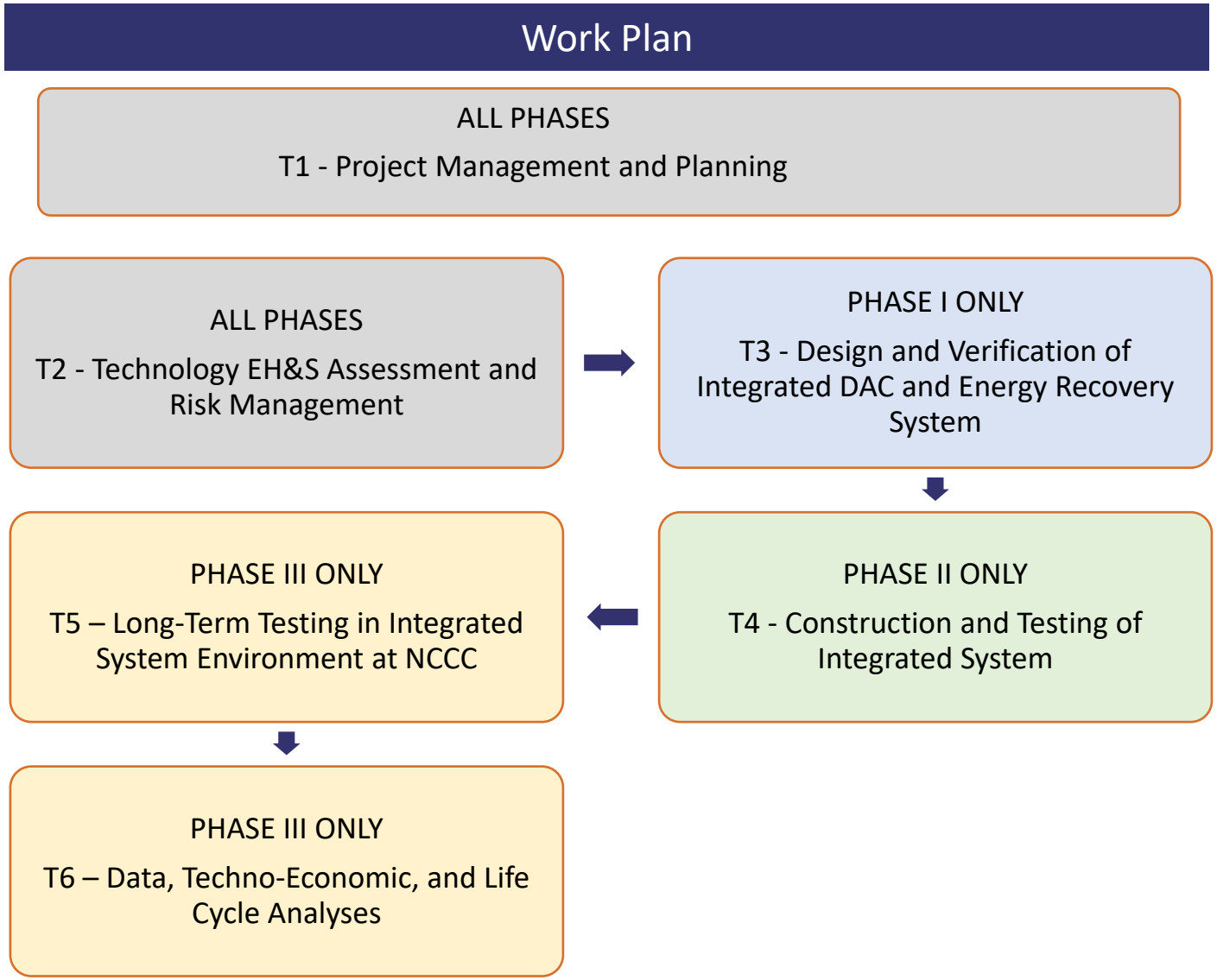
- Fabrication Facilities
- Testing Facilities
  - Simulations
  - Integrated Systems at the NCCC in Wilsonville, Alabama
- Laboratories

Synapse Build Labs

National Carbon Capture Center
https://www.nationalcarboncapturecenter.com

Technical Approach/Project Scope

- Project Schedule
  - Design Phase I (BP1)
    - 10/1/20 – 10/31/21
  - Construction Phase II (BP2)
    - 11/1/21 – 10/31/22
  - Integrated Systems Testing Phase III (BP3)
    - 11/1/22 – 1/31/24
- Project Success Criteria: TBD
  - PMP is currently under revision.



Technology Background

3 skids:

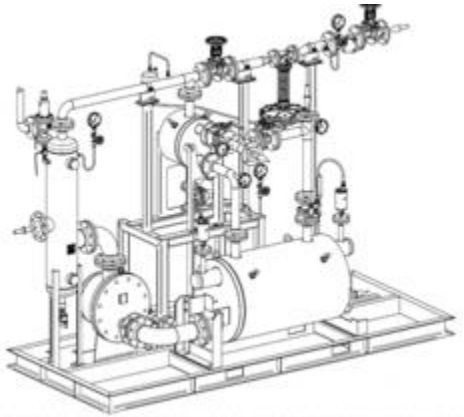
- Heat Integration/Recovery
- DAC
- CO_2 Liquefaction

Heat skid will enable simulation of varying qualities of industrial waste heat

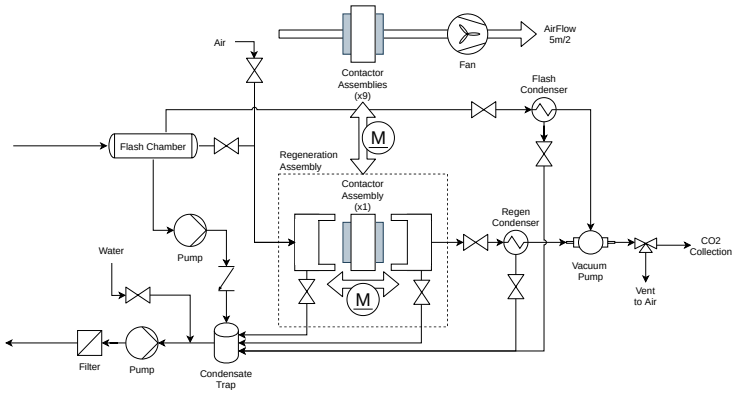
DAC will run in multiple modes of operation to demonstrate integration

CO_2 processing skid will produce CO_2 in varying qualities for testing

Integrated process will demonstrate economics, LCA and product carbon footprint

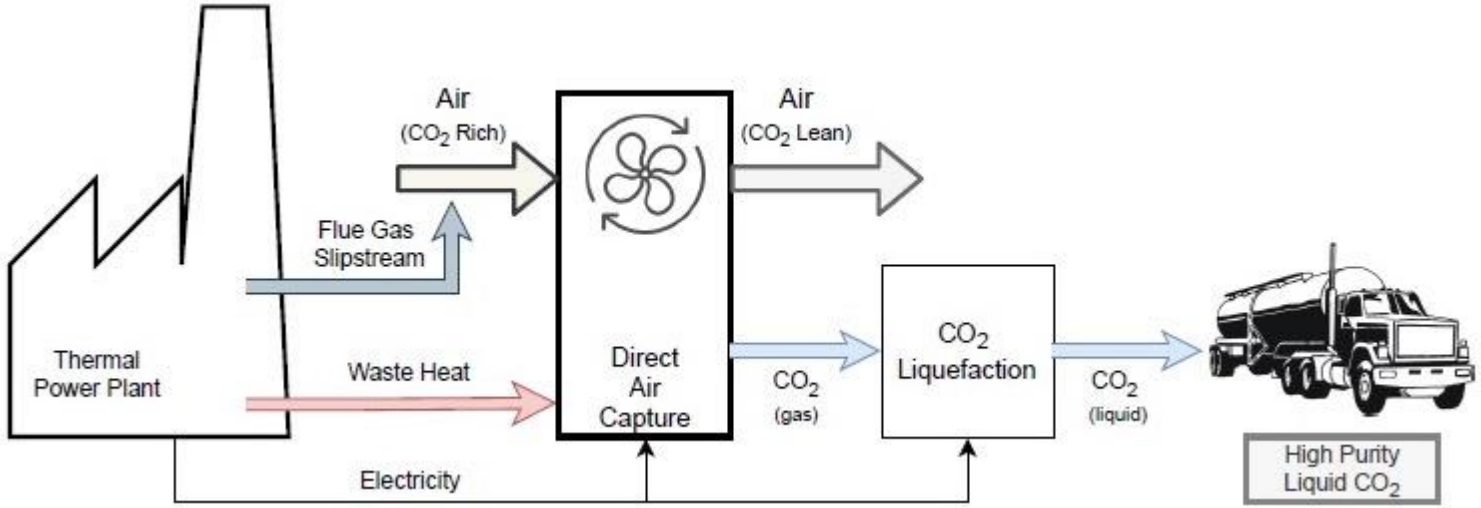


Heat Integration Skid



DAC Skid

CO2 Processing Skid



Opportunities for Collaboration

- Testing of produced CO_2 in commercial processes
  - i.e., agtech; food and beverage; materials
- Evaluation / Integration of process in varying commercial / industrial applications.
- Commercialization
  - Scale-up modeling
  - Integrated engineering & design
  - Fabrication / Construction & Manufacturing
  - CO_2 utilization / off-take
  - Project Finance

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