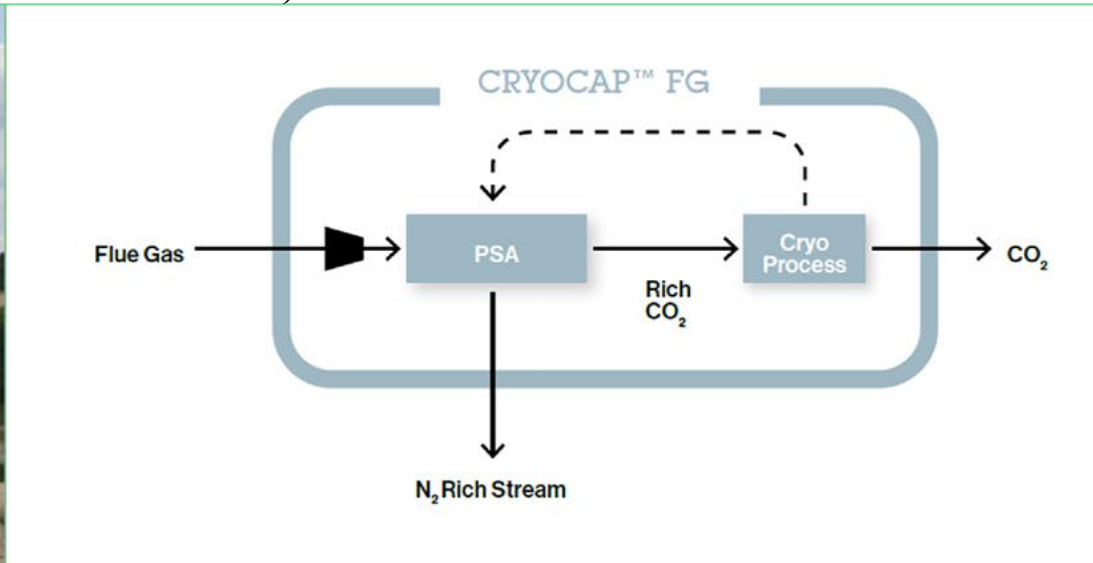


Industrial Carbon Capture from a Cement Facility Using the Cryocap™ FG Process (DE-FE0032136)



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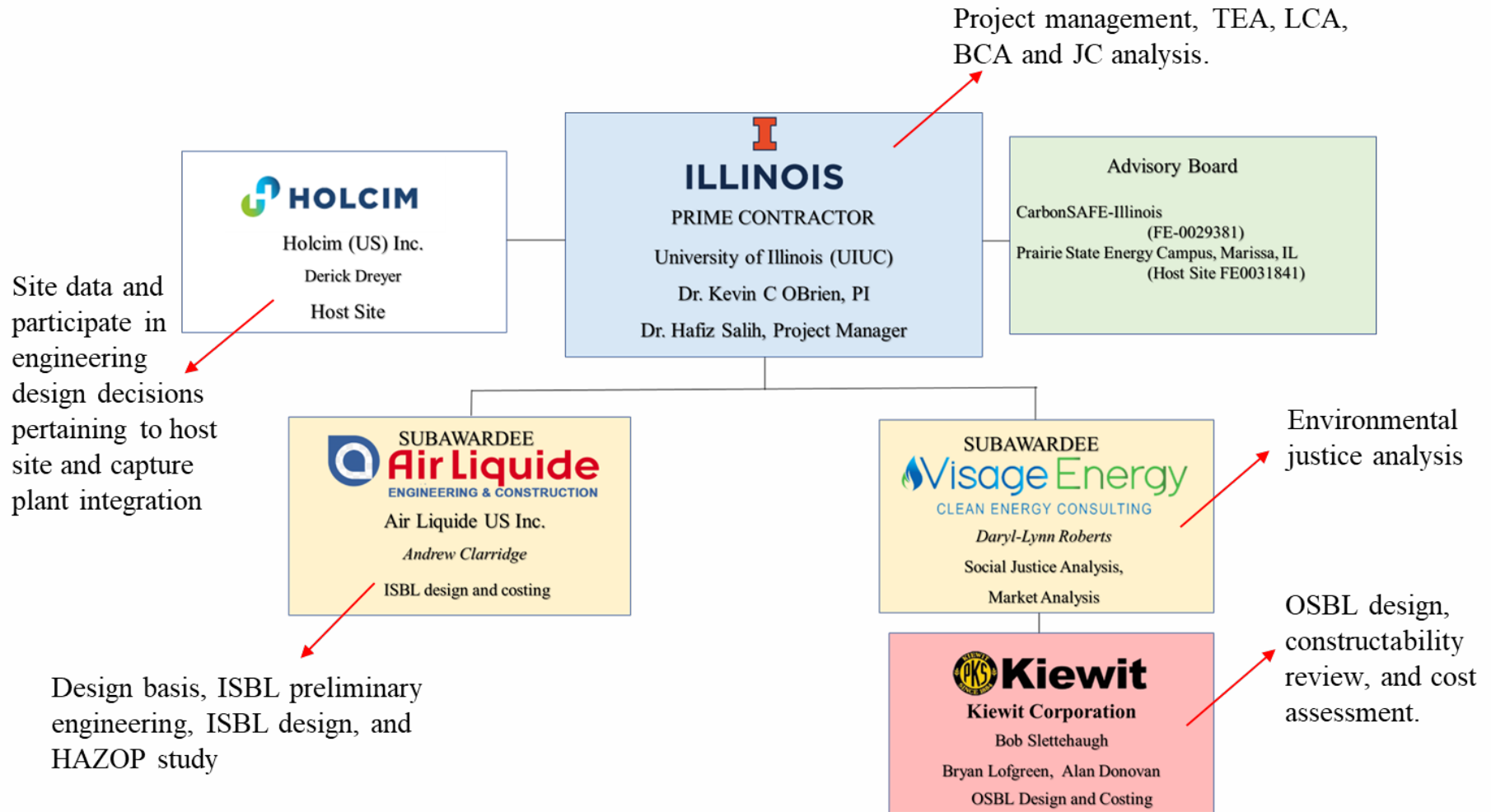
*DOE/NETL 2023 Cement and Limestone Decarbonization (August 15-19, 2022)
Pittsburgh, PA.*

Project Overview

- **Cooperative Agreement No. DE-FE0032136**
- **Total Funding: \$4,999,585**
 - DOE: \$3,999,585
 - Non-DOE: \$1,000,000
 - Cost Share: 20%
- **Performance Period:**
 - April 1, 2022– September 30, 2023
 - 18 months, 1 Budget Period
- **Main objective:** To execute and complete a front-end engineering and design (FEED) study for a commercial-scale, carbon capture system that separates 95% of the total CO₂ emissions at Holcim Ste Genevieve Cement Plant using Air Liquide’s Pressure Swing Adsorption (PSA) assisted Cryocap™ FG technology



Project Tasks vs. Lead Organizations



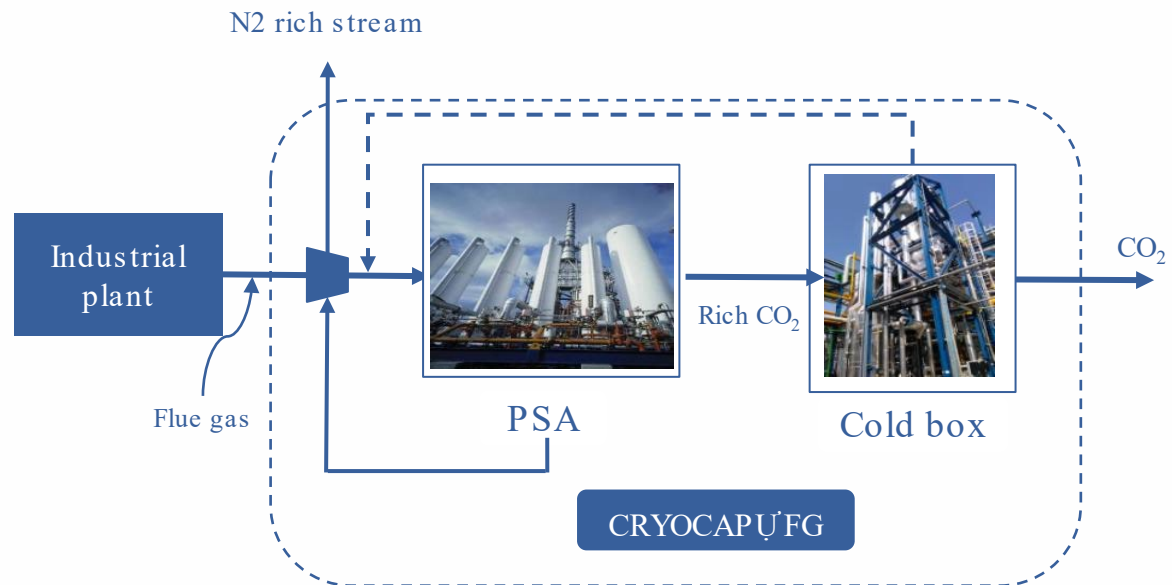
STE. GENEVIEVE CEMENT PLANT SIGNIFICANCE

- The largest single cement kiln in the world, commissioned in 2009
- Annual cement production capacity of 4.5 million metric tons
- A 4,000-acre site containing more than 100 years of limestone supply, in addition to 2,000 acres conservation area.
- Modern, efficient & state of the art facility, with high degree of automation and utilization (on stream factor)
- CO₂ transportation and storage partnership under development for storing CO₂ close to potential geological storage locations, i.e. the Illinois Corridor, where CarbonSAFE has highlighted significant storage potential

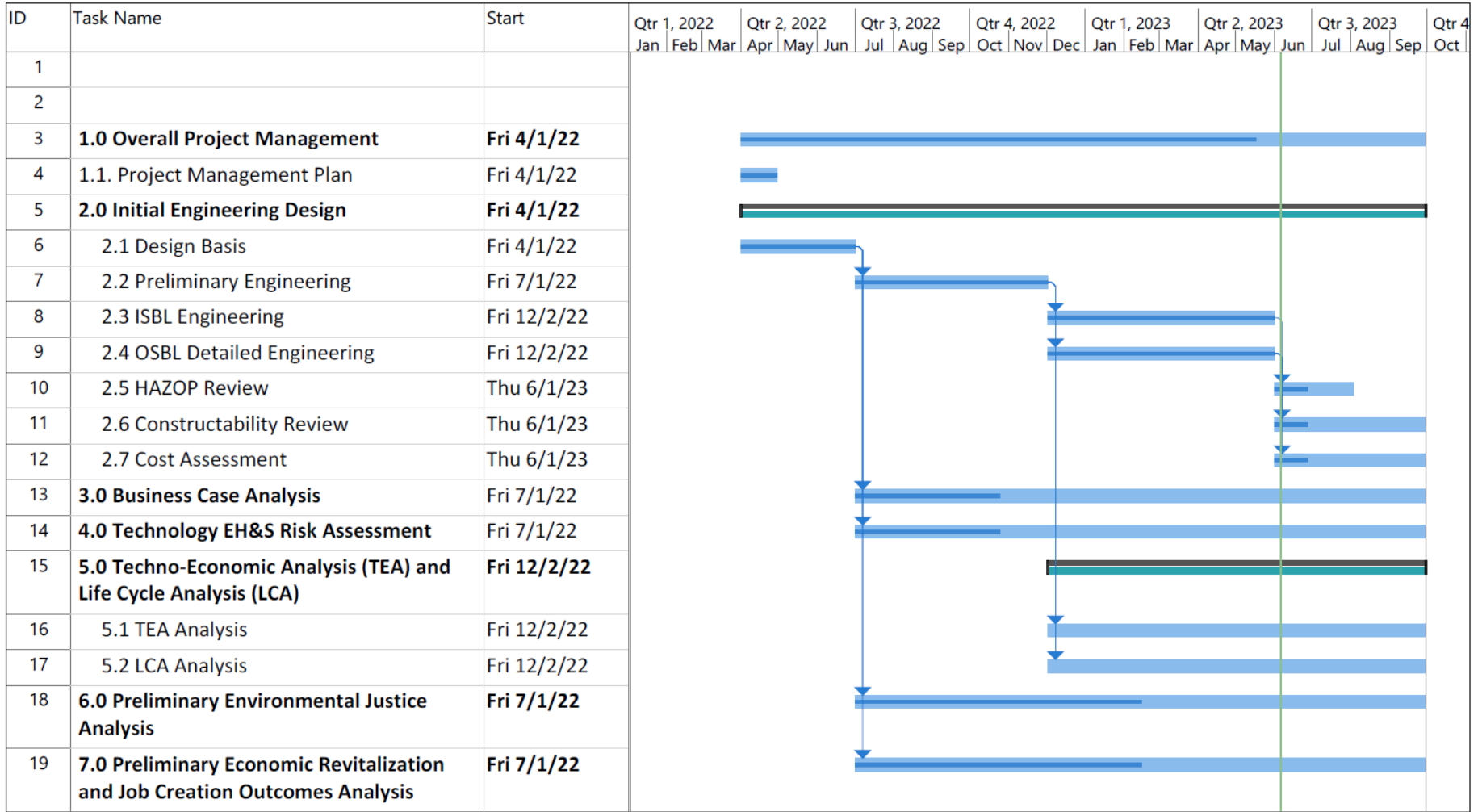


Cryocap™ FG: CO₂ Capture from Flue Gas (~15% to 40% dry mol CO₂)

- Suitable for Cement, Lime, SMR (flue gas), FCC, ...
- PSA as a preconcentration brick
- HSE friendly (no chemicals and no flammables)
- Electricity powered (no steam needed)
- Compact & Flexible footprint: Compressors, PSA and Coldbox can be located in 3 different plots
- NO_x Smart Management
- Gaseous or liquid CO₂
- CO₂ capture rate: 95%+



Project Timeline



Moving Forward

- Completion of all Studies and Investigations
- Business Case Analysis
- Technology EH&S Risk Assessment
- TEA and LCA
- Preliminary Environmental Justice Analysis
- Preliminary Economic Revitalization and Job Creation Outcomes Analysis

- Coordinate with synergistic geological storage projects near the Host Site so that the capture system would be part of a full CO₂ value chain system to capture, compress, transport, and store the CO₂ emissions from the Host Site.