

SEPARATIONS SAVVY

ENGINEERED SMARTER. BUILT MODULAR.

KOCH ACCIDENTALLY BECOMES PART OF HISTORY: Capturing CO₂ from Power Plant for Underground Sequestration

Background.

No one realized the implications of the CO₂ capture project that came through on Koch's web inquiry page. This project, which would end up in the *New York Times*⁽¹⁾ and *Scientific American*⁽²⁾, became the first operating carbon capture and storage facility. The requested scope was to design and build a section of a CO₂ capture unit in a Wisconsin power plant.

Challenges and Solution.

The customer had contracted another engineering company to develop an engineering package, but it soon became obvious that they were not geared to handle a pilot plant unit. A redesign was necessary and the customer contacted Koch Modular who immediately grasped the scope and potential technical problems ahead. They helped design a carbon capture unit based on the client's Chilled Ammonia Process. The process first absorbed the CO₂ using an ammonium carbonate solvent. The CO₂ was then stripped out from the solvent in a regenerator, converting the ammonium bicarbonate back into ammonium carbonate. The latter was returned to the CO₂ absorber, completing the solvent cycle.

The project was completed to the customer's satisfaction, with significant lost project time recovered.

However, operating a CO₂ capture unit in the Wisconsin winters presented special challenges.

The teams worked together, customer and Koch Modular, to resolve a few unique operating issues resulting in a successful test program.

Scale-up.

When the same customer needed a partner to build a larger carbon capture unit in a West Virginia power plant, Koch Modular was the logical choice.

With its own expertise and the experience gained from the Wisconsin project, Koch Modular designed heat-traced, free-draining piping with no stagnant areas. For high temperature corrosion areas, higher alloys instead of 316SS were used.

Because this project was also schedule-driven, modular construction was recommended to meet the schedule. This allowed the power plant to limit their on-site labor, and focus on off-module engineering, and other infrastructure, while Koch Modular handled the design and construction off-site.

Results.

The Koch Modular unit was the first to be completed within the larger Carbon Capture pilot project. The pilot unit was run by the power utility for two years to test the concept – up to 300 tons a day of CO₂ was compressed, injected and sequestered between layers of rock deep underground. The project was deemed a complete success⁽¹⁾.

References:

(1) *Scientific American* 2009/11/06, (2) *NY Times* 2011/07/14



K-Quips

Is it true that the carbon dioxide concentration in the atmosphere is rising at a rapid pace?

- A. Definitely.
- B. I am skeptical.
- C. No, it's a myth

For the answer, please visit modularprocess.com/separations-savvy

UPCOMING EVENTS

June 6-8
2017 AIChE Process Development Symposium (Toronto, Canada)

October 29 - November 1
2017 ISPE Annual Meeting & Expo (San Diego, CA)

October 29 - November 3
2017 AIChE Annual Meeting (Minneapolis, MN)

