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7th Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers

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Special Parallel Session: Workshop on Carbon Capture Technologies

Title of Presentation:

Project CO₂MENT: Building a CO₂ Marketplace for Cement's CO₂ Emissions with the eCO₂Source Capture System

Summary

While energy systems can be decarbonized through the use of renewables, emissions from industry face more significant challenges as many of their emissions are a natural byproduct of the manufacturing processes.

The cement industry, in particular, is both an energy- and emissions-intensive industry because of the extreme heat required to produce cement and the release of CO₂ from the limestone during the process. It represents approximately 5% of the world's anthropogenic CO₂ emissions.

Inventys is working with global partners LafargeHolcim and Total SA, to answer the following questions:

- Can we build a CO₂ marketplace around cement emissions?
- Is there a business opportunity for converting CO₂ from a global liability to a profit centre?
- How can the cement industry help itself by using the carbon dioxide they emit?

Project CO₂MENT: Campus of Innovation is an interdisciplinary program designed to create the conditions that will benefit all aspects of carbon management and evaluate opportunities for low carbon economic growth. It presents a compelling synergy among a variety of stakeholders interested in the potential to reduce capture costs plus assess the full value chain of CO₂ capture, conversion, and utilization.

Corporate Information

Inventys is a progressive carbontech company with a vision to be a global leader in building a CO₂ marketplace by matching manmade sources of CO₂ with CO₂-to-value opportunities. This business model, which leverages Inventys' breakthrough carbon capture technology, will enable the mass market for bulk distributed CO₂ supply.

VISION: BUILD A PHYSICAL CO₂ MARKETPLACE

Inventys aims to contribute toward CO₂ emission reduction at the gigatonne scale, by cutting the cost of carbon capture in half through its breakthrough scalable technology, called eCO₂Source™, and by developing a physical CO₂ marketplace.

eCO₂Source™ is a post-combustion CO₂ Capture system with a unique low capital cost structure and economy of scale, allowing it to be integrated and operated at a demonstration scale without prohibitive economic penalties.

As an end-of-pipe, point-of-source carbon capture technology, the eCO₂Source system doesn't require changes to the process that originally creates the CO₂, making this technology applicable to new plants and existing CO₂ emitters.

Designed as a self-contained, skid-mounted capture plant, eCO₂Source contains three critical proprietary elements, and a process-supporting balance of plant, to complete the gas-separation process. These proprietary components are:

1. Structured Adsorbent Beds
 - a. The synthesis and selection of adsorbent materials and formations of these materials into Inventys' patented parallel-passage architecture. Structured adsorbents have demonstrated their utility in intensifying adsorption processes and they are at the core of the eCO₂Source™ technology.
2. Rapid Temperature Swing Adsorption Process (VeloXoTherm™ Process)
 - a. The separation process, which completes in about 60 seconds, consists of three steps: adsorption, regeneration, and, cooling.
3. Rotary Adsorption Machine
 - a. Compact rotating machine design uses rapid valve cycling, process plant design, and the integration of the separation gas plant into an overall process solution

These small modular plants are designed to provide a match for industry between the emissions of manmade CO₂ and the need for CO₂ for CO₂-to-value opportunities. This distributed supply model approach is critical to reducing costs, proving the technology, developing markets, and managing emissions from industrial emitters.

The company is focused on decarbonizing industrial processes (cement), gas power plants, and hydrogen plants.

INVENTYS PROJECTS

Husky Energy: An equity investor in Inventys, Husky has a long-term relationship with Inventys. During the past three years, Inventys has been field-testing its 0.5 TPD CO₂ capture demonstration plant at Husky Energy's Pikes Peak South Lloyd Thermal Project in Saskatchewan.

The data accumulated from the 0.5 tpd testing contributed to the design and development of a 30 TPD pilot plant system, which is nearing commissioning. The 30 TPD, also for Husky, will be located on the same commercial site. It is currently in the final construction phase and will begin commissioning in Q2-2019.

PROJECT CO₂MENT: Project CO₂MENT: A Campus of Innovation aims to help reduce carbon emissions from industry by furnishing the cement marketplace with an advanced & viable post-combustion solution for capturing carbon emissions while also demonstrating & evaluating a practical path forward for re-use of the captured CO₂.

Project CO₂MENT centres around Lafarge Canada's Richmond Cement Plant, the global company's first North American operation. Operating since 1956, the Richmond Cement Plant is currently pursuing initiatives to increase its lower carbon fuels' usage but also needs to investigate solutions for addressing the carbon intensity of its process emissions, where alternative fuels or energy efficiencies have no impact.

The objective of Project CO₂MENT is to promote the development and demonstration of integrated solutions to capture and reuse CO₂ in value-added applications. The project scope consists of three distinct stages:

- Phase 1: Flue gas pre-treatment and contaminant-mitigation system design, construction, and testing;
- Phase 2: CO₂ capture plant design, construction, and testing; and,
- Phase 3: Utilization systems design, construction, and testing.

The scope includes the development of a full techno-economic assessment for cement production integrated with CO₂ capture and use and a CO₂ conversion study.

We have completed approximately half of the tasks in Phase 1 and kicked off Phase 2. Phase 3 awaits interest from a sufficient number of utilization technologies plus further resources. Contact us if you are interested in participating.

