VeloxoTherm™

Technology Platform that leverages the team’s expertise in structured adsorbents, optimized rapid cycle adsorption processes and novel compact equipment to revolutionize CO₂ capture

Inventys

- Team represents global leaders in developing commercial gas separation technology using structured adsorbents
- Private company, ~25 employees; headquartered in Burnaby, BC
- World class board of directors, investors and partners
- Large manufacturing facility and state of the art laboratories
- Technology poised for demonstration of breakthrough results with potential customers in place
Attracting Influencers

INVENTYS’ BOARD OF DIRECTORS

Wayne Thomson  Dr. Steven Chu  Roger Strauch  Dan Miller
Dr. Denis Connor  Dr. Wal van Lierop  Tracy Evans  Soheil Khiavi  Brett Henkel
Strong Partners for Execution
INDUSTRIAL, GOVERNMENT, AND FINANCIAL PARTNERSHIPS

Pilots and Partnerships

Project Investors

Equity Investors

Mitsui Global Investment
**VeloxoTherm™ CO₂ Capture Process**

Rapid Cycle Thermal Swing Adsorption

**Structured Adsorbent**

Solid sorbents = Low regeneration energy
Structured Adsorbents = Intensification (small equipment)

**Rotary Embodiment**

Continuous process created by rotating beds
Based on existing rotary air preheaters used in power plants
The Veloxo Therm™ Process

THREE SIMPLE STEPS

Step 1: Adsorption
As flue gas passes through the Veloxo Therm™ structured adsorbent, CO₂ clings to the adsorbent while the other gases pass through.

Step 2: Regeneration
After the structured adsorbent becomes saturated with CO₂, it is regenerated. Low pressure steam is used to release the CO₂ from the adsorbent.

Step 3: Cooling
After the CO₂ has been released, air is used to cool the structured adsorbent, preparing it for the adsorption step and the process is started over again.
Why Inventys?
PIECING IT TOGETHER – FIRST PRINCIPALS TO Viable PROCESS

Materials and Architecture

Process Modeling and Validation

Plant Design and Integration
The RAM
NOVEL EMBODIMENT | EXISTING EQUIPMENT
Challenges & Opportunity

+ Initial generations of structured adsorbent used activated carbons as raw materials
  + Plentiful & commercially available
+ Major progress made with advanced carbon material, but performance falling short of breakthrough economic targets

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<thead>
<tr>
<th></th>
<th>Competitor</th>
<th>Inventys</th>
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<tbody>
<tr>
<td>CO2 Captured</td>
<td>0.26TPD</td>
<td>0.26TPD</td>
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<tr>
<td>CO2 Capture Efficiency</td>
<td>68%</td>
<td>71%</td>
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<tr>
<td>CO2 Product Purity</td>
<td>93%</td>
<td>95%</td>
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<tr>
<td>Total Steam Required</td>
<td>127kg/h</td>
<td>44kg/h</td>
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<tr>
<td>Steam Ratio</td>
<td>11.7</td>
<td>4.1</td>
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Apply Technology Platform of Structured Adsorbents + Rapid Cycle TSA
Unlock potential of newly developed raw adsorbents for CO₂ Capture
Facilities & Capabilities

+ $2MM state-of-the-art adsorption characterization laboratory enables rapid, accurate screening of numerous adsorbent materials
+ In-house proprietary simulation capabilities dramatically shortens design-verify-validate timeline

+ Process validation and demonstration units enable highly accurate models of full scale performance
+ Multiple component test stations and durability/lifetime testing hardware de-risks large pilot development and full scale design

+ 21,000 sq. ft. manufacturing facility
+ Optimized structures manufacturing process
+ Sufficient manufacturing equipment to support in-house development of large pilot and pioneer-commercial plants
Company Timeline

2009

Proof of Concept

Single-bed cyclic testing confirms promise of structured adsorbent platform

2013

Process Demo

Process Demonstration Unit high-fidelity rotating bed embodiment

2014-15

In-House Pilot

Prototype Rotary Adsorption Machine completes >2,000 hrs of testing on natural gas

2016

Coal Field Test

Pilot Plant moved to coal fired power plant in Texas – promising resilience to key coal flue gas contaminants

2007 – Company Founded

2012 – Series ‘A’ financing (Mitsui, Roda); agreement with Husky Energy

2014 – Dr. Steven Chu joins board; Chevron & Chrysalix join Series ‘B’ financing

2015 – Move to new facilities – 21,000 sq.ft of manufacturing & process testing & state-of-the-art adsorption lab
Development Program

Q4-16 Adsorbent Selection

>50 adsorbents screened, next generation adsorbent(s) will be selected & performance verified with cyclic testing

Field Test of Next Generation Adsorbent

Small pilot on Saskatchewan gas-fired boiler to show next-gen adsorbent in the field

2017

Large Pilot

2018

Large pilot shows a breakthrough technology with a step-change in capture costs and enables technology commercialization

Commercial Deployment

12 Plants in Canada under MOU
62 Attractive coal-fired prospects in US (GW scale)

2019 +
Field Testing | Coal Flue Gas

Prototype | Field Test | Pilot Plant | First of a Kind Commercial

Q1 2016

Field Test System

Location: Houston, TX
Funding: IRAP, DoE, NRG
Source: Coal-fired power

- Testing on raw flue gas from a coal power plant
- Coal flue contaminants (SO$_x$, NO$_x$) and other contaminants which challenge other technologies
Oil Sands Pilot Plant Field Test

November 2016  Once Through Steam Generator Flue Gas
Oil Sands Large Pilot Plant

30 TPD PILOT PLANT to DEMONSTRATE STEP-CHANGE CAPTURE COSTS

30 TPD Pilot Plant
Oil Sands Once Through Steam Generator

Commercial Deployment
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