Enzymatic Technology for Low-Cost Carbon Capture

Carbon Sequestration Leadership Forum
June 16, 2015

Forward Looking Statements

All statements in this presentation that are other than statements of historical facts are forward-looking statements which contain our current expectations about our future results. Forward-looking statements involve numerous risks and uncertainties. We have attempted to identify any forward-looking statements by using words such as “anticipates”, “believes”, “could”, “expects”, “intends”, “may”, “should” and other similar expressions.

Although we believe that the expectations reflected in all of our forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. A number of factors may affect our future results and may cause those results to differ materially from those indicated in any forward-looking statements made by us or on our behalf. Such factors include our early stage of technology development; our need for capital to finance necessary research and product development; our ability to attract and retain key employees and strategic partners; our ability to achieve and maintain profitability; fluctuations in the trading price and volume of our stock; competition from other providers of similar products and services; and other unanticipated future events and conditions. For further information concerning risks and uncertainties that may affect our future results, please review the disclosures as may be contained from time to time in our filings with SEDAR. Other than as required by applicable securities laws, we undertake no obligation to publicly update or revise any of our forward-looking statements, whether as a result of changed circumstances, new information, future events, or for any other reason occurring after the date of this presentation. *This presentation does not constitute an offer to sell or solicitation of an offer to buy securities in any jurisdiction.*

About CO_2 Solutions Inc.

- Leader in the field of enzyme-based CO_2 capture
- Based in Quebec, Canada
- $45 million invested to date
- 22 employees, including 6 PhDs
- 49 issued and 40 pending patents
- Entering commercial phase
- Publicly traded on TSX Venture Exchange (Symbol: CST)

Conventional CO_2 Capture is Inefficient

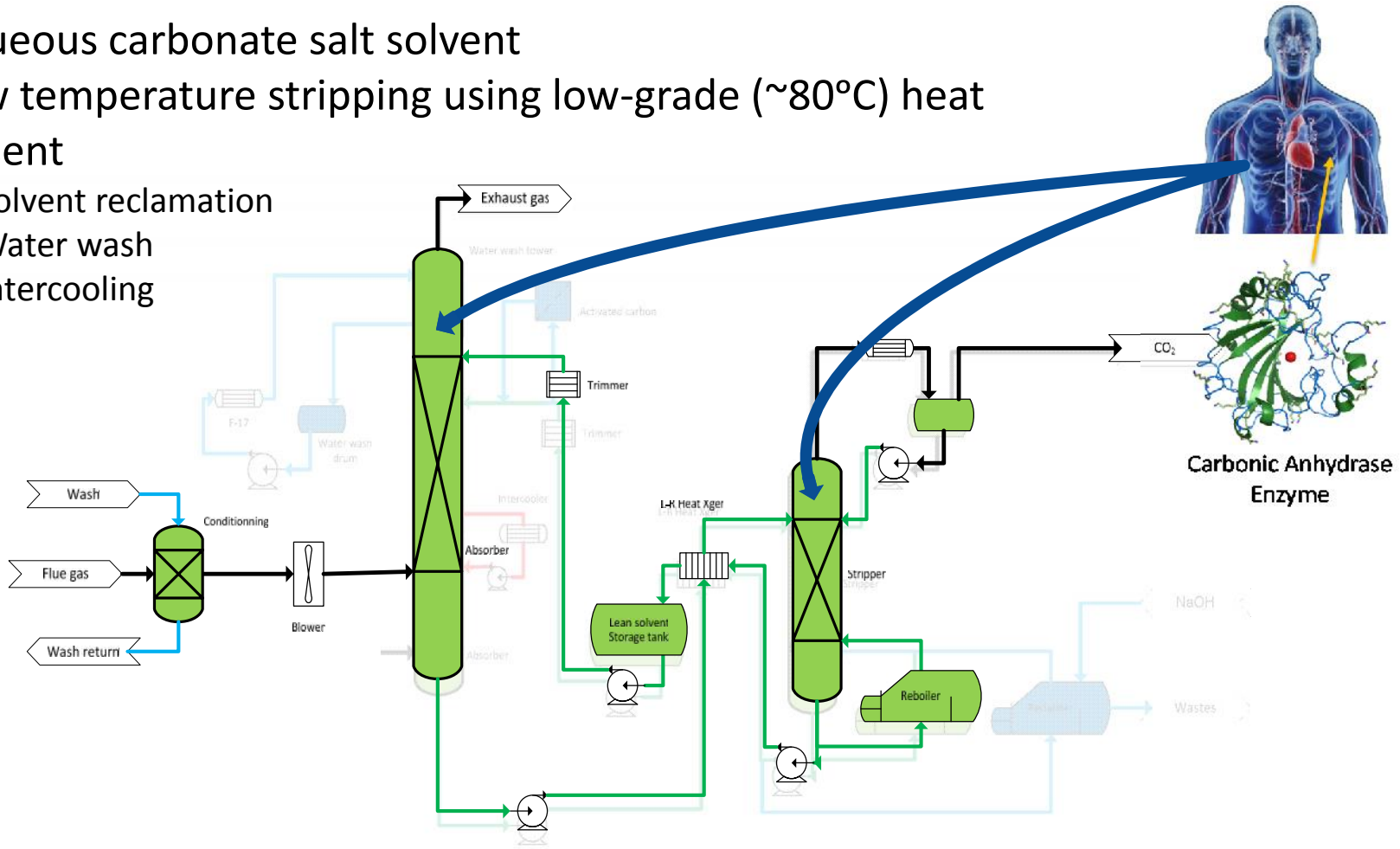
- High costs
  - Steam required for solvent regeneration = high operating costs
  - \$60-90/tonne of CO_2 for flue gas application[1,2]
  - Cost is critical issue to be resolved for EOR and other CO_2 reuse and sequestration to be expanded[3,4]
- Operational and environmental problems[5]
  - Degradation and stability issues; extensive flue gas pre-treatment required
  - Toxic aerosol emissions
  - Solvent losses
  - Waste products to handle

Sources:

1) http://ccemc.ca/wp-content/uploads/2012/12/C101033-HTC-DEV-JA-03-001-1-R1-+-FEED-REPORT-CCEMC.pdf, Page 19 (~$70/tonne cost)
2) https://www.netl.doe.gov/File%20Library/Events/2014/2014%20NETL%20CO2%20Capture/A-Bhown-EPRI-CO2-Capture-RD-EPRI.pdf, Page 6
3) http://www.ai-ees.ca/media/10958/2010_barriers_to_co2_eor_report_final_june4-13.pdf, Page 44
4) http://www.energy.gov.ab.ca/Org/pdfs/CCS_Implementation.pdf, Page 10
5) http://www.sciencedirect.com/science/article/pii/S1750583614001777

Our Process – An 'Industrial Lung'

- Aqueous carbonate salt solvent
- Low temperature stripping using low-grade (~80°C) heat
- Absent
  - Solvent reclamation
  - Water wash
  - Intercooling



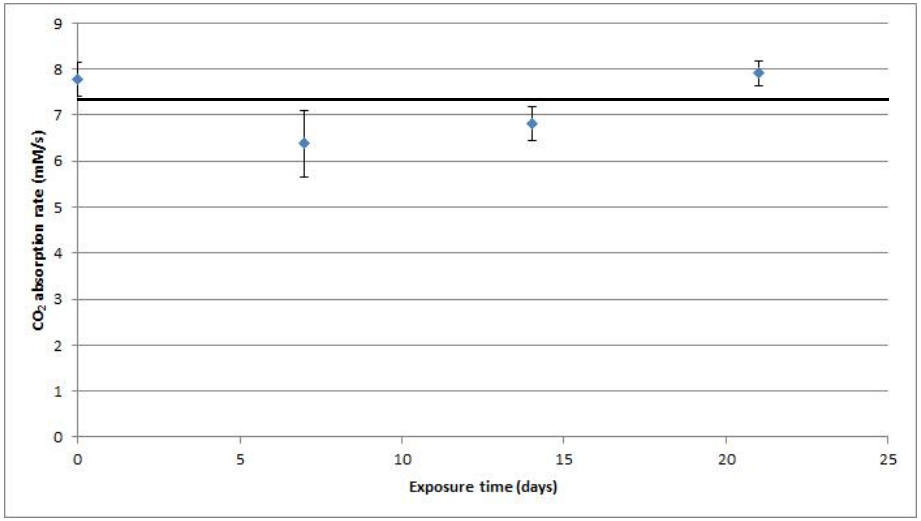
Industrially Robust Enzyme

- Natural Carbonic Anhydrase (CA) is not stable for CO_2 capture process conditions in solvents
- CO_2 Solutions has bio-engineered a CA suitable for commercial deployment
- Sustained performance under CO_2 capture operating conditions
- Industrial quantities produced

TSX-V: CST
Outstanding Shares: 100,494,626 *For Immediate Release*

CO_2 Solutions Unveils New Carbon Capture Enzyme

Quebec City, November 19, 2014– CO_2 Solutions Inc. (TSX-V: CST), the leader in the field of enzyme-enabled carbon capture technology, today announced the completion of the internal development of a new high-performance carbonic anhydrase enzyme.



Performance of 1T1 Enzyme
Carbonate Solvent, lean conditions
40 - 70°C Cycling

Results of Pilot Testing

- ~1 tonne-CO_2/day testing conducted Energy & Environmental Research Center (EERC)
- Coal and natural gas flue gases
- Stripping heat was provided by hot water; steam never used
  - Effective parasitic load of **0.2 GJ/t** for capture used to maintain reduced stripping pressure
  - Use of low-grade, nil value heat from outside power plant steam cycle is the key
- Cost of capture incl. compression to 2250psi estimated at **$39/tonne** by EERC engineers
- Constant capture performance
  - No enzyme activity loss during the test
- No solvent make-up
- Zero waste produced

EERC
Energy & Environmental Research Center®
Putting Research into Practice

Now: 10 tonne/day Demonstration

- Located in Salaberry-de-Valleyfield, near Montreal
- Operations began May, 2015
- 90% CO_2 capture from flue gases of natural gas fired boiler (8.3% CO_2 content)
- 2500 hours operation scheduled
- Stripping uses hot water (no steam)
- Supported in part by Government of Canada's ecoENERGY Innovation Intiative (ecoEII) and Alberta's Climate Change and Emissions Management Corporation (CCEMC)
- Open for visitations by interested parties
- Positions technology for initial commercial availability in 2015

Natural Resources Canada Ressources naturelles Canada
Canada
ecoENERGY an ecoACTION initiative
CCEMC

Next: High Mass Transfer Contactor

- Work has begun on incorporation of high-intensity absorber in process
- Higher mass transfer maximizes catalytic impact of enzyme
- Greatly reduced absorber size vs. traditional packed column
  - 20 to 50 factor reduction in volume
- Potential for CO_2 capture cost <$30/tonne incl. compression

Overall Benefits

- Solvent regeneration using heat outside of power plant steam cycle
  - Minimal boiler upgrade/rebuild or auxiliary steam generation required
  - 30% less gas volume to treat vs. amine process
- Smaller footprint of capture unit
  - Better suited to retrofit and space-constrained operations
- Environmentally benign solvent
  - No degradation products or aerosols
  - Ease of environmental and waste management operations
- Lower total cost of capture
  - Economics more favourable relative to Enhanced Oil Recovery opportunities and potential carbon pricing to support CCS

THANK YOU

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