July 17, 2014 – Please see the following article that Featured HTC’s CO2 Capture Technology in the Industry publication “Oil Sands Review” on July 9th, 2014

CARBON CAPTURE TAKES THE STAGE AT HUSKY’S PIKES PEAK SAGD PROJECT

By Melanie Collison published on July 9, 2014

Carbon capture is a costly business, but commercializing the process is seen as a key piece of the environmental and economic structure enabling continued heavy oil and oilsands growth.

As producers evaluate different methods, Husky Energy Inc. is embarking on three small-scale steam assisted gravity drainage (SAGD)—based CO2 capture pilots with an eye to reducing emissions by 35 tonnes per day—half the output from a 50-million-BTU once-through steam generator—for a total of one megatonne by 2021.
Located at Husky’s Pikes Peak South thermal heavy oil project about 35 kilometres east of Lloydminster, on the Alberta-Saskatchewan border, pilot designs call for captured CO2 to be piped to a compression facility and then injected into partially depleted oil reservoirs, where carbon capture and storage (CCS) has been proven to increase production.

“We are conducting small-scale CO2 capture pilot projects with three companies, each designed to test and evaluate the technologies for potential use in enhanced oil recovery,” says Husky spokeswoman Kim Guttormson. “It will take time to evaluate the results.” Husky declined comment on further details, but two of its three technology vendors have been publicly disclosed.

HTC CO2 Systems Corp., an internationally known CO2 capture company based in Regina, Sask., says that by late fall its advanced post-combustion amine capture technology pilot will be operating at Pikes Peak South. The company says it has completed the engineering and is proceeding rapidly with facility construction.

In July 2012, Husky garnered $2.955 million to run the pilot from the Climate Change and Emissions Management Corporation (CCEMC), which invests penalty dollars from Alberta’s big greenhouse gas emitters in low-carbon technology development.

CCEMC shows the total cost of the project has since risen from $10 million to $12.132 million.

In April, Quebec City–based CO2 Solutions Inc. announced it would be joining the project to conduct the first field trial of its biotechnological alternative to traditional amine capture technology.

The third company has not yet been publicly identified.

“We’ve been involved in just about every CO2 capture project around the world—North Dakota, Norway, Germany, China. We’re always in the top five in
every project,” HTC senior vice-president Jeff Allison told Oilsands Review in a recent interview from Regina.

Parent company HTC Purenergy Inc., which had early ties to the University of Regina, created HTC CO2 Systems in 2012 to manage commercial opportunities when global focus started shifting from the stick (regulating GHG emissions) to the carrot (developing CO2 into a valuable commodity).

HTC’s Canadian experience includes a 2011 study detailing process design and front-end engineering and design for a 1,000-tonne-per-day CO2 capture set-up at Devon Canada Corporation’s Jackfish SAGD project near Conklin, Alta.

CCEMC funded the $315,000 report to evaluate how HTC’s advanced post-combustion amine CO2 capture technology could be added to Devon’s existing facilities and integrated into the design of new SAGD boilers.

CCEMC envisioned HTC’s modular phased approach being applied across the oilsands and in other industries in Alberta and worldwide. Canada’s Oil Sands Innovation Alliance is currently discussing the report, Allison says.

**Improving capture economics**

Segregating CO2 is the most costly component of any CCS or capture and reuse project. HTC intends to prove at Pikes Peak South that it can be done economically.

Accepted industrial practice for four decades has been to bubble post-combustion flue gas into a solution of 30 per cent amine and 70 per cent water. The CO2 adheres to the amine, a synthetic chemical, while nitrogen passes by.

When the solution becomes saturated with CO2, it’s transferred to another vessel and heated. Boiling releases the CO2, and water vapour from the amine is separated from the materials and captured.

To make the process economically viable, proponents have to reduce the energy cost of heating the solution to release the CO2 and reclaim the solvent. HTC has tweaked each step to improve efficiency.
“We came up with optimal packing materials, which provide the surface area where the gas meets the solvent,” Allison says.

The company developed combinations of solvents to be optimally absorbent in any given application, yet boil at a lower temperature to hasten CO2 release and reduce energy cost.

Their multi-phased reclaimer is designed to adapt to the different solvent blends’ various boiling points.

“We also looked at the process to use heat exchangers and other mechanical [improvements] to optimize the solvent reclaiming system. Like the kidney in the human body, the reclaiming system removes impurities so the solvent does a better job of absorbing the CO2 [in repeated usage].”

And finally, HTC adopted oilpatch construction techniques to mount the process units on skids for installation flexibility.

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