Backgrounder: Project summaries

Cenovus Energy: Solvent Driven Process Field Demonstration

- Alberta Innovates: $2,000,000
- NRCan: $7,525,000

MEG Energy: eMVAPEX

Funding:

- Alberta Innovates: $2,300,000
- NRCan: $9,933,000

Field Upgrading: DSU DBM and FEED Study

Funding:

- Alberta Innovates: $971,000
- NRCan: $3,560,000

Cenovus Energy: Solvent Driven Process Field Demonstration

The proposed demonstration project will test an oil sands extraction technology using a solvent-driven process. This involves co-injecting solvent together with steam into a well at Cenovus's Foster Creek project after approximately one to two years of steam-assisted gravity drainage (SAGD). Unlike in previous solvent pilots conducted by Cenovus, the majority of the steam-solvent mix in this demonstration project will be solvent (between 50 and 95 per cent by weight). The steam will heat the solvent to about 80-100° C, and the heat and solvent are expected to sustain steam chamber growth in the reservoir. Among other things, the demonstration project will evaluate the reduction in steam requirements with the goal to develop a technology that can potentially significantly lower the cumulative steam-to-oil ratio and water treatment costs associated with steam generation.

MEG Energy: enhanced Modified VAPour Extraction

The main objectives of the enhanced Modified VAPour Extraction (eMVAPEX) technology are to efficiently grow MEG's bitumen production rate, achieve sustainable cost savings and minimize environmental impacts to land, air and water. It is anticipated that by employing eMVAPEX, the bitumen production rate and overall bitumen recovery will increase relative

to the SAGD process while requiring significantly less steam injection. As eMVAPEX requires less steam per barrel of oil, MEG is projecting an approximately 43 per cent reduction in GHG emissions relative to the industry average as well as a significant reduction in water usage. The efficiency gain in steam deployment will allow MEG to redeploy existing steam generation capacity to new patterns, further increasing bitumen production and reducing the overall per barrel footprint and cost of bitumen production.

MEG targets annual production of 80,000-82,000 barrels per day in 2017. Steam generation is the main contributor to GHG emissions and the operating cost of bitumen production. eMVAPEX involves injection of a light hydrocarbon instead of steam after initial SAGD operation when bitumen recovery reaches between 20-30 per cent. It is anticipated that by employing eMVAPEX, overall plant bitumen production could be increased by up to 70 per cent with the same steam assets employed for SAGD bitumen production. The overall GHG emission intensity is expected to be reduced by as much as 43 per cent for industry standard assets at 3.0 SOR, as well as improving the overall recovery from the reservoir.

Field Upgrading: Clean Seas Demonstration Project
The objective of this project is to advance Field Upgrading's (DSU™) technology by completing a Front-end Engineering Design (FEED) study for a first of its kind modular large scale 2500 barrels per day (Bpd) demonstration plant.

DSU™ technology removes sulphur and metals from heavy oils and refinery bottoms to produce a marine fuel that complies with the lower ISO sulphur specifications s for marine fuel. DSU technology is more energy efficient than conventional technologies, has no direct SO_x, NO_x, PM or GHG emissions, and does not leave coke or asphaltenes behind.

The DSU™ technology has been extensively proven in the lab and at pilot scale, with an operating 10 Bpd pilot plant, across over 30 different feedstocks from Alberta bitumen and refinery bottoms to Columbia heavy oils with consistent positive results.

This FEED study will be a building block for a full-scale commercial plant. An important advantage of the DSU™ process is its scalability. An objective of the project will be to package the commercial plant into sea container-size skids that can be prefabricated and delivered to site to speed rollout of the technology and minimize low-productivity work in the field.