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## Producers Outline Alternatives To Natural Gas In Oilsands Operations

**By Elsie Ross**

Alberta oilsands operators looking for alternatives to natural gas, their single biggest operating cost, are being presented with a growing number of potential technologies to reduce or eliminate the need for gas in their operations.

At a technical luncheon session Monday at the **Canadian Association of Petroleum Producers** annual investment symposium, delegates heard from three companies, including a service company, that are already doing just that.

At the Long Lake SAGD project, **OPTI Canada Inc.** a 50-50 partner with **Nexen Inc.**, is building a gasification unit for its upgrader using its proprietary OrCrude process. "It will be the first gasifier in Canada's oilsands but I certainly don't expect it will be the last," said **Sid Dykstra**, OPTI president and chief executive officer.

**Suncor Energy Inc.** has plans to build a stand alone coke gasifier for its third upgrader while **Synenco Energy Inc.** will have a gasifier at its proposed 50,000 bbl a day Northern Lights mining project with partner **Sinopec**.

Dykstra said OPTI has focused on extracting energy from the least valuable part of the barrel of bitumen. Early in the process, the heavy tar is removed in the liquid form of asphaltine. Oxygen is added to oxidize the fuel and create a synthesis gas that is rich in hydrogen. The hydrogen, extracted in a conventional refinery process, supplies the hydrogen for the hydrocracker.

The remaining energy content coming off the top of the gasifier is equivalent to about 100 mmcf per day of natural gas, said Dykstra. The remaining part of the bbl goes through a conventional hydrocracker and is converted to light sweet products.

While there are two types of gasifiers, a solid (used in mining projects with cokers), the liquids gasifier OPTI is using is cheaper, more reliable on a run-time basis and much more economic to run, he said.

**Petrobank Energy and Resources Ltd.** is currently developing the WHITESANDS pilot project to field demonstrate its patented THAI (toe to heel air injection) technology which uses controlled combustion within the reservoir.

Following a pre-ignition heating cycle to condition the reservoir, air is injected into a vertical well at the toe of a horizontal well, said **Chris Bloomer**, vice-president of heavy oil and chief financial officer. Temperatures of 400 to 700 degrees Celsius heat the heavy oil or bitumen to the point where it can be produced from a horizontal well. Petrobank is initiating the steam cycle in the first set of three wells and wants to be on combustion in all three wells by the end of the year, he said. It takes a year to propagate combustion 100 metres. "Because this is an insitu coking process, you also can expect to get some partial upgrading," said Bloomer.

A third technology, MSAR (Multi-phase Superfine Atomized Residue) adds water and proprietary chemicals to bitumen to produce a steam emulsion resembling black paint, said **Gordon Hoy**, vice-president of business development for **Quadris Canada Fuel Systems** which produces the fuel. The emulsion is then burned in the same steam generators in place of natural gas, generating sulphur oxides and sulphur dioxides along with particulates which have to be removed before they are vented into the atmosphere.

MSAR is designed to have combustion characteristics similar to those of natural gas. In a SAGD project that means 100% carbon burnout and a very short combustion time, he noted. The flue gas stream also can be customized to produce a stream that is 90-95% pure, enabling it to be used in enhanced oil recovery projects or simply sequestered in the reservoir.

In the Fort McMurray area, the flue gas could be injected into the overlying gas cap, solving concerns that production of gas overlying bitumen can reduce the reservoir pressure, making it uneconomic to produce the bitumen in a SAGD project, said Hoy.

MSAR was first used in 1988 by **PDVSA** in Venezuela but "we have come a long way since then," said Hoy whose

company recently signed its first commercial contract.

Responding to questions from the audience, the companies indicated their technologies offer attractive economics in relation to projects that rely on natural gas. A liquids gasifier, for example, is economic at a price of \$3 per mcf for gas at AECO, said OPTI's Dykstra.

The capital cost for THAI is one-half or less that of SAGD because it requires only one horizontal well and does not require steam and water handling facilities, said Bloomer. Operating costs also would be lower with minimal water handling facilities. The economics would be twice those of typical SAGD projects and would be even greater if the greater recovery rate (70% to 80% of oil in place) is taken into account, he suggested.

THAI also offers environmental advantages in that it uses minimal water and does not emit large volumes of greenhouses gases, two of the major concerns, said Bloomer.

For MASR, the most important aspect would be the bitumen price because it would have to factor in the lost opportunity to an oilsands company for the bitumen required to make the emulsion, said Hoy. In a base case scenario of \$60 a bbl WTI, the price advantage for bitumen coming out of the ground would be nearly \$5 per bbl, he said. As the steam oil ratio (SOR) in a SAGD project increases, the economic advantage of MSAR increases, he said.

With between 0.5 mcf and 0.7 mcf of gas required to extract and upgrade each bbl of synthetic oil, there is an incentive to find alternatives to the use of natural gas, said **Greg Stringham**, vice-president of markets and fiscal policy for CAPP. The Alberta **Energy and Utilities Board** is forecasting that growth in oilsands demand for purchased gas will increase to 1.1 bcf per day by 2013, up from just under 500 mmcf per day in 2005, he noted.

CAPP is forecasting Alberta oilsands production will rise to 3.5 million bbls a day by 2015 and four million bbls per day by 2020. In addition, nearly 2.9 million bbls of upgrading capacity have been approved or announced and all that will require natural gas, he noted.

The CAPP symposium, which wraps up Wednesday, has attracted a capacity crowd of 400 delegates and sponsors, of which about one-half were from outside Canada, including a number from France, said **Stephen Ewart**, an association spokesman. A total of 97 companies are presenting.

Ewart suggested the numbers this year are due in large part to the strong commodity prices coupled with the growing international interest and awareness of the Alberta oilsands.

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