

ExxonMobil Licenses Oil Sands Steam Injection Technology to Baker Hughes

- Improves economics of steam injection and oil production at in-situ oil sands projects
- Technology reduces CO₂ emissions up to 10 percent
- First license granted for patented steam injection system and production method

IRVING, Texas--(BUSINESS WIRE)-- ExxonMobil Upstream Research Company has awarded the first license for its patented steam injection system and production method to Baker Hughes to improve the efficiency of in-situ oil sands projects. Approximately 80 percent of Canada's oil sands can be produced using in-situ technology, which involves the injection of steam to enable bitumen to be extracted through drilling versus surface mining.

The ExxonMobil-patented technology provides more effective regulation and distribution of steam in long horizontal wells for in-situ oil sands production. The technology reduces the number of wells needed, lowers operating costs by reducing steam consumption and improves overall recovery from the field.

The technology can be used in cyclic steam stimulation (CSS), steam-assisted gravity drainage (SAGD) and steam flood (SF) heavy oil production projects. The technology was developed by Imperial Oil Limited, an ExxonMobil Canadian affiliate, and applied at the Imperial [Cold Lake](#) oil sands project.

"We have demonstrated that our technology can improve the economics and the environmental performance of oil sands projects," said Sara Ortwein, ExxonMobil Upstream Research Company president. "This is one of several significant technologies we have developed over the past five decades for improving oil sands production."

The steam injection technology (embodied in United States patent 6,158,510 and Canadian patent 2,219,513) has two key components:

- An externally mounted screen section that enables excellent contact between the well and the reservoir, and
- One or more small flow orifices beneath the screen section that creates the desired level of flow restriction between the inside of the pipe and the reservoir.

The technology enables control of steam into the formation over the entire length of the horizontal well. For SAGD applications, this technology can be used on both injector and producer wells to manage steam distribution and oil production from the reservoir.

"This robust technology has proven itself in oil sands applications in Canada by increasing the efficiency of the injected steam and improving ultimate recovery, which translates into

lower CO₂ emissions per barrel of oil produced,” said Eddie Lui, Imperial Oil Resources vice-president, oil sands development and research. “We have seen CO₂ reductions of up to 10 percent compared to traditional vertical CSS completions.”

“This steam-injection technology benefits in-situ oil sands operations through its ability to design and control distribution of steam and is a fitting addition to our wide portfolio of capabilities in Canada, where heavy oil producers look to Baker Hughes for solutions to the unique challenges of oil sands projects,” said Mike Davis, president of Baker Hughes International Canada.

Over the past 40 years, ExxonMobil has invested more than 2,000 work years in heavy oil research. These efforts include developing proprietary in-situ recovery processes, enhancing surface-related technologies to improve the economics of mining operations, and creating technologies to increase the value of heavy oil and aid in its transport.

Imperial Oil’s Calgary research center is considered to be one of the leading oil sands research facilities in the world. Since 1961, Imperial has held more than 160 upstream patents, including the first patents on CSS and SAGD, two key processes used across the industry in bitumen recovery. Today, those inventions are continually being refined at the center to improve productivity and environmental performance.

About ExxonMobil Upstream Research Company

ExxonMobil Upstream Research Company is the Upstream research affiliate of Exxon Mobil Corporation (NYSE:XOM), a leading global oil, natural gas, and petrochemicals company with operations in nearly 200 countries and territories worldwide. ExxonMobil Upstream Research Company is charged with developing an industry-leading array of proprietary technologies that support the Corporation's continued leadership position in exploration, development, production and gas commercialization. For more information, visit www.exxonmobil.com.

About Imperial Oil Limited

Imperial Oil is one of Canada's largest producers/refiners of crude oil with almost \$25 billion in operating revenue and more than \$2 billion in earnings (2010). It also has more than 2.5 billion barrels of proved and developed reserves. Imperial Oil was formed in 1880 and has been a key part of ExxonMobil since Standard Oil acquired a majority stake in 1898. For more information, visit <http://www.imperialoil.ca>.

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