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Oil Sands and Shale Gas - Western Canada's Unconventional Answer to Global Energy Demand

Canada is uniquely positioned to provide an abundance of secure and reliable energy. With conventional oil supply declining, the need for unconventional resources, like oil sands and shale gas, will increase. Alberta and British Columbia, Canada's two western-most provinces, house the vast majority of Canada's oil and natural gas deposits, making both provinces key players in the push to develop resources sufficient to meet growing energy demand in North America and beyond.

Alberta's Oil Sands

Alberta has the 3rd largest proven crude oil reserve in the world, next only to Saudi Arabia and Venezuela. Ninety-nine percent of those reserves are found in Alberta's oil sands. Oil sands are a natural mixture of sand, water, clay and bitumen. Bitumen is oil that is too heavy or thick to flow or be pumped without being diluted or heated. Alberta's oil sands underlie 54,132 square miles of land in northern Alberta (an area roughly the size of the state of New York). Together, these oil sands areas contain an estimated 1.8 trillion barrels (initial volume in place) of crude bitumen. About 10% of this volume is recoverable using current technology and is considered to be a proven reserve. To date, less than 5% of the initial established resource has been produced.

Oil sands within 200 feet of the surface can be mined, whereas oil sands below this threshold must be extracted using drilling (in situ) methods. Of the proven oil reserves, approximately 80% is recoverable by in situ methods, and 20% by surface mining methods. In situ projects, which resemble conventional oil development and do not require tailings ponds or mine pits, inject steam, combustion or other heat source into the reservoir to warm the bitumen so it can be piped to the surface through recovery wells.

As of August 2010, there were 91 active oil sands projects in Alberta. New projects continue to be added, with production expected to more than double in the near term to 3 million bpd in 2018 – almost $170 billion in oil sands related projects are currently underway or proposed.

Oil sands production is controversial outside Alberta largely because of the perceived level of greenhouse gas emissions associated with production. While the oil sands industry has reduced its greenhouse gas emissions per barrel of oil by an average of 29% since 1990, and the province of Alberta has committed $2 billion toward carbon capture and storage initiatives to capture carbon dioxide that would otherwise go into the atmosphere, there nevertheless remains

significant potential obstacles to fully realizing the economic benefits associated with oil sands production. This controversy has most recently been manifest in the significant opposition to the Keystone XL pipeline intended to carry oil sands production to the U.S., and the Gateway pipeline carrying oil to Asian markets via tankers from the west coast of BC.

Realization of the potential of the oil sands will depend upon the success that government and industry have in a regulatory regime that properly balances public concern for the environment with the significant benefits on offer from development. Those companies that can adapt to the regimes that will evolve will prosper but those that cannot may see their prospects significantly diminished.

BC's Shale Gas

Shale gas is natural gas produced from the fractured pore spaces of shale rock. With the commercial success of technological advances combining horizontal drilling and hydraulic fracturing, several shale gas plays are now recognized as potential reservoirs for 100 years of natural gas supply at current demand levels. The two most significant shale gas deposits in Canada are both in northeast BC – the Montney and the Horn River shale plays. Each is estimated to have approximately 500 TCF of natural gas originally in place.

BC has encouraged development of its shale gas resources over the past decade by creating a progressive regulatory environment administered by the BC Oil and Gas Commission and establishing an attractive royalty environment that recognizes the need for industry to recover the significant up front costs of investing in capital intensive shale before paying full royalties. While these measures have been highly successful in attracting initial investment in the region, full development will require the industry to successfully deal with two key issues.

The first is public concern with hydraulic fracturing, which involves injecting a mix of water, sand and fracking fluids at high pressure to shatter the shale thereby releasing the natural gas trapped in its pores. These concerns focus on the amounts of fresh water used, waste water treatment and the potential for groundwater contamination. These concerns have resulted in moratoria on hydraulic fracturing in New York, France and Quebec.

Because the Montney and Horn River areas are very remote and the region as a whole has a long history of oil and gas production, the tensions that have developed in highly populated areas unfamiliar with the industry have not been as prominent. However, concerns have been raised with both the adequacy of water supply for large scale production and the disposal of water after use in the fracturing process. Development of a robust regulatory regime that is generally recognized as adequate to deal with these concerns will be key to the ongoing success and development of the industry in British Columbia.

The second issue relates to concerns of First Nations that have traditionally occupied the area. The BC Oil and Gas Commission has been at the forefront of ensuring that First Nations consultation has been adequate to meet the government's constitutional obligations in this regard but a blanket capacity funding protocol that had been in place in the Horn River area has now expired and renewal negotiations have as yet been unsuccessful. Obtaining First Nation support for significant developments will continue to be a high priority for producers in the region.

In summary, there is vast potential for the oil and gas industry in Alberta and BC but realization of that potential will depend upon successful navigation of a regulatory environment that is likely to become increasingly complex.

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