Shaping the future of Canada's energy providers

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According to Ed Crooks, Vice-Chairman of Energy in the Americas for Wood MacKenzie and former energy editor of the *Financial Times*, Canada is poised to be a global leader in supplying premium, low-emission oil and natural gas, even in the most extreme climate scenarios. As proof, he cites Canadian Natural Resources Limited's (CNR) 2018 annual report, which outlines Canada's unique position in the energy landscape.

CNR should know. The company spent $527 million in 2015 alone toward research and technologies to enhance resource recovery, operating efficiencies and environmental performance — a spend that ranked CNR 7th in Canada in overall research and development spending.

But is Crook's prediction about Canada's market position correct, and what will it take to progress from speculation to implementation?

The role of technology

"The key is to reduce costs, reduce carbon content and ensure good access to markets in order to compete globally in the next 20 or 30 years," says Graeme Edge. "But if you're going to make the necessary changes, technology needs to be at the heart of your strategy."

To some extent, it already is. For example, Canada's ability to leverage technology has turned what was a high-intensity oil in 2009 into a premium oil. Technology also led the way in helping Alberta's oil sands producers reduce their emissions by 18 per cent between 2010 and 2017.

"We have world-leading extractive and processing technology and unbelievable high tech on the environmental stewardship and management fronts, all of which allow us to produce energy in the mostly environmentally responsible way in the world," says BLG's Miles Pittman.

Pittman notes that a great deal of the natural gas produced in association with oil in the Permian Basin south of the border is flared or burnt off.

“Alberta, however, has prohibited flaring for the past 20 years,” he says. “We have to capture the natural gas and report any flaring that does occur.”

The innovation imperative

Because the regulatory strictures on the oil and gas business in Canada are so high, Canadians have had to innovate — which, serendipitously, led to export opportunities that benefit our local and national economies.

The fact remains that technology and innovation are as much a product of necessity for Canadian companies as anything else.

“Our oil is a reasonably long way from its markets and can’t easily be sold elsewhere other than the U.S., so our ability to get a return is based on our ability to be efficient,” Pittman says. “What that means is that there continue to be geologists and engineers inventing new stuff in their garage. It’s been a tough time recently, but it’s these sort of times that often lead to the best innovation.”

Pittman cites oil and gas producer Modern Resources under the leadership of Chris Slubicki as an example of “what the average small Canadian company is all about.”

Highlighting Modern’s environmental performance is a program to replace thermal energy generators at its remote well sites with methanol-powered fuel cells, virtually eliminating CO2 emissions, reducing maintenance requirements and lowering operating costs. The company also piloted a solar-powered, zero fugitive emissions site in 2016 that uses new electric motors to draw less current at start up to conserve battery life.

The value of clean tech

The estimated value of clean tech in Alberta’s oil and gas sector market is $2.7 billion, including $1.3 billion in Calgary. And while there were virtually no patents filed by the industry in the late nineties, the number had reached 2000 in 2013, with a continuing uptick since.

“Canada has been exceptionally active on the innovative side, partially because of the tough weather conditions in this country and partially because of the challenges of extraction from places like the oil sands,” says BLG’s Peter Bryan. “And that’s been occurring on both the process and the product side.”

According to a 2017 Calgary Economic Development report prepared by the Delphi Group, what’s impressive is that the innovative streak seems to be permeating the entire industry, not just the giant producers and service providers.

“Entrepreneurs developing new clean technologies, service providers that are creating new business models that support clean technologies, oil and gas producers and pipeline companies in the midst of inventing and adopting clean technologies, and an innovation ecosystem that is keen to support, form this growing sector,” the report states.

The innovations include faster and more precise drills; using artificial intelligence (AI) for ocean floor exploration; and taking advantage of AI to guide drills underground based on historic information or simulated data — a concept that has much in common with the driverless car.

This innovation, as BLG's Kent Howie observes, is just one of many reasons for renewable power developers to invest in Alberta, including the following:

- due to the economic importance of its carbon intensive oil and gas business to the province, Alberta will need to encourage renewable power to reduce CO2 as an alternative to curtailing oil and gas production
- the current government has committed to ensuring that the Alberta market-based system welcomes renewable power
- Alberta is the only electricity market in Canada where a developer has the right to build a renewable power project and sell its power into an open electricity market
- Alberta is a thermal province, and a number of those thermal plants will eventually need to be replaced with new generation facilities
- Alberta has demonstrated that it has a great wind and solar resource for developers to harness
- the United Conservative Party killing the transition to a capacity market is good for renewables
- the C&I market is looking to contract and hedge their power price risk in the future, especially now that the capacity market transition is dead
- many international companies have committed to net zero emissions and are looking to acquire or contract renewables around the world (e.g., IKEA has many more MW of wind power in Alberta than it needs for its own consumption)
- pool prices are projected to be good
- Alberta has and will continue to boast a carbon pricing regime (now $30) that will be a source of additional revenue for renewable projects
- Alberta has solar and wind projects under development that could be acquired cheaply by more sophisticated developers with deeper pockets now that the Renewable Electricity Program is dead

Still, much remains to be achieved.

"Here in Alberta, we're good at developing the next drill bit or other engineering hardware, but I'm not sure we can say the same around digital technology, which requires a culture that embraces a different perspective," Edge says.

That's particularly true in the case of AI.

"AI is intended to augment processes and procedures where companies have large data sets and are trying to get some repeatability," says BLG's Melissa Smith. "The back office and finance departments, for example, are places where companies have large data sets and can clearly identify a problem. But where these conditions do not exist and on top of that companies have to deal with the pressures of today's market, they're not necessarily focused on how to apply next generation technologies. After all, people don't tend to put in digital thermostats when their house is burning down."

As it turns out, the challenges may be more about culture change than technology.

“AI can be an incredibly powerful tool, but it’s just another tool that we humans must find a way to implement,” says theoretical neuroscientist, AI expert and Socos Labs founder Vivienne Ming.
In the same vein, Peter Tertzakian, an economist, investment strategist, author and executive director of ARC Energy Research Institute cautions that “too much emphasis on technology” without sufficient regard to social, cultural, economic and political factors can lead to “siloed, non-holistic thinking.”

Avoiding that type of thinking can be critical, as it was when Manila sought out Spanish-based QEV Technologies, an electric mobility pioneer, to help the city solve environmental problems created by the city’s 70,000 minibuses.

“We couldn’t just change over to electric vehicles because it would destroy the local industry that manufactured the minibuses,” notes Monika Mikac, chief business officer at QEV. “So instead, our solution was to convert the minibus powertrain to electric power.”

Creativity and broad thinking

It’s clear that creativity and a broad perspective are the keys to workable solutions.

“It’s important to bring in all players in the ecosystem,” Mikac said.

That means changing the culture, something that needs to start at the top.

“We’re starting to see some of the energy companies shaking up their boards and bringing in the different skills sets required to navigate a world where tech is impacting every single industry,” Edge says. “What this means is that technology and technology skills are a strategic advantage for companies — so much so that in 10 years it will be as common to have a digital person on a company’s board as it is to have a lawyer or accountant today.”

“I work with oil companies that are still filing patent applications for oil and gas related technology,” says the firm’s Tim Webb. “My advice to them is, ‘That’s great, but you also need to diversify and plan for the next 40 years.’”

There’s much to be gained, which is why BLG emphasizes forward thinking to its clients.

“Alberta has the ability not only to power the world with energy, but to transform the world with technology,” said Ryan Petersen, CEO of San Francisco-based international freight forwarder Flexport Inc.

And it is this convergence of technologies around business problems that is the great equalizer in the world today.”

By

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