An Up-Close Look at the Canadian Oil Sands

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Thursday, November 21, 2013 at 09:46 AM

E-newsletter Issue #127 | November 21, 2013 [2]

ALBERTA, Canada—From above, the gray Albertan landscape looks untouched in many areas. The active areas of oil extraction become clearer as the small charter plane hovers, but still pale in size comparison to the forested land blanketed with the haze of an early winter chill.

The white plumes of steam emanating from the landscape belie the cold air—that steam serves a purpose; it heats the oil sands from the hard, hockey puck consistency to a form that can be pumped from the ground before being readied for shipment. The oil sands are a naturally occurring mixture of sand, clay, water and bitumen, which is a very heavy oil. Bitumen is separated from the sand and upgraded to refinery-ready crude oil.

It’s below freezing in the Alberta oil sands region of Fort McMurray, but the cold doesn’t stop the work of mining and drilling nor a Canadian Consulate-sponsored tour of the area for journalists. The goal of the tour is to share an up-close look at the work being done in Canada in an effort to dispel inaccurate notions and to garner more support for moving the oil from the sands to various parts of Canada and the United States.

Few would dispute the energy and economic benefits of extracting oil from the sands. Canada has the world’s third largest oil reserves—behind only Venezuela and Saudi Arabia—and 97 percent of those reserves lie in the oil sands of Alberta, according to Alberto Benzo, Alberta Energy’s director of Oil Sands Economics and Policy.

Philip Keele, vice president of mining for Canadian Natural, one of several companies granted development rights by Alberta’s Department of Energy, pointed to the development benefits of Canadian Natural’s Horizon Oil Sands. The value of contracts in the first phase range from $183 million in British Columbia to $765 million in Ontario, he said.

Those economic benefits transcend the national border between Canada and the U.S. Keele said the site uses more than $400 million worth of mining equipment made by Caterpillar in Peoria, Ill.

In fact, 906 U.S. companies supply equipment, parts and services used in the oil sands production, ranging from one in Alaska, Maine and Wyoming to 170 in Texas, according to Holly Driscoll, director of U.S. Federal Relations with the government of Alberta.

Canadian Natural’s Horizon plant strip mines the oil—about 20 percent of the oil sands can be removed that way. Strip mining accounts for about 55 percent of current oil sands production, according to Driscoll.
The strip mine is perhaps the most visible evidence that the Boreal Forest is producing energy. The crater is so big that the giant Caterpillar vehicles traversing the roads in the heart of the mine look like playthings. All the vegetation and layers of sediment—they call it “overburden”—is removed and stored in such a way that once the area is reclaimed, the original ground cover can be placed much as it was before the disturbance.

A much larger portion of the oil is deeper than what can easily be mined. Companies like Cenovus use a technique called “in situ” or “in place” extraction. It’s pretty similar to the oil drilling technique with which most people are familiar with one exception—the bitumen in the oil sands is very heavy; so heavy, in fact, that it’s like a hockey puck in the ground.

To loosen up the bitumen, which must be upgraded to refinery-ready crude oil, companies pump steam into the ground to heat it up so it can be mined.

While the physical footprint for in situ isn’t as big as strip mining, that type of extraction carries with it higher emissions of greenhouse gases, said Simon Dyer, policy director for the Pembina Institute, a Canadian nonprofit think tank that has worked on oil sands issues for more than 20 years.

Among Pembina’s concerns, he said, is the impact on climate change—the most significant concern from an international perspective. The product emissions from upgrading bitumen to usable crude oil are three and a half to four times more intense than conventional oil, Pembina asserts. Dyer said Canada is a long way from meeting its goal of target emissions.

John Zhou, executive director of Water and Environmental Management for Alberta Innovates—Energy and Environment Solutions, said his organization is working on solutions for the greenhouse gas emission problem. Alberta Innovates is a system that connects government, academia and business to share resources, experts and ideas in various sectors.

In addition, Pembina is concerned about the use of water from the Athabasca River for the oil extraction. While Dyer acknowledges industry has done a good job reducing the per barrel use for oil extraction and uses a small percentage of water from the river, the big variation of water flow in the Athabasca creates concerns, as does downstream pollution.

The Pembina Institute is concerned about the environment, but Dyer said it’s not opposed to mining the oil sands.

“We do believe it’s possible to develop the oil sands responsibly,” he said. He’d just like to see the development slowed to address the environmental concerns.

That would be difficult to do, with companies already working the sands and with rights to develop even more.

Representatives from Canadian Natural and Cenovus said their companies are actively looking for ways to be good stewards of the environment while providing energy needed for a growing world.

“It makes good business sense to be as energy efficient as possible,” said Joy Romero, vice president of technology for Canadian Natural.

Expanded development of the oil sands will depend on pipelines to the east and west in Canada and the Keystone XL pipeline going south through the U.S. Dyer said approval of the Keystone XL would facilitate a 36 percent expansion of oil sands production. All the proposed pipelines face opposition for various reasons, according to Dyer.

Oil from Alberta already is making its way into the U.S. through existing pipelines and by rail, Benzo said,
but refineries in Chicago and Pakota, Ill., are already at capacity. The Keystone XL would deliver crude to 
the Gulf Coast, which has the largest refining capacity in the world.

Getting oil sands crude to the Gulf Coast is a key to development in the oil sands region, and a reason for 
the tour for journalists and others wishing to see first-hand how the companies operate and the impact 
mining has on the area.

What matters, of course, are the people—those who benefit economically from the jobs the sands provide 
in the fields and the region and those who care desperately for preserving the environment and protecting 
the other natural resources where the sands are located.

Oftentimes, those categories of people overlap.

Also in this issue

• States Decoding Keys to Successful Economic Partnerships [3]
• Meet a Member: Bringing a Hobby into Work [4]

Tags:

E-Newsletter [5]
Content Type [9] Publications [10]

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