



## Oil shifts country's centre of gravity

**Bernard Simon and Sylvia Pfeifer look at the effects of advances in oil extraction techniques**

centre of economic and political gravity westward from the industrial heartland of southern Ontario and Quebec.

So many people have moved to Alberta from Windsor, the depressed centre of Ontario's automotive industry, that Westjet, a Calgary-based airline, has started a daily service between the two cities.

According to Statistics Canada, the sector's share of gross domestic product grew from 5.6 per cent in 1997 to 9.6 per cent a decade later. Philip Cross, the agency's chief economist, says that more recent numbers are likely to show a further increase. Oil export earnings reached a new record this year, as pipeline capacity to the US was expanded and prices remained high.

But whatever their economic benefits, the Alberta oil sands – described as tar sands by their critics – have become a prime target for environmental activists, especially those campaigning against global warming.

The nine Nobel laureates wrote in an open letter to President Barack Obama: "We understand that strip-mining and drilling tar sands from under Alberta's boreal forests and then transporting thousands of barrels of oil a day from Canada through to Texas will not only hurt people in the US – but will also endanger the entire planet."

It is hard to imagine human-rights activists such as the Dalai Lama, Bishop Desmond Tutu and Ireland's Mairead Maguire and Betty Williams letting off steam against a country as inoffensive as Canada.

Yet they and five other Nobel Peace Prize winners did just that in early September. Their target: a proposed 2,700-km oil pipeline linking Alberta to the US Gulf Coast.

The \$7bn project, known as Keystone XL and led by Calgary-based TransCanada Corp, has become the most potent rallying point for protests that have built up over the past decade against the development of Alberta's vast bitumen-like oil sands.

The oil sands, located across an area the size of Florida, have put Canada on the map as an energy superpower, drawing in tens of billions of dollars in investment, and positioning it as an important long-term supplier to the US as well as Asian economies, especially China.

More than that, the oil and gas sector is shifting Canada's



Steaming ahead: the biggest challenge is to diversify oil and gas exports away from the US and find new markets

Reuters

Jeff Sundquist, the province of Alberta's representative in Europe, acknowledged that the industry's main challenge "is misperceptions of the Canadian and Alberta energy sectors".

In response to the critics, Mr Sundquist says oil sands mining projects cover 660 sq km, or less than 0.1 per cent of Alberta's land area. In addition, the bitumen can also be extracted through a less unsightly process known as steam-assisted gravity drainage.

He says producers have posted C\$1bn in performance bonds to ensure the reclamation of natural habitats. "The notion

that Canada is destroying its boreal forest is simply not true," he says.

Canada's oil reserves total more than 175bn barrels, according to the US energy department, putting it behind only Saudi Arabia and Venezuela, and ahead of Iran.

Ninety-five per cent of its oil is in the Alberta oil sands, which have attracted the world's biggest operators, including ExxonMobil, Royal Dutch Shell, BP and Total.

These resources place Canada in a unique position as a member country of the International Energy Agency, the western

nations' oil watchdog, and a non-member of Opec.

A recent IEA analysis said: "Any analysis of Canada's emergency preparedness should not overlook both the role of the country as a stable and growing supplier of oil, and the contribution that it makes to the collective security of all IEA member countries."

John Dunn, lead analyst for Canada and Alaska at Wood Mackenzie, adds: "In terms of resource potential, Canada represents a viable, near-term opportunity for international oil companies."

"The country has a superior

ranking in terms of political and fiscal risk compared with some of the others in the top 10."

Ben Rogers, a Calgary-based partner at Norton Rose, a law firm, says that Canada ranks with Australia as "probably the friendliest jurisdiction to invest in energy projects in the world".

Activity in the oil sector has picked up since the fall in prices in the second half of 2008 and 2009 put many projects on hold. According to the Canadian Association of Petroleum

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Founder: Adam Waterous



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# THE WORLD NEEDS MORE THAN OIL.

**WE AGREE.**

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## Canadian Energy

# Industry fights back over a toxic perception

## Public opinion

### Sheila McNulty reports on the battle over oil sands development

Canada has the third-largest oil reserves in the world. Yet, instead of this being a pure selling point, it has turned into a public-relations nightmare.

The reason is that 97 per cent of those reserves are in the Alberta oil sands.

It is more carbon-intensive to produce oil from this source than from conventional crude oil, as the reserves start out as bitumen – a thick, gritty substance that environmentalists refer to as tar sands.

Traditionally, the bitumen has been mined, crushed, diluted and cleaned before being turned into synthetic crude in a refinery.

Some producers now take advantage of a new process using steam to heat the bitumen, so it can flow to the surface without extensive mining operations.

Nonetheless, both processes require a lot of water and felling trees in the boreal forest – one of the planet's big carbon-storage banks. Trees, peat and soil in the boreal forest store 186bn tonnes of carbon – equivalent to 27 years of the world's CO<sub>2</sub> emissions from the consumption of fossil fuels.

To extract all 170bn barrels of oil sands reserves would mean destroying some of these carbon

'If Obama sides with greedy oil companies, he will be urging a huge part of his base to sit out the election'

stores, along with wildlife habitat, and leaving behind mountains of toxic waste.

Environmentalists in the US are lobbying the Obama Administration to limit the amount of fuel sent south by blocking the Keystone XL pipeline extension project.

Erich Pica, president of Friends of the Earth US, one of many environmentalist groups opposed to oil sands development, says: "Whether to approve this pipeline is the most important environmental decision President Obama will make before the election."

"If he sides with greedy oil companies instead of people and the climate, he will essentially be urging a huge part of his base to sit out the election."

This was the message delivered in August by 2,000 activists from 50 states, who launched a two-week protest in front of the White House, in which hundreds were arrested.

But the battle for public opinion has gone beyond the US, with nine Nobel Peace Prize laureates writing an open letter to President Obama, asking him to reject Keystone XL, the third pipeline that would import this fuel to the US.

A number of governors, congressmen and mayors have also objected to the imports, with many questioning the government's environmental assessment of the project.

Among the critics is Representative Ed Markey, a member of the House natural resources committee of the US Congress, which has

jurisdiction over endangered species and energy issues.

"By concluding that the pipeline will have minimal environmental impact, absent the expert opinion from our government's wildlife experts, it appears that the state department has not taken a comprehensive look at the potential impacts of this project on our nation's most vulnerable wildlife," Mr Markey said in an open letter to Hillary Rodham Clinton, secretary of state, in August.

He argued there are at least 10 endangered species that may be further threatened by this project, including the whooping crane, which, after decades of conservation work, has seen its wild population increase from just 15 individuals in 1940 to more than 260 today.

"The proposed pipeline route falls within the migration corridor for the crane and will cross the Platte River, dangerously close to one of most important feeding and resting locations during the cranes' 5,000-mile annual migration route," wrote Mr Markey.

ForestEthics, a pressure group that for several years has been campaigning to lead the US corporate sector away from oil sands fuel, has won over some high-profile names, such as Whole Foods Market, an organic grocery chain, and Bed Bath & Beyond, the household goods company, which have sought to avoid suppliers that source fuel from the oil sands.

But the battle for public opinion is not over.

Canada and the oil industry are fighting back by trumpeting the world's growing energy needs and the fact that this fuel will be needed and used – whether the US wants it or not.

Indeed, there is an effort under way to export the fuel to Asia, which the Canadians and industry note will be more carbon-intensive than piping it to the US, because of the shipping and, therefore, should be considered a worst-case scenario.

"It's mind-boggling that people think that crude won't get produced," says Roger Inhe, in the energy and resources practice at Deloitte Consulting.

The Canadian government and the industry have been highlighting the job growth that will come by building the Keystone XL at a time of high unemployment in the US.

They also note that Canada is a friendly and stable source of supply amid much global political and economic upheaval.

By 2035, Canada's oil sands alone could generate close to \$775bn in gross domestic product for the US and support 600,000 American jobs, according to the Canadian Energy Research Institute.

"Pipelines are one of the few labour-intensive segments of the oil sector," says Tony Reinsch, senior director in the upstream and gas group at PFC Energy, the consultancy. "It's shovel-ready."

While this argument is being heard in Washington, there is a possibly more meaningful case to be made to counter charges by environmentalists.

This is that significant steps are being taken to limit the environmental footprint of producing from the oil sands through pilot projects on everything from carbon capture and sequestration to recycling water.

In the battle for public opinion, this is a rallying cry that has yet to be heard.



Alberta oil sands: extraction processes require a lot of water and felling of trees in the boreal forest

Getty

## Carbon capture companies try to counter their critics

In 2008, the Canadian province of Alberta pledged to reduce its carbon emissions 50 per cent by 2050.

It has been moving quietly towards that goal and is planning a public education campaign to counter arguments that oil sands leave a large environmental footprint.

Sandra Locke, who is responsible for Canada's carbon capture and storage programme, says the campaign will explain that 70 per cent of emissions reduction will come from capture and storage.

The government of Alberta, where the oil sands are located, is spending \$2bn on four large-scale projects to move the process forward. The federal government is adding another \$500m and funding additional efforts outside the province.

The campaign, followed by town hall meetings, will explain that the projects involve capturing carbon from oil sands developments and coal-fired power plants, as well as that produced in gasifying unmineable coal.

The carbon dioxide will be stored underground or piped to conventional oilfields, where it will be used in enhanced oil recovery – the process of flushing old oilfields with carbon dioxide or water to push still more oil from the ground.

After forcing out the oil, the carbon dioxide will be reinjected and capped deep underground in depleted hydrocarbon reservoirs.

"We're going to be storing millions of

tonnes of carbon dioxide every year," says Susan Cole, president of Enhance Energy, which is to build the pipeline, known as the Alberta Carbon Trunk Line. "This project really has a double win – accessing oil reserves that you can't get without carbon dioxide and, along the way, storing carbon dioxide," Ms Cole says.

It is being billed as the world's largest carbon capture and storage project. It is also the first large-scale enhanced oil recovery and storage scheme to work towards reducing environmental impacts. This 240km pipeline is to gather, compress and store up to 14.6m tonnes of carbon dioxide a year. This will be the equivalent of removing 2.6m cars from the road each year, or about a third of all registered vehicles in the province.

The stored carbon dioxide will be injected into depleted oil reservoirs and result in the recovery of what is estimated to be more than 1bn barrels of oil.

The project, which is being funded by the state and private companies, is one of many being undertaken across Canada.

"Continuous improvement is always the focus," says Cal Watson, vice-president of heavy oil thermal operations at Devon Energy.

The company uses salt water from 1,000 feet underground as part of a commercial process it created in 2007.

It became the first oil sands operator to use 100 per cent saline water to

create steam in its steam-assisted gravity drainage (SAGD) operations.

"That was a game changer," Mr Watson says. "That's going to be the standard."

Devon explains that SAGD uses steam to heat the bitumen, so that it is more viscous, allowing it to flow to the surface. But with water at an increasing premium around the world, the company found a way to use water from a saline aquifer more than 250 metres below ground.

The water is unsuitable for drinking and cannot be used to support livestock or irrigation. Now the company's Jackfish project circulates more than 20,000 cubic metres of saline water each day, recycling what it can to reuse in the steaming operations.

Devon's goal is to recycle 95 per cent of that water to prevent wasting the salt water resource. "We're in the low 90s, so we're getting close," Mr Watson says. "We think we can hit those thresholds."

Devon is also working to bring carbon emissions on oil sands to the same level as conventional oil production. Now, Mr Watson says, it is about 15-25 per cent higher, "not bad, but not good enough".

But he notes that technology continues to improve, as illustrated by the 40 per cent reduction in carbon emissions on oil sands production since 1990.

On another front, GE Water & Process Technologies has created a water evaporation process to recycle up to 97 per cent of the water produced in one of its oil sands projects, according to Heiner

Markhoff, the company's chief executive.

"It sharply reduces freshwater requirements and offers lower total capital and operating costs," Mr Markhoff says.

John Abbott, executive vice-president for Royal Dutch Shell's heavy oil business, says the company is working to improve cost competitiveness and environmental performance.

Shell puts an internal price on carbon that puts energy efficiency in its designs. On top of that, it is tasked with delivering one of the government-funded carbon capture and storage projects: Quest. This will pull carbon from oil sands production, pipe it up to 80km, and sequester more than 1m tonnes of it a year 2.3km below ground.

Shell equates this with taking 175,000 cars off the road. The carbon dioxide would be permanently stored under multiple layers of geological formations – the same trapping mechanisms that have stored oil and gas for millions of years.

The project, on which Shell is to take a final investment decision early next year, would be fully operational by 2015.

Mr Abbott believes it is important to engage with oil sands critics to learn what else could be done and explain what it is doing.

"I'm a big believer that good things come out of these dialogues," he says. "I see this as a very constructive debate."

Sheila McNulty

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# Oil and gas projects shift country's centre of gravity

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producers (CAPP), capital spending will be C\$2bn higher this year than in 2010.

Projects moving ahead include a joint venture, known as Sunrise, between Husky Energy and BP; further phases of Suncor Energy's Firebag expansion; and expansions at Foster Creek and Christina Lake, jointly owned by Cenovus Energy and ConocoPhillips.

This year, the producers' association cited revived oil sands projects as one reason for boosting its 2025 forecast of domestic oil output to 4.7m barrels a day, from its previous estimate

of 4.3m and actual production of 2.8m b/d in 2010.

Conventional oil production is also set to rise after several years of decline.

The association bases its optimism on the improved economics of horizontal drilling technology as well as new investment encouraged by the continued strength in oil prices.

Even so, companies are being "much more conservative, executing small phases with longer time horizons", Mr Dunn says.

Memories still linger of the 2006-08 boom when projects were bedevilled by labour shortages, inadequate infrastructure and sharp cost increases.

The outlook for natural

gas is less rosy. "The biggest challenge today revolves around seemingly perpetually low natural gas prices," Mr Rogers says, citing anecdotal evidence that many producers have been shutting in production given natural gas prices in the range of \$3.

"It's not worth it, they can't cover their field operating costs," says Mr Rogers.

Besides the storm over environmental damage, the biggest challenge for the industry is to find new markets for its oil and gas and ways to get it there.

Canada's heavy reliance on the US – the destination of more than 90 per cent of oil and gas exports – has

prompted calls from some energy industry executives for the country to diversify its customer base.

Lorraine Mitchelmore, head of Royal Dutch Shell's Canadian unit, told a business audience in September



'Unless we diversify, we could be in trouble' – Lorraine Mitchelmore

that diversification was crucial if Canada did not want to miss "an opportunity to sell oil and gas to Asia, which is the world's fastest growing energy market."

"Every major energy

exporting country in the world is going after that market," she warned. "We are the only major oil and gas exporter in the world that does not have access to a global market."

"All our eggs are in one basket, the US. But US demand for our energy products is not growing and, unless we diversify our market, we could be in trouble down the road," she added. Shell Canada holds 30 per cent of its Anglo-Dutch parent's resource base.

Ms Mitchelmore said other energy producing countries were moving quickly to position themselves where demand is, such as Australia which

wants to lead the global liquefied natural gas export market by 2020 and has LNG projects worth \$250bn under construction or planned. By comparison, the number of oil sands projects under way "would be about half of that", she said.

Several ambitious initiatives – including Keystone XL, the first pipeline connecting Alberta to the Gulf of Mexico – are on drawing boards.

Calgary-based Enbridge said in August that it had signed agreements with Asian customers for the full capacity of its proposed Northern Gateway pipeline, linking Alberta with an export terminal at Kitimat,

British Columbia.

Houston-based LNG Partners has teamed up with a local aboriginal group to build a second, smaller terminal. Kinder Morgan plans to add 240,000-400,000 b/d of capacity to an existing pipeline to BC and Washington State.

The US state department is widely expected to give Keystone XL the go-ahead before the end of the year. But the other projects face equally intense opposition from environmental activists and aboriginal groups, among others.

Canada may eventually succeed in opening up new markets for its oil and gas, but the process promises to be neither quick nor easy.

# Juicy opportunities attract Asian operators

## Foreign investment

Chinese groups have shown the most interest, writes **Bernard Simon**

**F**ew big energy producing countries can match Canada's attractions to foreign investors.

Together with Australia, "this is probably the friendliest jurisdiction to invest in energy projects in the world", says Ben Rogers, a Calgary-based partner at Norton Rose, a law firm.

Resources of oil and gas – not to mention renewable energy forms, notably hydro-electric and wind power – are abundant. Opportunities abound for further discoveries. A big, receptive market is on the doorstep. Canada shipped an average of 1.9m barrels of oil a day to the US last year, compared with 1.2m b/d from Mexico and 1.1m b/d from Saudi Arabia.

Canada offers political stability, a robust legal system and competitive tax and royalty rates. There is little, if any, prospect of a repeat of the late-1970s National Energy Programme, under which then-prime minister Pierre Trudeau proposed to buy out the Canadian operations of several foreign companies and control domestic fuel prices.

Numerous US and European companies have done business in Canada for decades. Imperial Oil, controlled by ExxonMobil, and Royal Dutch Shell have extensive interests not only in upstream production and development, but also in retail distribution.



It's complicated. the Long Lake oil sands facility where production is 'a more technically complex and expensive endeavour' than traditional oil recovery methods

The oil sands have drawn, among others, France's Total and Statoil of Norway.

Statoil's interest began four years ago when it bought about 250,000 acres of leases for C\$2bn as part of a drive to diversify beyond its ageing North Sea oil fields.

Total formed a partnership last December with Calgary-based Suncor Energy to help both groups develop their oil sands projects. The deal included a 49 per cent stake in Suncor's third bitumen-to-oil upgrader, known as Voyageur, and raised Total's holding in the huge but stalled Fort Hills project from 20 to 39 per cent.

The big story in recent years has been the arrival of Asian, especially Chinese, groups.

● China's state-owned Cnooc agreed in July to acquire Opti Canada, a bankrupt oil sands producer, for C\$2.1bn. Opti's main asset is a 35 per cent stake in the Long Lake project, which has been plagued by technical problems and is still producing well below its original target.

● Malaysia's Petronas paid more than C\$1bn for a stake in three shale-gas properties in north-east British Columbia, held by Calgary's Progress Energy Resources.

● China's Sinopec is a partner in the proposed C\$5.5bn Northern Gateway pipeline that would link the Alberta oilfields with an export terminal on the coast of British Columbia. Calgary-based Enbridge, the project's main sponsor, said in

August that it had signed agreements with Asian customers for the pipeline's full capacity. Sinopec has also bought a 9 per cent stake in Syncrude, one of the biggest oil sands producers.

● Thailand's state-owned PTT Exploration & Production made its biggest overseas acquisition last year, paying C\$2.3bn for a 40 per cent stake in the Kai Kos Dehseh oil sands project owned by Statoil. PTT said at the time that the deal provided access "to a highly attractive oil sands deposit... and a strong platform for future growth into unconventional resources".

However juicy the opportunities, a recent Norton Rose report noted that investors in Canada also face significant risks, especially in the oil sands. "The oil

sands represent a more technically complex and expensive endeavour" than traditional oil recovery methods, the report said. "While higher prices have boosted oil revenues, operating costs have also increased."

Alberta has at times sought to push up royalty rates, and could be tempted to do so again as a way of balancing the provincial budget. Royalties are assessed on a sliding scale, based on a project's pay-out and on prevailing crude oil prices.

The royalty starts at 1 per cent for early-stage projects when the West Texas Intermediate price is at \$55 a barrel. It rises to a maximum of 9 per cent when the price reaches \$120.

The royalty rate rises to

between 25 and 40 per cent once a project has reached pay-out – in other words, development costs have been recovered, plus a predetermined return on investment.

Tightening environmental regulations and escalating protests in the US and Europe against the oil sands present another difficulty. Companies are under increasing pressure to defend their environmental records, as well as broader strategies.

Aboriginal groups have also become more assertive in pushing for compensation for land use, help with development of local skills, a slice of new business opportunities, and the mitigation of social and environmental costs.

Foreign investments exceeding C\$600m require federal government approval under the Investment Canada Act. Buyers must show that their proposals provide "a net benefit" to Canada and meet a national security test.

The current Conservative government has blocked two foreign investments since it took office in 2006 – one in aerospace technology, the other in potash, an important fertiliser ingredient.

Every energy sector deal has so far been approved. "They have sent the message that we need your capital," says Subrata Bhattacharjee, partner at Heenan Blaikie, a Toronto law firm.

Human-rights campaigners have increasingly lobbied against investments by Chinese state-owned oil companies. But Mr Bhattacharjee said he would be "very surprised if the [government's] attitude changed such that we discouraged an influx of capital into the oil sands".

Human-rights campaigners have lobbied against Chinese state-owned oil companies

## The risky business of leaving home

### Canadians abroad

**Bernard Simon** on the experience of operations beyond North America

Over the past two years, Canadian oil and gas companies have both savoured the rewards and discovered the risks of leaving home.

The industry has built a sizeable presence beyond North America, in areas as far-flung as the North Sea, Colombia, Tanzania, Albania and Syria.

"One of the things we do very well in Canada is exporting our expertise", says Frederick Kozak, analyst at CanaccordGenuity in Calgary, who takes a special interest in Latin America. Mr Kozak points, for example, to horizontal drilling technology and other techniques to improve oil and gas recovery rates.

Talisman Energy produced more than 220,000 barrels a day in the second quarter from interests in the North Sea, Malaysia, Indonesia, Vietnam and Australia.

It spent \$282m on exploration, expanding its efforts in Colombia, Papua New Guinea, Peru, Poland and northern Iraq.

Husky Energy, controlled by Li Ka-shing, the Hong Kong tycoon, gave the go-ahead in mid-September for development of the two main fields of the Liwan natural gas project in the South China Sea, a joint venture with China's Cnooc. The fields are due to come on-stream by 2014.

Much of the Canadian industry's international drive in recent years has centred on smaller companies that have used advanced technology and access to capital markets to expand global exploration, especially in emerging regions.

Investors flocked to these companies in 2009 and 2010, encouraged by the combination of a bullish outlook for oil prices and foreign government policies that favoured energy investment.

Many institutional investors seeking a heavier exposure to the energy sector were attracted by the higher returns seemingly offered by the small companies compared with the industry's majors.

But the mood has swung in the opposite direction since last spring, as the appetite for risk has diminished. Share prices have



Suncor in Syria: 'Locals' livelihoods depend on our presence'

plunged and raising fresh capital has become more difficult.

"We've definitely seen the bloom coming off the rose a bit," says Shane Fildes, BMO Capital Markets' global energy head.

Some foreign operations have been hit by turmoil in specific countries. Mr Fildes says some projects in Colombia, India and Brazil had yet to deliver on their promise.

In Brazil, projects have been delayed by uncertainty over the oil and gas royalty structure.

Suncor Energy has been caught up in the turmoil in Libya and Syria, where it has investments stemming

Small exploration groups doing business in the developing world have been hit by aversion to risk

from its 2009 takeover of PetroCanada.

Suncor suspended operations in Libya shortly after the civil war began, and took a C\$514m writedown on its 49 per cent stake in a joint venture with Libya's National Oil Corp.

It said in late September that it was co-operating "to the extent possible" to restart production, but that a final decision on its return depended on the safety of employees, functioning institutions and availability of services, among other conditions.

Meanwhile, Suncor has defended its continued presence in Syria, where it shares ownership of the Ebla natural gas project with the state-owned General Petroleum Corp.

"The natural gas we extract is used to generate power for the Syrian people

and we have local employees whose livelihood depends on our presence there," Suncor says in a recent posting on its website.

The flock of small exploration companies doing business in the developing world has been hit by investors' growing aversion to risk, as the US and the eurozone have slipped towards another financial crisis.

The prospect of a dip in oil prices as the global economy slows has also raised a red flag.

Canacol Energy, which operates in Colombia, Brazil and Guyana, saw its share price more than quadruple between late 2009 and its peak last November.

Since then, however, it has tumbled from C\$1.87 to less than 70 cents in late September, despite the company reporting an eightfold jump in operating cash flows in the quarter to June 30 from a year earlier.

Bankers Petroleum, another former investor favourite developing oil and gas reserves in Albania, has seen its shares tumble from almost C\$10 to about C\$4 since the spring.

The company says its financial position remains strong, with sizeable cash reserves and minimal debt.

Anatolia Energy, a small Calgary-based exploration company with interests in Turkey, cancelled plans for a flotation. Instead, it agreed in September to be acquired by Bolivar Energy, which had previously focused on Colombia.

"There's a total buyers' strike right now," Mr Kozak says.

While his view in late September was that "people should definitely be buyers at these valuation levels", he also acknowledges that the current uncertainty may continue for some time.

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LET'S GO.



# Canadian Energy



Fresh fields: the prairie province of Saskatchewan has been caught up in an oil boom, mostly centred on the Bakken shale formation which straddles Saskatchewan, Alberta and the US states of Montana and North Dakota

Alamy

## Technology opens far-flung possibilities

### New frontiers

Much is happening beyond the confines of Alberta, reports Bernard Simon

While the Alberta oil sands capture most attention, other parts of Canada – the world's second biggest country – have drawn significant interest from the oil and gas industry.

The prairie province of Saskatchewan, adjacent to Alberta, has also been caught up in an oil boom, mostly centred on the Bakken shale formation which straddles Saskatchewan, Alberta and the US states of Montana and North Dakota.

Helped by horizontal

drilling and other new technology, Bakken production has ballooned from 279,000 barrels in 2004 to 21.4m last year and 10.9m in the first half of 2011.

According to the province's energy and resources department, horizontal drilling is set to reach another record this year. Close to 1,600 wells have been in operation this year. The two biggest operators are Crescent Point Energy and PetroBakken Energy, both headquartered in Calgary.

Hopes in north-west Saskatchewan have been centred on a 2.7m hectare oil sands deposit across the provincial border from Alberta's big Athabasca deposit.

Calgary-based Oilsands Quest has conducted extensive exploration around Axe Lake with a view to setting up a pilot steam-assisted

gravity drainage (SAGD) project as the prelude to a 30,000 b/d commercial operation.

Work was suspended in August 2010 while Oilsands Quest sought a deeper-pocketed partner. "We are experiencing the growing pains that are common to smaller oil sands companies with significant opportunities," it said at the time.

It announced a C\$60m rights issue this summer, but cancelled it in early September. Instead, it raised a similar amount from the sale of an early-stage oil sands exploration property in Alberta.

The deal "will provide us much of the capital we need to complete the Axe Lake pilot [project]", the company said.

Elsewhere, north-eastern British Columbia has become a shale-gas mecca, thanks to hydraulic

fracturing technology and generous royalty credits.

The Canadian Association of Petroleum Producers estimates natural-gas reserves at more than 100 years supply. Shale-gas and coal bed methane make up two-thirds of the total, compensating for an expected decline in conventional reserves.

PetroChina signed a tentative \$5.4bn partnership with Encana this year to develop a big shale-gas project straddling the British Columbia-Alberta border. Talks broke down in June, apparently over price, and Encana said it would seek new partners.

On the other side of the country, the oil industry accounts for more than half of Newfoundland and Labrador's economic growth over the past two decades.

Three Atlantic offshore fields – Hibernia, White

Rose and Terra Nova – made up 11 per cent of oil output last year, equal to 276,000 b/d.

Production from these fields is gradually declining. But the shortfall could be at least partly made up by

Arctic development will face scrutiny from regulators and environmental groups

extensions to the existing fields as well as a heavy-oil project, known as Hebron, under construction 350km off the coast.

A satellite project of Husky Energy's White Rose field – North Amethyst – came into production last year, with a target output of 37,000 b/d. Hebron, in

which ExxonMobil, Chevron and Suncor Energy are the biggest shareholders, is due to come on-stream in 2017 with reserves of 400m to 700m barrels.

Suncor and Norway's Statoil have each announced other promising offshore discoveries. About C\$100m has also been spent on on- and offshore exploration wells in western Newfoundland.

Oil and gas companies are also eyeing Canada's vast Arctic region. The Alaska oilfields and discoveries of natural gas around the Mackenzie River delta in the Northwest Territories have raised hopes for years that the Arctic might some day become a hub of oil and gas activity.

A snail's-pace regulatory process, high costs and inadequate infrastructure have so far held back development. But global

warming has again piqued interest. The department of aboriginal and northern affairs issued two offshore Arctic oil exploration licences this year to Arctic Energy & Minerals, a little-known company based in the UK. No drilling has yet taken place.

The government also handed out 11 licences for onshore exploration in the central valley of the Mackenzie River. ConocoPhillips, Husky Energy, Royal Dutch Shell and Imperial Oil were among the recipients.

Development will face protracted scrutiny from regulators and environmental groups, especially in the wake of last year's Gulf of Mexico oil-spill disaster.

The National Energy Board held a public hearing in Inuvik, Northwest Territories, in early September to consider safety and

environmental requirements for offshore drilling in the Arctic.

In a sign of the obstacles that face Arctic exploration, the Pew Environment Group issued a report that calls for numerous regulatory reforms to protect Arctic waters and the local Inuit population.

One important point in dispute is whether to continue a rule dating back to 1976 that requires companies to ensure that they are able to drill a relief well in the same season as a blow-out, thereby preventing a spill continuing all winter before it can be stopped.

The industry maintains that such a demand is both impractical and unnecessary. On the other hand, the Pew report concluded that "the same-season relief well policy is the strongest element of Canada's regulatory regime".

## US advances change rules of the game

### Pipelines

Sheila McNulty reports on a shift of market emphasis

Canada has long billed its oil and natural gas resources as a solution to its southern neighbour's ravenous demand for energy. But the discovery of a way to extract natural gas from tightly packed shale rock has meant the US no longer needs to import as much natural gas.

And an environmentalist movement against the high carbon nature of Canada's oil industry has raised questions about whether there will be big exports to the US as planned.

The protests have centred on the proposed Keystone XL – a 2,673km pipeline extension that would start in Alberta and run south-east through Saskatchewan, Montana, South Dakota and Nebraska. It would incorporate a portion of the Keystone Pipeline that runs through Nebraska and Kansas to serve Oklahoma and, eventually, Port Arthur in Texas.

The pipeline would be the third that imports fuel from Canada's vast oil sands deposits, also known as tar sands. TransCanada, the pipeline operator, is waiting for the US State Department's decision by the end of the year whether to let it build the Keystone extension.

Roger Ihne, in the energy and resources practice at Deloitte Consulting, says: "Being in the industry, it's easy for me to see what drives the project. The oil will be produced and consumed somewhere in the world. It is more economic and environmentally friendly to pipe it to the US than ship it to China or elsewhere."

Environmentalists are not only objecting to the higher carbon content of oil sands fuel,

but also that the first Keystone pipeline has had a series of spills in its first year of operation. Russ Girling, president of TransCanada, says that nearly all the oil releases over the past 12 months "have been minor – averaging just five to 10 gallons of oil".

Mark Lewis, a partner at the law firm Bracewell & Giuliani, believes the arguments against the Keystone XL are red herrings. "Since 1972, we've been talking about energy security," he says. "It seems a little silly to turn away this resource from the north."

Nonetheless, there is talk of building a pipeline to the coast to ship out what oil sands fuel the US does not buy. The export project makes sense to Tony Reinsch, senior director in the upstream and gas group at PFC Energy, the consultancy, regardless of what President Obama decides on Keystone XL.

"The US and Canada won't absorb all the oil sands [production] in North America," Mr Reinsch says.

There is talk of building a pipeline to the coast to ship out what oil sands fuel the US does not buy

Canada has 170bn barrels of oil sands reserves. The extension was being put forward as an exclusively oil sands development, yet it had other selling points, he says. "While the Keystone XL pipeline will move oil sands product to the Gulf Coast, it will also carry crude from the Bakken shale formation in North Dakota, where production is poised to grow from 400,000 to 700,000 barrels a day to 1.2m."

He says that neither the industry and environmentalists have paid much attention to



Keystone campaign: actress Daryl Hannah at White House sit-in Getty

this point, presenting the likely passage of the Keystone XL as a debate between jobs and the environment.

Yet the US needs to move its crude out of central states as shale oil production rises.

Mr Reinsch says: "Right now, access to alternative markets is constrained, noting the differential between West Texas and Brent crude because of the glut of regional crudes in Cushing, Oklahoma."

"There is strong industry focus on increasing pipeline access to the Gulf Coast refineries. You don't want to be constraining US oil production with inadequate pipeline capacity."

On top of that, he says, "Pipelines are one of the few labour-intensive segments of the oil sector," Mr Reinsch says. "It's shovel-ready."

The industry's position is that the project has undergone years of environmental reviews and would be constructed to the highest standards.

Regardless of whether the US approves the Keystone XL, he says, Canada was likely to go ahead with at least one of the two proposals being considered for an alternative pipeline to move oil sands production to the west coast for export to Asia.

Canada is also rich in natural gas, and a project to export that fuel is under way.

Janine McArdle, Apache's senior vice-president of gas monetisation and president of Kitimat LNG, a project to liquefy and export natural gas from Canada, says the company is in discussions with several North Asian buyers, including China, Japan and South Korea.

The project, which is owned by Apache, EOG Resources Canada and Encana, already has its environmental approvals and Apache expects to make its final investment decision in the first quarter of 2012.

Initial capacity will be 700,000 thousand cubic feet a day, but there is room to double that to improve the economies of scale, though that would require amending some of the permits.

Apache is looking to supply natural gas in contracts running 15 years or longer, with the selling point that it has a "long life and a safe, reliable source of supply", Ms McArdle says. The company's view is that Canada must look beyond the US.

"Historically, their big export market was the US," Ms McArdle says. "But shale changed that. We have, in the US been pushing back on imports. It is important for Canada to find another outlet for its resources."

## 'Why environmentalists have got things wrong'

### CEO interview John Richels

Sheila McNulty talks to the head of one of the big independent operators

For John Richels, chief executive of Oklahoma-based Devon Energy, investing in Canada's oil and natural gasfields is a no-brainer.

Not only is the resource base among the biggest in the world, but, at 170bn barrels of oil sands reserves alone, in a friendly neighbouring country, it represents the holy grail to the US, which for decades has talked about the need for a secure and stable energy source.

That is why he is so annoyed by the environmentalist movement that has built up in the US to block the import of the 97 per cent of Canada's reserves that are in oil sands.

"For us not to take that oil from Canada makes absolutely no sense," Mr Richels says in an interview. "If we don't use it, it will go somewhere else. We will continue to be more dependent on foreign sources of oil in less friendly and less stable places."

Devon is among the largest independent gas and oil producers in Canada. The company does it all there – conventional oil production, oil sands and shale gas, and has been an innovator in reducing its carbon footprint.

Mr Richels takes issue with the activists threatening to block the Keystone XL pipeline to deliver fuel from the Alberta oil sands to the US.

They have staged White House protests, marches and a big media campaign to persuade the Obama administration that the president would be selling out the environmentalist constituency by approving the proposed 2,700km pipeline that

would link Alberta to the US Gulf coast.

The main objection by activists is that the oil sands start out as bitumen, making oil production more carbon-intensive than conventional fuel.

But Mr Richels says that, as projects develop, the most carbon-intensive production – open-pit mining – should represent just 20 per cent of oil sands output, because that is how much of the oil is accessible through mining.

The remaining 80 per cent can only be reached through technology such as steam-assisted gravity drainage (SAGD), a process that requires heating the bitumen so it flows to the surface.

Open-pit mining operations are criticised for big tailings ponds, but SAGD has none.



'Having a regulatory regime that is uncertain is bad' – John Richels

Another criticism is that oil sands production risks polluting Canada's pristine water systems. Yet, Mr Richels says, Devon uses saline water from deep underground in its operations – a procedure others have also adopted. "We only use fresh water, so our guys can have showers and heat oatmeal," he says.

He takes issue with the charge that oil sands production leaves a big environmental footprint.

Conventional oil production would use 150 times more surface area than SAGD oil sands production, Mr Richels says.

He insists that carbon dioxide emissions created by SAGD by burning natural gas to heat water to create steam to soften the bitumen are no greater than those in the output from California's heavy oilfields, which have been under production for the past

50 years. On top of that, the industry is using solvents and other technologies further to reduce the amount of gas needed in the process. "We're getting more efficient over time," he says.

These issues, he believes, pale in comparison with the benefit of the oil sands fuel to the US. "Keystone XL is critical to making sure we're going to have a stable source of oil over the long haul," Mr Richels says.

The industry estimates that the \$7bn project would create 20,000 jobs – a fact he believes will lead to its approval, in view of the high rates of unemployment in the weak US economy.

Nonetheless, Mr Richels believes Canada could develop alternate export markets for at least its oil sands fuel. He says there are already calls to export gas to Asia through the Kitimat LNG project.

While the US still imports, on a net basis, 7bn cubic feet of natural gas from Canada a day, the technological breakthrough in shale gas has meant the US will need less gas than expected.

But there is no doubt in his mind that Canada's natural gas and oil will be in high demand globally, given the growing needs of Asia and Africa.

Producers are finding Alberta a welcoming place to work, with a tax regime that Mr Richels characterises as being friendlier than the US.

While Alberta had "hit a speed bump" in attempting to increase its royalties when commodity prices spiked several years ago, the setback had been short-lived.

"Once they did it, they realised it was the wrong thing to do." Alberta has since revised its royalty regime to make it more favourable for the industry.

"It's a good lesson," Mr Richels says. "Having a regulatory regime that is uncertain is bad. They saw that in Alberta and have done a lot to fix it."

# What to do with a lavish endowment

## Gas

The prospect of growing output has attracted much interest. But how do you realise maximum value, asks **Ed Crooks**

In *Robinson Crusoe*, as the hero picks through the wreckage from his ship to see what he can make use of on his desert island, he comes across £36 in assorted coins.

"What art thou good for, thou art not worth to me," he reflects. "I have no manner of use for thee, e'en remain where thou art."

Canadian gas companies must sometimes know how he felt.

The country is thought to be sitting on some of the world's richest natural gas resources. Proved reserves are estimated at 62,000bn cubic feet, which is more than the Netherlands and the UK put together, and Canada is already the world's third largest gas producer, behind only the US and Russia.

Canada's real prize, however, is in "unconventional" gas trapped in shales and other rocks from which it does not flow easily.

The US government's Energy Information Administration has estimated that those resources could yield a further 388,000bn cubic feet of gas, making Canada the world's seventh-largest country for unconventional gas potential, close behind Australia.

The production techniques pioneered in the US – hydraulic fracturing of the rock by pumping water sand and chemicals underground, and long-reach horizontal drilling – mean that for the first time these unconventional resources can be extracted at commercially viable rates.

Wood Mackenzie, the consultancy, believes that Canadian gas production will continue declining, as it has done for the past five years, as mature conventional fields are depleted, but then begin rising again from 2014-15, as significant volumes from unconventional fields begin to come on-stream.

The prospect of growing gas output has attracted intense interest from Canadian and international companies, interested in both extracting and transporting the gas.

In western Canada, the Horn River basin and Montney and Duvernay shales in British Columbia and Alberta have been the target of investment from companies including Encana and Talisman of Canada, Sasol of South Africa, Chevron of the US, and Royal Dutch Shell, Europe's largest oil and gas company by market capitalisation.

The problem for those companies, those provinces, and the country, is how to realise the maximum value from that lavish endowment.

Canada already produces much more gas than it needs; last year 41 per cent of its production was exported.

It only has one export customer, the US, and that customer is going through a gas production boom of its own that means it is increasingly uninterested in gas imports.

As a result, Canadian gas prices are tied to US gas prices, and both are depressed.

With US gas on the Henry Hub benchmark – referring to deliveries at a pipeline junction in Louisiana – at about \$3.60 per million British thermal units, prices for gas at the Cana-



Rock resources: Canada's real prize is in 'unconventional' gas trapped in shales and other rocks that could yield 388,000bn cu ft, making the country the world's seventh-largest producer

Corbis

dian border coming in to the US were typically in the \$3.45 to \$3.70 range.

At a time when exporters to Japan are securing \$16 per mBTU for their cargoes of liquefied natural gas, those prices in the North American market are almost insulting.

Local demand for gas in Canada and the US can be increased by the continuing shift from coal to gas for power generation, and by a greater use of

Canada only has one export customer, the US, and that customer is going through a gas production boom of its own

gas in road transport such as trucks and buses.

It is export sales, however, that could really transform the profitability of Canadian gas.

"The focus in Canada should be on serving the fast-growing markets in Asia," says Lorraine Mitchelmore, Shell's Canada country chairman.

As she explains it, the logic is sim-

ple: "With increasing demand for energy, and a need for cleaner fuel, there is going to be growing demand for natural gas, and Canada is on the doorstep of Asia."

Making the connection needed to match supply with demand, however, is not quite so simple. Exports to Asia will need a gas liquefaction plant on Canada's west coast, on a site that can take large LNG tankers, and pipelines to connect that plant to the fields of British Columbia and Alberta.

Several proposed projects for doing that are under development.

Shell has teamed up with China National Petroleum Corporation, the Korea Gas Corporation, and Mitsubishi of Japan to explore a possible gas export project, which could use Shell's revolutionary floating LNG technology to liquefy the gas offshore.

The project that is most advanced is being run by a consortium of Encana with Apache and EOG of the US, which plan to build a plant at Kitimat in British Columbia.

However, it could be 2018 before the plant is operational, according to Phani Gadde of Wood Mac.

Canada's shale reserves will still be economically viable, even without the LNG export facility, he believes, because production costs are relatively low. However, a plant would

make gas production in western Canada much more attractive.

In the end, Crusoe decides that even though the coins he has found have no immediate value to him, they

might be worth something some day, and he takes them with him.

That is an inspiration that might give the Canadian gas industry some heart.

## Scotia Waterous High premium on the value of market intelligence

Wall Street's investment banking groups have found a doughty competitor for oil and gas business in faraway Calgary.

Scotia Waterous, a division of the Bank of Nova Scotia, was an adviser to 124 mergers and acquisitions valued at \$102bn between 2006 and 2010.

According to Bloomberg, it held top spot ranked by volume of deals – ahead of Royal Bank of Canada, Jefferies & Co, JPMorgan and Bank of America Merrill Lynch.

It was in fifth place ranked by value, behind JPMorgan, Barclays Capital, Bank of America Merrill Lynch and Goldman Sachs.

The pace has continued, if not quickened, in 2011. Scotia Waterous joined Barclays as advisers to BHP Billiton for the Australian miner's \$15.1bn bid last month for Petrohawk Energy, a big US shale gas producer. The deal is the sector's biggest in two years.

Scotia Waterous also advised BHP on its \$4.7bn acquisition of Chesapeake Energy's natural gas assets in Arkansas.

Most recently, it has joined Citigroup and Morgan Stanley to help Anadarko Petroleum find a buyer for a portfolio of Brazilian oilfields valued at up to \$5bn.

Adam Waterous, who founded the company with his brother Jeff in 1991 and remains at its helm, ascribes its growing business to two factors: market intelligence and technical expertise.

"It's a success-begets-success business," says Mr Waterous, who is now also in charge of Scotiabank's entire global investment banking business.

"The more deals you do," Mr Waterous says, "the more market intelligence you get. The more intelligence you get, the better value you provide your clients."

To that end, Mr Waterous takes about 200 flights a year.

"This is a face-to-face business," he says. "You can't get market intelligence off the phone."

He adds that "the more you're prepared to travel in our business, the greater competitive edge you get".

As for technical skills, Scotia Waterous employs about 30 geologists and engineers.

The oil and gas industry "does not lend itself to multiples of Ebitda [earnings before interest, tax and depreciation]", Mr Waterous says. Instead, the emphasis in assessing mergers and acquisitions is on geological and engineering data that play a crucial role in determining the future value of an asset.

"You have to understand the subsurface issues."

Waterous & Co, as it then was, started off focusing on oil and gas deals in Alberta. "What we found was that many of our clients in the early 1990s were foreign companies looking to do transactions in Canada," Mr

Waterous recalls.

"Many said to us that if we opened offices in other countries, they would hire us there as well."

The company set up in Houston and London in 1997, and has subsequently expanded to Beijing, Singapore, Latin America and Denver.

About a third of its deals are in Canada, a third in the US and the remaining third elsewhere in the world.

It was sole adviser to Sinopec last year, when the Chinese oil and gas producer bought a 40 per cent stake in Repsol Brazil for \$7.1bn.

Mr Waterous sees huge M&A opportunities among national oil companies, especially in Asia, seeking to broaden their horizons.

"They're trying to become supermajors in the course of a single generation," he says.

Scotiabank, Canada's third biggest by assets and the most active outside North America, does not disclose Scotia Waterous's financial performance. All Mr Waterous will say is that "it's worked out very, very well". Jeff Waterous left the company when Scotiabank bought it in

### Bernard Simon



Adam Waterous: 'The more deals you do, the more market intelligence you get'

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## Canadian Energy

## Stable source seen as good investment

## Oil Sands

Ed Crooks analyses the reasons behind change occurring in the sector

When Bill McKibben, the environmental campaigner, describes the Keystone XL pipeline as "a 1,700-mile fuse to the biggest carbon bomb on the continent", it is a backhanded compliment to the oil sands industry of Alberta in western Canada.

Keystone XL, which is intended to carry diluted bitumen – heavy oil – from Alberta to refineries on the US Gulf of Mexico, has become a ferociously controversial project. It has put the US state department, which has yet to rule on whether to approve the pipeline because it crosses an international border, in the unusual position of facing questions over wildlife in Nebraska, and finding that one of its most politically fraught relationships is with Canada.

The intensity of the environmentalists' opposition is a testament to the fact that rapid growth in the oil sands is now a real prospect.

Unless governments block it, output of the oil sands could easily double by the end of the year.

Three years ago, with crude prices plunging, that prospect seemed to be fading fast.

The resource base has never been in doubt. With an estimated 170bn barrels of oil in the sands, Canada is the world's third-largest holder of oil reserves, behind Saudi Arabia and Venezuela.

The problem is the economics of extracting that oil and turning it into usable products.

Oil sands production is an arduous business: the bitumen needs to be extracted from the sand using hot water or steam and then processed before it can be fed into a typical refinery.

Those processes mean operating costs and sometimes capital costs are higher than for traditional production, making out-



Hard driving: a mining truck carries a load near Fort McMurray, the heart of the oil sands region

Bloomberg

put of oil sands some of the most expensively produced crude on the market.

As it became clear that oil prices were on an upward trend in the 2000s, an investment boom poured billions into the small area around Fort McMurray, the heart of the oil sands, and the consequence was soaring prices, wages and costs for the oil companies.

In the autumn of 2008, with some new projects needing

prices of around \$100 per barrel to be viable, and benchmark US crude heading towards the low of about \$32 it touched the following year, the idea of making commitments to raise production in the oil sands seemed ludicrous.

Of all the regions worldwide hit by project delays and cancellations during the downturn, the oil sands were the most conspicuously affected.

By the summer of 2009, the

International Energy Agency, the energy watchdog, counted 16 separate oil sands projects that had been suspended or delayed.

Many of those projects will never be revived. In May 2009, Imperial Oil, 70 per cent owned by ExxonMobil of the US, announced it was going ahead with the first phase of its C\$8bn Kearn project: a large-scale development of the old school,

mining the mixture of bitumen and sand from open-pit pits.

It looked as though that might reopen the floodgates but, since then, nothing else of that scale has been announced.

However, investment is picking up again in the oil sands and production is set to rise. The Canadian Association of Petroleum Producers (CAPP), the industry group, forecast total capital spending in the region, C\$11bn in 2009 and

C\$13bn in 2010, will rise to C\$15bn this year.

One sign of the revival of interest in the region has been the investments by the leading Chinese oil companies. In July, CNOOC of China agreed to acquire Opti Canada, a bankrupt Calgary-based oil sands producer, for \$2.1bn, including debt, and PetroChina and Sinopec have also made investments.

The industry is still not back

where it was. In real terms, allowing for inflation, the CAPP does not expect capital spending to exceed 2008's peak until 2015. Even so, the government of Alberta says it thinks oil sands production will rise from 1.5m barrels per day at the moment to about 3m b/d by 2020, a projection shared by Wood Mackenzie, the consultancy.

In this new age for the oil sands, however, the types of investments are rather different. They are typically smaller, offering more flexibility, so companies can lift production gradually, rather than waiting for a blockbuster development.

Royal Dutch Shell, the European oil and gas group, has been one of the big investors during the past decade through its 60 per cent-owned Athabasca Oil Sands Project, which has just had a \$14bn expansion at its Jackpine mine.

Shell's immediate focus now, however, is on "de-bottlenecking" its existing facilities, adding additional investment to remove capacity constraints. The first phase of that could add 35,000 b/d to Jackpine's output of 255,000 b/d.

Another change is that companies are not generally interested in investing in upgraders: plants for converting the heavy bitumen into a form of crude that can be sold in world markets and used in a standard refinery.

Instead, they plan to transport the bitumen in pipelines, diluted with lighter hydrocarbons to keep it flowing, to specially adapted refineries, often in the US, that can process it. That is the business model for Keystone XL, for example.

As John Dunn of Wood Mac points out, the long life of oil sands projects – they do not suffer from decline in the way that conventional oilfields do – means that as long as oil companies believe in the long term strength of oil demand, the investment is likely to keep coming.

"Oil sands projects may start off as economically marginal and need relatively high oil prices to break even," he says. "But they also offer very large reserves and last a very long time."

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