



# **THE FUTURE OF ENERGY IN CANADA**

**September 30, 2016**

## **Michael Crothers**

Shell Canada Country Chair and VP North America Unconventionals,  
at the Global Business Forum, Banff, Alberta, September 30, 2016.



Michael Crothers was appointed the President and Country Chair of Shell Canada on January 1, 2016. Michael holds this role in addition to his role as Vice President, North America Unconventionals.

Michael has more than 30 years of experience leading teams across Shell's upstream and downstream businesses and his assignments have taken him to countries throughout Asia, Europe, Africa and the Americas.

Michael's career with Shell began in 1987 as a process engineer. Over the next ten years, he held several Operations leadership roles at the Sarnia refinery and advised the Downstream Strategy team. In 1997, he became the ninth employee to join Shell's Oil Sands venture as the Commercial and Business Strategy Manager for the Upgrader. Once the project was approved, he took on responsibility for the facility's operations through the start-up and remained General Manager until mid-2004.

In mid-2004, he was appointed Vice President, Health, Safety and Environment & Social Performance for Downstream, based in London. During this time, he also acted as Business Advisor to the Director of Downstream, through the Downstream One transformation and merger of Royal Dutch and Shell Transport and Trading into one entity.

In 2006, Michael moved to the Chemicals business as General Manager for Global Supply and Logistics spanning over 30 countries. In mid-2008, he returned to Heavy Oil as General Manager for Expansion Operations with responsibility for the Jackpine Mine and the Upgrader Expansion, leading the business through a successful start-up and integration with the base plants by late 2011. Michael then moved to Ireland to lead the Corrib Gas Project and was Managing Director for Shell E&P Ireland and Country Chair before returning to Canada in January 2015 as VP Unconventionals.

Michael graduated with distinction in Chemical Engineering from University of Alberta in 1984. Michael and his wife Cheryl have three children — twin girls and a son. When he's not on an airplane, Michael enjoys cycling the hills in NW Calgary or do-it-yourself jobs around the house.

Before I begin, I would like to acknowledge that we meet today on the traditional territory of the Treaty 7 First Nations.

And now for a message from our lawyers which effectively tells you not to take any investment decisions based on what you hear from me today.

This is the third CP hotel I have been in this week and that really got me thinking about the grand nation building vision CP had for Canada.

In 1911, Shell Canada opened an office with six employees and \$50,000. At that time, the world moved by horse and steam. The internal combustion engine and the future it promised was, for many, a risky — even dangerous — investment.

We were greatly outnumbered by those who preferred the status quo. Success wasn't quick or easy. We didn't open our first service station until 1925.

It isn't in our DNA to protect the status quo. Royal Dutch Shell began as a marriage of explorers and traders — always looking ahead to what comes next. We pioneered sour gas exploration in the 1950s. We were the first in Canada to remove lead from gasoline in the 1970s.

A decade later we built the Scotford Refinery, the first refinery exclusively for synthetic crude from the oil sands, which I'll come back to in a few minutes.

For roughly as long as we've been refining synthetic crude, Shell has been calling for a price on carbon. It should have surprised few when Shell stood on stage last year with Premier Notley, environmental groups, and some peers in our industry to support Alberta's Climate Leadership Plan.

We've known this for years: If we aren't part of the climate change solution, the solution won't include our industry.

Speaking of the future, for forty years Shell has developed scenarios to stretch our thinking. Our scenarios aren't meant to predict the future but rather to map out plausible ways the 21st century could unfold and to test strategy.

I encourage you to look at Shell's latest work focused on how society could achieve net zero emissions on a timescale consistent with global aspirations.

The Paris agreement reached last year points to the need for net zero emissions at some point in the second half of the century. If that sounds far into the future, consider that the second half starts in less than 35 years which is roughly the span of my Shell career thus far. A humbling thought.

While we seek to reduce our operations' average energy intensity through both new projects and divestments, I should be clear that we have no immediate plans to achieve a net-zero emissions portfolio over our investment horizon of 10-20 years.

However, Shell believes getting close to net-zero emissions during the century, combined with economic growth, is potentially achievable but will be an enormous global undertaking. Compounding the challenge is that we expect energy demand to double in size this century. Net zero does not mean there are no emissions anywhere, but that they are offset.

So what could the energy system of the future look like? We expect wind and solar to comprise about 40 per cent. Another 20 per cent will come from nuclear and hydro, with some growth in geothermal energy. The "bio" realm — biofuels and biomass — will make up 15 per cent of the mix.

This leaves about 20 to 25 per cent of the world's energy to come from oil and gas. That's down from 80 per cent today. And we believe gas will be the biggest part of that mix, as it displaces coal for power generation.

Industry will continue to rely on oil and gas for heat-intensive work with iron, cement, and steel. We'll need it for heavy-duty long-distance transport, and for manufacturing chemicals.

Hydrocarbons will likely remain a part of our lives well into the future, but the way in which we produce and use them may be vastly different.

But at Shell we don't fear the future; we're hopeful about it. And we're working with thinkers, with leaders in business and government and in environmental organizations, with entrepreneurs, with you, to achieve a future that protects the environment and makes business sense.

We're taking steps to produce natural gas and oil as cleanly as possible. And we've also deployed an important clean technology that the world will increasingly need.

That technology is carbon capture and storage or CCS. The UN's Intergovernmental Panel on Climate Change believes the world's climate goals are likely unobtainable without it. We agree.

So that brings me back to our Scotford facility near Edmonton which I mentioned previously. In 2003, I had the privilege of leading the start-up of our bitumen upgrader at Scotford. It was already one of the world's most efficient hydrocarbon processing facilities before we began working with the provincial and federal governments on a carbon capture and storage facility we call Quest.

Last November, we opened Quest, the world's first carbon capture and storage plant attached to an oil sands operation. And importantly, we opened it on time and on budget. The total cost of Quest was originally estimated at around \$1.35 billion, with \$865 million of that coming from the governments of Alberta and Canada. That is, from you.

We said it would capture one million tonnes of carbon dioxide in its first year and we reached that milestone this month, 2 months ahead of schedule.

How much is one million tonnes? Consider the fourth largest solar farm, Desert Sunlight, in California. It's massive, covering a land area equivalent to 2,000 times the size of this Banff Springs Hotel conference facility. The project received a \$2 billion federal loan. And it displaces 300,000 tonnes of CO<sub>2</sub> a year.

It's a remarkable facility, but consider that you would need a solar facility more than three times bigger — the size of 12 Banff townsites — to displace the same amount of CO<sub>2</sub> that Quest is storing away for good. A solar facility of that size would be the biggest in the world. It would be a top news story, everywhere. Yet you may not have heard about Quest until today.

I don't mean to suggest the world does not need solar farms. This is not an either/or. The world needs all the technologies it can get to tackle climate change. It needs renewables. It needs big progress on energy efficiency. And it needs CCS.

I want to acknowledge that even though we're oriented toward the future, current times have been enormously difficult for Shell employees, for our industry, and for Alberta. We can't go back, but I'm confident our sector will make this transition in a typically Canadian way: with pragmatism, resourcefulness and optimism.

We believe well designed carbon pricing mechanisms can help improve competitiveness through technology and allow us to compete for market share and access new markets where Canada should be a preferred source of environmentally responsible energy.

I'm part of a leadership group called Smart Prosperity that wants to see Canada boost its competitiveness, innovation and environmental performance so that "made in Canada" can be a globally respected brand across all economic sectors.

Indeed we can't go it alone and that's why I appreciate Hal and everyone involved for bringing us together to discuss such critical issues.

So there you have it — some perspectives on the energy future from a company of traders and explorers. I look forward to discussing this further during our session.

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