CHAIR JAMES HACKETT: Hal Kvisle is an engineer and MBA and was a former executive in both the production and pipeline sides of the energy business. He has just completed a six-and-a-half month study for the Canadian government on the implications on the environment of the trends in the energy sector. He's also been a chair of the Nature Conservancy Board in Canada. He has some great views on where the North American resource base is going. So with that, Hal, please.

HAL KVISLE: I would like to talk about three challenges that we face in North America energy. I will speak from a Canadian perspective, but my message I think will relate to all of North America, Canada, Mexico, and the United States.

The first challenge is that of the environment, that clearly as we move to increase production of natural gas and crude oil in North America, we face some very significant environmental challenges. Some of them are real challenges, and some of them are challenges just posed to us by various activist organizations.

The second one that has changed dramatically, as Adrian mentioned, in the last few years is that of energy supply. Energy demand in North America grows at a very predictable level, around one percent per year. When we get price shocks or economic downturns, it will grow at zero and sometimes contract, but generally over a multi-decade period, the demand for natural gas, crude oil, refined products, and electricity, all tend to grow at about that one percent per annum.

The much bigger question is on supply. We've gone through periods of excess supply and exports, 50 years ago, and then a long period of decline in production and growth and demand that has left North America as an importer on the oil side of around 10 million barrels a day. It's a very significant number, roughly half of the oil that we consume, and if you include Canada and Mexico in that equation, it would be about a third of the oil that we consume is imported from outside of North America. So energy supply is a big challenge in that the emerging of economic products at Fort McMurray in the oil sands and the shale gas developments have given us a new lease on life, if you will, on energy supply and I'd like to talk a bit about that.

The third one, though, is the economic prosperity challenge. We heard last evening and some comments today about just how difficult it's going to be to restart and see significant economic growth here in North America. I believe the energy sector with these newfound sources of supply can be a major source of economic growth and prosperity, and I'd like to touch on that.

First, on the environment, when people talk about the impact of the energy industry on the environment, the focus today is very much on CO₂, carbon dioxide. There are also emissions of NOX, SOX, mercury, heavy metals, and a variety of other things that our industry, oil and gas, and also the power sector,
have done a pretty good job of controlling and of reducing the environmental impact of that. So, today, the major focus is on reducing CO₂. And it's a worthy objective because in addition to CO₂ reduction, you do reduce the energy intensity of our economy and that reduces our exposure to high and volatile energy prices.

We're all North American energy consumers, and a point that is very often missed by the activists and by the media is that roughly 85 percent of the emissions from the crude oil motor fuel value chain come from the consumer. There's about 15 percent that occur in the production and in the transportation and the refining process. So if we really want to address the issue of CO₂ emission from motor fuels, we really need to look at what the consumers can do.

Government focus so far has very much been on the production side for a variety of reasons. Number one, I think, is that voters don't react kindly to a doubling of energy prices. But secondly, a carbon tax, while it may be the right solution over the longer term, takes a long time. It's a very long-cycle solution. If you do double the price of motor fuel, you will inspire people to buy a smaller car when the time comes to change out their automobile, but it won't have much of an impact on the amount of gasoline that they use month to month. So these kinds of things are going to take a long time.

Over that 10- to 20-year period, we would see meaningful reductions in CO₂ that will come from cleaner and smaller and more efficient automobiles. We do have the opportunity to roughly double the fuel economy of the cars that we drive, but beyond that we need a shift to urban transportation systems that do not rely on the automobile, and ultimately if we want to make the kind of CO₂ reductions that people are aiming for, it's going to take a real change in lifestyle and behavior.

Why then is the focus so much on stalling and stopping supply projects? Today, we see that projects at Fort McMurray, we see shale gas developments, and we see, of course, one of my favorite projects, the Keystone pipeline, are all running into very fierce public activist opposition. I think that much of this opposition is misplaced. It's based on a misunderstanding of where CO₂ emissions come from, and it comes at a very, very high cost.

Now I will not make an argument that we should have unconstrained production on transportation of crude oil in North America and damn the environmental consequences. That's not the right argument. But I think it's important that people understand what the economic realities are of artificially constraining our ability to supply our own markets.

People often talk about billion dollar impacts or trillion dollar impacts, but I think we can think of it more simply in terms of a barrel of crude oil. If you think about $100 as the notional price of a barrel of crude oil in the world today, if we buy that barrel from Saudi Arabia or from foreign suppliers, generally, $90 of that $100 is sent overseas, about $10 is spent on administration and transport and other activities here in North America. On the other hand, if we procure that barrel from a source in North America, whether it's deepwater Gulf of Mexico or the Fort McMurray oil sands, or the Bakken play in North Dakota, about $60 out of that $100 revenue is spent on finding and developing and operating and producing those barrels. About $20 out of that $100 goes to local, state, and federal governments, and about $20 is distributed to shareholders and other stakeholders as a return on capital.

So if you think about that $80 difference coming into the North American economy, the difference between the two scenarios, and we look at one million barrels a day, we have eight million barrels today of foreign oil that we can displace. Looking at just one million barrels a day, that's $30 billion a year gets spent in North America. Most of that is spent on truck drivers, drilling crews, restaurants, motels, things that go in at the very low level of the economy. If you apply a three times GDP multiplier to that, on one million barrels a day, you're talking about nearly $100 billion a year. And we have this opportunity to displace seven or eight million barrels a day of oil that is imported from outside of continental North America.
Now you might say that's impossible, where would we get that? Ten years ago, I think the widely held view would be that it is impossible. But I would see that our friends in Mexico have the potential, quite happily, to add one million barrels a day with the right level of capital investment.

In Alaska, there's one million barrels a day of opportunity there. And those people active in the Gulf of Mexico, where many new developments come on stream at several hundred thousand barrels a day, would widely see something in the order of two million barrels a day being potentially developable there.

At the oil sands in Canada, there are projects today of 4 million barrels a day of incremental production over the next 20 years, over and above what we're producing now. And finally, gas to liquids with the abundant supplies of shale gas could add in the order of 2 to 3 million barrels a day as an offset.

So in summary, I'd like to leave you with three points. The first is to remind you that 85 percent of CO₂ greenhouse gas emissions are emitted by the consumer, emitted by all of us; 10 or 15 percent emitted in the production and transportation and refining process. If we could reduce our hydrocarbon CO₂ emissions at the consumption point by 20 percent, we would offset all of the emissions that would come from becoming self-sufficient in crude oil production here in North America.

Second point, change takes time, whether it's automobiles or power plants. It's a multi-year exercise to change out equipment. We need to get our value out of it and replace it when the time comes.

And third point, production self-sufficiency is a huge economic opportunity for North America, and that applies in all three countries, Mexico, the United States, and Canada. At one million barrels a day with $80 a barrel we cycle into our economy, that's $90 billion a year of economic impact. And, of course, if we could replace the full 8 million barrels a day, we're taking about something close to $1 trillion a year. So I think those are worthwhile numbers for us to think about as we contemplate our options for oil and gas and electric power in North America. Thanks.

James T. Hackett is chairman and CEO of Anadarko Petroleum Corporation, Houston.

Hal Kvisle is former CEO and TransCanada Pipelines, Calgary.