Innovation: Key to Past and Future Success
PTAC AGM, May 5, 2016
Oil and Natural Gas are part of our every day life
Oil & gas creates jobs across Canada

More than 2,400 companies across Canada have direct business with the oil sands, more for conventional oil & gas, LNG, pipelines ...
Change & Disruption Around the World

**Oil (WTI)**
- 2014: $90+
- 2015: $40

**Natural Gas (AECO)**
- 2014: $3.75
- 2015: $2.75
- $1.49

Price Influencers:
- USA
- Saudi Arabia
- Iran
- Russia
- Mexico
- China
Our biggest customer is our biggest competitor

OIL $+3.7 M$ BPD

NATURAL GAS $+15.0$ BCF D

2008 - 2014
Impact of falling oil prices on Canada’s energy sector

100,000 jobs lost to date

$33 Billion dollar decline in capital Investment

$60 Billion dollar decline in earnings

Another big Drop in 2016
Pipelines = economic infrastructure

$60 billion in private capital investment to grow Canada’s economic capacity

TRANSMOUNTAIN $6.8 BILLION
NORTHERN GATEWAY $7.9 BILLION
ENERGY EAST $15.7 BILLION
PACIFIC NW LNG $30 BILLION
MISSION: Facilitate innovation, collaborative R&D, demonstration and deployment for a responsible Canadian hydrocarbon energy industry

- Multiple programs, including AUPRF
- Five 2016 priority areas;
  - Air
  - Soil
  - Ecologic
  - Water
  - Well Abandonment
- 37 AUPRF projects in 2016; 273 since inception
PTAC Programs – Tight Oil and Gas Innovation Network (TOGIN)

- TOGIN formed in 2015 to focus on tight oil & gas innovation
  - Reduce environmental footprint
  - Facilitate social permission
  - Optimize economic outcomes

Minimizing footprint with pad drilling
Infrastructure and Innovation: Path to Future Success
Innovation: Key to our past and future success

Keynote Address – Michael Gatens, CEO UGR & CAPP Chair

PTAC AGM – May 5, 2016

Introduction

Canada has the opportunity to become this century’s supplier of choice for the world energy needs from oil and gas. But around the globe, the oil and gas industry is undergoing tremendous disruption. Canada must invest more into energy infrastructure and innovation if it is going to compete and supply the world with more reliable, responsible energy.

It is a critical time to discuss oil and gas in Canada – for our choices today on infrastructure and innovation will determine how we will compete as a country to shape the world’s energy future, and as importantly, shape the future for all Canadians, young and old.

Today I want to focus on three topics:

• First, I’ll talk about the competitive challenges facing the oil and gas industry. These are not just Western Canadian energy challenges — these are Canadian national energy challenges.

• Second, I’ll speak about critical policy choices we can make as a country. And that’s the urgent need to build more energy infrastructure to get our product to more markets and more customers.

• And, third, I’ll discuss the role of innovation – the innovation needed to create a stronger, more sustainable oil and gas industry for the long-term benefit of Canadians from coast to coast. PTAC plays an important role here.

Innovation: Was the key to our past success, and will be key to our future success.

Canada’s oil and gas industry — why it matters

Canada’s oil and gas industry matters ...a lot.

From the time we wake up in the morning to brush our teeth, the way we get from point A to B, to the time we go we load up the dishwasher at night and go to bed, oil and gas is enhancing our quality of life.

Oil and gas matters in this country because we’re blessed with abundant energy resources. Our energy resources are among the largest in the world. We have the third most oil in the world,
with 97 per cent of it in the oil sands. We’re also the fifth largest producer of natural gas in the world.

Stephen Harper declared Canada and energy superpower, touting Canada’s reputation for its natural resources, and he was right. But we have to take action to back up that claim. Our new Prime Minister, Justin Trudeau, declared Canada will also be known for the “resourcefulness” of Canadians. He is also right. Our unique combination of abundant resources and resourcefulness, in the form of technical and environmental innovation, will be the key to our future success.

We have a highly skilled workforce. We operate under strict environmental and safety regulations. We have a strong, voluntary record of investing in technology and environmental innovation (I’ll say more on this later). And we’re among the leading energy-producing countries when it comes to the rule of law and human and Aboriginal rights.

**Jobs across Canada**

Oil and gas matters in Canada because the development of our resources energizes our entire economy.

Thanks to the energy sector, we enjoy one of the highest standards of living in the world. The oil and gas industry generates on average $17 billion per year for government revenues across the country, not just in Alberta, BC, and Saskatchewan. That’s money used to pay for schools, hospitals, senior care and infrastructure for our communities across Canada.

The oil and gas industry remains the largest capital investor in the country. Oil and gas is expected to invest more than $31 billion in capital this year – as much as any other sector. But we are in the midst of the worst two-year decline in capital investment on record – down $50 billion or 62% per cent since 2014.

This massive decline in capital spending should be a concern to all Canadians. When Alberta gets the economic flu, all Canadians are at risk of catching it.

When oil and gas companies spend money to grow operations, those are dollars that come back into economies all across the country, employing businesses, creating job, investing in our shared quality of life, all across the country. We have seen the job losses in the west, 100,000+ and counting. It has especially hit our service sector hard as the rig count and well completion activity have fallen off.

Today there are more than 2,400 Canadian companies outside Alberta that are building their businesses with Canada’s oil sands. That makes the oil sands a Canadian industry. We are all hoping that the current disaster striking Ft. McMurray will be under control, CAPP, the Red Cross, and others are organizing relief efforts as we speak.
Studies by CERI and others show similar distributions of jobs and economic activity across Canada stimulated by our upstream industry, our pipeline industry, and hopefully soon, our LNG industry.

It’s hard to imagine a Canada without the development of our oil and natural gas resources. For many years, development of our country’s abundant energy resources has been an essential link to our country’s prosperity.

And yet we compete in a highly competitive energy world. Today our ability to maintain a strong oil and gas industry and protect our future prosperity is at risk.

In the next few minutes, I’d like to touch on some of the competitive challenges facing our industry ...and affecting our country’s prosperity, now and for the foreseeable future.

**Our energy world is being disrupted**

In the last year and half, we’ve seen a series of disruptive changes in the world’s energy markets.

The precipitous fall in world prices for oil and gas due to slower demand and higher supply. I wish we were getting $2.75/Mcf at AECO. Yesterday we were getting $1.49 at AECO, $1.37 at Station 2 in BC where we sell our gas at UGR.

Outside North America, demand for oil in China and emerging countries is growing at a slower pace. OPEC countries and Russia have decided to maintain production at record-high level. Sanctions have been lifted and Iran will soon supply more than a million new barrels a day into the market. Mexico has opened its oil industry to private investment in an effort to sell more oil to our No. 1 customer, the United States.

In short, competition in the global energy markets is intensifying.

Closer to home, changes in the U.S. market have created an even greater competitive threat to Canada’s oil and gas industry. At the same time, we have seen major government changes in Alberta and Ottawa. These new governments inherited a big challenge in a Canada with reduced energy prices and increased competition from the U.S.

For many years, we’ve sold our oil and natural gas almost exclusively to the United States. This customer has been a good customer but today the U.S. is becoming our greatest competitor.

**U.S. Production growth**

In less than a decade, technological advancements such as horizontal drilling and multi-stage hydraulic fracturing from multi-well pads have produced an energy revolution in America (and in Canada, PTAC had a hand in that). From 2008 to 2014, oil production in the U.S. jumped by
3.7 million barrels a day. That’s roughly equivalent to all oil production in Canada. And that increase makes the U.S. the fastest-growing oil producer in the world.

Earlier this year the U.S. Congress lifted a 40-year-old ban on American oil exports. So for the first time since Richard Nixon was president, the United States is exporting oil offshore. It’s been piped to tankers on the coast and shipped offshore to Asia.

Our Number 1 customer is now our Number 1 competitor.

At the same time, U.S. natural gas production has ramped up substantially, over 70 Bcf/D. I stood in this room 10 years ago and talked about the potential for shale gas production in North America when the U.S. was producing less than 5 Bcf/D and Canada nothing from shales. Today, the U.S. is producing 60% of its dry gas, over 42 Bcf/D from shales. 15 Bcf/D from the Marcellus alone; more than all of Canada. We aren’t doing bad, either. We are approaching 7 Bcf/D from the Montney in AB and BC. That’s partly PTAC’s fault. We went from worrying about running out of gas to a supply glut.

This has driven down the volume of Canadian natural gas exports by about a third. Eastern Canada now gets about two-thirds of its natural gas from the States, displacing Canadian gas. This American natural gas supply is projected to continue to grow, increasing pressure on our natural gas production to compete for market share in the central and western U.S., abroad and even here at home.

The result: the U.S. needs less and less of our oil and gas.

Before the end of this decade, the United States – our only customer for natural gas – may not need to buy any natural gas from Canada. This is a critical challenge for gas producers like me. Our energy world is being disrupted, and Canada is feeling the pain. We need to remain a good supplier to the U.S., but we also need to find new markets

**Impact on jobs, spending**

As Canadian wellhead prices have declined, energy companies have had to respond by scaling back operations. Less capital investment. Less economic activity.

In the process, more than 110,000 jobs from Canada’s oil and gas industry – or about 1 in every 5 jobs related to this sector – have been lost.

More than $50 billion in capital investment has been cut from the country’s leading private investor – the worst two-year decline on record.

How big was that drop in capital investment? That decline was more than second-largest industry, the utility sector, spent in total capital last year.
Imagine if not a single dime was spent on capital for power plants or waste-water treatment facilities. That is what our capital decline would be like for utilities.

And industry’s revenues fell 40 per cent last year. That’s a drop of $60 billion. Think about that for a minute: that’s like wiping out revenues from Canada’s entire forestry sector, or from the aerospace and mining industries combined...or wiping out 75 per cent of revenues from our manufacturing sector.

Any way you measure it, it’s a huge impact. And it’s not over.

And with dropping industry revenues, those $17 billions of dollars in government revenues shared across Canada are at risk. These are losses that will impact every Canadian household ...from the public services they get ...to the taxes and deficits they will have to bear.

The Governor of the Bank of Canada has said that the drop in oil prices has had an unambiguously negative impact on the Canadian economy.

And he’s right.

Unemployment claims are up more than 100 per cent in Alberta.

WestJet has cancelled 6 daily flights between Edmonton and Calgary and has shifted planes out of Western Canada.

Moncton used to have 14 chartered flights a week to Fort McMurray. Today it has none. That’s more than 3,000 Atlantic Canadians who no longer work in the oil sands every week to support their families back home in New Brunswick.

As the Alberta flu spreads, Canadians ...in all walks of life and in all parts of the country ...are feeling the blunt force of these changes in the energy market. Just last month, welders were being laid off in Quebec due to lack of oil industry demand for their services.

So, what’s to be done?

**Why we need to invest in infrastructure**

Here’s what we need – Canada needs infrastructure and innovation. Canada needs to find more customers. We have the energy the world needs – our challenge is getting it there.

As a country, we have little influence on world prices, but we do control our choices when it comes to energy policy. At the top of this list has to be the choices we make on energy infrastructure in this country.
And here’s why.
In part due to constrained pipeline infrastructure, Canadian oil and gas sells at a discount. Virtually all of our country’s oil and natural gas exports go to one customer ...the United States ...who buys Canadian oil for less that it buys other oil.

At the same time the U.S. has quickly become our biggest competitor, with growing oil and natural gas supplies that are increasingly being exported, including to Canada. American oil exports to Canada are growing – and are now at record levels.

And here’s something else to be aware of.

Last year, refiners in Ontario, Quebec and Atlantic Canada imported about 736,000 barrels a day of oil from foreign countries. It came by pipe across the border from the United States and it came by tanker from places like Saudi Arabia, Algeria, Angola and Nigeria. This was largely because there is no direct pipeline to move oil from Western Canada to Eastern Canada.

Canada has the 3rd largest reserve of oil in the world – yet last year we paid about $17 billion to import oil from other countries.

There is something seriously wrong with this picture. It’s one we need to fix in Canada ...starting with new infrastructure.

For Canadian oil and gas, we need to invest in pipeline infrastructure to reach more customers in Asia, Europe and yes, in Canada.

For natural gas, we need to develop a liquefied natural gas export market to Asia and find more uses for natural gas at home.

With more infrastructure, Canada’s oil and gas could reach more customers ... across North America and around the world. And by reaching more markets, we can ensure Canadian resources are sold for higher prices ...to the benefit of all Canadians.

And here is another benefit to more infrastructure. Canada can become the energy supplier of choice to the world. The export of more Canadian natural gas to emerging countries could displace other fuels such as coal – adding to Canada’s global contribution on climate change.

Here in Canada, there’s been lots of talk recently among politicians about the need for public infrastructure to boost our economy.

Well, we have a number of opportunities right in front of us:

... We have $60 billion in private capital from our industry ready to be invested in shovel-ready projects coast to coast. I’m thinking specifically of the Energy East ($15.7B), the Trans Mountain Expansion ($6.8B), and Northern Gateway ($7.9B) pipeline projects.
...in addition, there are several LNG pipeline and export facilities that have been proposed for British Columbia and New Brunswick, but are awaiting government approval. The Pacific NW LNG project alone will invest over $30 B

...and finally there are opportunities to use more clean-burning Canadian natural gas in the country ...as different regions look to transition to lower-impact fuels to make electricity. Alberta plans to replace coal with gas and renewables over the next decade.

Getting the green light on these energy infrastructure projects would be a tremendous stimulus to the Canadian economy.

They come without taxpayer cost. They give taxpayer benefits.

So the need to take action on all these fronts is urgent.

Without more pipelines, costs for Canadian producers will increase, prices will continue to be discounted, and growth in investment and jobs will be constrained, or decline.

Without LNG markets or efforts to use more Canadian natural gas at home, our country’s natural gas industry will lose market share and production will shrink.

And all of this will hurt us as Canadians.

So it’s time to build the infrastructure to get our oil and natural gas to more customers ...and generate more economic benefits for us here at home.

In today’s tough economic climate, we have another way to turn challenges into opportunities ...and that’s how our oil and gas industry innovates to compete. And that’s where groups like PTAC play a key role.

PTAC

Today we’re facing increasing societal expectations to lessen our impact on the environment. Clearly, even when oil prices improve, it’s imperative we find new ways to extract value from the incredible oil and gas resources we have in Canada ...and that we do so more cost-effectively and with less environmental impact. Society demands it.

Our political leaders have pointed out the need for these new infrastructure projects for the benefit of provincial and Federal governments, and all Canadians. They have also emphasized the need for high environmental standards as pre-conditions for various project approvals – by governments and by Canadian society. That’s a good thing.
Environmental leadership has been a hallmark for our Canadian industry, especially compared to many of our global competitors. We just haven’t done a great job communicating the high environmental values we share and the tough regulatory standards we operate under. That is changing.

Environmental leadership is continuing to evolve in the Canadian oil and gas industry – and could become a long-term competitive advantage for Canada.

Energy technology and innovation could be Canada’s greatest contribution to climate change. PTAC has facilitated over 450 completed projects, and 75 are underway. Many of these focus on environmental, rather than economic, research. PTAC has clearly established the relevance and value of its work to our member companies and EPAC members. Last year, 426 producers voluntarily funded their share of the 2015 Alberta Upstream Petroleum Research Fund (AUPRF) Program (over 90% of CAPP/EPAC members). CAPP and EPAC both approved funds for the 2016 AUPRF program.

PTAC’s 2016 AUPRF program has 37 different projects focusing on key environmental and ecological challenges

- Air – Methane emissions mandate
- Soil
- Ecologic
- Water – Encana example
- Well Abandonment

These and many other innovations are taking place right now in Canada’s oil and gas industry. This is breakthrough science at work. And it’s the future of the industry today.

PTAC leverages industry funding with government and other sources. Since inception, 273 AUPRF projects have cost $119 MM, with only $19.2 MM, or 16%, coming from industry.

**PTAC Programs**

PTAC is also facilitating extractive research programs and has played an important role in the growth of the oil sands and unconventional gas industries in Canada.

PTAC formed the Tight oil and Gas Innovation Network (TOGIN) in 2015 to focus on Canada’s increasingly important tight oil and gas resources to reduce the environmental footprint, facilitate social permission, and make better economic projects. The graphic shows how all 3 are accomplished by pad drilling

**Summary**

Our industry faces many challenges. But even if prices recover, we will need more infrastructure to reach more customers ... and we will need more innovation to compete better in a lower-carbon future.
With the right resourcefulness, we can overcome these challenges so that, when our economy recovers, our country’s oil and gas industry is stronger ...and we can compete better — not only on cost but on the environment too.

Today the need has never been greater for all of us as Canadians to take a thoughtful look at our country’s energy opportunities and consider how our country can evolve to compete in a changing, challenging world.

Here in Canada we’re in the midst of a national energy debate. At times, our industry’s energy projects have become a “proxy” for polarizing debates, with some calling for keeping Canadian oil in the ground, for shutting down oil sands development, for imposing fracking moratoriums, for banning tankers or for blocking new pipeline projects.

We need to balance this debate with an awareness of realities ...namely, that we live in a growing world that will want more energy — not less.

According to the International Energy Agency (IEA), world demand for energy is forecast to grow by some 37 per cent over the next 25 years. Even if we hit our GHG emissions targets, oil and gas use will increase in the near future. Certainly, our global energy mix is changing, and renewables will grow significantly in the decades ahead. The world will continue to need all forms of energy. And that includes oil and natural gas from Canada.

With new infrastructure and more innovation Canada can play a leading part in the world’s new energy future.

Thank you.