

TRENDS, TROUGHS AND PEAKS: HOW SHOULD CANADA ADAPT TO THE TRANSFORMING WORLD OF ENERGY?

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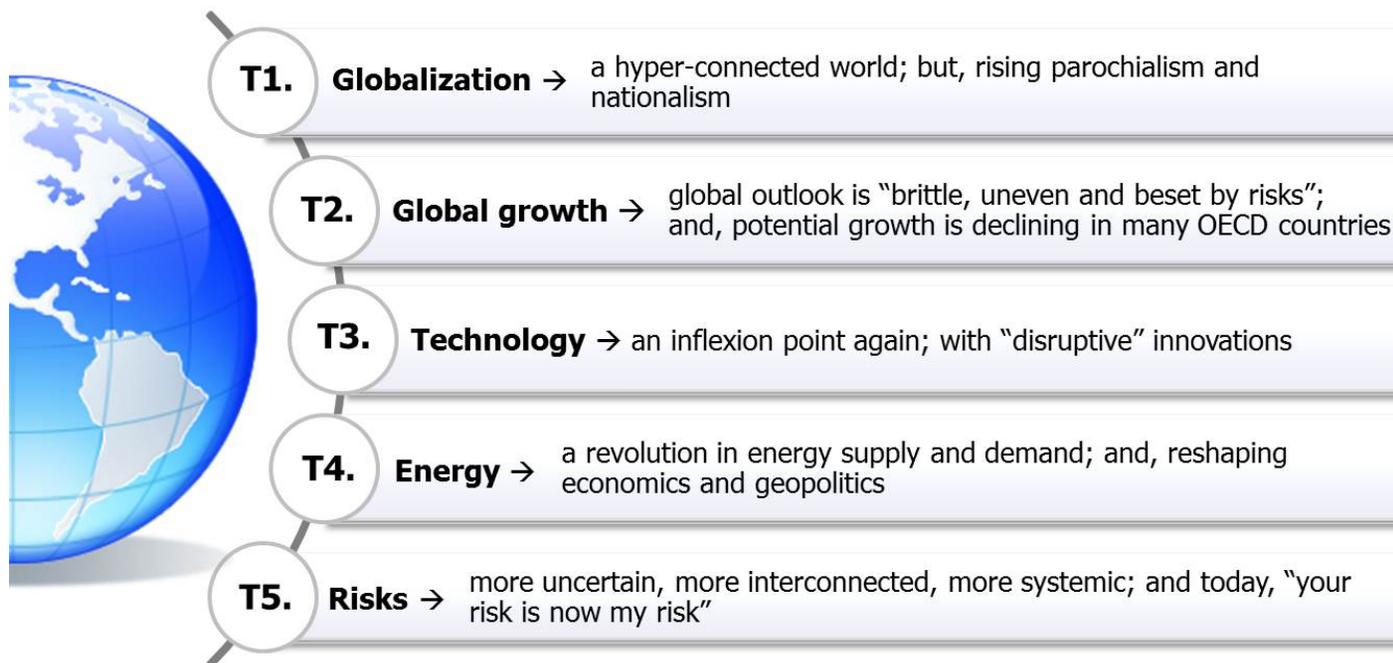


2015 Canadian Energy Industry: Updates and Insights

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Observation 1: **Global trends are reshaping our world, including the world of energy.** The reality today is structural trends that are reshaping economies, societies, politics, expectations, and are redefining the “drivers of success”, for everyone. **Change is the new constant, and the status quo is not a viable long term strategy.**

Observation 1: Global trends are fundamentally reshaping our world, including the world of energy ...



Observation 2: **There is a new global normal --- a hyper-connected and 2-speed world economy.** Emerging economies, led by China, have fundamentally altered the ranking of the world's largest economies. This pervasive globalization, combined with the ongoing technology revolution, have created a hyper-connected, and two-speed world. **And today, this new global normal is suffering from a weak global recovery.**

Observation 2: The new global normal is a hyper-connected and two-speed world --- with a weak and uneven global recovery

Updated IMF World Economic Outlook

	<u>2014</u>	<u>2015</u>	2015 Forecast Change from October
Global Economy	3.3	3.5	-0.3
U.S.	2.4	3.6	+0.5
Euro area	0.8	1.2	-0.2
Japan	0.1	0.6	-0.2
U.K.	2.6	2.7	0.0
Canada*	2.4	2.3	-0.1
China	7.4	6.8	-0.3
India	5.8	6.3	-0.1
Brazil	0.1	0.3	-1.1
Mexico	2.1	3.2	-0.3
Russia	0.6	-3.0	-3.5
MENA	2.8	3.3	-0.8

* updated Canadian forecasts for Canada in 2015 are 2-2¼%

The 2015 Top Global Risks

1. Interstate conflicts
2. High, sustained unemployment
3. Failure of climate change adaptation
4. Water crises
5. Cyber attacks
6. Asset bubbles
7. Terrorist attacks
8. Social instability
9. Food crises
10. Fiscal crises

Observation 3: **Technology is at an inflexion point, again, and it will be disruptive** --- driven by big data, big computing power, big analytics and adaptive learning. This technology revolution will drive competitiveness, affect comparative advantage, transform the nature of work and alter who does the work. **We have to decide in Canada if we want to be active players, with the capacity to do so, or be wary bystanders, with all the risks that entails.**

Observation 3: Technology is at an inflexion point, again, and it will be disruptive --- early adapters reap disproportionate gains

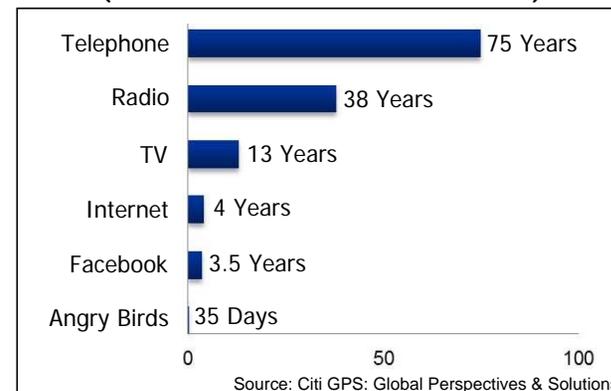
THE "DISRUPTORS"

- ✓ The Internet of things
- ✓ Advanced oil and gas exploration and recovery
- ✓ Energy storage
- ✓ Autonomous and near-autonomous vehicles
- ✓ Mobile Internet
- ✓ Cloud technology
- ✓ 3D printing
- ✓ Advanced robotics

Source: McKinsey

THE PACE OF DISRUPTION

(time to reach 50 million users)



THE "BIG QUESTIONS"

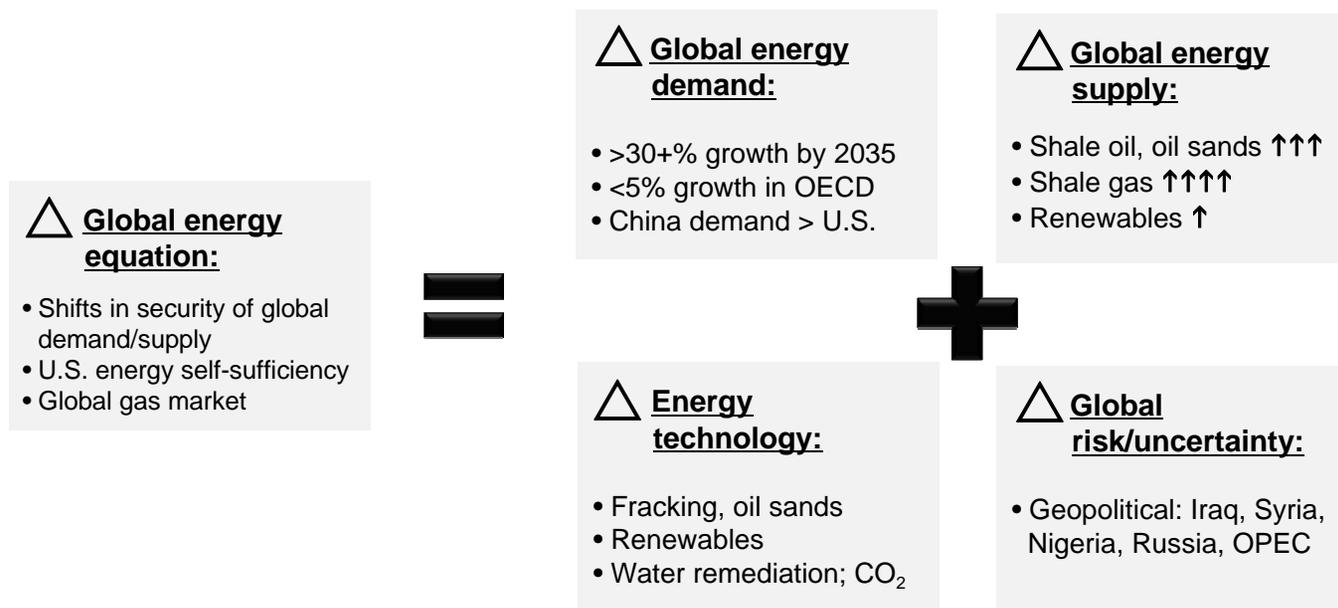


Do we have the capacity and entrepreneurship to be the disruptors, or simply be the disrupted?

Do we have the technology skills, management and culture to be early adapters, or simply late followers?

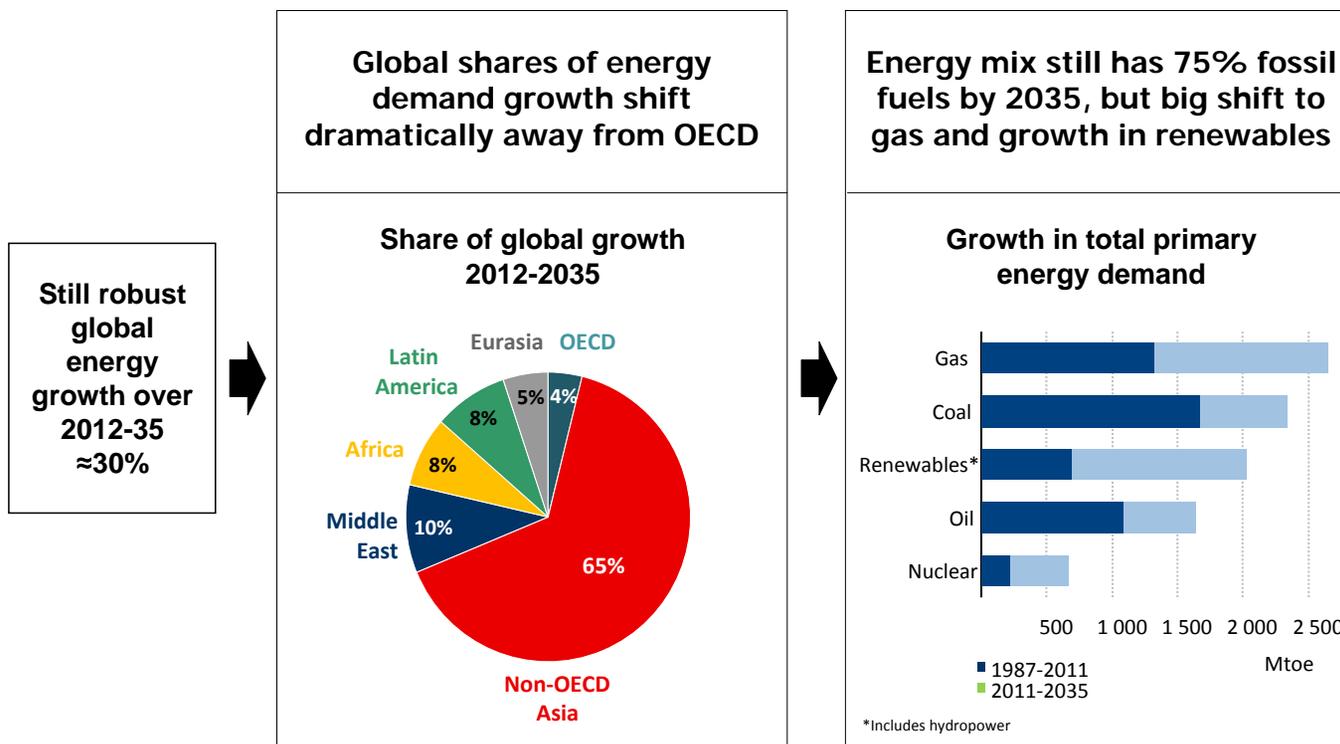
Observation 4: **Trends in technology and shifting markets add up to an energy revolution.** The energy world is changing, profoundly. Globalization is shifting **energy demand** from the OECD countries to the “unconventionals” --- the rapidly growing emerging economies, particularly in Asia. Technology is shifting **energy supply** to “unconventional” sources --- oil sands, shale oil, shale gas, etc. **The result: transforming global energy markets, with enormous economic and geopolitical impacts including price volatility.**

Observation 4: Trends in technology and shifting markets add up to a global energy revolution, with economic and geopolitical consequences, and price volatility



Observation 5: **Trends in global energy demand will continue to grow substantially**, but not in the traditional geographies and fossil fuels still dominate --- demand will grow by about 30% from 2012 to 2035, with Asia accounting for 65% of this growth. For the first time, OECD economies will account for little (4%) of this demand growth as energy efficiency matters and slower potential growth take effect, and China will surpass the US as the world's largest energy consumer.

Observation 5: Trends in global energy demand will continue to grow, and substantially, but not in the traditional geographies, and fossil fuels still dominate, but not to same extent



Source: IEA

Observation 6: **The ramifications of these trends for Canada are profound, just as recent price volatility will have short term impacts.** Canada has a single buyer for our oil, gas and electricity --- and the U.S. is becoming an increasingly unreliable buyer of Canadian oil and gas. Long taken for granted, our security of energy demand is declining. At the same time, Canada's capacity to supply more energy from shale gas and the oil sands is rising, significantly. **The result: growing Canadian insecurity of energy demand as our biggest market becomes our newest competitor --- a national "energy security conundrum."**

Observation 6: The long term ramifications of this energy revolution for Canada are profound --- a Canadian "energy security conundrum"

Canadian Energy Exports (2010):
Single Buyer for Oil, Gas,
Electricity

Commodity	% of Total Exports to US by Value
Natural gas	100.0%
Electricity	100.0%
Petroleum*	98.1%
Uranium	25.5%
Coal	5.2%



CANADA'S ENERGY SECURITY CONUNDRUM

US Hydrocarbon Supply ↑

US Hydrocarbon Demand ↓

+

100% reliance on US market for gas, oil and electricity exports

+

Increasing Canadian unconventional supply capacity: oil sands + shale gas

=

Declining Canadian security of energy demand

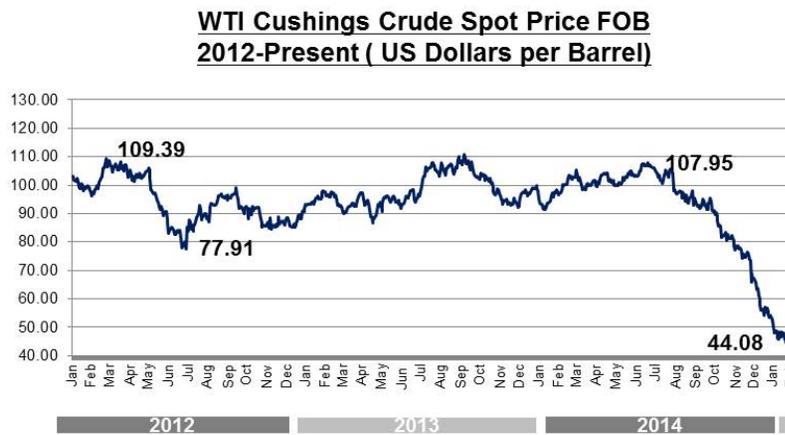


Source: Stats Canada, Natural Resources Canada
<http://www.nrcan.gc.ca/statistics-facts/energy/895>

*Trade data include crude oil, refined petroleum products and liquefied petroleum gases (LPGs).

Observation 7: **The world price of oil has rediscovered volatility in a transforming global energy market.** It has sagged 40+% in just five months due to increased supply (North America), decreased demand (EU, Japan, Emerging Markets), decreased market share (OPEC) and increased uncertainty. With a weak global economy, and question marks about China's pace of growth, price declines are not unexpected. **The extent, however, is surprising,** and reflects OPEC market share concerns, U.S. incremental supply, and the sharp rise in "demand uncertainty."

Observation 7: In a transforming global energy market, Canada will need to carefully balance these long term trends and short term price volatility

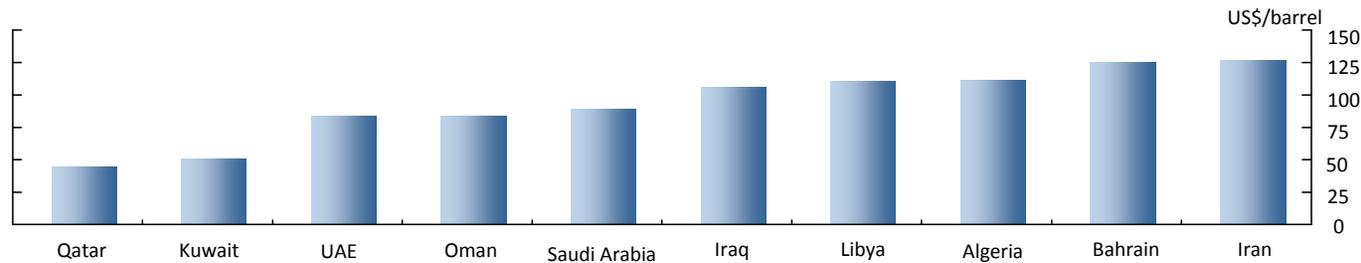


Sources: EIA, data as of Feb 2, 2015

Disruptive Factors

- Supply↑: U.S., Canada, Russia
- Demand↓: EU, Brazil, China, Japan, South Africa
- Market Share↓: OPEC
- Supply Uncertainty↑: Iraq, Iran, Libya
- Demand Uncertainty↑: Eurozone, Asia
- All-in-costs↑: Saudi Arabia, others

Oil Prices Required to Balance the Fiscal Budget



Source: Bank of Canada, January 14, 2015

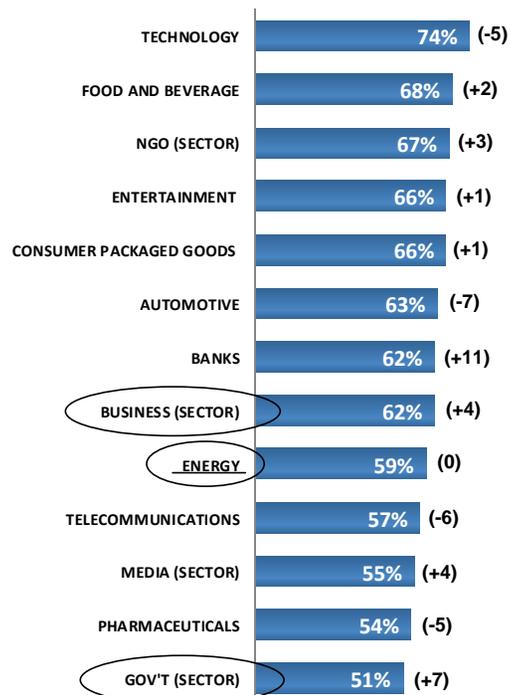
Observation 8: Trust matters for managing change. The Edelman Global Trust Barometer shows a decline in the public's trust over the last decade. And this matters when introducing change. **Canada has more trust in business and government than the global norm**, with trust levels in Canada for business at 62% (compared to 50% in the U.S.) and yet Canadians strongly look to government to “protect them” from “inappropriate” business practices.

Observation 8: Trust matters for managing change, including energy diversification ...



“These new regulations will fundamentally change the way we get around them.”

Trust in industries, 2014 Canada (Canada vs global rating)



Source: Edelman Trust Barometer 2014

Observation 9: **Private interest versus public interest?** How well have we made the case to the public that diversification to new energy export markets, and building new infrastructure to reach them, is in the public interest in Canada? To move forward, we must demonstrate that the energy sector growth and diversification is in the national interest not just the private interest. To create such a shared sense of energy purpose, we must demonstrate an acceptance of the “multiple licensing imperative” for major energy transportation projects.

Observation 9: Is a major “energy pivot” possible without invoking the “public interest” and the “multiple licensing imperative” for successful change??

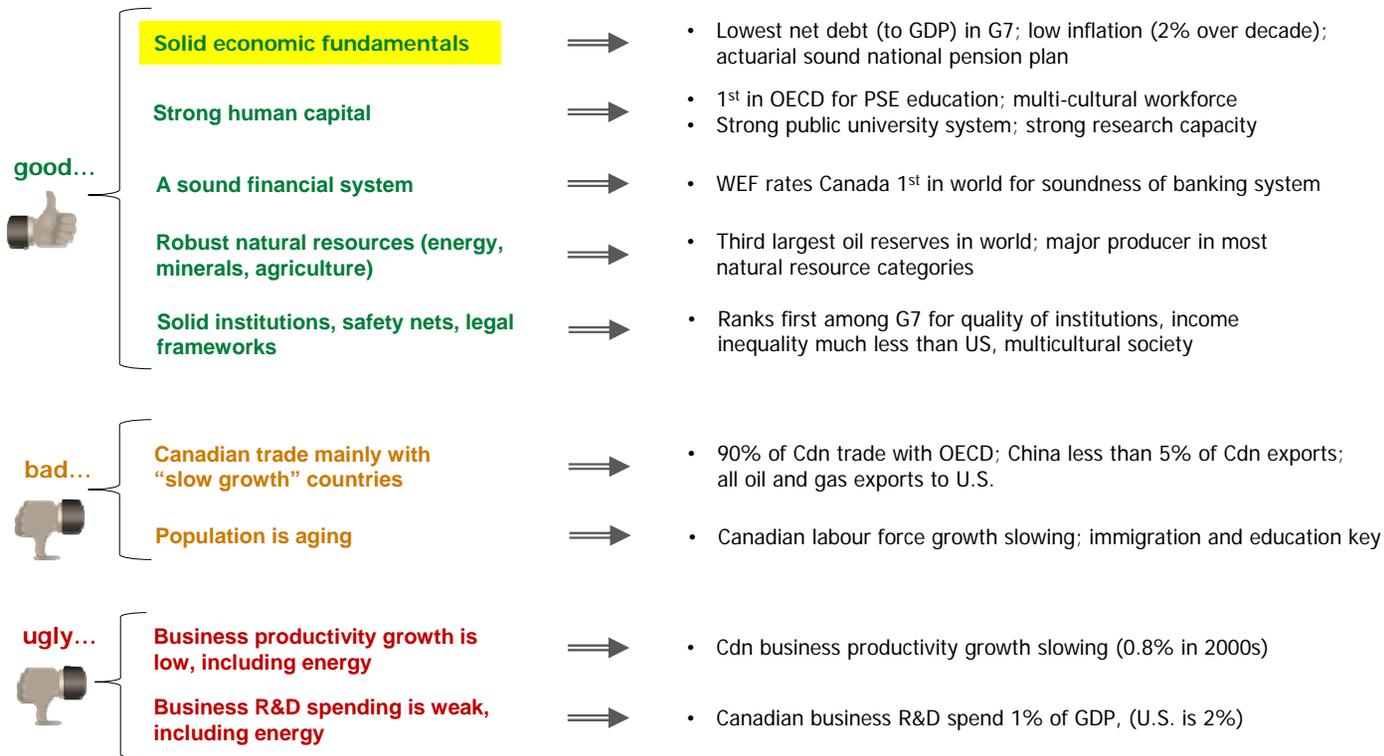
The “Multiple Licensing Imperative”

- Commercial License** → **Market diversification improves the economics**
- Policy License** → **Jobs, incomes, growth and the public interest matter to gov'ts**
- Social License** → **Public dialogue and consultations are social license enablers**
- Innovation License** → **Technology is a trusted problem solver**



Observation 10: The status quo is no longer a recipe for future success. Canada has fared reasonably well over the last 15 years because of a number of strengths. But, to continue to do so, we need a trade diversification strategy, a focus on business innovation, excellence and inclusivity in our human capital building, and entrepreneurship as a societal norm --- **in short, we face an adaptation imperative in Canada, including the energy sector.**

Observation 10: The status quo is no longer a recipe for future success --- we need to adapt in all sectors, including energy



Observation 11: **Culture and mindset matter to success in this profoundly changing world.** To realize our full energy potential, we need to be clearer about our national interests as well as our private goals, be longer term and more strategic in our thinking, and avoid the trap of the status quo in a transforming energy world.
Complacency is a risk best avoided.

Observation 11: Culture and mindset matter to success in this profoundly changing world ...

- We need to avoid “**short term-ism**” --- it is hard to build for our long term future with a quarterly mindset
 - a focus on long term energy demand trends, not just short term troughs, and these are for substantial global growth, but not in our sole export market
 - A public energy dialogue leading to a pan-Canadian energy strategy would be a good place to start
- We need to avoid “**status quo-ism**” --- it cannot be a strategy for long term success in a changing world
 - More integrated energy and the environment thinking would be a good starting point
 - Job #1 for Canadian energy is market diversification
- We need to avoid “**risk aversion**” in energy policy
 - A “Public energy transportation corridor”, established by government(s) and operated by the private sector, could be a game-changer

