



# CANADA'S NEW ENERGY LANDSCAPE

## Enabling Continued Collaboration on Energy

The energy landscape is changing, both within Canada and internationally, pointing to the dawn of a new energy era for Canada. Moving forward, it will be imperative that Canada address energy as an integrated system that involves balanced action across the areas of energy production, distribution and use.

### GLOBAL TRANSFORMATION

Globally, the way that energy is being produced and used is shifting. A variety of factors point to what the International Energy Agency is calling "a vast international reordering of energy supply and demand patterns."

- 3% Annual vehicle miles traveled in the US - down from high of 3.03 trillion in 2008 to 2.95 trillion in 2013
- 19% US crude oil imports - down from 3,695,971 thousand barrels in 2005 to 3,107,825 thousand barrels in 2012
- 67% Chinese energy consumption - up from ~6,000 thousand barrels of oil per day in 2003 to 10,000 thousand barrels per day in 2012
- 40% Estimated increase in global natural gas resources due to technically recoverable shale
- 35% Decrease in the share of nuclear power in electricity generation worldwide from all time high of 17% in 1993 to 11% in 2011
- 1233% Growth in global installed wind power capacity - up from 18GW in 2000 to around 240GW at the end of 2011

### International Energy Agency Projections

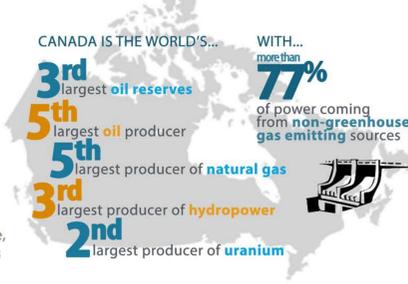


"If as of 2017 there is not a start of a major wave of new and clean investments, the door to 2 degrees will be closed."  
- Fatih Birol, International Energy Agency

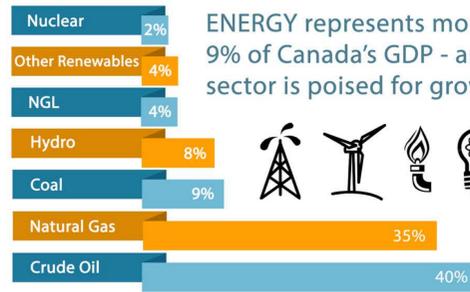
### CANADIAN CONTEXT

Energy is critical to Canada's economy, competitiveness, and society - driving jobs, growth, investment and commercial opportunities.

Canada's energy system has evolved dramatically over the past decade, with unconventional sources now accounting for the majority of our oil and gas reserves. And, with the US moving closer to energy self-sufficiency, Canada is looking to build new markets for its energy products. At the same time, renewable energy generating capacity is growing at a rapid pace.



### Primary Energy Production in Canada (2011)



ENERGY represents more than 9% of Canada's GDP - and the sector is poised for growth

**JOBS**  
**335,500**  
People directly employed in the energy sector in 2012

**EXPORTS**  
**\$119 BILLION**  
Or 27.8% of Canadian domestic merchandise exports

**GOVERNMENT REVENUE**  
**\$26.6 BILLION**  
Average annual payments to governments by energy industries

## A NEW ERA FOR ENERGY IN CANADA

### BUILDING THE RESOURCES OF TOMORROW

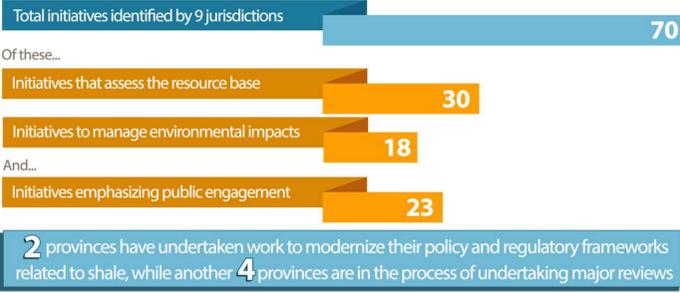
The way that energy is being produced in Canada is changing. Breakthroughs in shale and tight gas have doubled Canada's oil and gas resources. At the same time, the average annual growth rate of wind and solar has been nearly 40% over the past decade, and Canada continues to be a leader in emerging renewable technologies such as tidal energy.

### Shale Oil and Gas

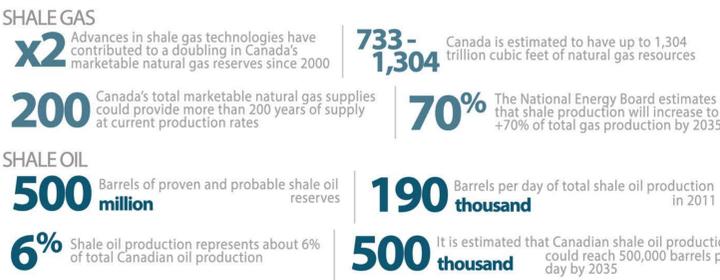
"...the shockwaves of rising United States shale gas and light tight oil and Canadian oil sands production are reaching virtually all recesses of the global oil market"  
- International Energy Agency, Medium-Term Oil Market Report, 2013

To date, shale development in Canada has been focussed in the Montney and Horn River Basins in British Columbia. A number of jurisdictions across Canada are working to grow the knowledge base around their shale resources.

#### Provincial and Federal Initiatives to Better Understand Canada's Shale Resources



This work is helping Canadians to realize the significant potential associated with Canada's shale resources

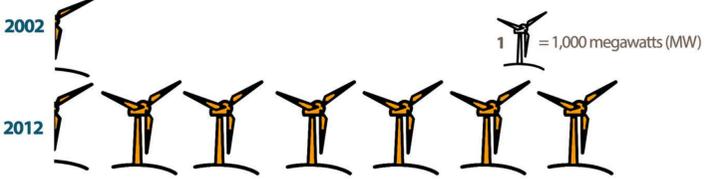


### Renewables

"If implemented properly, renewable energy sources can contribute to social and economic development, to energy access, to a secure and sustainable energy supply, and to a reduction of negative impacts of energy provision on the environment and human health."  
- Intergovernmental Panel on Climate Change, 2011

Canada is a world leader in the production and use of renewable energy. Over the past decade, renewable energy has been growing at a rapid pace.

Wind power has grown from just 231 MW in 2002 to 6,201 MW in 2012. Currently, there are more than 3,750 wind turbines across the country - up from 320 in 2002.



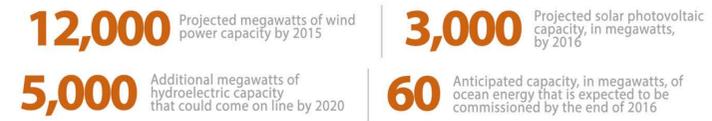
Solar photovoltaic has grown from only 10 MW in 2002 to 765 MW in 2012.



And hydro electricity has consistently grown since 2002, adding more than 8,000 MW of installed capacity.



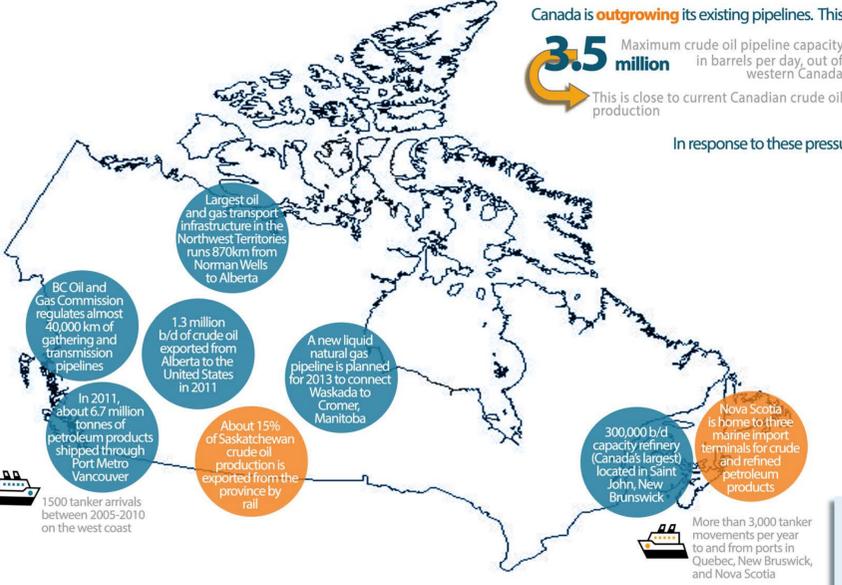
Going forward, this growth is projected to continue, based on existing policies and initiatives.



### REACHING DOMESTIC AND INTERNATIONAL MARKETS

#### HOW WE DISTRIBUTE OUR ENERGY

Canada's energy transportation systems will need to accommodate growing production and respond to changing markets. Greater access to global and domestic markets for Canada's energy resources represents an opportunity to create wealth and economic prosperity, improve energy security globally, and obtain maximum value. An effective, safe and expanding energy transportation system will enable Canada to achieve this goal.



In addition, transporting oil by rail is growing as an alternative to pipelines. In 2011, an average of 109,000 b/d of fuel oil and crude were transported by rail. This increased to 180,500 in 2012 - an increase of 66%

- And action is being taken to promote responsible resource development, and achieve 'one project, one review'
- 1) Implementing Early Warning Systems
  - 2) Strengthening Coordination of Aboriginal Consultations
  - 3) Further Harmonizing Fed/Prov Major Resource Project Reviews
  - 4) Mapping F/P/T Review Processes
  - 5) Implementing Alignment Mechanisms through Pilot Projects

### THE DEMAND EQUATION

At the same time, Canadians are thinking about the ways that they use energy in order to achieve considerable savings. According to the International Energy Agency's Tracking Clean Energy Report 2013, energy efficiency remains a largely untapped resource. A number of initiatives are underway across Canada to improve energy efficiency.

There are significant opportunities associated with energy efficiency - both globally and for Canada.

**\$18 trillion** Global economic growth and energy savings available by 2035 using existing efficiency technologies (\$US)

**\$32 billion** Savings to Canadians in 2010 as a result of energy efficiency improvements since 1990

**32 million** As a result of energy efficiency improvements made since 1990, Canadians saved the amount of energy used to power 32 million cars in 2010

**93 MT** Megatonnes of avoided greenhouse gas emissions in 2010 as a result of energy efficiency gains between 1990 and 2010

Much of Canada's potential to reduce energy demand remains untapped



According to the International Energy Agency, North America has the potential to become virtually oil self sufficient around 2030. Energy efficiency would be responsible for 45% - or nearly half - of this outcome

Canada is making progress on energy efficiency, and taking action to address International Energy Agency recommendations to improve energy efficiency.

32 million cars are equal to... 1.55 times all cars registered in Canada

The International Energy Agency has made a series of recommendations for energy efficiency improvements, including:

- Normalize higher efficiency standards as technologies advance
- Make energy efficiency affordable
- Make energy performance visible to the market
- Monitoring and verification are essential to realizing savings
- Raise the profile and importance of energy efficiency

#### BUILDINGS

Adoption of Code 2011 underway in 12 jurisdictions

WHAT IS CODE 2011? The National Energy Code for Buildings 2011 is among the most stringent codes for buildings in North America. It has the potential to generate annual energy savings of \$350 million in 2020.

640,000 households have improved energy efficiency by an average of 20 percent.

Federal, provincial, and territorial collaboration is achieving improvements in home efficiency

Tools like EnerGuide Rating offer consistent way to value energy savings

INDUSTRY Canadian Industry Program for Energy Conservation has supported industry since 1975

Canada was the first country to adopt the ISO 50001 as the national energy management standard

This voluntary standard, adopted by 43 major countries, could yield some \$80 million in energy savings by 2020 from Canadian organizations that comply.

TRANSPORT New, online version of SmartDriver released

The US SmartWay Transport Partnership adopted in Canada

Currently more than 3,000 SmartWay Partners are working together on the goal of saving fuel

WHAT IS SMARTDRIVER? SmartDriver training offers a series of courses providing truck drivers with the knowledge they need to reduce fuel use.

The SmartWay Partnership allows companies to build supply chain management strategies that include energy efficiency and environmental considerations directly into their transportation decision-making process. By bringing SmartWay to Canada, Canadian firms will have the same opportunities to compete as their American counterparts.

### GOING FORWARD

Canada's energy future, and the role that Canada plays in the global energy story, will depend on a careful balancing of the supply and demand sides of the equation. Indeed, the International Energy Agency expects that it is the growth in unconventional sources of energy coupled with improvements in energy efficiency that can get North America to oil self-sufficiency by 2030. Preparing our energy transportation infrastructure to reach new markets will help Canada to play a strong role internationally.

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