

The BC CONSTRUCTION MONITOR

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Multiple opportunities to lower the temperature
Canada's energy economy

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A Balanced and Realistic Energy Future



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President

We get and use our energy in very different ways today than we did just a decade or two ago. But does that mean we're on pace to make the changes we need to, or should we be trying instead to end fossil fuel use

as completely and quickly as possible?

The federal government has clearly signaled that it foresees a long-term transition away from fossil fuels: One that will involve continued carbon-reduction, as well as new infrastructure to get responsibly produced conventional energy to world markets where the long-term demand outlook is strong.

Demand growth will be driven by an expanding global population, and a determination on the part of developing countries to improve their living standards. It's true that renewables are poised to make up a much bigger part of the energy mix. But they're starting from a low baseline and won't be able to fully meet demand without more modest but still significant growth in conventional energy sources as well.

Even putting demand growth aside, a quick and complete transition to renewables is simply not viable. Their costs are coming down, and technical challenges such as the irregular availability of sources like wind are being tackled. But these remain big hurdles. Carbon-free energy sources can also have significant ecological footprints of their own.

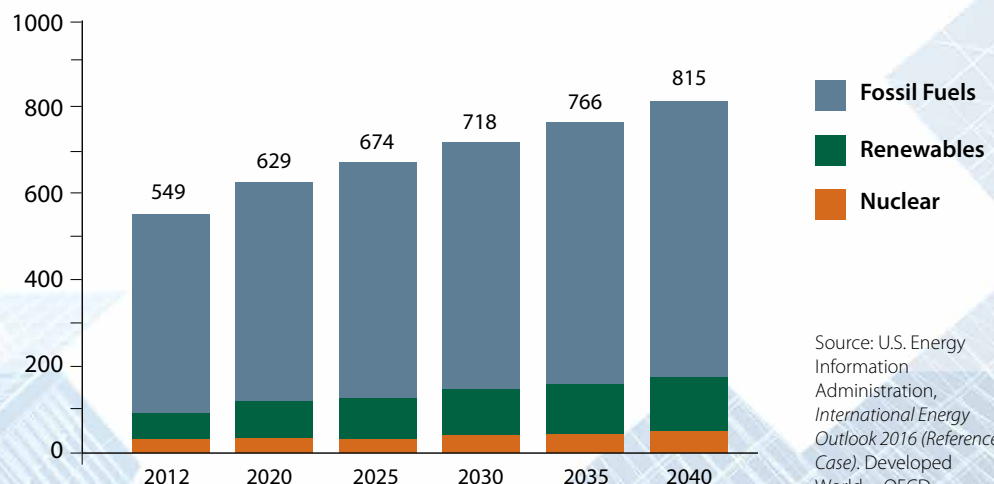
Fortunately, renewables are one tool among many in meeting our climate change goals. Ongoing improvement in energy efficiency is actually the single most important tool. There's also huge potential to capture and store carbon. And making more use of cleaner burning fuels like natural gas will also have a cooling effect.

Our energy transition needs to continue. But conventional energy sources will clearly fuel human progress for a long time to come. And that opens the door to continued Canadian leadership, both as a supplier of responsibly produced conventional energy, and as an innovator in renewables and other fields that need to be part of a balanced global energy strategy.

Growing Demand Means we Need all Energy Sources

The world's population is growing. And better access to energy, often in basic forms like clean and safe cooking fuels, is vital to lifting more people out of poverty. Even with more renewables and energy efficiency, rising global demand means we'll need to rely on conventional energy sources for a long time yet. Fossil fuels provided 84% of the world's energy in 2012, and are projected to provide 78% in 2040.

World Energy Consumption (quadrillion Btu)



	2012	2020	2025	2030	2035	2040
Developed World	238	254	261	267	274	282
Developing World	311	375	413	451	491	533

Source: U.S. Energy Information Administration, *International Energy Outlook 2016 (Reference Case)*. Developed World = OECD countries; Fossil Fuels = Petroleum and other liquids, natural gas and coal.

The Energy Transition is a Long-Term Play

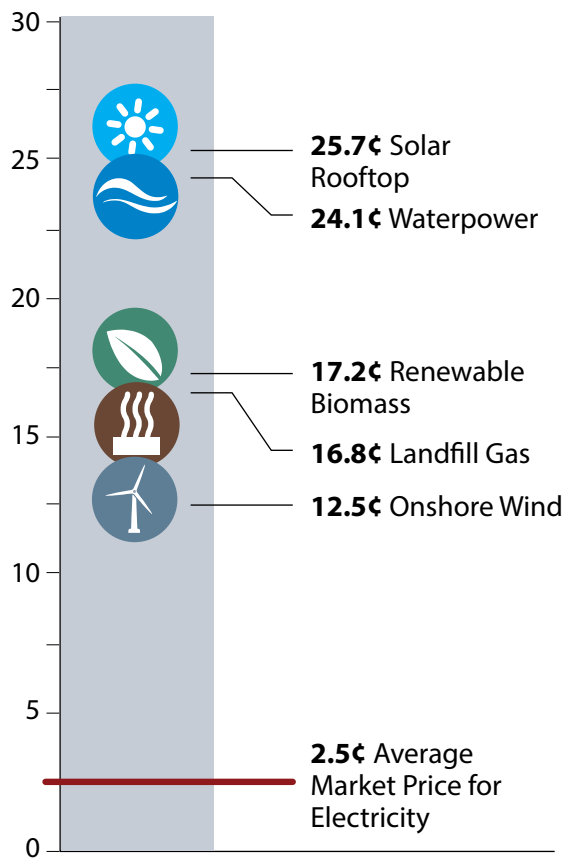
Renewables: Huge Promise, but a Work-in-Progress

Renewables are the alternative most often pointed to by those who think we should be able to cut ourselves off fossil fuels right away. Renewables are vital to the transition to cleaner energy, and they are growing fast. But various challenges mean the ramp up to larger-scale use will be gradual.

The Costs are High

Renewables are getting cheaper but are still expensive. In its aggressive push to promote renewables, Ontario is offering generators prices that are often vastly higher than average market prices. This has contributed to strong pushback on energy costs and widespread concern with “energy poverty”.

Ontario Electricity - Prices Offered to Generators (¢ per kWh)



Source: OEB Regulated Price Plan Report, October 2016; IESO FIT/microFIT Price Schedule, January 2017. Solar Rooftop is average of prices for several different project sizes.

The Sun Can't Shine Every Day

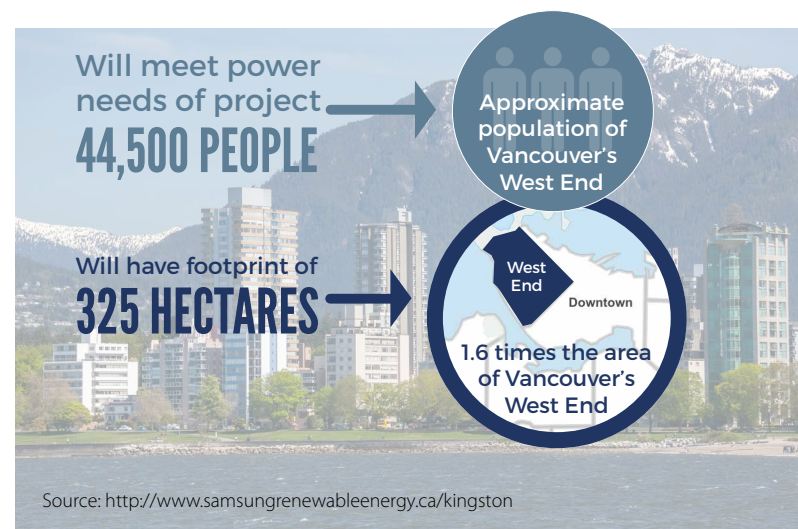
Renewable energy is intermittent - often most available when least needed - and widely dispersed. So it's very challenging to integrate into electricity grids without hurting reliability. And with the current state of energy-storage technology, renewables need to be backed up with standby conventional generation.

US\$7 BILLION Cost of CREZ Transmission Project - required to better integrate wind projects with Texas state power grid

Source: www.google.com/IA3FvK

They Have Their Own Footprints

Renewable sources are low carbon, but they have their own environmental footprints. Sources such as solar energy, for example, take up a lot of space relative to the energy they produce. Consider the example of Kingston Solar, a 425,000-panel project in southern Ontario that recently secured financing.



Lowering the Temperature in Diverse Ways

Continued use of fossil fuels doesn't mean giving up on dealing with climate change. A recent international agreement commits countries to work to keep the average global temperature increase to below two degrees, instead of the four-degree increase many believe we're headed for. This is an International Energy Agency projection of the combination of approaches that could achieve that:

Meeting the Two-Degree Goal: % Contribution of Key Strategies

RENEWABLES

Renewables are important, but they alone will take us less than one-third of the way to the 2 Degree goal.

POWER GENERATION EFFICIENCY & FUEL SWITCHING + END-USE FUEL SWITCHING

Switch it Up

Switching to lower-impact fuels will deliver big benefits. A major shift is already happening from coal to natural gas - by far the cleanest fossil fuel.

CO₂ Emissions per Unit of Energy Produced

Coal (average of various types)	216
Diesel Fuel & Heating Oil	161
Gasoline	157
Propane	139
Natural Gas	117

Source: US Energy Information Administration

Source: www.google.com/Kp9wFq

END-USE EFFICIENCY

Use it Carefully

Continued strong momentum towards more efficient energy use will help the most in meeting the 2 Degree goal.

↓ 1/3 World Energy Intensity from 1990-2015
(Energy Used per \$ of GDP)

Source: US Energy Information Administration

CARBON CAPTURE & STORAGE

Put Carbon Back in its Place

CCS involves capturing carbon that would otherwise go into the atmosphere and either safely storing it back underground where it came from, or putting it to some beneficial use. Canada is a leader in developing this promising technology.

6.4 Megatonnes of Carbon/Year
Removal Capacity of 4 Major CCS Projects in Operation or Development in Canada Now - Equivalent to 10% of BC's Total Annual Emissions

Source: National Energy Board

NUCLEAR

More use of this emission-free form of generation could round out the strategy to meet the 2 Degree goal.

"In short, a world powered by renewables is not around the corner. This will be a long-term transition - a matter of decades, not years."

- McKinsey & Co. Analysis, June 2015

Canada is an Energy Economy

With a clear global need for continued use of conventional energy for decades to come, there's no reason for Canada to give up on developing its oil and gas resources - especially since we insist on high standards on carbon management and environmental performance. And the social and economic consequences for our country would be severe if we did give up on these resources.

\$81 BILLION
Oil & Natural Gas
Industry Investment
in Capital Projects in 2014




440,000
JOBS 

Direct and Indirect
Industry Employment
Impact Across Canada

35%

Proportion of Canadian
Private Sector
INVESTMENT
Represented by
OIL AND GAS

Trade Surplus for
Canada Generated by
Oil in 2014
\$70 BILLION

Sectors Whose Trade
Deficits that Offset:
Autos/Auto Parts,
Machinery &
Equipment,
Electronics



\$15
BILLION
Estimated Annual
Industry Contribution
to Government
REVENUES

\$115 MILLION
Property/Corporate Taxes
& **\$60 MILLION**
Procurement

Economic
Contribution
in BC from
EXISTING
Oil and Natural
Gas Pipelines

Industry (CAPP) and Media Sources



The BC CONSTRUCTION MONITOR is an ICBA publication providing ahead-of-the-curve information and statistics on the BC construction industry and issues relevant to it.

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