

Forget Trans Mountain, here's the sustainable way forward for Canada's energy sector

Jeffrey D. Sachs Opinion piece for [The Globe and Mail](#) April 13, 2018



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Oil seems to make politicians lose their bearings. The get-rich-quick mentality or too-much-to-lose thinking is very hard to overcome. Thus, two of Canada's most progressive leaders, Prime Minister Justin Trudeau and Alberta Premier Rachel Notley, have both doubled down recently on Alberta oil sands and the pipelines to carry them to world markets. Whether Kinder Morgan's controversial Trans Mountain pipeline expansion through British Columbia is built, or the company steps away from the project, remains uncertain. Either way, the truth is that **Alberta oil sands** have absolutely no place in a climate-safe world. Investing in them is almost surely to be investing in a future bankruptcy.

The story is really quite simple if you are not facing an election soon. In the Paris Climate Agreement, strongly backed by Mr. Trudeau and Ms. Notley, the entire world has agreed to stay well below 2-degree C warming. To achieve that requires the world to decarbonize the world's energy system by mid-century. Otherwise, the human-induced emissions of carbon dioxide will break the "carbon budget" and drive warming above the target.



A new study by the UN Sustainable Development Solutions Network (SDSN) shows the sustainable way forward for Canada's energy industry. Rather than building more oil and gas pipelines to carry Alberta's high-cost and highly polluting oil sands to world markets, Canada should be building long-distance transmission lines to carry zero-carbon electricity to U.S. markets. In that way, Canada would honour its commitment to the Paris Climate Agreement and avoid losing billions of dollars on foolish, dead-end projects in the meantime.

There are overwhelming reasons to honour the Paris Climate Agreement. Even with the amount of global warming to date (1.1 degrees C above the preindustrial average temperature), the world is experiencing record hot temperatures, devastating heat waves, droughts, extreme floods, and increasingly frequent high-intensity storms and hurricanes. Climate attribution science links these extreme events to human-induced warming. With two degrees C or more of warming, the world could well experience a devastating rise in the ocean level, as well as devastating losses and dislocations from crop failures, temperature-linked diseases, invasive species, forest fires, and mega-storms.

For these decisive reasons, the world will rapidly shift away from fossil fuels toward renewables. Herein lies the rub for Canada. The world already has vastly more proven reserves of oil and gas than it can safely burn, and a glut of reserves at far lower production costs than Alberta's oil sands. The marginal costs of the oil sands are typically estimated to be around US\$60 per barrel, yet the world will find itself awash in US\$30-per-barrel oil as world demand is cut back in the future. There is no way that Alberta's oil will maintain a profitable niche in a world that is ending its dependence on oil.

One impulse wants to say to Kinder Morgan and TransCanada, *"Okay, build the pipelines. Then we will bankrupt you."* But admirers and friends of Canada should speak honestly to friends. *"Don't waste your hard-earned money on the Trans Mountain and Keystone XL pipelines. Spend your money on sustainable projects tapping Canada's abundant zero-carbon energy."*

Canada is already moving rapidly to a zero-carbon future. As of 2015, two-thirds of Canada's power generation was from renewable sources, mainly hydro power. The share of renewables in Canada's power generation is already among the highest in the world, exceeded only by Norway, New Zealand, Brazil, and Austria, and roughly the same as Denmark. Yet far more is possible.



Canada has so much untapped zero-carbon energy that it can be a major exporter to the United States. And, as a bonus, Canada can provide energy storage services to the United States by deploying the hydroelectric reservoirs as giant storage “batteries” for an interconnected Canada-U.S. power grid. When an excess of intermittent renewable energy such as wind power is to be stored, the reservoirs are allowed to fill. When the stored energy is to be utilized, perhaps because of seasonally low wind and solar power, the hydroelectric reservoirs are lowered to produce more hydroelectricity for the Canada-U.S. grid.

This is the powerful conclusion of the new study of energy decarbonization of the U.S. northeast. The UN SDSN teamed up with Hydro-Québec and an expert energy modelling firm, Evolved Energy Research, to examine the best strategy for the U.S. northeast to move to a zero-carbon future by 2050. The basics of decarbonization are clear enough. **To slash carbon-dioxide emissions we will need three major energy transformations: much higher energy efficiency, the generation of electricity from zero-carbon energy sources, and the mass electrification of automobiles, heating of buildings, and industrial processes.** (Some other sectors, such as aviation and shipping, will probably rely on synthetic liquid hydrocarbons produced using renewable energy).

This decarbonization, in principle, could be accomplished in the U.S. northeast by deploying American renewable energy. Yet the study shows the huge advantage to both the United States and Canada of working together to supply much of the zero-carbon energy from Canada's hydroelectric potential, and to store excess flows of renewable energy in Canada's hydroelectric reservoirs (just as Denmark stores its excess wind power in Norway's hydroelectric reservoirs). **The study shows that the cost of decarbonizing the U.S. northeast is reduced by more than US\$4-billion a year by greatly expanding the grid connection with Quebec's hydroelectric power and storage capacity.**

Herein lies the real future for both Canada and the United States in energy competitiveness. **Rather than building pipelines that will soon be shut, Canadians and Americans should be building a smart grid to carry renewable energy between the two countries.** Canada's renewable energy is vast right across the country. Alberta, fortunately, has vast wind and hydroelectric power potential to enable the province to continue to be a major exporter of energy, only this time with zero-carbon energy that is sustainable for the long haul.

With Donald Trump trying to break the Paris Climate Agreement and championing fossil-fuel development, it may seem convenient to Canada's politicians to go along with the U.S. President's fossil-fuel recklessness. Yet Mr. Trump will be gone and human-induced climate change will remain. Canada is clever enough to look beyond Mr. Trump to its true long-term interests and those of the world.