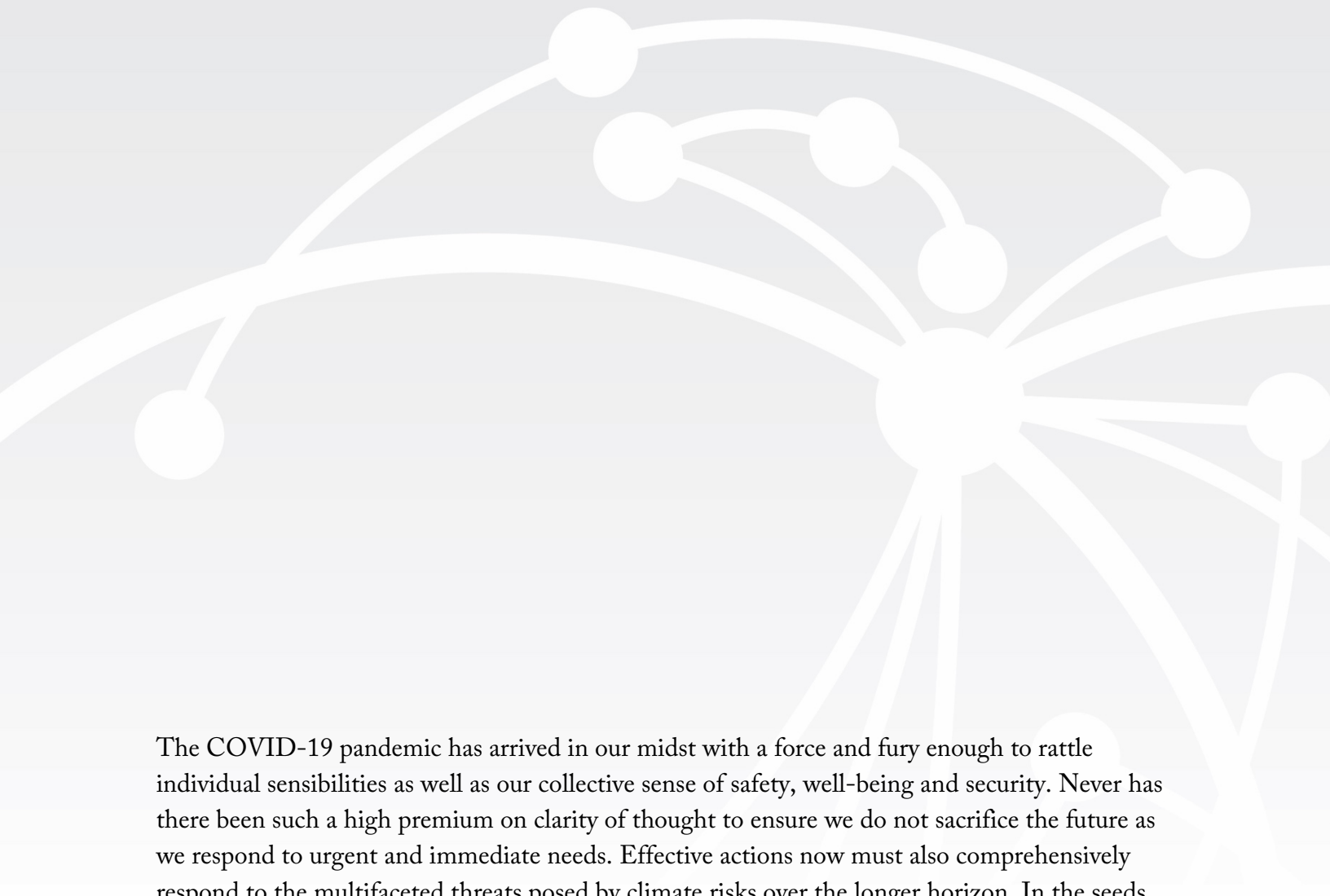


# Coronavirus, Climate and a Clean Energy Transition: Is Resiliency Achievable?

**Jatin Nathwani**

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The COVID-19 pandemic has arrived in our midst with a force and fury enough to rattle individual sensibilities as well as our collective sense of safety, well-being and security. Never has there been such a high premium on clarity of thought to ensure we do not sacrifice the future as we respond to urgent and immediate needs. Effective actions now must also comprehensively respond to the multifaceted threats posed by climate risks over the longer horizon. In the seeds of this current tragedy lies a historic opportunity for Canada to transition to a low-carbon energy economy — away from dependence on the oil and gas sector.

Yes, resiliency is achievable — but only by leaning on Voltaire’s crutch: “No problem can withstand the assault of sustained thinking.” The COVID-19 pandemic has arrived in our midst with a force, fury and features as ugly as Banquo’s ghost at Macbeth’s feast, enough to rattle individual sensibilities as well as our collective sense of safety, well-being and security. The trajectory and scale of what this human tragedy will deliver are unknown. Never has there been such a high premium on clarity of thought to ensure we do not sacrifice the future as we respond to urgent and immediate needs. While effective intervention for COVID-19 can be imagined through the development of a single vaccine, a silver bullet solution is not credible for the multiple threats emerging from climate change. Effective actions now must also comprehensively respond to the multifaceted threats posed by climate risks over the longer horizon.

In the seeds of this current tragedy lies a historic opportunity for Canada to transition to a low-carbon energy economy — away from dependence on the oil and gas sector — through the national fiscal capacity that has been marshalled to deal with COVID-19. The current response of governments in Canada is exemplary, showing a commitment to stem the tide of the pandemic, minimize fatalities and help us get back on our feet economically. The federal government’s willingness to intervene in the economy through a powerful fiscal stimulus, in the order of \$102 billion, and adjusted upwards regularly, for income support to individuals, businesses and volunteer organizations (food banks, homeless shelters and others) is tangible evidence of a serious response.

What is disconcerting is that the Government of Canada is in the midst of preparing a \$15-billion dollar bailout of the oil and gas industry.<sup>1</sup> Providing much needed financial support to employees and business is clearly the right thing to do, and Alberta’s needs are more acute, given the dominance of the oil and gas sector in its economy. The global drop in demand for oil, which began as an international price war, has now been coupled with a pandemic-driven global recession — a double whammy that has hit Alberta particularly hard, with similar impacts on Saskatchewan and Newfoundland.

However, the immediate responses to the management of the COVID-19 crisis should not blind us to the troubling underlying realities of the global marketplace: that is, the destruction of long-term demand for oil and gas. Whether this will be a case of demand driven lower by an economic recession, or structural shifts in the patterns of global economic production, future requirements for oil and gas will not remain robust. Nor will Alberta have a competitive price advantage for a barrel of oil against low-cost producers. In such a scenario, any further investment in the development of the oil sands will be dollars on their way to becoming stranded assets. A recent decision by Teck Resources to abandon its \$20-billion-plus investment in a massive oil sands project is a clear recognition of difficulties ahead. While the corporate sector has a duty to protect its shareholders from poor investment choices, the Canadian government is compelled by an even more serious duty: not to engage public capital for a dubious cause.

The time is ripe for Canada’s oil and gas sector to craft a new future, one that not only aligns with deep reductions in greenhouse gas emissions, but also transforms the sector to become a vanguard for a clean

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<sup>1</sup> Robert Fife, Emma Graney and Kelly Cryderman, [“Ottawa prepares multibillion-dollar bailout of oil and gas sector.”](#) *Globe and Mail*, March 19, 2020.

energy economy. If today's fiscal support — in the name of COVID-19 relief — becomes the linchpin for additional investments in the continued extraction of oil sands resources, it would be an unforgivable bequest to future generations. The fiscal stimulus must only be used to support today's workers and to meet the immediate social and income needs of communities that currently depend on the sector.

An outright bailout supporting the industry status quo would be a huge mistake, as it would create a historical lock-in to a high-carbon future. It would be a tragedy to pass on to future generations not only the debt obligations that accrue to the investment patterns of fossil fuel extraction, but also to foreclose other options and create a path dependency that makes it difficult for the national energy system to evolve on a cleaner trajectory. An energy future that is economically promising, environmentally sustainable and free of any dependence on fossil fuel extraction is entirely achievable — with strong investments in the clean energy technology sector.

What is the evidence that continued investments in the oil and gas sector are not sustainable in the long run? There are four key, interrelated trends that not only pose a serious threat to the long-term viability of the oil and gas sector in Canada, but also point to clear pathways for positive alternatives:

- divestment of fossil fuel securities and disclosures of carbon liability;<sup>2</sup>
- decarbonization;
- diversification of supply; and
- digitalization and electrification to replace existing energy sources.

## **Divestment, Disclosures and Transition Risks**

The political impasse that now characterizes relations between Alberta and Ottawa is a clear sign that the oil and gas sector is not aligned with the requirements of Canada's climate change commitments. The sector is all too aware of the "transition risks" that arise from federal policy interventions intended to ensure compliance with international obligations, such as the carbon reduction goals committed to under the Paris Agreement. The knock-on effects range from divestment decisions by institutional investors, the insurance sector unwilling to underwrite the physical risk of extreme events, and the collapsing financial valuations of a company's stocks. The result: reserves in the ground, owned by corporate entities and held as publicly traded securities, become stranded assets. The risk-return profiles of organizations exposed to climate-related risks will change as the physical impacts of climate change, climate policy and the competitiveness of new technologies undermine the financial soundness of the companies in the sector. Transition risks arise not because the extractive capabilities are exhausted: the world's known fossil fuel reserves in the ground are three times greater than could be burned

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<sup>2</sup> Bank of England, Prudential Regulation Authority, [\*The Impact of Climate Change on the UK Insurance Sector\*](#) (September 2015); Financial Stability Board, [\*Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures\*](#) (June 2017); Mark Campanale and Jeremy Leggett, [\*Unburnable Carbon — Are the World's Financial Markets Carrying a Carbon Bubble?\*](#) Carbon Tracker, July 13, 2011.

under a 2°C climate target.<sup>3</sup> The scientific basis for urgent action on climate is clear and compelling.<sup>4</sup> Aggressive policy interventions will follow to make continued reliance on fossil fuels unattractive and unprofitable.<sup>5</sup>

## Decarbonization of Global Economic Output

Worldwide decarbonization will remain the core principle to mitigate the threat of climate change. Given that the energy system is the dominant contributor to greenhouse gas emissions, with fossil fuels comprising 85 percent of primary energy demand,<sup>6</sup> a dramatic decline by 2050 to meet net-zero carbon targets can be readily foreseen. A mitigation strategy that rests on a dramatic reorientation of the global energy supply mix,<sup>7</sup> combined with an adaptation strategy,<sup>8</sup> provides a solid foundation for required actions to achieve climate resiliency.

All this will require massive investment capital once we emerge out of the COVID-19 crisis. If we assume that the fiscal capacity of governments around the world will be substantially diminished, this is an important time to pay close attention to flows of public capital and ensure they are directed to non-fossil fuel-based solutions.

There are several options available to the federal government and the oil and gas sector. If a bailout is envisaged in the multiples of billions of dollars, then from an investment perspective, a historic opportunity exists now to reshape the patterns of capital expenditures in the oil and gas sector toward non-carbon solutions, in tandem with innovation on a massive scale to diversify the supply resources.

## Diversification of Supply

Canada has the technological and scientific capacity to go from transportation of fossil fuels by pipelines to movement of electrons by wires,<sup>9</sup> utilizing diverse sources of energy such as hydroelectricity, advanced

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<sup>3</sup> Christophe McGlade and Paul Ekins, [“The geographical distribution of fossil fuels unused when limiting global warming to 2 degrees C,”](#) *Nature* 517 (January 2015): 187.

<sup>4</sup> Intergovernmental Panel on Climate Change, [Special Report: Global Warming of 1.5 °C. Summary for Policymakers](#), October 8, 2018.

<sup>5</sup> United Nations Environment Programme, [Emissions Gap Report](#), November 26, 2019; International Energy Agency, [Global Energy and CO2 Emissions Status Report 2019](#) (March 2019).

<sup>6</sup> BP, [Statistical Review of World Energy](#) (2019).

<sup>7</sup> International Institute for Applied Systems Analysis, [Global Energy Assessment](#) (2012); International Energy Agency, [World Energy Outlook 2019](#). Also note Germany’s recent commitment to exit coal by 2038, with shut-down of one-third of its coal generation capacity by 2022.

<sup>8</sup> Global Commission on Adaptation, [Adapt Now: A Global Call for Leadership on Climate Resilience](#), September 10, 2019.

<sup>9</sup> Jatin Nathwani et al., “Energy 2030 — A Roadmap for a Low-Carbon Electricity Future”, Waterloo Global Science Initiative (2012); Richard J. Marceau and Clement W. Bowman, eds, [Canada: Becoming a Sustainable Energy Powerhouse](#), Canadian Academy of Engineering, July 9, 2014.

nuclear (including small-scale modular reactors), geothermal energy and large-scale wind and solar with storage and bioenergy resources.

I highlight geothermal energy in particular because it is a highly relevant option, perhaps the easiest choice for Alberta's current challenges. Its development can be led by the oil and gas sector, with each dollar of investment by the sector matched by the federal government dollar (or any similar formula). Over the past century, the oil and gas sector has acquired an unparalleled technological capacity to explore, drill, extract and bring carbon energy to markets. Now the goal should be to repurpose this extensive knowledge of geology and geotechnical engineering expertise to extraction of heat energy for homes, industry and the power sector on a large scale. Geothermal energy resources, among other non-carbon energy resources, provide a perfect substitute for fossil fuels, a bonanza in waiting without any drastic changes to the existing financial incentives, depreciation allowances and tax credits available to the oil and gas sector for drilling activities.

## Digitalization and Electrification

Deep electrification of the economy,<sup>10</sup> aided by the emergence of digitalization, provides a powerful pathway for decarbonization of large sectors of the economy, including transport and heating for buildings. Electrification is critical for long-term carbon reduction goals and will represent an increasing share of final energy consumption. Digitalization will enable a significantly higher level of productive utilization of all assets and components of the energy system, maximizing true societal benefit.

With high levels of urbanization and intelligent energy networks, commercial and industrial enterprises have the opportunity, along with households, to participate actively in energy markets as both producers and consumers of energy. These players are the agents of change, as they adopt innovative solutions for greater energy efficiency and enhanced electric mobility.<sup>11</sup>

And it is becoming increasingly clear that, by 2030, oil will no longer maintain its dominance as the fuel of choice for transport: what is a high value product today will become less so as we approach mid-century. The evidence is mounting. Disruptive innovations enabled by digital technologies, data science, a remarkable decline in battery costs (70 percent in the last six years) and electrification of mobility (cars, trucks, tractors, two- and three-wheelers, e-trikes) spell trouble for the oil and gas sector. For example: it took 20 years to sell the first million electric vehicles (EVs), but only 18 months to sell the next million; the fifth million sold in four months. Growth rates of EV market shares, projected to double every two

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<sup>10</sup> Cheryl Martin, Francesco Starace and Jean Pascal Tricoire, [\*The Future of Electricity: New Technologies Transforming the Grid Edge\*](#), World Economic Forum (March 2017); DNV-GL, [\*Digitalization and the Future of Energy\*](#) (2019).

<sup>11</sup> Vangelis Marinakis and Haris Doukas, [\*"An Advanced IoT-based System for Intelligent Energy Management in Buildings."\*](#) *Sensors* 18 (2018): 610.

years into 2025 and beyond,<sup>12</sup> reflect an underlying reality that customers choose EVs because they offer superior performance and a cost advantage over gasoline cars.

The sudden shift in consumer preferences is at the root of the dramatic shift within the auto industry, a full-scale pivot away from gasoline cars toward EVs. The retooling of factories, with massive investments in electric mobility, is proceeding on all fronts — choice of models, longer-range performance, an expanding charging infrastructure and batteries coupled to high-efficiency electric motors — and showing no signs of decline in cost performance. With national governments strengthening policy support by mandating the phaseout of gasoline and diesel vehicles between 2025 and 2040, the global movement away from the internal combustion engine is now firmly entrenched. This is a tectonic shift that will be neither orderly, linear nor predictable.

Recall history. Oil was discovered in Ontario in 1858. Today, oil extraction in Ontario is no longer of any economic significance, yet Ontario continues to thrive. There are other examples. Saskatchewan adjusted to a collapse of wheat prices in the 1970s through innovations in crop farming to create a legumes industry. There is no reason to assume that a different economic future for Alberta or Saskatchewan is not possible.

The time has come to bid a fond farewell to fossil resources and for the oil and gas sector to turn its gaze to extracting heat rather than carbon. The sector must begin to make a painful adjustment to the combined threats of a pandemic and a world that may not require as much oil and gas as it once did.

The COVID-19 pandemic will strain the fiscal capacity and resources of all countries. Whether a deep recession, or a global depression, follows on the heels of the pandemic is a matter of speculation. If clarity of thought can make any contribution today, it is crucial that the decisions on major investments be calibrated through a lens that favours the long view: will the choice lead to a resilient social and economic system that can manage the complexity of climate risks? Given the complicit role of fossil fuels in the energy system in exacerbating climate risks, it is more important than ever to ensure scarce resources are directed primarily to the development and deployment of clean energy resources and solutions that create new fundamental economic value.

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<sup>12</sup> International Energy Agency, *Outlook for Transport* (2018).



**Jatin Nathwani** is the founding Executive Director, Waterloo Institute for Sustainable Energy (WISE) and holds the prestigious Ontario Research Chair in Public Policy for Sustainable Energy at the University of Waterloo.

He is also the Co-Director of the consortium 'Affordable Energy for Humanity (AE4H): A Global Change Initiative' that comprises 90+ leading energy access researchers and practitioners from 17 institutions and 10 countries. Prior to his appointment at the University in 2007, Professor Nathwani worked in a leadership capacity in the Canadian energy sector over a 30 year period. He serves on several Boards at the provincial and national levels and has appeared frequently in the media (print, TV, radio) and has over 100 publications related to energy and risk management, including seven books.

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