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AN ENERGY THESIS FOR CANADA

The Addition Paradox

Why the energy transition did not happen, why that is acceptable, and why Canada is uniquely positioned to win the forty years that follow.

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EXECUTIVE SUMMARY

A record year for clean energy was also a record year for fossil emissions. Both are true. Both will remain true.

The most consequential energy fact of 2024 was not the record deployment of renewables. It was that the record deployment of renewables coincided with a record year for fossil fuel combustion. Both happened. Neither cancelled the other. The global system did not transition. It expanded.

This paper documents that expansion, names what it implies, and argues that Canada — uniquely among industrial democracies — holds the cards to win the next forty years of a global energy market that will not, in any honest reading, be exclusively electric or exclusively clean.

01 **The global "energy transition" as conventionally described is not happening.** Investment in clean energy reached two trillion dollars in 2024, twice the level invested in fossil fuels. The share of fossil fuels in global electricity supply fell by less than two percentage points. The clean buildout has not displaced. It has added.

02 **The substitution that did occur was not from molecules to electrons, but from one chokepoint to another.** Eighty to ninety-five percent of refining and assembly capacity for the technologies of the clean transition is concentrated inside the borders of a single nation, which is also engaged in the largest naval expansion of the twenty-first century. The world swapped Saudi influence for Chinese influence and called it independence.

03 **Canada holds, simultaneously and uniquely, the four assets the next forty years will reward.** 168 billion barrels of proven oil reserves produced at the lowest carbon intensity of any major producer; the highest per-capita output of clean hydroelectricity in the industrial democracies; the world's highest-grade uranium reserves; and the only Pacific-and-Atlantic deepwater export capacity in the G7. No other industrial democracy holds this combination.

The recommendation of this paper is that Canadian energy policy should stop apologising for the production of energy and start designing for the export of it — not as a transitional embarrassment, but as a forty-year national project to which clean and conventional energy contribute in proportion to the demand they actually serve.

CONTENTS

Four sections. One thesis.

PART I

The Diagnosis

It would be ungenerous to call the energy transition a fraud. It was sincere. Its publicists believed every word they published. They simply happened to be employed by a civilisation incapable of subtraction, and so the project's life work — designed to subtract — was metabolised, in the manner of a body processing an indigestible meal, into addition.

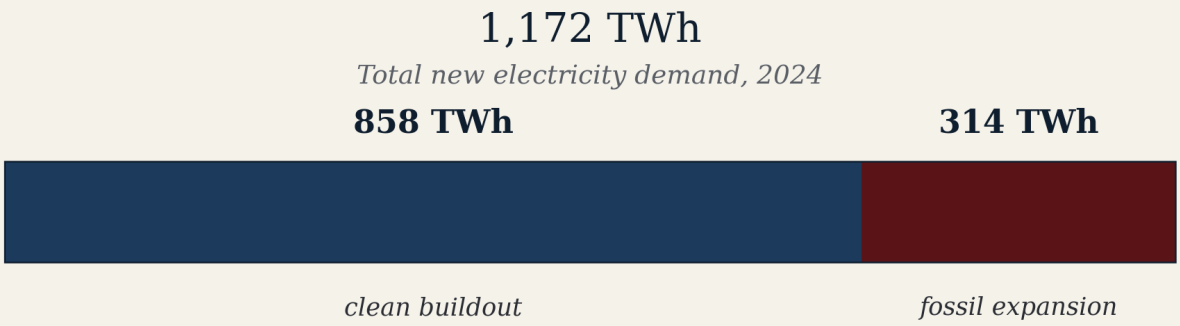
The numbers tell the story plainly. In 2024, the world deployed **858 terawatt-hours** of new clean electricity, the largest single-year clean energy build in human history. In the same year, the world burned more coal than it had ever burned, more natural gas than it had ever burned, and emitted from its power plants **14.6 billion tonnes of carbon** — also more than it had ever emitted.

How does record clean deployment produce record fossil emissions? Through a fact obvious to any honest reading of the data: global electricity demand grew by **1,172 terawatt-hours** that year, driven by air conditioning required to survive heatwaves the system itself had made hotter, by data centres belonging to an industry that has not yet decided what it is for, by electric vehicles whose batteries are charged from the same grids that power the refineries producing the fuel they were intended to replace.

Of the 1,172 terawatt-hours of new demand, the clean buildout provided 858. The remaining 314 were provided by precisely those parties the buildout had been retained to retire.

FIGURE 1

The Addition, Visualised



Of the 1,172 TWh of new global electricity demand in 2024, the renewable buildout supplied 858 TWh — the largest single-year clean build in history. The remaining 314 TWh was supplied by coal and natural gas.

Source: IEA, Ember, NPSI analysis

> *This is not failure. This is addition. The renewable energy industry has performed exactly the task it was hired to do, at unprecedented scale and unprecedented cost-effectiveness. What it has not done, because it cannot do alone, is shrink the demand for fossil energy.*

The implication for the next forty years is structural, not cyclical. Coal generated **10,613 terawatt-hours** of global electricity in 2024 and is forecast to remain the largest single source of generation in the world through the mid-2030s. Natural gas signed export contracts in 2024 with delivery windows extending past every climate target nominally in force. Oil received **570 billion dollars** in upstream investment last year, the highest level since 2017, indicating that whatever rumours had reached the family of an impending inheritance, the patriarchs are not yet packing.

The deceased — the energy transition as advertised — was buried with a thick stack of renewable energy certificates. They will be of considerable comfort in the dark.

PART II

The Chokepoint Migration

The honest reframing of the past decade is not that the world replaced fossil energy. It is that the world replaced one form of energy concentration with another, and the new concentration is, by any sober reading of geopolitical risk, more dangerous than the one it succeeded.

The chokepoints of the molecule economy were known. Saudi crude. Russian gas. Hormuz, Suez, Panama, the Bosporus. These were the places where energy supply could be physically interdicted. They were defended by alliance structures built over seventy years, by a global naval order, and by mutual interest in their continued open functioning.

The chokepoints of the mineral economy are also known. The defence is not yet built.

Polysilicon, the foundational material of solar photovoltaics, is refined for approximately ninety-five percent of global supply by facilities concentrated inside the borders of the People's Republic of China. **Lithium battery cells**, the foundational technology of grid storage and electric vehicles, are manufactured for approximately eighty percent of global supply by the same nation. The **neodymium-iron-boron permanent magnets** required for direct-drive wind turbines and electric vehicle traction motors are sourced for upwards of ninety percent of global supply from facilities within the same political jurisdiction. The **refining and separation of rare earth elements** — the step that turns ore into usable material — runs at over ninety percent inside the same borders even when the ore itself is mined elsewhere.

This is not an artefact of comparative advantage. It is the result of two decades of explicit national industrial policy, executed with patience, capital, and an absence of the regulatory frictions that prevent comparable buildouts in democracies. The clean energy supply chain is, on every objective measure, more concentrated than the oil and gas supply chains of the 1970s.

The same nation that controls those supply chains is engaged in the largest naval shipbuilding programme of the twenty-first century. The People's Liberation Army Navy now operates more than 370 hulls, surpassing the U.S. Navy in vessel count, and is

commissioning new warships at a tempo that exceeds the entire active fleet of any European NATO member. Its blue-water capability has expanded faster than that of any navy since the Imperial Japanese fleet of the 1930s. The strategic significance is not contested.

> *Every megawatt of solar, wind, or battery storage deployed in a democracy increases that democracy's dependence on a nation whose strategic objectives are explicitly revisionist. The transition did not buy independence. It bought a different dependence. The patriarchs who sold the world its oil have been replaced by a different family, and the family is not, on the available evidence, friendlier.*

This is not an argument against clean energy. It is an argument against pretending that clean energy as currently sourced is independent energy. Honest decarbonisation requires a supply chain that does not depend on the strategic permission of a single adversary. The transition will not be honest, or durable, until that condition is met.

PART III

The Canadian Thesis

The temptation for Canadian policymakers reading the global energy picture is to mourn it. Canada is a major fossil producer; the world is being told it must consume less fossil energy; ergo Canada is on the wrong side of history. This reading is wrong on the facts, wrong on the timing, and wrong on the strategy.

Canada is not on the wrong side of the energy future. Canada is the only G7 nation that simultaneously holds all four of the assets the next forty years of global energy will reward: the world's third-largest proven oil reserves, produced at the lowest carbon intensity of any major producer; the highest per-capita output of zero-carbon electricity in the industrial democracies; the highest-grade uranium reserves on earth; and the only Western export geography with deepwater capacity facing both the Pacific and the Atlantic. The remainder of this section examines each of these in turn, and then names the specific buyers whose decade-long energy security calculations Canadian export policy will service for as long as the present geopolitical geometry holds.

The cleanest barrel.

Canada holds approximately **168 billion barrels** of proven oil reserves. Only Venezuela and Saudi Arabia hold more. What distinguishes Canadian crude from the rest of the top ten is the emissions intensity of its production. The carbon intensity of Canadian oil sands has declined by roughly thirty-three percent since 2009; the largest operators — Cenovus, Suncor, Imperial — now produce crude at intensities at or below the global weighted average for conventional production. New in-situ projects approved this decade target intensities materially below the global benchmark, supported by carbon-capture commitments backed by the federal Investment Tax Credit framework. The country that the loudest voices in the climate movement have spent fifteen years asking the world to boycott is, on the evidence, the cleanest major producer of the commodity the world will continue to consume for the next four decades.

The clean-electron surplus.

Canada generates approximately **380 terawatt-hours** of hydroelectricity annually — more than sixty percent of national electricity supply and roughly **9,500 kilowatt-hours per capita per year**, the highest in the industrial democracies by a wide margin. Sixty percent of installed hydro capacity sits in four jurisdictions with structural surplus: Quebec, British

Columbia, Manitoba, Newfoundland and Labrador. That surplus can be exported in three forms. As electrons, across the U.S. border under expanding transmission interconnections. As molecules, in the form of green hydrogen or ammonia loaded onto cryogenic vessels for Asian and European markets. Or as embedded clean energy inside processed metals — aluminum, copper, nickel — that command an emerging premium in markets indifferent to embodied carbon a decade ago and increasingly attentive to it today.

The uranium asymmetry.

The world's second-largest reserves of uranium are concentrated in Saskatchewan's Athabasca Basin. The Cigar Lake mine, the highest-grade uranium operation in commercial production, mines ore averaging approximately **seventeen percent U_3O_8**. The McArthur River mine, scheduled for staged restart, produces at comparable grades. The global average is between 0.1 and 0.2 percent. Canadian uranium ore is, on average, roughly one hundred times the concentration of the rest of the world's commercially exploited deposits. As the small modular reactor industry transitions from regulatory development to commercial deployment over the next decade — a transition already underway in Ontario, Saskatchewan, the United States, the United Kingdom, Japan, South Korea, and Poland — the country that produces the fuel will hold a strategic position comparable to that of Saudi Arabia in the 1970s oil market. With one critical difference: this resource sits inside a stable democracy, governed by transparent law, with established regulatory institutions and a hundred-year track record of safe operation.

The two-ocean geography.

The Port of Prince Rupert is the closest deepwater port in North America to Asia. Vessels departing Kitimat for Yokohama travel approximately **4,500 nautical miles** — a five-day crossing at standard LNG-carrier speeds, materially shorter than the equivalent transit from any U.S. Gulf Coast terminal. **LNG Canada**, commissioned in 2024 at an initial capacity of fourteen million tonnes per annum, is the first major Canadian LNG export facility; Phase Two, under engineering review, would double that figure. The **Trans Mountain Expansion**, in service since 2024, delivered tidewater access for 590,000 barrels per day of Canadian crude, ending a three-decade dependence on a single U.S. customer. On the Atlantic seaboard, the same infrastructure that built the modern North Atlantic trade can serve a re-industrialising Europe whose government leadership has stated, in plain language, that future LNG contracts will not run through politically adversarial jurisdictions. No other Western producer holds Pacific and Atlantic deepwater export capacity simultaneously.

The buyers, named.

The markets that will pay this premium are not hypothetical. They are identifiable, they are contractually motivated, and the energy security calculations driving them have already been published by their own governments.

Japan imports approximately ninety-three percent of its primary energy. Following the Fukushima Daiichi shutdown and the 2022 dislocation of Russian-routed energy flows, Japan's Strategic Energy Plan has explicitly prioritised supply diversification from stable, like-minded states. Japanese trading houses — Mitsubishi, Mitsui, Marubeni — are already significant equity holders in Canadian LNG and oil-sands operations. The fit is direct.

South Korea imports approximately ninety-four percent of its primary energy and is restarting and expanding its nuclear fleet under the current administration's Energy Master Plan. Korean shipyards — Hyundai Heavy Industries, Samsung Heavy Industries, Hanwha Ocean — already build a majority of the LNG carriers that will move Canadian gas to Asian markets. Korea is also a primary commercial-deployment market for small modular reactors. Korea wants Canadian gas, Canadian uranium, Canadian critical minerals, and, in the longer arc, Canadian green hydrogen.

Taiwan imports approximately ninety-seven percent of its primary energy. Its structural exposure to seaborne LNG and its strategic exposure to a single supplier corridor make non-adversarial supply diversification not a preference but a survival imperative.

Germany, having severed its dependence on Russian pipeline gas in 2022, has signed memoranda of understanding with the Canadian government on hydrogen, LNG, and critical minerals, and is openly seeking supply contracts that do not run through politically adversarial jurisdictions.

India's primary energy demand is forecast to grow faster than that of any other large economy over the next two decades. The Indian government has stated an explicit preference for diversified, non-Chinese-controlled supply chains for critical minerals, fuel, and reactor technology — categories in which Canadian export capacity is structurally aligned.

The intersection of those buyer profiles with Canada's asset stack is the strategic geometry this paper exists to name. Korea wants Canadian gas, Canadian uranium, Canadian shipbuilding inputs. Japan wants Canadian gas and Canadian critical minerals. India wants Canadian uranium, Canadian potash, Canadian crude. Germany wants Canadian LNG and Canadian green hydrogen. The United States wants Canadian electrons, Canadian oil, and Canadian critical minerals at non-adversarial reliability. Each of these is a multi-decade flow, denominated in hundreds of billions of dollars across the next forty years, currently being structured by other producers in other jurisdictions while Canada debates whether to be embarrassed by what it has.

What this requires.

To capture this opportunity requires the abandonment of one specific intellectual habit: the habit of treating fossil fuel production as a moral failure to be apologised for. The fossil fuels Canada produces will be produced and consumed somewhere. The only question is whether they will be produced in Canada — under Canadian labour standards, Canadian environmental review, Canadian carbon-capture investment, and Canadian Indigenous economic participation — or elsewhere under conditions worse on every measurable dimension. The continued displacement of Canadian production by less responsible production in other jurisdictions does not reduce global emissions. It increases them. It also impoverishes Canada.

The honest position for a Canadian government interested in both prosperity and climate outcomes is to maximise responsible Canadian production, maximise the clean-energy buildout alongside it, capture the resource rents the next forty years will generate, and invest those rents in the infrastructure, education, and industrial base required for whatever the energy mix of 2065 turns out to be.

> *The countries that will win the next forty years are not the countries that virtue-signalled fastest. They are the countries that supplied the world's actual demand while building, in parallel, the foundations for what comes after. Canada is one of perhaps three countries on earth in a position to do both.*

PART IV

The Verdict

The deceased — the energy transition as advertised — is alive, well, and presently boarding a private jet to the next summit, where attendance is mandatory, the food, as always, is excellent, and the bill, as always, will be settled later.

What is not alive is the comfortable story it told. The story was that virtue and prosperity were aligned: that the fastest emitters were the worst people, that the cleanest producers would be rewarded, that the supply chains of the future would be more democratic than the supply chains of the past. None of this turned out to be true.

The fastest emitters were the people whose populations were industrialising, whose grids could not yet carry the load, whose air conditioning was a survival good rather than a luxury. The cleanest producers — and Canada is among the cleanest — were boycotted by the people who continued buying from dirtier producers because the dirtier producers were closer or cheaper or both. The supply chains of the future turned out to be more concentrated, and more authoritarian, than the supply chains they replaced.

These are the facts. They are not pessimistic facts. They are honest ones.

Canada has spent fifteen years arguing about whether it should be ashamed of its energy industry. While that argument was occurring, the global energy system was settling into a new geometry. In that geometry, Canada holds the cleanest barrel of the commodity the world will continue to consume for forty more years, the largest per-capita supply of zero-carbon electrons in the industrial democracies, the dominant share of the highest-grade uranium reserves on earth, and the only Pacific deepwater export capacity in the G7. The buyers are named. The deals are structurable. The infrastructure, in part, is already built. What remains is the political will to admit out loud what the geology, the geography, and the customer book already say.

A country with this hand does not need to apologise. It needs to play.

The next forty years of global energy will be won by the producers who can deliver responsibly, at scale, into the markets that will continue to need molecules and into the markets that will increasingly need clean electrons, while building the supply chains and alliances that will define the energy order of 2065. This is Canada's hand. It has rarely been a better one.

The casket will remain closed.

— Jesse James · North Pacific Strategy Initiative · 15 May 2026

ABOUT THIS SERIES

The North Pacific Strategy Initiative.

NPSI is an independent research practice publishing working papers on the strategic geometry of the North Pacific. Its remit is the corridor of relationships, capital, energy, and defence linking Canada to its Pacific partners — chiefly the Republic of Korea, Japan, and the United States — at a moment when the architecture of that corridor is being rebuilt.

Working papers in this series are released for public distribution. They are intended for policy makers, sovereign and pension investors, energy and defence sector leadership, and the working press. They are not commissioned. They reflect the views of the author alone.

THE AUTHOR

Jesse James writes on energy, defence, and the geometry of the North Pacific from Victoria, British Columbia. Prior work has covered the Hormuz strait closure, the architecture of Libyan upstream re-entry, Canada-Korea defence-industrial alignment, and the role of municipal infrastructure as a national-security surface. He is the founder of NPSI and writes in his own name.

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