

CANADIAN GLOBAL AFFAIRS INSTITUTE
INSTITUT CANADIEN DES AFFAIRES MONDIALES

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by John Stewart

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POLICY PERSPECTIVE

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Suppose my neighbours and I drink a lot of beer, and we wouldn't want to be interrupted at it. To make sure we never run out of beer, we come up with two possible strategies.

Strategy 1: We grow hops and barley in the community garden plots, and install malting and brewing gear in our basements, so nobody can ever threaten our beer security.

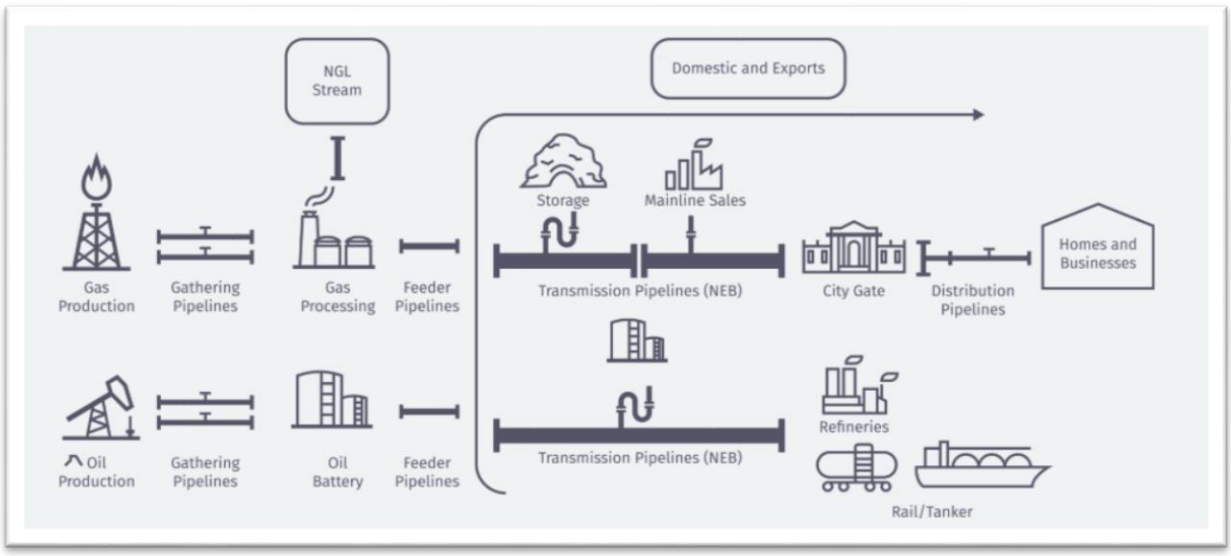
Strategy 2: We patronize several local purveyors of beer, giving them reliable business. And we make sure our incomes are healthy enough that we can afford to sustain that business.

While it might not feel quite as safe as the first strategy, the second one lets us enjoy a diverse mix of beers, and it enriches neighbourhood life. It also allows my neighbours and me to spend less time gardening and brewing, and more time doing things we're probably better at.

Strategy 1 appeals to people's emotional definition of supply security: feeling that we control the source of supply. Strategy 2 appeals to a more economic definition of supply security: ensuring that the product's price is affordable and relatively stable (in other words, price spikes will be rare, brief and manageable), even if we don't have direct physical control of the source.

During the second half of the 20th century, the West's resource security – then as now, mostly based on oil – progressed from Strategy 1 toward Strategy 2. The world wars and the Cold War certainly showed the importance of controlling supplies of key resources, like iron and rubber. But they also showed the viability of shifting from a resource you had at home (like coal in Britain) to one that could be reliably delivered by or with others (like the Anglo-Iranian Oil Company, later BP).

It wasn't obvious whether Strategy 2 was better than Strategy 1. Relying on distant suppliers brought complex problems with it, like political engagement in the Persian Gulf region. It intensified the need to keep shipping chokepoints open to free navigation, as a closure could bring sudden economic pain. So Strategy 2 added a complicated layer of services (transport, security, diplomacy, possible military deployment) to the energy product. And prices were far from stable.



Modern energy supply is not just a natural resource, but a package of resources and (increasingly) services and data. Source: Canada's Energy Regulator

But across a big enough market area, with diverse suppliers, with globalized capital markets and with declining barriers to trade and transport, global supply chains offered energy security. And they allowed non-oil-producers (like Japan, Israel or Sweden) to prosper by focusing on doing things they were good at.

That globalized world is now disrupted and threatened, if not in retreat. The West is in relative economic (though not necessarily technological) decline, with the G7's share of world GDP having fallen from about 65 per cent to about 45 per cent in just two decades. The West's cohesion has declined, too. America First is a real political trend (arguably, it's a reversion to the historical norm), not the doing of just one president.

The United States and China are in more than a passing trade fight; they are in a rising-power/falling-power confrontation that has pervasive security dimensions and may continue for many decades into the foreseeable future. Others will come under pressure to choose a side in their defence, commercial and technological relations. And the current pandemic has not only strangled international business travel, but also taught direct lessons about the vulnerability of long and thin supply chains for vital products.

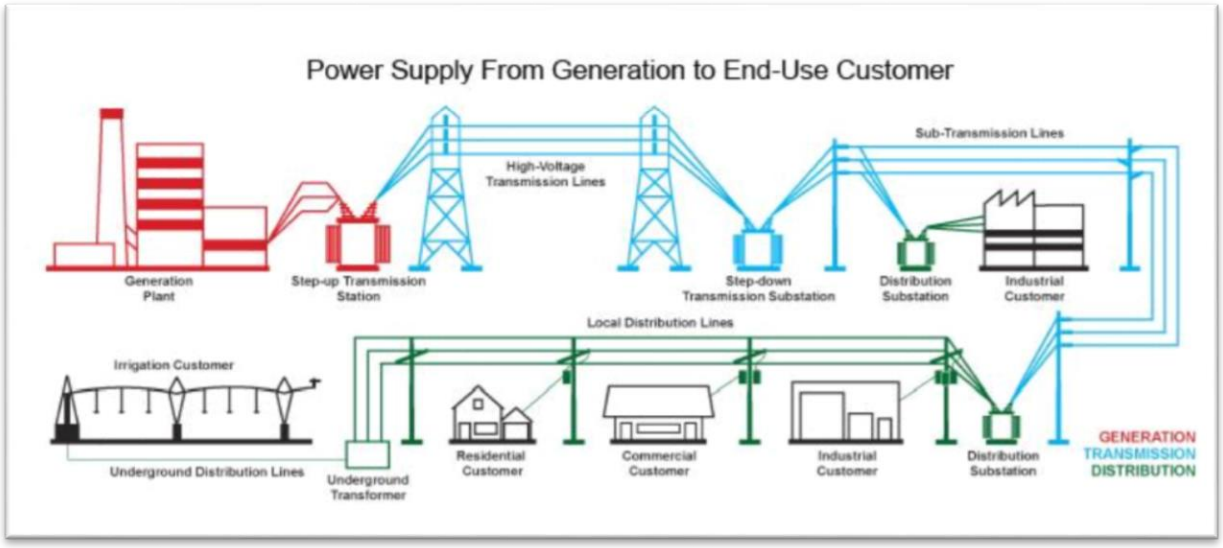
On the positive side, China has strong economic interests in a globalized world. Unlike the USSR during the Cold War, it does not aspire to global revolution. If China seeks forms of global dominance, presumably such dominance would be aided by global integration. And as for energy security, China is not a fuel supplier to the world market the way the U.S., Russia, Iran or Saudi Arabia are.

However, we are still living though a deep disruption of the globalized world. Trade, investment linkages, educational exchange and human mobility are all at risk or actually being pulled back, though the duration and impact of these trends are still unknown.

How much might such disruption threaten Canadians' – and our many partners' – energy security?

To the extent that energy means resources – oil, gas, water reservoirs, uranium, sunlight, wind, geothermal heat and so on – the answer is probably not very much. And, at least until now, energy has indeed been mostly resources.

But in the present century, energy is increasingly a matter of infrastructure, transport, storage, conversion, data, technology leadership, technology diffusion and creativity. Mere possession of oil or gas or uranium or river basins, or being able to buy access to them, never guaranteed energy security for a nation's people (do most Angolans have resource security?)



Supplying electricity is about more than generation – and the energy supply will be increasingly electrical.
Source: Ontario Society of Professional Engineers / Nebraska Public Power District

This is truer than ever if our ways of collecting, storing and using energy are likely to change and to require large investments in novel kinds of infrastructure and business models. If electrification is a trend – that is, if more energy-using activities will be converted to electricity (small motors, electric cars, building heat) – then that by itself requires many such investments. China does not sell the world much oil, gas or uranium, but it is a major supplier of equipment and technologies (most obviously solar photovoltaic panels) that will be an increasing part of the world's energy future.

Such changes in technology and in business structures are already upon us in areas from solar energy collection to micro- nuclear reactors to energy storage to vehicle propulsion. Moreover, energy systems now have to be protected from things like cyber-attacks and changing climates. This further grows the services-and-data content in energy supply, and adds various new layers of complexity to the energy security problem.

These are problems of knowledge, creativity and investment. They look set to matter a great deal to energy security over the next few decades. And they are very different from the resource supply problems typified by the world oil market of the past 100 years. As with many products, and especially electronics, the share of natural resource content in energy remains very important, but it's declining in relative terms ("relative dematerialization"). More and more of our energy systems' investment is not in the what but in the how: better ways to transmit, process, control, protect, sell and apply energy. And know-how is linked to globalization because ideas and innovations travel in people, products and services.

Nuclear energy has already provided a preview of this shift since the 1950s. Other energy sources (wood, fossil fuels, hydro) took lots of resources, the costs for which caused swings in energy prices. Extracting these resources was costly and left big environmental footprints. While resource-based energy created considerable science, engineering and safety culture along the way, nuclear energy is essentially an engineering product. It takes small amounts of land and uranium (its cost is affected little by uranium prices), and a lot of engineers. Consequently (by the actual evidence), it has small land, environmental and health impacts compared to the alternatives.

Like nuclear, the fast-growing renewables industries – wind, solar and associated energy storage – mainly sell sophisticated manufactured hardware resulting from a lot of innovation. This is what the future of energy increasingly might look like.

Suppose globalization is in retreat. Does this threaten the knowledge, creativity and investment that our changing energy systems might depend on for the rest of this century?

It might. First, rates of investment matter in driving innovation. Other places, such as eastern Asia, are building things at a much higher rate than the West, and certainly faster than Canada. This is likely to drive innovation in those other places. We are now disadvantaged in the innovation game by being a relatively low-growth society. Deglobalization could subtract further from our growth opportunities by choking off the trade and investment on which we thrive.

Second, Canada's innovation strengths have always tended to be in niches, not broad fronts. Our innovative firms are often acquired by foreigners who then add Canadian know-how to their broader portfolios of technology.

We Canadians have been strong in certain aspects of energy systems so far. Hydroelectricity, non-conventional oil extraction, nuclear reactors, governance, safety and environmental protection are examples. If Canadians are smart, we can probably sustain our innovation and competitiveness in these areas, even with a slower growth trend.

However, we depend greatly on the diffusion of knowledge and innovation across the world. Deglobalization can materially reduce that diffusion. For example, what if the cyber-security questions around Huawei and 5G are dividing the world market for new telecommunications technology in half? What if this happens in other areas of advanced technology – like electric vehicles, hydrogen or small modular reactors?

Canada is now a little country, economically and demographically speaking, and we continue to shrink in relative terms. There is only so much we can do to shore up the integrity of our alliances or of the international trading system – though we can do our best at that – with smart, engaged, coherent and realistic foreign policies.

And we can continue to develop selected energy strengths, based on our comparative advantages. Some of our policies (such as Ontario's effort a decade ago to become a manufacturing centre for wind and solar) have not played to our strengths. Those strengths lie in our sophisticated natural resource processing; in legacy accumulations of science and technology (as in nuclear); in policy coherence (if and when we have it) and in the quality of our governance, regulation and safety culture. We have to keep playing to those strengths, but the world could be much less helpful to us than it used to be.

About the Author

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Canadian Global Affairs Institute

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The Institute was created to bridge the gap between what Canadians need to know about Canadian international activities and what they do know. Historically Canadians have tended to look abroad out of a search for markets because Canada depends heavily on foreign trade. In the modern post-Cold War world, however, global security and stability have become the bedrocks of global commerce and the free movement of people, goods and ideas across international boundaries. Canada has striven to open the world since the 1930s and was a driving factor behind the adoption of the main structures which underpin globalization such as the International Monetary Fund, the World Bank, the World Trade Organization and emerging free trade networks connecting dozens of international economies. The Canadian Global Affairs Institute recognizes Canada's contribution to a globalized world and aims to inform Canadians about Canada's role in that process and the connection between globalization and security.

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