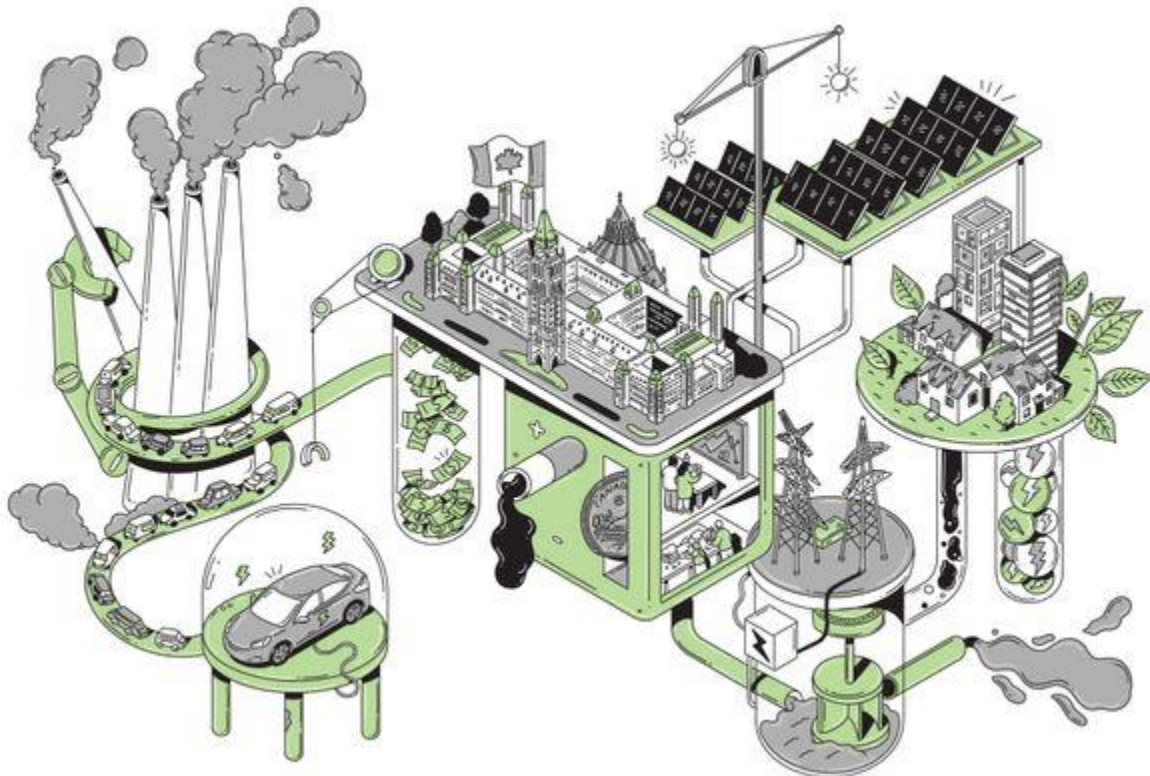


A Canadian advantage in peril: Why the next federal government will need a plan to double our supply of clean electricity

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Creating a sense of common purpose around modernizing Canada's power grids is one of the biggest uphill battles the next federal government will need to take on.

ILLUSTRATION BY KATHLEEN FU

During a federal election campaign in which all parties claim they will meet international climate commitments and attract green industry, a basic reality should get a lot more attention: Those goals will only be achievable if Canada massively builds upon its supply of clean, reliable electricity.

It's a pivotal aspect of reducing greenhouse gas emissions, and competing in a decarbonizing global economy, in which Canada has a massive head start over other countries that are scrambling to decarbonize much dirtier systems.

But due to a combination of complacency, short-term political thinking, parochialism and the very nature of Canadian federalism, we are at risk of squandering our lead.

So creating a sense of common purpose around modernizing this country's power grids is one of the biggest uphill battles the next federal government will need to take on, if it is truly devoted to laying the foundation for net-zero emissions by 2050.

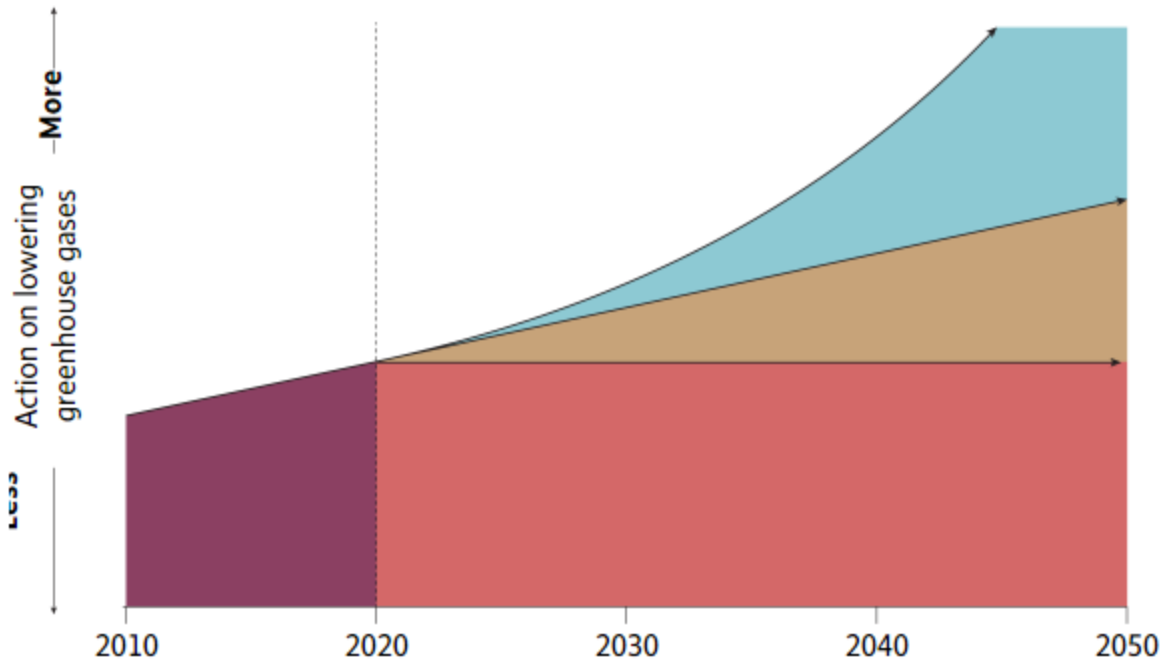
The need to march toward this next frontier in Canadian climate policy, and the scale of that challenge, were made clear in pre-election interviews with industry executives, environmental leaders, academics and other experts. Francis Bradley, chief executive officer of the Canadian Electricity Association, which represents Canada's power utilities, put it in terms that may be jarring in a country where an ample supply of energy is taken for granted: He compared it to building a national railway and instituting national health care.

Many numbers explain why that is, but at its heart is some basic calculus. If Canada is serious about meeting its emissions-reduction targets, experts project that electricity demand will at least double because of the electrification of transportation, buildings and industries that currently rely on fossil fuels. And the demand will need to be met only with zero-emissions supply, not natural gas or other polluting forms of generation currently among the cheapest options.

(con't below)

CANADA'S ENERGY FUTURE SCENARIOS

The Canada Energy Regulator lays out two scenarios in detail in its Canada Energy Future report for 2020. In the Evolving scenario, there is increasing action on climate change. In the Reference scenario, it's business as usual.



● Toward net-zero

The pace of action on addressing climate change increases from current levels.

● Evolving scenario

The historical trend of increasing action on climate change continues throughout the projection. Policies and agreements are strengthened after they expire. Low-carbon technologies continue to be developed.

● Reference scenario

Climate change actions are limited to the measures currently in place. Technological development is modest, and generally limited to initiatives with existing momentum and/or market share.

● History

Gradually increasing action on climate change, including policies, regulations and development of low-carbon resources and technologies.

THE GLOBE AND MAIL, SOURCE: CANADA'S ENERGY FUTURE 2020, CANADA ENERGY REGULATOR

Getting there will require large-scale investment in capacity-building, including greater electricity transmission between provinces, which have to date kept their grids fairly isolated despite big efficiency opportunities through integration.

At a more micro level, the effort will involve adopting new technologies for which traditional, heavily centralized electricity distribution systems are not built – from ones that allow homes and businesses to generate their own renewable electricity and sell it back onto the grid, to emerging energy-storage options, to new ways of encouraging conservation and off-peak usage.

Politicians seeking office haven't totally ignored the challenge. While in government, Justin Trudeau's Liberals have sprinkled money around clean-power projects, most notably a \$2.5-billion allocation through the Canada Infrastructure Bank for generation, storage and interprovincial transmission.

Conservative Leader Erin O'Toole has a paragraph in his campaign platform promising "strategies for developing and expanding smart grids, improving interties, increasing the use of mass storage, and developing and deploying new clean energy technology such as nuclear, hydrogen and renewables."

Somewhat more ambitiously, if still vaguely, Jagmeet Singh's NDP proposes to support those sorts of investments through a new Canadian Climate Bank.

The next government won't have to look too far for more detailed ideas, since outside groups are starting to crank them out with mounting urgency.

The Transition Accelerator, an environmental non-profit, this summer launched "Canada Grid," a new coalition to advocate for stronger interjurisdictional electricity planning. The publicly funded Institute for Climate Choices has a study on clean-electricity policy coming out next spring. The David Suzuki Foundation and other NGOs recently commissioned a report, co-authored by influential academic Mark Jaccard, on ways Ottawa can show leadership despite electricity being primarily within provincial jurisdiction.

Mr. Jaccard and co-author Bradford Griffin, for instance, propose a strengthening of standards under the Canadian Environmental Protection Act to require that all electricity generation has net-zero emissions from 2030 or 2035 onward, and an expansion of industrial carbon pricing to ultimately tax all pollution from electricity generation.

In interviews, other experts pointed to various ways Ottawa could use its fiscal muscle – including greater subsidization of transmission and other infrastructure, increased research and development funding, tax credits for investment in renewable power, and improvement of energy efficiency through more ambitious building retrofit programs.

But while there are evidently many specific federal policy levers, they won't be enough on their own to ensure the steady, forward-looking, extremely complex systems-building

that needs to happen below the national level to ensure adequate power supply in an electrified world.

There is something else, though, that federal politicians have over other levels of government, beyond their spending capacity. They have a platform to convert a crucial but rather wonky policy area into a national priority. They can convene; they can cajole; they can set goals that might steer action, even if those goals aren't binding.

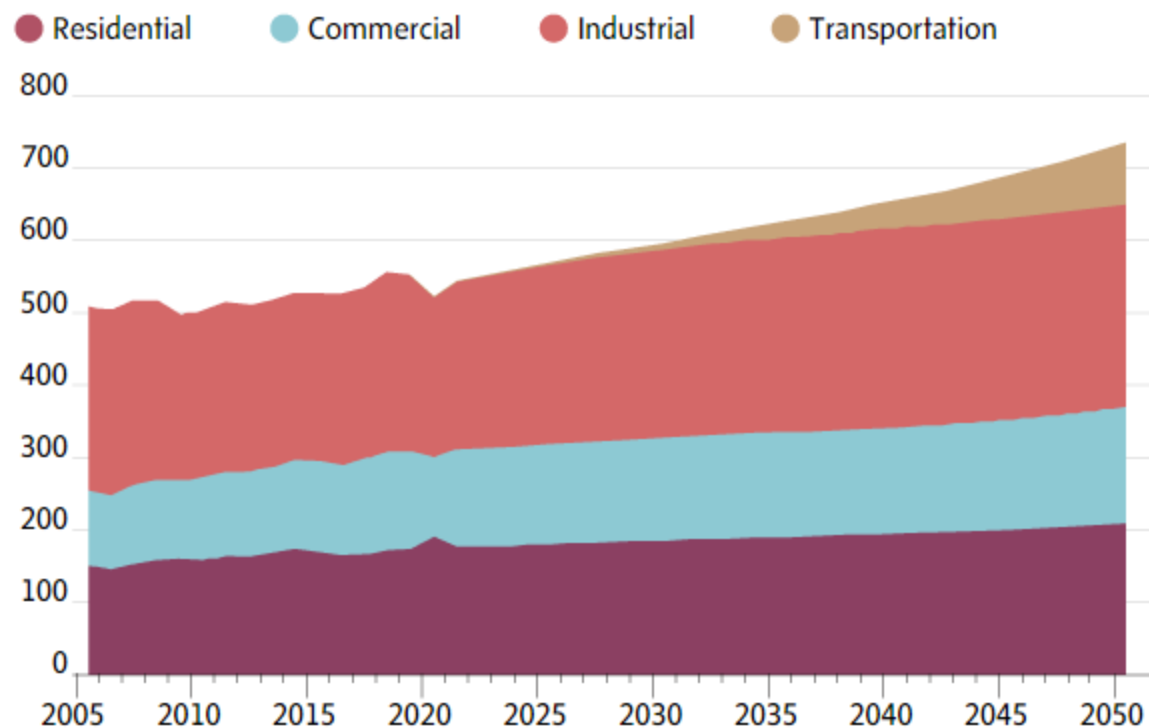
Not least during an election campaign, when the spotlight shines on politicians more brightly than usual, they can tell a story that all Canadians – provincial officials, investors and regular energy consumers – need to hear.

“We do need, maybe not a program or policy, but a national vision of where we see energy in Canada going,” is how Richard Carlson, the director of energy policy at the NGO Pollution Probe, aptly puts it. “Places that are successful, there is that political narrative that pushes people.”

EVOLVING SCENARIO PROJECTIONS

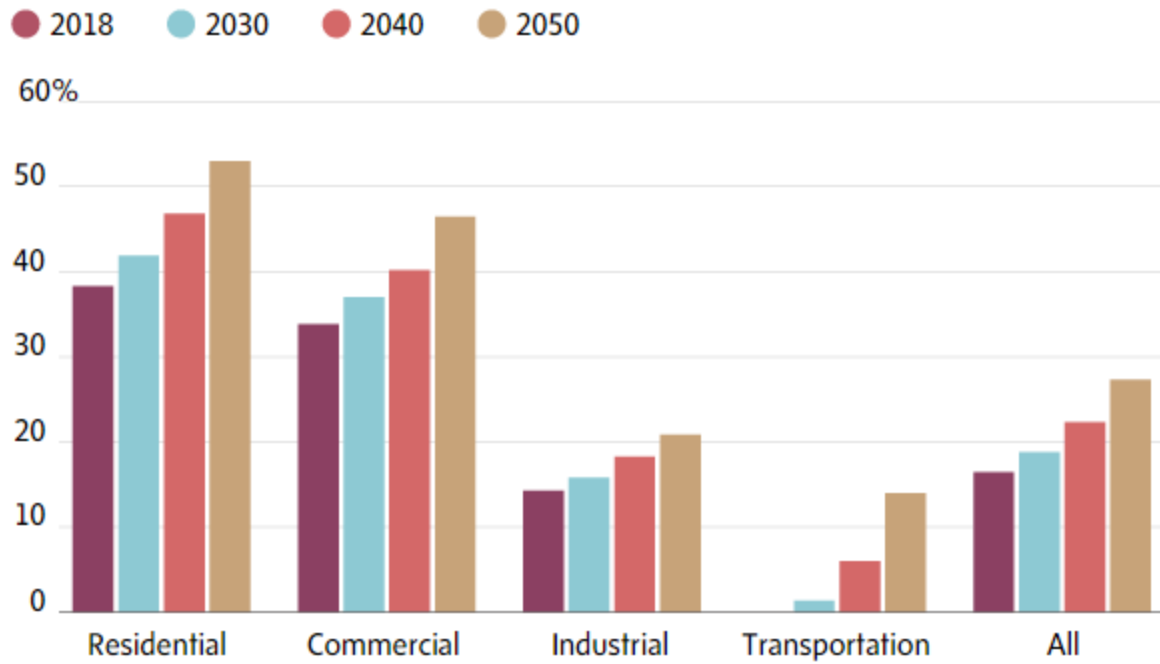
Electricity demand by sector

Terawatt-hours



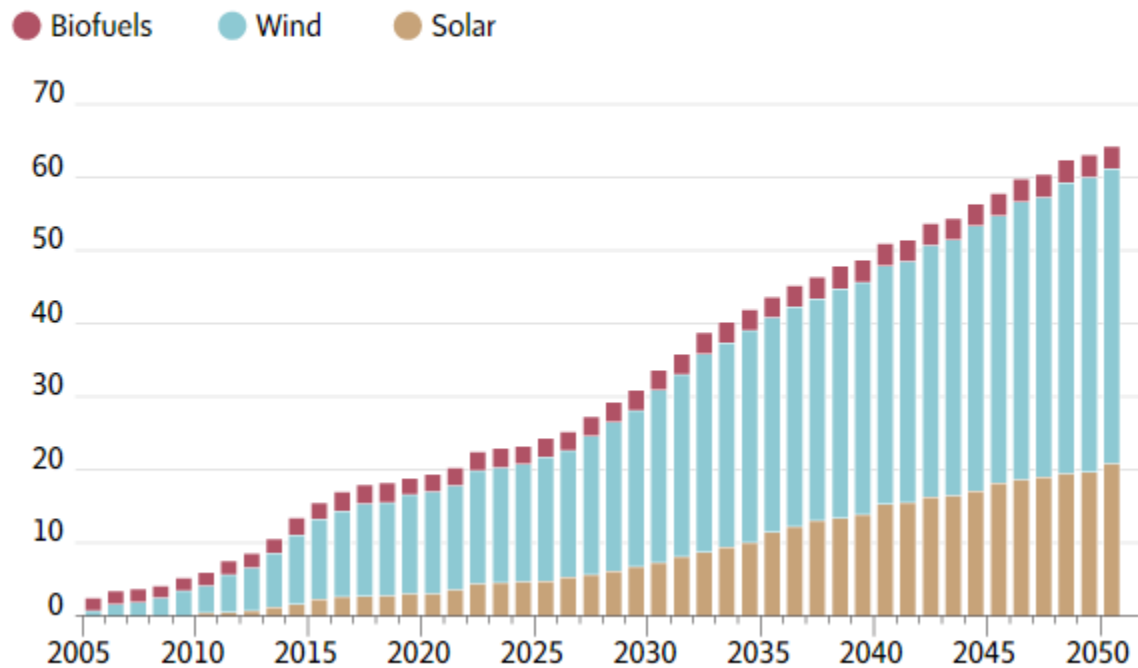
Electricity's share of end-use demand by sector

Per cent



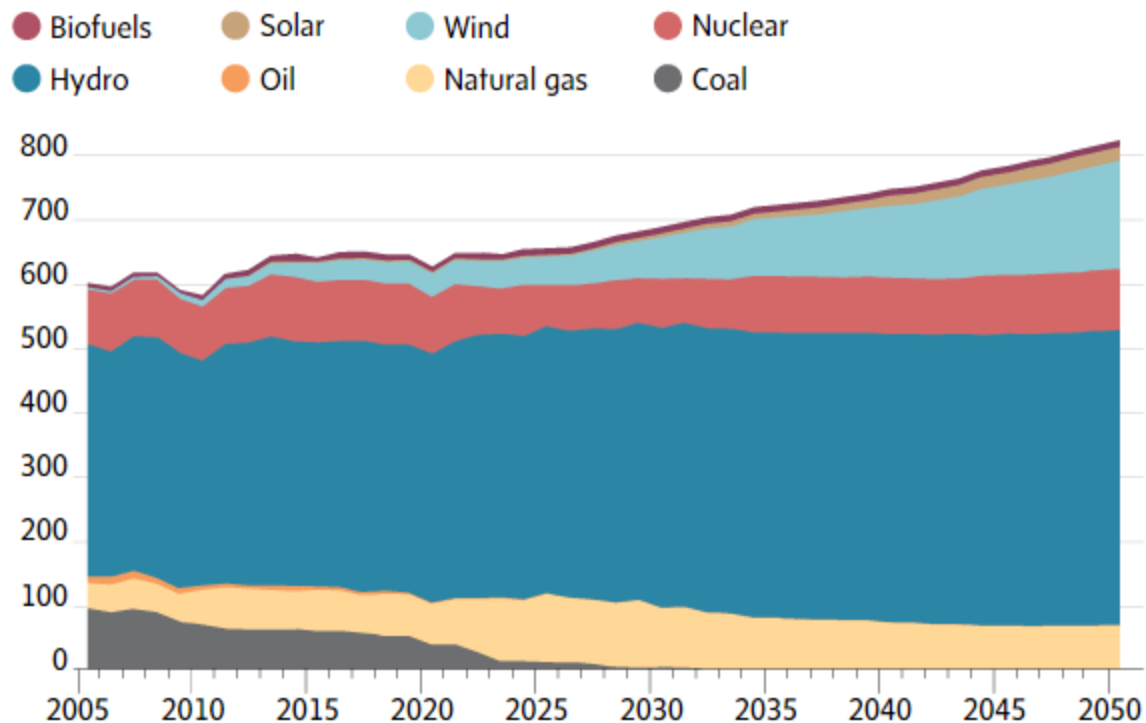
Capacity of non-hydro renewables

Gigawatts



Electric generation by primary fuel type

Terawatt-hours



THE GLOBE AND MAIL, SOURCE: CANADA'S ENERGY FUTURE 2020, CANADA ENERGY REGULATOR

A good way to start building that case might be to try to instill a greater awareness and sense of pride in Canada's existing clean-electricity landscape, which should be the envy of much of the world.

Currently, less than 20 per cent of Canada's total generation comes from fossil fuels. That's a stark contrast to the United States, where it's about 60 per cent. Or Europe, where it's around 40 per cent. Not to mention China, where it's around 85 per cent.

That's primarily due to Canada's relative abundance of hydroelectricity, which delivers more than half our total power emissions-free – largely a result of geographic good fortune, as well as big investments mostly in the 20th century.

It also has to do with Canada being ahead of the curve in phasing out coal generation. With Ontario leading the way with a transition off that dirtiest of power sources, countrywide GHG emissions from electricity decreased by 46 per cent between 2000 and 2018.

More than just its environmental benefits, the clean supply offers considerable economic opportunities. The more the private sector joins governments in adopting net-zero targets, the more companies with significant energy needs for industrial processes will be drawn to places with non-emitting electricity.

There is a positive story to be told, too, about that advantage potentially growing in the near term. The few provinces that still rely somewhat on coal have been mandated by the federal government to transition off it by decade's end. The biggest coal user among them, Alberta, is on pace to do so much sooner, albeit mostly by switching to natural gas.

Federal politicians could also point optimistically at recent progress in remote communities, especially Indigenous ones, transitioning off diesel toward renewable electricity sources, although still not at a quick enough pace for people living there and suffering health effects atop environmental ones.

But there are huge red flags about the broader trajectory in the coming decades, necessitating a narrative shift toward a wake-up call.

Ontario, despite being central to the happy story in recent decades, is illustrative here too. It's now poised to move back in the wrong direction by significantly increasing its use of natural gas, which is the only fossil fuel in its supply mix and currently accounts for less than 10 per cent of its generation. Nuclear power typically comprises over 50 per cent of Ontario's total annual generation, hydro around 25 per cent, and wind and solar around 10 per cent.

In the short term, gas's share is growing because of nuclear reactors coming offline for refurbishment or retirement starting around the middle of this decade. But with current excess capacity relative to its actual use, gas is also a likely answer to rising electricity demand – an impression reinforced by the provincial utility, Ontario Power Generation, making a \$2.8-billion purchase of three existing gas plants that had been privately owned.

Not that increased use of natural gas is likely to fully meet Ontario's coming demand, if projections of an eventual doubling are accurate. But major new nuclear or hydro projects are likely too expensive, and investment in wind and solar capacity has slowed to a crawl despite those renewables becoming cheaper by the year.

Ontario may be a somewhat extreme case, because of public backlash around electricity prices that skyrocketed partly due to an ill-conceived and needlessly expensive push toward wind and solar power a decade ago. More recently, provincial political parties have jockeyed to offer relief to ratepayers, and shown little enthusiasm for anything that could increase costs.

But while other provinces may not be moving backward, few are moving forward anywhere near the needed pace. Governments that either own or have strong regulatory control over utilities have limited incentive to drive up electricity bills or pass costs onto

the tax base in order to address supply needs that will be experienced after the people currently running those governments have left office.

Federal politicians aren't clamouring to make the case for those costs, either. But one way they might be able to do so – and that should certainly be top of mind, if they're concerned about future economic competitiveness – would be to talk about not falling behind trade partners after being so far ahead.

A perverse effect of having relatively clean supply now is that Canada does not have the same immediate incentive to kick-start clean energy growth as a country such as the U.S., where President Joe Biden is trying to move toward an emissions-free grid by 2035.

Somehow, the message needs to be delivered that Canada can't take comfort in the present while other countries are turning a sharp eye to the future.

Politicians could also paint some rather dark pictures about how failure to build enough capacity could force Canada to either stop short of full electrification of transportation and buildings, or suddenly and inefficiently ramp up grid spending dramatically later on, or endure frequent power outages of the sort that most Canadians have rarely experienced.

But from there, a more optimistic way to build collective will to avoid those scenarios would be by making a forceful and well-founded argument that provinces can build future grids far more effectively – and at lower cost to Canadians – by working together.

A map of Canada showing electricity supply would reveal a very helpful pattern: provinces with ample hydroelectric resources next to those that lack them.

British Columbia and Manitoba, which both have abundances, sandwich Alberta and Saskatchewan, which do not. Hydro-heavy Quebec has Ontario on one side and New Brunswick and Nova Scotia on the other, all of which have much less of it. Newfoundland and Labrador has the hydro capacity to help the other Atlantic provinces, too.

What that map would not show is sufficient interprovincial transmission lines, known as interties, to take advantage of the electricity-sharing opportunity.

That form of trade should be a win-win, helping electricity-rich provinces maximize the value of capacity surpluses. It should be particularly appealing where recent, controversial hydro projects have had major cost overruns – the Site C dam in B.C. and Labrador's Muskat Falls.

Hydro imports won't be a panacea for provinces facing shortfalls, since that electricity will eventually be needed to meet rising demand in provinces where it's produced. But because hydro dams have huge electricity-storage capacity, interties' main long-term benefit is to facilitate investment in wind and solar power in non-hydro provinces by solving the problem of the renewables' intermittency.

When renewable sources produce excess supply (while the wind is blowing and the sun is shining), it can be transported across provincial lines, then sold back later when needed. Likewise with surplus power produced during non-peak times, and needed when demand is higher.

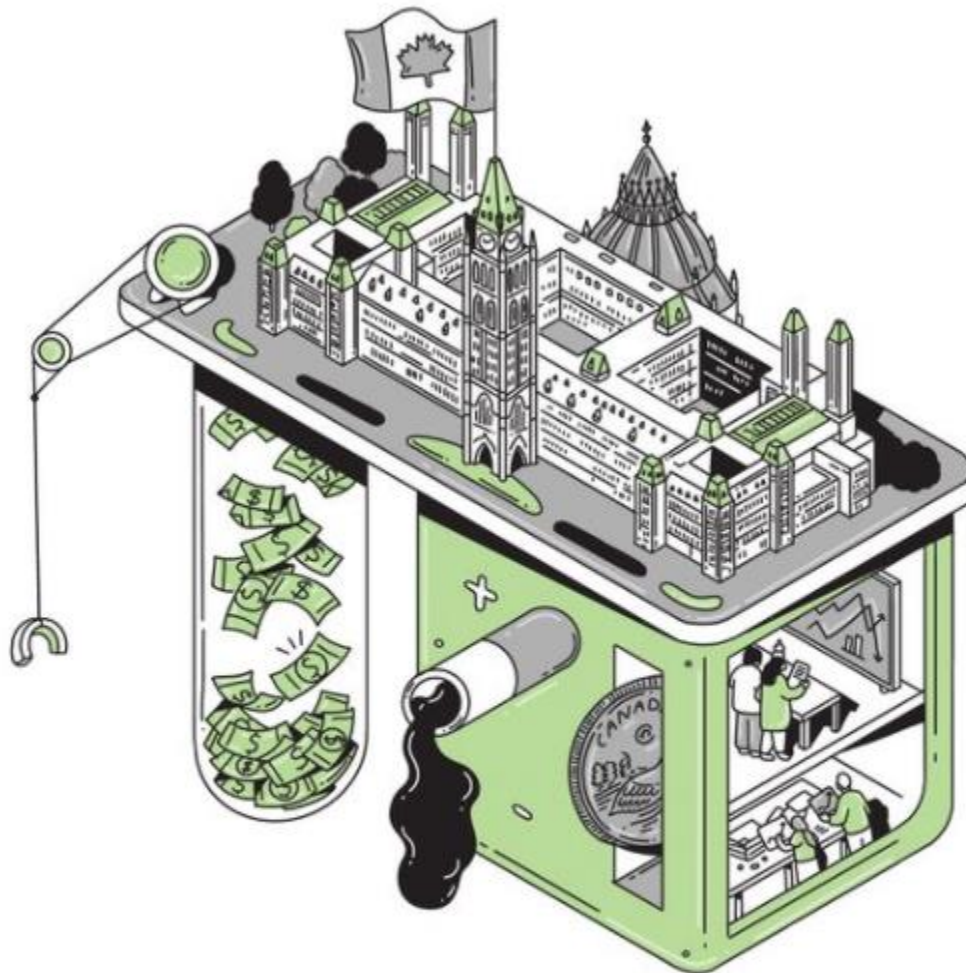
The federal Liberals can point to some support for transmission lines, notably the financing through the Infrastructure Bank. But Ottawa has had minimal success breaking through what Philip Duguay, the head of the Transition Accelerator's Canada Grid initiative, calls a "political fortress" mentality that stands in the way of provinces co-operating with each other.

There has been some recent progress toward an "Atlantic Loop," which would increase the electricity flow between the Atlantic provinces and Quebec, but even that still seems largely conceptual. "Nobody knows what it is – it's a series of good ideas that may never really change how the system works," says Pierre-Olivier Pineau, the chair of energy-sector management at the business school HEC Montreal.

There has been even less interprovincial progress elsewhere. For the most part, hydro provinces have preferred to export to the U.S., where they have found more willing and well-paying customers.

Many factors contribute to the stasis here. The provinces all have different electricity systems with varying market mechanisms, which complicates transactions; they're reluctant to put their energy reliability at each other's mercy; they worry about losing financially and wearing it politically; compared with many other countries, including the U.S., the federal government has little regulatory control that it can wield. The lack of urgency – because even the hydro-poor provinces haven't faced severe supply shortages in recent decades – is overarching.

(con't below)



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But there are also many potential policy remedies being kicked around that could be good fodder for federal parties looking to show ambition on this front.

Mr. Duguay advocates establishing regional transmission organizations, bringing together multiple provinces and possibly neighbouring U.S. states. Mr. Jaccard suggests allowing provinces to join together for equivalency agreements to avoid impositions of federal backstops such as electricity carbon pricing and emissions standards.

Kristen van de Biezenbos, an energy law professor at the University of Calgary, goes further by proposing the federal government make a jurisdictional play by taking control of interprovincial lines, paying for the infrastructure and then recouping the cost through tariffs.

Many experts agree that Ottawa will at least need to put more money on the table to build the infrastructure and financially de-risk the interprovincial trade, and that the funds allotted so far through the Infrastructure Bank won't be nearly enough.

But here, again, the soapbox may count for as much as anything else. Federal politicians could try, much more than they have so far, to use their platform to make co-operation a political imperative that provincial premiers reject at their peril.

The notion of a national grid attracts skepticism from some insiders, since it's really more a matter of building regional ties than a coast-to-coast network. But that nuance may not be terribly important if the broad concept helps articulate a compelling case for Canada collectively taking ownership of its energy future.

Coupled with that public communication could be efforts to bring the provincial governments and utilities together to find common ground; to figure out how to make their energy markets more compatible; to simply allow for consistent, continuing discourse. And that could usefully go far beyond just discussing interprovincial transmission.

In the years and decades ahead, every province will have to reimagine its electricity market. That will include deciding where and how much to invest in new capacity-building technologies – from hydrogen, to small nuclear reactors, to new energy storage options – but it will go beyond that.

They won't be able to just stick with the traditional model of large-scale generation, transmission across vast expanses and local distribution to consumers. They will also need to embrace more flexible, less centralized models that reward households for generating their own electricity through solar panels and perhaps selling it back into the grid, or that allow electric vehicle batteries to be used for energy storage, or that are more sophisticated than current options in managing when customers ramp up usage to avoid overloading the system at peaks.

All these initiatives will necessitate a high degree of innovation, investment and experimentation. Ottawa can support them financially, as it already does to a limited extent through research funding and pilot projects.

But crucially, the push could also involve making sure provinces and their utilities can collaborate and learn from each other, and have the best planning tools at their disposal, none of which is currently the case.

“The best thing the federal government could do is make sure they provide all the necessary data and tools to help with decision making,” says Louis Beaumier, the executive director of the Trottier Energy Institute in Montreal.

Ottawa could use its bureaucratic heft, perhaps through a dedicated new agency, to collect and disseminate detailed and up-to-date information on all of the country’s energy systems, and to draw lessons about what is needed, what’s working and what isn’t.

It could create a platform for energy officials and utility executives from different provinces to be in consistent contact with each other. That might avoid existing scenarios such as multiple provinces running very similar pilot projects, and might be another step toward something approaching the setting of national electricity strategies.

Here again, the federal pulpit could be used to engage Canadians in modernization that may be onerous, but also has the potential to be exciting – particularly when it’s about letting consumers or communities take more control of their options, as new technologies will allow.

That all these forms of grid modernization are scarcely on most people’s radars yet, and that those who are paying attention now are most likely to notice inertia, is something campaigning federal politicians can shrug off if they choose.

It’s not their constitutional responsibility, and the path of least resistance is to pump some money out and otherwise avoid raising the hackles of turf-protecting provincial politicians.

But the people setting national climate goals can’t just leave such a pivotal component of meeting them to subnational governments and market forces.

The next federal government may not need a specific mandate from voters to pursue grid modernization after the election.

But when better, than when Canadians are being asked to consider their national ambitions, for those seeking office to start setting expectations for making Canada more of a clean-electricity powerhouse rather than letting its advantage slip away.

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