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Jean-Luc Plourde
Committee clerk
House of Commons Standing Committee on Natural Resources
Ottawa, Ontario

Via e-mail: RNNR@parl.gc.ca

Re: Study on Canada's Electrification, Energy Self-Sufficiency and Domestic Energy Security

Dear Committee Members,

I understand that the House of Commons Standing Committee on Natural Resources is undertaking a study on Canada's Electrification, Energy Self-Sufficiency and Domestic Energy Security.

I have published more than 50 refereed articles and book chapters dealing with these issues in a Canadian context. I was co-editor of *Sustainable Energy Transitions in Canada* (UBC Press 2023 (open access)),and am currently editing the volume *Carbon Federalism: Canadian Climate Governance in a Disrupted World* for the University of Toronto Press.

I make the following observations, which may be of relevance to the committee's study on Canada's current situation and trajectory around electrification, climate change and energy security. My comments are provided in the context of the recent publication of the federal government's National Electricity Strategy, and in my capacity as an individual researcher.

Electricity and Decarbonization

In a climate context, the electricity sector has drawn attention as a major source of GHG emissions itself, and as a potential contributor to GHG emission reductions in other sectors, like industry, transportation and space heating, through electrification. Analyses have suggested that Canada's achievement of a net zero emission target by 2050 through electrification could require a two-to-three-fold increase in electricity generation by mid-century. Addition growth in demand is projected from new industries as well, particularly Artificial Intelligence (AI) data centres.

The federal government's national electricity strategy was tabled in this context. The strategy includes some important elements related to energy efficiency and productivity, and the strengthening of east-west grid connections. However, its overwhelming focus for meeting the projected growth in electricity demand is on fossil gas-fired generation and nuclear energy. The accelerating global movement in the direction of renewable energy seems mostly overlooked.

Implications of a gas and nuclear focus for climate and energy security

The reconciliation of this technological focus with the strategy's stated goals of providing clean, affordable and reliable electricity presents some major challenges. Fossil gas-fired generation is already the source of major growth in electricity related emissions. This is particularly the case in Ontario, where emissions from gas-fired generation have at least quintupled since 2017, and are projected to continue to rise well into the 2030s. There are proposals for major additional gas-fired generation from New Brunswick to British Columbia. The strategy proposes a further weakening of the Clean Electricity Regulations, currently intended to achieve a net zero electricity by 2050.

Nuclear energy, for its part, continues to be subject to enormous capital costs and construction delays as ever. Long-standing issues around waste management throughout the nuclear fuel cycle remain unresolved. The global scale safety, security and weapons proliferation risks associated with nuclear power have been again highlighted by the wars in Iran and Ukraine. Reliability will be challenged by reactor choices that will be 'first of kind' -never built or operated before in Canada, and in some cases, globally.

The core technological choices in the strategy raise serious energy security questions as well. Canada is increasingly reliant on 'fracked' fossil gas from the United States for electricity generation. The current proposals for new nuclear reactors seem, unlike the existing CANDU reactors in Ontario and New Brunswick, almost certain to require enriched uranium fuel, which is not produced in Canada. It will have to come from the United States as well.

Costs, Financing and Competitiveness

The plan suggests the cost of its implementation are likely to be in the range of hundreds of billions of dollars, but it is unclear on how it would be financed, or its impacts on electricity costs. Ontario's heavily nuclear and gas dependent electricity strategy is already raising alarm over its potential impact on electricity bills, and the implications of those costs for competitiveness, affordability and decarbonization through electrification.

Underlying the plan seems to be an assumption that Canada has a comparative advantage in terms of its ability to provide large volumes of low-cost electricity. Unfortunately, that is a view very much rooted in past, not the future.

Historically, some parts of Canada have had comparative advantages in electricity supply and costs due to availability of readily accessible large-scale hydroelectric resources. The experiences of Ontario, Quebec, BC, Manitoba, and Labrador are prominent in this regard. Power from Niagara Falls for example, provided the basis for industrialization around the western end of Lake Ontario in the first half of the 20th Century.

The situation going forward is more complicated. The supply of readily developable large hydro-electric sites in Canada is largely exhausted. The experiences with the Site C development in BC and Muskrat Falls project in Labrador, have highlighted the economic, technological, environmental and political risks associated with new large hydro projects.

Paths Towards Decarbonization, Affordability, and Sustainability

The implication is that future expansions of electricity supply will come from technologies where Canada has no inherent comparative advantage - gas and nuclear as suggested in the federal strategy. At the same time, domestic policy instability has left Canada falling behind the global trajectory of accelerating expansion of renewable energy sources, particularly wind and solar based technologies.

The situation suggests two important areas of focus. The first, in the absence of obvious cost advantages, will be to control energy costs through the maximization of energy efficiency and productivity. Secondly, on the supply side, although largely overlooked in the federal plan, non-large hydro renewables offer the best option for capacity expansion given their low costs, operational and planning flexibility, scalability, relatively short planning and construction timeframes, wide range of commercially proven and available technologies, low GHG and broader environmental impacts, and avoidance of the geopolitical and cost risks associated with dependency on out-of-country fuel supply chains. These were the rationales driving renewables development globally even before the US-Israel-Iran War.

Large scale deployment of renewables will require making optimal use of new and existing energy storage capacity, regional interties and grid management technologies. Meeting critical winter peaks will remain a challenge in parts of the country subject to sustained overnight temperatures below in the mid –20s. But an electricity strategy rooted in energy productivity, and renewable

energy expansion remains Canada's best option for decarbonization, affordability, competitiveness and sustainability.

I would be pleased to respond to any questions members may have regarding my comments on these matters.

Yours sincerely

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