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Canada and the Low Carbon Energy Revolution

by Michael Cleland

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ENERGY SERIES

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Under the Paris Accord of 2015 Canada has committed to reduce its greenhouse gas (GHG) emissions by 30 per cent from 2005 levels, by 2030. Less formally, we have set out a goal of 80 per cent reduction by 2050. It is important to put this in perspective. The time frame involved here is 13 to 33 years. Over the approximately 25 years since 1990 when Canada made its first GHG reduction pledge, its emissions have grown by 20 per cent, albeit with significant ups and downs and various underlying causes for both.

The 2050 pledge involves a time frame approximating our GHG management history to date but it is an abrupt reversal of direction in emissions performance which will require both steep reductions in energy intensity and a radical transformation of the fuel mix. In other words, it is a massive energy transformation, arguably a necessary one, but massive nonetheless. Mainstream thinking suggests that this transformation will be dominated by a huge shift in the role of electricity as a source of end-use energy, from where it stands today — approximately a fifth to a quarter (depending on province) of all end-use energy — to something closer to three-quarters by 2050.

Although the above is largely well understood among the people who dominate the energy and climate change conversation in Canada, most choose to brush off the implications. Consequently, the conversation has a surreal quality, with the great majority of Canadians quite unaware of what they are ostensibly committed to. As long as that remains the case, we really are not committed to anything at all.

Canada and other western countries have experienced several fuel mix transformations over the past century or so. Since 1900 we have moved from an energy economy largely dependent on wood to one dominated by coal, then oil, and more recently to what we could call the multi-fuel economy. This involves all the traditional fuels combined with natural gas and a broad spectrum of power-generation technologies from hydro to nuclear to new renewables.

Big transformations are far from unprecedented, although they typically entail time frames of approximately 50 years, not the 30 years contemplated for the transformation to a low-carbon economy. The trend has been to add to the diversity of our energy sources. These transformations have typically entailed use of resources where Canada had a very significant comparative advantage (oil, natural gas, hydro power, uranium) or where Canada was a technological leader (nuclear). They conferred several big benefits. They gave the Canadian energy-using economy a large advantage with respect to both cost and security. And they typically led to the emergence of important industries — particularly in regional economies — as well as significant export opportunities.

Energy transformations have been a big economic plus for Canada. Common sense suggests that the low-carbon transformation, even if it is made manageable with realistic time frames and the most efficient possible mix of policy, will be a different proposition. It will quite likely entail net economic costs: the stranding of Canadian resources and established infrastructure, the loss of Canada's comparative advantage, higher end use energy costs to the economy and the

diminution of the fuel diversity which has underpinned the security, reliability and resilience of our energy systems.

It is important to be clear with Canadians that they are being asked to step up to some serious choices if their aspirations to do the right thing for the global environment are more than political rhetoric. Canadians are also going to have to believe that their governments can get this right. The previous energy transformations resulted from a mix of factors: world economic forces, technology largely developed in other countries, the happy coincidence of energy needs with the emergence of means to exploit Canadian resources, and a great deal of private capital and entrepreneurial energy. These market forces cannot be relied upon to shift our energy systems at anywhere near the degree or speed that the Paris accord suggests.

Government had important roles in the previous transformations, especially in exploiting hydro power or developing nuclear technology, as well as less direct but critical roles in establishing sensible tax, regulatory and trade regimes. Government played, on balance, a relatively modest role; in contrast, the low-carbon transformation will unavoidably require a much larger role for government. It will have to establish heavy new regulatory and tax regimes and in many cases directly mobilize capital investment. All this will happen at the same time that the forces of slowing economic growth, aging demographics, aging infrastructure throughout the economy and growing expenditure demands in other areas are creating other priorities.

Meanwhile, public trust in government is in question and apparently declining, a reality underscored by recent research by the University of Ottawa's Positive Energy Program

One of the inevitable consequences of the low-carbon fuel transformation will be a large growth in new energy infrastructure. Recall that we are talking about our electricity systems not only being cleaner but potentially delivering a vastly greater share of energy end use than they do now. In some instances the inherent efficiency gains from electricity use (in vehicles, notably) will offset the new demand. But the inherent land intensity of the new energy systems will be much greater than today — from a potentially massive increase in hydroelectric capacity, and because wind and solar have much lower energy density and much greater land requirements compared with fossil fuels.

There are many ways of looking at the numbers. However, to illustrate the point, according to recent work done by the Canadian Energy Research Institute, meeting a major electrification push in only the buildings (residential, commercial and institutional) and road passenger transport sectors (which alone would leave Canada far short of the requirements to support the pledge for 2050) would require power generation to more than triple from today's level. In addition to new capacity and probably new transmission to support that generation, we would need to replace or refurbish older power infrastructure whether because of its carbon emissions (either through retirement or adding carbon capture) or simply because of age. This adds up to a very large construction program, all to be undertaken in an era when the old way of making decisions has become as obsolete as Ontario's coal-fired power plants.

Canadians no longer accept that major capital projects can be undertaken without extensive engagement of affected communities. There is a growing skepticism on the public's part that government can be trusted to do its job fairly and competently. Much of the private sector appears to get this; the question is whether governments do, in the sense of something more than rhetoric.

The new world of energy decision-making will need a lot more than warm words. It will add significantly to the time required to get things done. It will require genuine a priori commitment to changing plans if need be. It will involve substantial hard costs to account for changed plans including various measures to mitigate impacts, to offset negative effects on communities or to ensure that local communities have a genuine financial stake and some measure of ongoing control. It will involve significant rethinking of our decision-making infrastructure and institutions. It will require new human resources, skills and organizational cultures far beyond anything undertaken or envisaged to date.

It will be hard. And for governments it will involve mostly political grief and only rarely, political joy.

None of the foregoing is an argument for governments to walk away from their climate commitments even though Canadian governments – federal and provincial going back to 1990 – have not been able to connect rhetoric with results. This is an argument for getting real.

First, a massively interventionist economic policy framework is – fortunately –improbable. The transformation will need to be done in a framework of open trade and investment largely supported by private investment sources. It will need to engage a multitude of private players complemented by local and indigenous governments and many participants from civil society. It will be enormously complex and will need to rely at its foundation on sound, stable market signals rather than direct government action.

Second, we need to worry less about targets and more about what needs to be done. Such a change of focus would steer us in much more productive policy directions. We are very unlikely to meet most of the targets that governments have expressed, whether for 2030 or 2050. Governments can't admit that but all knowledgeable observers know it. So what? As noted, this has become something of a national specialty and the world has not collapsed around us. The question is not about targets but about what path Canada's medium-sized, open, resource-intensive economy — which contributes very little to the world's emissions — should follow so that we stay aligned with our competitors in the transformation. We will need to protect and ideally improve our competitive economic position and maintain (or perhaps recover) some measure of moral authority and self-respect.

Third, we need to recognize that no one can know what the physical energy economy might look like in 2050. Public policy should strive at all costs to avoid actions that presume that we do. This means whatever policies are chosen must be flexible, and just as important, that we get

ready to make lots of mistakes as we grope our way forward. The challenge is to keep the mistakes small and correctable and to learn from them. The new energy economy may be predominantly electrical, or it might not be. The issues here are how best to deliver the energy services we demand, how to manage cost and system integrity challenges and how to ensure environmental performance. How that will actually get done remains to be seen.

Fourth, the transformation will inevitably involve an immense number and broad diversity of players in active roles, relying on a broad base of well understood, stable rules and price signals. Many actions that involve detailed government interventions will be unavoidable (building codes, equipment standards) but history tells us that the big forces generating truly transformative change are far beyond the reach of governments. Most — including market and technological changes — will come from outside Canada.

What about price signals? The clearer and the simpler the better, ideally with a future path that investors can see. If carbon price signals could be delivered through straightforward carbon taxes that can truly be offset by reduced taxation elsewhere, then we would have the most essential part of the foundation needed for real change. The issue is efficiency. If we are taking on what may be the toughest public policy challenge in our history, we can't afford to go about it except as efficiently as possible.

We will also need new and redesigned institutional infrastructure and much more, and more effective, use of civil society. Public policy-making mechanisms will need to be more inclusive and able to operate effectively at a regional scale to catch the land-use implications of the transformation. That includes more effective regional planning and strategic environmental assessment, mechanisms that we have worked with for years but which remain a long way from being adequately developed or deployed. We will need much more extensive, deeper, more broadly accessible and more credible energy information, something that governments persistently ignore. All of this will entail significant investment by government, and investment in government or government-like capabilities with zero direct political payoffs — a reality that political leaders will have to be prepared to admit to taxpayers.

Much of the job of approving projects needs to be left in the hands of diverse, independent energy regulators. Here we have a conundrum. We need better policy and planning mechanisms that operate with clear and direct political accountability. However, they need to be able to operate in better co-ordinated ways with the regulatory system — treating regulators as sources of advice as well as execution capacity. Then, the regulators need to be left to do their jobs. Far too much has been done in the past few decades to erode the independence of regulators at both federal and provincial levels, making their decisions subservient to political priorities unsupported by objective evidence. This needs to be reversed.

Ultimately, an open and realistic public debate on energy is missing, a debate that confronts our physical, economic, social, institutional and political realities at the same time that it addresses our aspirations regarding greenhouse gases. The optimists may be right and Canadians may

come out of all of this as winners three or four decades from now, but it is certain that there will be costs and risks. Some people and communities will bear the bulk of the negative consequences. Those realities raise political questions. As long as those questions continue to be glossed over, they will continue to emerge and crystallize around individual energy projects of all sorts, unhinging regulatory processes, adding cost and risk and satisfying no one.

All in all, this adds up to a very big job for the next 25 years but it is not impossible to make real progress — and the point is real progress, not targets — if we learn the lessons of the past 25.

About the Author

Michael Cleland is a private consultant with extensive experience in energy and environment policy. He is Senior Fellow with the University of Ottawa and a member of uOttawa's Positive Energy research team', *Chair of the Board of Directors at the Canadian Energy Research Institute and a member of the Board of Directors of QUEST (Quality Urban Energy Systems of Tomorrow). In 2015, Mr. Cleland was named Canadian Energy Person of the Year by the Energy Council of Canada. He is formerly President and CEO of the Canadian Gas Association, Senior Vice President, Government Affairs for the Canadian Electricity Association, Assistant Deputy Minister, Energy Sector at Natural Resources Canada, and Director General of the Energy Policy Branch. From 1987 to January 1990, he was Assistant Director, Resource Policy Division in the Department of Finance. Before joining the federal government, Mr. Cleland was a private consultant who also lectured in business –government relations at Dalhousie University. Prior to that he worked in various capacities with the Nova Scotia Departments of Development and Municipal Affairs. Mr. Cleland was educated at the University of British Columbia (BA in political science 1972) and Queens (MPL urban and regional planning 1974).*

Canadian Global Affairs Institute

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