

Question 2. What resources should qualify as “clean energy”?

Submitter’s Name/Affiliation: Pierre Guimond/Canadian Electricity Association

In response to this question, the Canadian Electricity Association (“CEA”) believes it would be valuable to offer a perspective on the development and deployment of clean energy resources for electricity generation in the Canadian context.

Canada is fortunate to enjoy one of the cleanest electricity systems in the world. As illustrated in the pie chart in Appendix A below, more than 75% of the resources in Canada’s generation mix are non-emitting. This is primarily attributable to the widespread use of hydroelectric and nuclear technology across the country.

Hydropower

Canada is blessed with an abundance of hydro resources and is the second largest producer of hydroelectricity in the world.¹ Hydropower comprises the vast majority of generation in four Canadian provinces – British Columbia (80%), Manitoba (97%), Québec (97%) and Newfoundland (96%) – and, in varying quantities, remains part of the generation mix in each of the other provinces plugged into the North American electricity market. Overall, hydropower provides over 60% of the electricity consumed by Canadians and represents a sizeable majority of Canada’s electricity exports to the United States.

The expansive use of this versatile renewable generation source in Canada has facilitated the simultaneous achievement of key public policy objectives – such as a low-emitting profile for the electricity sector and affordable rates for consumers – and enhanced system performance, as hydropower enables improved reliability, greater supply diversity and firming-up of variable generation resources. CEA strongly encourages any policy program or mechanism which seeks to recognize and promote hydropower – of any generating capacity – as a valuable source of clean, affordable, reliable electricity. In this regard, CEA supports the inclusion of hydropower

¹ http://www.iea.org/textbase/nppdf/free/2010/key_stats_2010.pdf

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on the menu of renewable resources identified by the Obama Administration in its *Blueprint for a Secure Energy Future* as necessary for achieving the target of 80% clean electricity generation by 2035.²

Nuclear

Nuclear energy plays an important role in each of the three Canadian provinces where it contributes to the generation mix. In the country’s most populous province, Ontario, nuclear power has historically provided upwards of half of overall supply. Nationally, nuclear represents 15% of Canada’s generation.

Similar to hydropower, the public policy and operational benefits of nuclear are multitudinous. Nuclear energy is a virtual non-emitter of greenhouse gases and air contaminants. It has also historically served as a critical source of both reliable and affordable baseload power. Moreover, the nuclear industry is a powerful driver of economic growth, in both direct and indirect employment. Accordingly, CEA believes that public policy tools should support the vital role nuclear energy has played and will continue to play in the transition to a cleaner energy economy.

In addition to hydroelectricity and nuclear, there are several other resources which are showing immense value as part of the solution for moving towards a clean energy future.

Renewables Other Than Conventional Hydropower

As in many other parts of the world, renewable resources other than conventional hydropower are assuming a greater share of the electricity mix in Canada. For example, each of the country’s 10 provinces, along with one of Canada’s northern territories, has installed

² http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf

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generating capacity in wind energy, with ongoing investments in expansion. Interest and usage in solar energy are likewise growing rapidly. As the industry familiarizes itself more with the operational challenges associated with such technologies, the benefits of these resources are becoming increasingly apparent, particularly in terms of the economic and environmental value propositions. Canada’s unique geography has also enabled industry participants to lead the development of emerging technologies. In Nova Scotia, for example, work is underway to harness the world’s most powerful tides in the Bay of Fundy, with the aim of improving the electric industry’s ability to deploy tidal energy on a commercial scale. Particularly with energy storage technologies set to improve over time, it will be vitally important to continue supporting the deployment of a full suite of renewable resources through forward-looking public policy frameworks.

Clean Coal

Canada is also forging ahead with investments in what could potentially emerge as a breakthrough, game-changing cleaner energy technology – clean coal. Electric utilities in Alberta have already made significant strides in deploying world-class supercritical combustion technology to achieve greater fuel efficiency and lower emissions in coal unit operations. The province is the site of Project Pioneer, an industry-government partnership for the construction of a commercial-scale carbon capture and storage (“CCS”) facility – adjacent to an existing advanced fuel-efficient coal-fired plant – currently scheduled to come online in 2015. In neighboring Saskatchewan, an integrated demonstration project is also underway to retrofit a coal-fired generating unit with CCS technology. Both projects are expected to capture close to one megatonne of carbon dioxide per year and to enhance oil recovery in nearby production fields.

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These projects are making tangible in-roads for the development and deployment of CCS technology, and will yield tremendous dividends in terms of enabling consumers to enjoy the benefits of significantly reduced environmental impacts. With CCS on the verge of broad commercial deployment, CEA is confident that favorable public policy treatment will help to accelerate the transformation of the electricity sector through this cleaner energy technology.

Natural Gas

Finally, experience in Canada has shown that natural gas possesses numerous attributes which favor its consideration as a clean energy resource. Several jurisdictions in Canada are looking more earnestly at natural gas as a cleaner-burning and more efficient alternative to conventional thermal generation, particularly in combined cycle applications. In Ontario, for example, installed capacity for natural gas generation more than doubled between 2003 and 2010.³ With a lower-emitting profile, the ability to reliably facilitate the integration of variable generation, and, in view of North America’s abundance of new economically recoverable shale reserves, natural gas is quickly becoming a popular option for power generation purposes. This versatility offers a host of attractive benefits for decision-makers to weigh as they seek solutions for shifting towards expanded use of cleaner electricity resources.

Conclusion

CEA hopes that the above information regarding the development and deployment of clean energy resources in Canada will serve as a useful point of reference for the U.S. Senate Energy and Natural Resources Committee, as it assesses the potential qualification criteria and merit for various resources under a clean energy standard.

³ http://www.mei.gov.on.ca/en/pdf/MEI_LTEP_en.pdf

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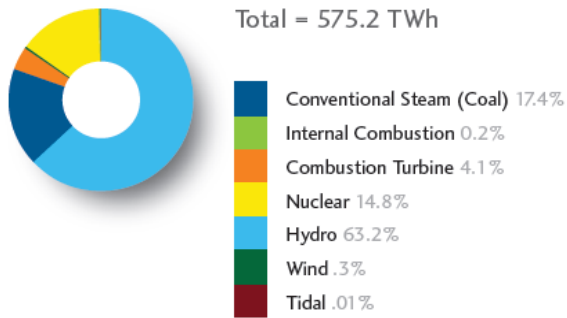
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APPENDIX A

Electricity Generation by Fuel Source in Canada and the U.S., 2009*

Canada

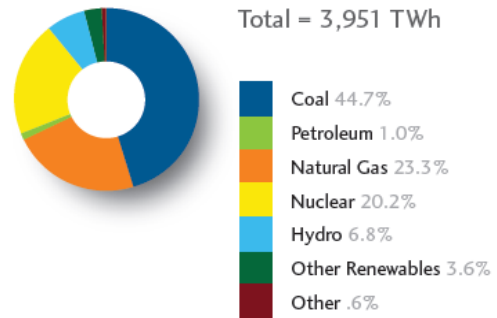
Net Electricity Generation, 2009



*Numbers may not sum to 100 percent due to rounding.
Source: Statistics Canada, *Survey 2151*, 2010

U.S.

Net Electricity Generation, 2009



*Numbers may not sum to 100 percent due to rounding.
Source: US Energy Information Administration, *Electric Power Monthly*