

## BRIEFING NOTE ON PRIORITY CLIMATE ACTION AREAS FOR NOVA SCOTIA

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### ***Opportunity***

The Federal government continue to sit down with provinces in the coming months to work collaborative toward advancing Canada's climate commitments. Our Federal government seems determined to stay true to its election promises related to the environment and climate change. Thus, provinces will be challenged to partner with Ottawa in strengthening Canada's action on greenhouse gas emissions reductions, goals for green growth and establishing a nation-wide price on carbon. This challenge comes with opportunity, as the Federal Government, in collaboration with the provinces, have also signalled their intentions to: invest in clean technology and innovation<sup>1</sup>; develop new financing instruments for energy conservation measures<sup>2</sup>; dramatically increase Federal investments in green infrastructure<sup>3</sup>, and; create a Low Carbon Economy Trust<sup>4</sup>.

Nova Scotia has made substantial progress in reducing greenhouse gas (GHG) emissions and developing the province's energy efficiency and renewable energy sectors. However, we still have some way to go in reducing our per capita emissions if we are to play our full part in enabling Canada to meet its 2020 and 2030 targets<sup>5</sup>.

With the prospect of a strong Federal partner on these matters, the Province is in a position to leverage its recent track record by identifying immediate actions that will benefit Nova Scotians while playing our full part in meeting new Federal commitments. This brief offers three practical recommendations to advance those objectives.

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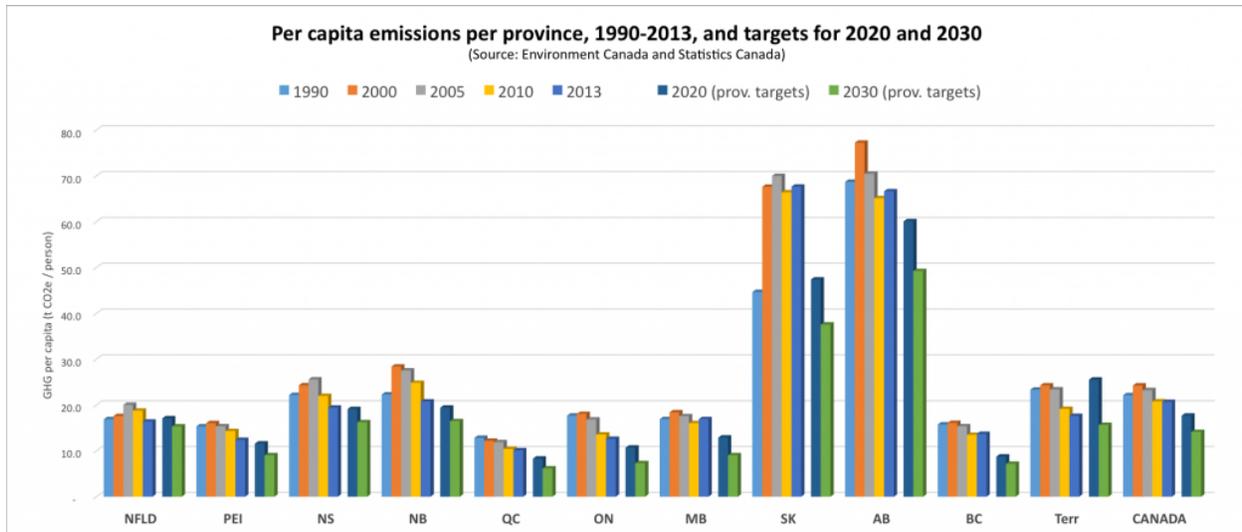
<sup>1</sup> \$100 million more each year for clean technology producers, \$200 million more each year to support innovation and use of clean technology in natural resource sectors. From "A New Plan for A Strong Middle Class", Liberal Platform, 2015.

<sup>2</sup> Specifically, to encourage energy-saving retrofits to industrial, commercial and residential buildings. From "A New Plan for A Strong Middle Class", Liberal Platform, 2015.

<sup>3</sup> Increase by \$6 billion over the next four years and almost \$20 billion over ten years. From "A New Plan for A Strong Middle Class", Liberal Platform, 2015.

<sup>4</sup> The Trust "will provide funding to projects that materially reduce carbon emissions under the new pan-Canadian framework." It will be endowed with \$2 billion between 2017 and 2019. From "A New Plan for A Strong Middle Class", Liberal Platform, 2015.

<sup>5</sup> Data Paul Boothe & Felix Boudreault of the Ivey Business School



## Recommendations

### **1) Explore how carbon pricing can work for Nova Scotians; engage neighbouring provinces on a regional approach to carbon pricing**

Carbon pricing is the new norm in Canada with five provinces, representing almost 90% of the country's population, committed to a carbon tax or cap and trade system. The Federal government is clear about its intentions to introduce a national carbon price, and work with provinces as they design carbon pricing policies<sup>6</sup>. Clearly some form of carbon pricing is coming to Nova Scotia.

It is recommended that the Province take advantage of the present political momentum and relatively low oil prices to design a carbon pricing system tailored to Nova Scotia's particular circumstances and needs. Failure to do so may result in hasty adoption later, amid increasing pressure from the Federal government and nearby jurisdictions with their own systems. The resulting carbon pricing system may be less suited to the Nova Scotian context and will not be customized to provide maximum benefit to this province.

Concerns over potential adverse impacts of carbon pricing are understandable. Highly GHG-intensive, trade-exposed industries may be vulnerable to carbon pricing. These sorts of industries make up a significant proportion of Nova Scotia's industrial base, although not as significant a portion of the province's GDP<sup>7</sup>. Alberta, Manitoba, and Ontario have or are committed to carbon pricing systems even while elements of their economies are arguably more impacted than Nova Scotia's to competitiveness pressures resulting from a carbon price<sup>8</sup>. Clearly it is possible to design a system sensitive to these concerns whilst improving economic competitiveness overall.

<sup>6</sup> "A New Plan for A Strong Middle Class", Liberal Platform, 2015. "Minister of Environment and Climate Change Mandate Letter", Office of the Prime Minister, 2015.

<sup>7</sup> "Provincial Carbon Pricing and Competitiveness Pressures", Canada's Ecofiscal Commission, 2015.

<sup>8</sup> *ibid*

Concerns over carbon pricing are to be expected. Experience elsewhere in Canada suggests that concerns are effectively mitigated by: 1) measures which manage the impact of carbon pricing on vulnerable people and industries, and; 2) very clear communication of the ways expected revenues resulting from a carbon price will be put to use<sup>9</sup>. Revenue neutrality - the return of all generated revenue to the public through tax cuts or other means - proved an effective response to public concerns about carbon pricing in British Columbia. Quebec invests all resulting revenue in the Green Fund, for implementation of that province's Climate Change Action Plan, and the system has enjoyed wide acceptance.

Nova Scotia may hesitate to be the first province in the region to put a price on carbon. Regional cooperation will in any case be optimum from a design perspective. It is recommended therefore that Nova Scotia immediately engage with neighbouring jurisdictions on a regional approach to carbon pricing.

These details, ideas and concerns were discussed at length during two Carbon Pricing Forums held in Halifax in May 2016 and July 2016. These Forums were attended by over 100 stakeholders, between the two sessions and brought together voices from a diversity of sectors and industries to discuss principles, and identify key challenges and opportunities for carbon pricing frameworks in the Nova Scotian context. Notably, the second Carbon Pricing Forum was co-sponsored by Saint Mary's University, Cape Breton University, the Maritimes Energy Association, the Atlantica Centre for Energy and the Ecology Action Centre.

A Synthesis Report from the May 2016 Carbon Pricing Forum is attached to their briefing note, along with a Consensus Document from the July 2016 Carbon Pricing Forum.

## ***2) Partner with the Federal government and Nova Scotia Power to get Nova Scotian homes off of heating oil***

Over 60% of homes in Nova Scotia are heated with oil<sup>10</sup>. This is not only a burden on Nova Scotia's emissions profile<sup>11</sup>, but also on consumers who pay high and often volatile prices for oil. Fuel oil prices increased by 90% between 2001 and 2012<sup>12</sup>.

It is recommended that the Province work with the Federal government to develop a program that makes use of energy conservation financing, the Low Carbon Economy Trust, and potentially green infrastructure investments to transition the highest possible number of Nova Scotian households off of home heating oil while improving building envelopes and converting to alternative heating sources.

Nova Scotia Power (NSP) will be an important ally in this effort as it is in the company's interests to grow electricity load through conversion to heat pumps. NSP may also be a source

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<sup>9</sup> "Adopting a Winning Carbon Price: Top Ten Takeaways from Interviews with the Architects of British Columbia's Carbon Tax", *Clean Energy Canada, 2015* and "Inside North America's Largest Carbon Market: Ten Lessons from the Front Lines of Quebec's Fight Against Carbon Pollution", *Clean Energy Canada, 2015*.

<sup>10</sup> As estimated by Nova Scotia Power and reported in "Solving Nova Scotia's Electricity Pricing Problem", Brian Gifford, 2013. Most recent statistical date is from 2007 and puts residential dependence on heating oil in Nova Scotia at over 50% ("The ways we heat our homes", *Canada Year Book, 2007*).

<sup>11</sup> "Comparative Analysis of Greenhouse Gas Emissions of Various Residential Heating Systems in the Canadian Provinces", *Canadian GeoExchange Coalition, 2010*.

<sup>12</sup> From "Solving Nova Scotia's Electricity Pricing Problem", Brian Gifford, 2013 with information provided by Statistics Canada.

of supplemental financing for households. Efficiency Nova Scotia (ENS) can be counted on to provide the expertise and capacity required to simultaneously implement aggressive marketing and appropriate efficiency upgrades to buildings participating in the program.

Nova Scotians heating their homes with electricity are already benefiting from programs, offered by ENS, that improve building envelopes as well as programs, offered by NSP, that aid the conversion to electric heat pumps. While these programs are available to homes heated with oil, the barriers to implementation are much greater. A program specific to oil-heated homes is required.

Using electricity for home heating remains GHG intensive for the moment in Nova Scotia<sup>13</sup>. However, transition away from fossil fuels is continuously reducing the GHG intensity of electricity generation in the province, whereas the GHG profile of oil heating will remain consistent well into the future. Conversion to electricity is in Nova Scotia's long-term interests and could reduce home heating bills by as much as \$1000 per household per annum and may reduce provincial CO<sub>2</sub> emissions by as much as one megaton.<sup>14</sup>

That being said, it will be necessary to develop an evaluation metric to determine which alternative heating method will allow each home to achieve optimal efficiency and pollution reduction. It is anticipated that electric heat pumps will be a popular alternative, but other heating systems such as high efficiency wood stoves may achieve greater cost savings and net pollution reduction in certain circumstances.

If such a program is undertaken, it will also be necessary to educate contractors in the home construction and renovation sectors about Nova Scotia's commitment to phasing out home heating oil and determining appropriate heating alternatives. Calling on NSP and ENS to engage and educate the networks of contractors they work with on this effort will be essential.

While the cost of fuel oil has dropped along with global oil prices, reducing the burden on consumers that heat with oil, it is difficult to predict how long that will remain the case. Historically, Nova Scotians heating with electricity are also exposed to relatively high and volatile electricity rates. However, energy efficiency programs combined with heat pump technology are already working to reduce consumers' electricity bills across the province while the ongoing transition to renewable energy works to stabilize rates.

### ***3) Make Nova Scotia a centre for excellence in research, development and installation of renewable energy and storage technologies***

Nova Scotians are very interested in renewable energy and grid modernization<sup>15</sup>. There are several elements of the Province's most recent Electricity Plan that acknowledges this: the coupled release of the Marine Renewable Energy Act; the introduction of the Community Buildings Solar PV Pilot Program; discussion of lessons learned from the PowerShift Atlantic smart grid pilot project; discussion of potential for enhanced regional electricity system planning,

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<sup>13</sup> According to Nova Scotia Power, one kilowatt hour of electricity use emits 693g of CO<sub>2</sub>e.

<sup>14</sup> Correspondence between Cape Breton University and Nova Scotia Power.

<sup>15</sup> "Electricity Review Report", Nova Scotia Department of Energy, 2015 and "Electricity Review Survey Findings", Thinkwell, 2015.

and; acknowledgement of the vast potential for innovation in solar photovoltaic (PV) and storage technologies<sup>16</sup>.

Experience in Nova Scotia exemplifies the economic and job-creation potential of renewable energy - for example, over a thousand people across the province are employed in the delivery of renewable energy, over 1,300 people in the province are employed within the efficiency sector<sup>17</sup>, and rural communities are already benefiting from investments in tidal power development<sup>18</sup>. The rate stability and system resilience offered by making use of a diverse range of renewable energies are well understood by the province.

It is recommended that Nova Scotia take full advantage of the opportunity that now exists to partner with the Federal government on commercialization of the research and development into renewable energy and storage technologies already underway in the province, and to initiate more of this valuable activity.

For instance, there is still room for the improvement of solar technology, particularly in optimizing efficiencies for specific geographies and weather patterns<sup>19</sup>. Nova Scotia has the opportunity, as it begins a foray into the expansion of solar PV and hybrid PV/thermal installations throughout the province, to simultaneously develop Nova Scotian expertise that could be in demand outside of the province<sup>20</sup>.

~~While it is unlikely that Atlantic Canadian provinces will ever become major players in solar panel manufacturing, as jurisdictions like China consistently outcompete Canadian manufacturing in cost, some provinces, notably Ontario, are already benefitting from early investments in the research and development of solar PV technologies<sup>21</sup>.~~

With the dramatic drop in the cost of the main components of solar PV, high installation and service costs are quickly becoming the main barrier to solar making a major breakthrough in Nova Scotia. Experience elsewhere demonstrates that these costs can be reduced drastically with an experienced local industry.

Nova Scotia, with its wealth of post-secondary institutions, has an existing reputation for innovative, high quality research. Ground-breaking research on renewable energy and storage technologies is already underway in projects such as Nova Scotia Community College's Applied Energy Research (AER) lab<sup>22</sup> and the Dalhousie Research in Energy, Advanced Materials and Sustainability (DREAMS) program<sup>23</sup>. Multi-stakeholder initiatives such as the Fundy Ocean Research Centre for Energy (FORCE), Offshore Energy Research Association (OERA), Acadia Tidal Energy Institute and Fundy Energy Research Network (FERN) are other world-leading examples.

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<sup>16</sup> "Our Electricity Future Nova Scotia's Electricity Plan 2015-2040", Nova Scotia Department of Energy, 2015.

<sup>17</sup> "EfficiencyOne Annual Report 2015", Efficiency One, 2015,

<http://efficiencyone.ca/2015/assets/files/EfficiencyOne%20Annual%20Report%202015.pdf>

<sup>18</sup> "Nova Scotia Power Sets Renewable Energy Record", Nova Scotia Power, 2016 and "Building Nova Scotia's Tidal Power Supply Chain", Marine Renewables Canada, 2015.

<sup>19</sup> "British scientists develop solar panels which work better on a cloudy day", The Telegraph, 2014.

<sup>20</sup> "NSCC scientist working to adapt solar panels to N.S.", UNews.ca, 2012.

<sup>21</sup> "Solar power surging to forefront of Canadian energy", Globe and Mail, 2014.

<sup>22</sup> <http://www.nscnow.ca/stories/innovation/waterfront-research-lab>

<sup>23</sup> <http://www.cheminst.ca/magazine/feature-story/dreams-weaver>

The gradual growth of the renewable energy and storage industries as part of the future energy mix of Nova Scotia - at rates that avoid having to subsidize them at unsustainable levels - will create jobs in rural communities<sup>24</sup>. It will also improve the province's energy security and independence, and the experience gained will help reduce the costs of these maturing technologies.

It is recommended that the Province investigate options to capitalize on upcoming Federal investments in clean technology and innovation to establish Nova Scotia as a centre for excellence in research, development and installation of renewable energy and storage technologies. The moment is now and Nova Scotia can capitalize on existing strengths to act quickly and seize the economic and industrial benefits.

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<sup>24</sup> *"Value Proposition for Tidal Energy Development in Nova Scotia", OERA, 2015 estimates a whopping 22,000 jobs might be created by tidal energy development over the coming 25 years.*