



environmental  
defence  
INSPIRING CHANGE

## **Showing Canadian Leadership on Climate Change: Environmental Defence submission to the federal-provincial working groups**

August 2016

### **Introduction**

Canadians have an incredible opportunity before us. The federal government has committed to creating a climate change framework for the country in consultation with provinces, First Nations, stakeholders, and citizens. This framework should allow Canada to finally take strong and decisive action on the most pressing challenge we face.

No federal-provincial decision-making has been so important to the lives and futures of Canadians since the implementation of Medicare. The health of Canadians, the protection of our natural environment, and the strength of the Canadian economy all hang in the balance.

This submission to the federal government was prepared through extensive discussion with a number of other experts in climate change policy: environmental NGOs, consultants, academics, and industry representatives. Environmental Defence helped prepare or endorsed a number of proposals from other groups that have been submitted already, and this submission draws upon those proposals to create one comprehensive and coherent policy package.

### **The Paris Agreement and the 1.5 degree limit**

The historic Paris Agreement, agreed to in December and signed by Canada and a majority of the world's countries in April, commits the world to limit global warming "to well below 2 degrees C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees C." The Canadian government championed the 1.5 degree limit in Paris and must now align the country's policies to fulfill that goal. That means a national climate plan, backed by laws, regulations and funding, that allows Canada to meet 2025 and 2030 greenhouse gas (GHG) targets in line with the 1.5 degree limit.

According to Climate Action Network-Réseau action climat Canada (CAN-Rac), Canada's fair share of limiting warming to 2 degrees would involve:

- Reaching a legally binding target to cut our carbon pollution in Canada by at least one third within the next 10 years (equivalent to 37 per cent below 2005 levels by 2025), and

- Committing one-half of Canada’s international public finance of \$4 billion/year by 2020 to lever additional, verifiable emissions reductions from investments in climate change mitigation in developing countries.<sup>1</sup>

Those figures should be the minimum commitment made by the Canadian government, with a consideration to updating and strengthening the commitment once analysis is undertaken on Canada’s fair share of a 1.5 degree limit. That means that Canada’s existing 2030 target—deemed “inadequate” for even the 2 degree threshold by four European think tanks<sup>2</sup>—needs to be significantly strengthened.

### Climate test

It is critical that energy development in Canada be consistent with our international commitments on climate change. As such, a robust climate test needs to be applied to every energy development project to ensure that energy projects don’t impede Canada’s ability to do its fair share to meet the 1.5 degree limit, *and* that the energy demand and emissions created from any given project fit into a world where countries are living up to commitments in the Paris Agreement.

At a minimum, therefore, a climate test would adhere to the following principles:

- **Environmental review processes must assess a project or policy’s GHG emissions.** Decision-makers should evaluate the GHG emissions associated with a project, assess the environmental impact of those emissions and evaluate their effect on national and international efforts to meet long-term carbon reduction targets. The government should be able to show how emissions from the project are accounted for in their plan to meet their targets in the medium and long term.
- **Environmental review processes must assess the need for projects and policies in the context of global energy supply and demand scenarios consistent with international climate goals.** Any environmental review should take robust models for global energy markets that are consistent with a well-below-2-degree and 1.5-degree limits and apply them to existing projects and policies under federal review to determine the economic and environmental viability of those proposals. Current demand scenarios used to understand the economic rationale for energy projects are inconsistent with the Paris agreement, and would put us on track for between 4 and 6 degrees of warming.

### Carbon pricing

Because the atmosphere can no longer be used as a free dumping ground for carbon pollution, the federal government must work with the provinces to implement a pan-Canadian carbon price. Putting a price on carbon is not a silver bullet for achieving emission reductions, as the rest of this briefing will show, but it is an important element of any serious climate change policy package. We are looking for a carbon pricing policy that:

- Sends a broad signal across the Canadian economy by anchoring market-based approaches to carbon emissions reductions linked to international Paris market mechanisms,
- Results in carbon emissions reductions in the near-term and the achievement of Canada's Paris targets by 2030,

<sup>1</sup> Climate Action Network-Réseau action climat Canada. (2015). “Canada’s Fair Share: The Story Behind the Numbers.” Accessed from : <http://climateactionnetwork-28b0.kxcdn.com/wp-content/uploads/2015/04/INDCBackgrounderFinalMarch2015.pdf>

<sup>2</sup> Climate Action Tracker. (2015). “Canada.” Accessed from: <http://climateactiontracker.org/countries/canada.html>

- Encourages increasing ambition in emission reductions, designed with a view toward achieving a maximum 1.5°C temperature increase,
- Generates predictability for business and industry in the near-term, and/or aids corporate planning by clarifying the long-term trajectory,
- Is fair for low-income households, communities and workers,
- Creates revenue streams that can be harnessed to finance other carbon reduction strategies,
- Incentivizes development and export of, and shifts to, cleaner technologies and enhances efficiencies in the use of status-quo technologies,
- Reflects cooperative federalism,
- Minimizes leakage and competitiveness concerns,
- May be coordinated with the US Clean Power Plan,
- Provides for consultation with and a role for First Nations and Métis,
- Is politically feasible and pragmatic.

In order for the pan-Canadian carbon price to reflect the social cost of carbon emissions,<sup>3</sup> including local air pollution impacts,<sup>4</sup> the carbon price should begin at a level that meets or beats the BC and Alberta carbon price on January 1st, 2018, and ramps up by a minimum of \$10/tonne/year. Since a carbon price is often regressive, i.e. it has a bigger cost impact on lower income individuals and households, some of the revenue from a carbon pricing regime should be used to assist those on low- and fixed-income.

In order to prevent carbon leakage, i.e. having industries move operations to other jurisdictions without a carbon price, the carbon pricing regime should enable the federal government to direct/allocate revenue to maintain the competitiveness of emissions-intensive, trade-exposed (EITE) sectors. The system should:

- Maintain (and ideally strengthen) the incentive to reduce domestic emissions,
- Only be used if a sector experiences demonstrable leakage and/or competitiveness challenges because of the carbon price,
- Be developed in a transparent and consistent manner, and
- Be transitional/temporary.

### **Eliminating fossil fuel subsidies<sup>5</sup>**

Federal production subsidies to the fossil fuel industry have been estimate at a minimum of \$CAN 1.8 billion annually; provincial subsidies to fossil fuel producers in Canada could amount to a minimum of \$CAN 1.1 billion annually.<sup>6</sup> So while First Ministers at their meeting in Vancouver in March 2015 expressed support for “adopting a broad range of domestic measures, including carbon pricing,” and

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<sup>3</sup> Environment and Climate Change Canada. (2016). “Technical Update to Environment and Climate Change Canada’s Social Cost of Greenhouse Gas Estimates.” Accessed at:

<http://www.ec.gc.ca/cc/default.asp?lang=En&n=BE705779-1>

<sup>4</sup> Sawyer, Dave. (2015). “The Benefits of Climate Action to Hard Working Canadian Families.” EnviroEconomics. Accessed at: <http://www.enviroeconomics.org/#!/The-Benefits-of-Climate-Action-to-Hard-Working-Canadian-Families/c1uze/55380e170cf21fee1339c111>

<sup>5</sup> This section adapted from Oil Change International et al. (2016). “Eliminate production subsidies to the fossil fuels sector in Canada.”

<sup>6</sup> Touchette, Yanick. (2015). “G20 subsidies to oil, gas and coal production: Canada.” International Institute for Sustainable Development, Overseas Development Institute, and Oil Change International.

federal Environment Minister Catherine McKenna has repeatedly supported putting a national price on carbon, fossil fuel subsidies amount to the opposite—a negative price on carbon.

The Government of Canada has a long-standing commitment to phasing out production subsidies to the fossil fuel industry, starting in the G20 Leaders' Statement at the 2009 G20 Summit in Pittsburgh, reiterated again at the G7 meeting in Japan in May 2016, and again at the North American Leaders' Summit in June 2016. However, the 2025 timeline committed to in the two most recent meetings is much too long. It should not take another nine years to realize a commitment made seven years ago. Instead the federal government should:

- Publicly release, ahead of Budget 2017, a comprehensive list of current accelerated capital cost allowances (ACCA) and other tax preferences available to the oil, natural gas, and coal industries in Canada, including estimates of foregone tax revenues, and
- Announce, in Budget 2017, a schedule for phasing out remaining federal production subsidies by 2020, including the ACCA to Liquefied Natural Gas, the duty exemption for imports of mobile offshore drilling units in the Atlantic and the Arctic, the Canadian Development Expense, the Canadian Exploration Expense Tax deductions, the Canadian Oil and Gas Property Expense, the Foreign Resource Expense and Foreign Exploration and Development Expense.

The federal government should also work with provincial governments to achieve the same at the provincial level—publicly releasing an accounting of remaining provincial subsidies by the end of 2017, including estimates of foregone tax revenues, and announcing a schedule for phasing out remaining provincial subsidies by 2020.

### **Electrification strategy<sup>7</sup>**

To tackle climate change, we need renewable electricity to power far more of our daily activities than it does today—even factoring in a dramatic improvement in energy productivity. Over time, we will need to shift from fuelling our personal vehicles with gasoline to driving electric cars. Electric pumps will draw heat from the air or the ground to keep our homes warm in winter and cool in summer. Innovative industrial processes will produce the goods and materials we need using clean power rather than fossil fuels. It is possible to generate electricity completely free of carbon emissions and without the use of fossil fuels. But natural gas, gasoline and diesel and coal are fossil fuels, and phasing out their use, as agreed to in Paris, means moving to renewable electricity.

In addition to carbon pricing, the federal government should develop a national strategy or action plan for electrification in Canada. In the development of its pan-Canadian climate plan, the federal government should pursue the following actions:

- Assess federal legislation to identify barriers existing to renewable electrification of buildings, transportation and industry. Following this, the federal government should propose amendments to remove those identified barriers. This could be secured through an omnibus act with the working title of the Canadian Electrification Act.
- Establish a funding mechanism that uses public funds to leverage private capital for investment, and reduces the cost of capital for deploying low carbon electricity infrastructure.

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<sup>7</sup> This section adapted from Climate Action Network-Réseau action climate Canada et al. (2016). “Modernizing Canada’s Electricity Systems: A pan-Canadian electrification strategy to cut carbon pollution.”

- Amend the existing Canadian Environmental Protection Act (CEPA) regulations for coal-fired power to accelerate coal phase out to a 40-year end-of-life requirement, with a no-later-than-2030 end date for unabated coal-fired power.
- As much as possible, avoid the risk of emissions growth in the electricity sector and natural gas lock-in for electricity generation and home heating.
  - For natural gas electricity generation, establish a natural gas GHG emissions performance standard under CEPA.
  - For home heating, provide a one-stop shop information source for consumers and contractors on alternative home heating technologies, including heat pumps.
- Incorporate the requirement to consider the “best possible option” for decarbonization under the Canadian Environmental Assessment Act (CEAA). Further, ensure the federal government evaluates the economic and climate viability of all proposed projects in a domestic and global policy context consistent with the Paris Agreement.
- Coordinate with provinces on economic and environment assessment for transmission grid modernization projects, including storage and smart grid infrastructure. Further, supply funding for grid improvements that support integration and optimal dispatch of renewable generation nationally and within North America.
- Coordinate the development of best practices and model guides for energy regulators, including in rate setting to encourage performance-based rate setting in support of increased renewable energy, energy efficiency, time-of-use pricing, storage and frequency investments.
- Establish federal funding criteria that would include the following principles:
  - Integrate federal-provincial agreements that secure long-term low carbon electrification;
  - Maximize renewable energy supply;
  - Incorporate lifecycle environment and economic assessments of infrastructure investments;
  - Consider the full carbon cost assessment of infrastructure investments;
  - Ensure governments are approving the best available technology solutions, to support Canada’s decarbonization process.
- Commit to federal procurement policies that support implementation of the electrification strategy and build on Procurement Canada’s recent commitment to purchase 100% clean energy by 2025.
- Work with First Nation, Métis and Inuit communities to develop and support Indigenous-led community electrification strategies.
- Fully integrate up-skilling, training and education programs to ensure adequate supply of skilled tradespeople and professionals to implement the electrification strategy.

Specific plans and policies in the areas of transportation, buildings, industrial processes, and electricity supply will also be needed.

## **Transportation<sup>8</sup>**

The transportation sector is currently responsible for 23 per cent of Canada’s GHG emissions and offers tremendous opportunities for significant emissions reductions. To reduce emissions in the transportation sector, Canada needs to drive a transition towards zero and low-emissions transportation

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<sup>8</sup> This section adapted from Équiterre et al. (2016). “Reducing GHG Emissions in Canada’s Transportation Sector: Submission to the Mitigation Measures Working Group, Pan-Canadian Framework on Climate Change and Clean Growth.”

modes, increase the use of cleaner fuels in Canada, increase public transit ridership, and encourage denser, mixed-use communities.

A coordinated policy package would drive long-term technological innovation in the transportation sector and further reduce the cost of future GHG emissions reduction. Its goals would be to:

- Maximize GHG emission reduction from federal investment in public transit; any federal funding for public transit be conditional upon meeting the following climate criteria:
  - Achieve the greatest GHG reduction at the lowest cost,
  - Encourage high-density development,
  - Ensure adequate operation and maintenance (O&M) funding to maintain quality of public transit, and
  - Support the electrification of transit.
- Encourage mode-shifting in personal transportation; the federal government should:
  - Establish a fourth infrastructure fund dedicated to supporting active transportation projects (walking and designated cycling paths) to support multiple modes of transportation,
  - Develop a biennial national benchmarking report, mandated by Transport Canada, that tracks progress in such areas as cycling and walking infrastructure (dedicated bike lanes, paths, trails, etc.), integration with transit hubs and corridors, cycling policies, and public health and safety indicators, in order to guide additional investments in walking and cycling infrastructure, and
  - Coordinate federal, provincial and municipal policies to promote auto-share programmes, such as minimum dedicated free-parking spaces for car sharing services (in both private and public institutions), and coordinate funding for infrastructure to support the electrification of the car share fleet (e.g. charging stations).
- Implement complementary federal and provincial policies to increase the share of zero-emission vehicles (ZEV) sold in Canada, including:
  - A federal zero-emission vehicle legislation, similar to that in California,
  - An increase in the federal excise tax on fuel-inefficient vehicles to finance a fee-bate program for ZEV purchases, and
  - Complementary federal and provincial funding to support a network of EV charging stations across Canada.
- Reduce the carbon intensity of all vehicles in Canada; the federal government should:
  - Implement a national Low Carbon Fuel Standard (LCFS) in Canada - a legislated intensity target (measured in grams of carbon dioxide equivalent [CO<sub>2</sub>e] per megajoule [MJ] of energy) for all transportation fuels sold in Canada. The national LCFS should require a 10 per cent decrease in CO<sub>2</sub>e intensity by 2020 and a 20 per cent decrease by 2030.
  - Reduce the CO<sub>2</sub>e per km travelled under the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations regulation by 10 per cent per year starting with 2018 models.
  - Reduce GHG emissions from the light and heavy freight sector in Canada by 40 per cent by 2025 through new stringent GHG emission regulations for light and heavy duty trucks, incentives for mode switching to lower carbon transportation modes and increased use of biodiesel.
- Implement exemplary government procurement in order to achieve a carbon-neutral federal public service, including :
  - Guidelines to reduce transportation needs and emissions associated with all federal public service activities,

- Safe bicycle parking spaces and showers for all federal workplaces,
- Requiring the fleet for all federal departments (e.g. all Ministers' cars) and agencies, including Canada Post, to be comprised entirely of EVs by 2030. The federal government should also install EV charging stations at all federal buildings and provide designated free parking spaces for EV drivers and auto-share programs at all federal workplaces,
- Providing incentives (through the Treasury Board of Canada), as part of the standard benefits provided to public service employees, to use car-share programs and public transit.

## **Buildings<sup>9</sup>**

In Canada, the total energy consumption of homes and buildings accounts for nearly a quarter of our national GHG emissions. In order for Canada to achieve its commitments under the Paris Agreement and its longer-term decarbonization goals, we must significantly reduce emissions from existing buildings and ensure that new buildings are designed for ultra low emissions. The buildings sector offers some of the lowest cost, most rapidly achievable GHG reductions. Furthermore, investing in the efficiency of Canada's building stock creates substantial co-benefits, including improved energy productivity and competitiveness, green jobs, and improvements to the quality and comfort of the places Canadians live and work.

As such, the federal government should undertake the following measures:

- Set national targets to signal the government's ambitious intentions and set the tone that will guide private and public investments necessary for market transformation, including research and development and training. These should include:
  - A national plan that sets the stage for deep energy retrofits (energy reductions of 25 to 50 per cent) for 30 per cent of the building stock by 2030, and
  - All new construction to be nearly zero energy by 2030.
- Create a system where reliable, comparable data for energy and water use in homes and buildings is available, so that energy reduction opportunities can be identified and owners and occupants can be motivated to improve the efficiency and desirability of their homes or buildings. An informed and skilled workforce is critical. Such a national plan should:
  - Support universal benchmarking and labelling across the country to expand market access to, and awareness of, building energy performance data. This includes continuing and enhancing federal support for national tools such as Energy Star Portfolio Manager, the EnerGuide Rating System, Energy Star for Homes and the R-2000 program, and the consideration and incorporation of new tools designed to reliably achieve ultra low emissions, such as Passive House.
  - Facilitate universal access for homeowners, building operators, and authorized third parties to secure, convenient, and consistent online utility consumption data, and
  - Provide support and funding for education and training of professionals and trades involved in retrofit and new construction projects.
- Progressively improve energy efficiency standards for new and existing buildings, and for the appliances and equipment used in buildings, including:
  - Update national building codes to achieve nearly zero energy new construction by 2030, and work with provinces to facilitate adoption of building codes,

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<sup>9</sup> This section adapted from Pembina Institute et al. (2016). Letter to Minister Jim Carr and Minister Catherine McKenna: A bold national action plan for energy efficient buildings.

- Develop or adapt national energy codes for major renovations of existing buildings, and
- Commit to long-term and continuous improvement of energy and water use performance standards for equipment and appliances, with appropriate consultation and notice for industry, and with consideration to harmonizing standards with the leading jurisdictions in North America.
- Incentivize private investment in renewable energy, energy efficiency and carbon reduction through strategic use of public funds. Financial incentives are a proven tool for accelerating investment in renewable energy and energy efficiency, both for new construction and retrofits, but public funds alone will not be enough to achieve the deep energy reductions required from the buildings sector. Programs will require using public dollars to leverage private investment and maximize impact. Projects with the highest carbon abatement potential should be prioritized and a price on carbon will help support the business case. The federal government should:
  - Provide strategic financial support, or support other levels of government, to incentivize and remove barriers to deep retrofits. For example, consumer rebates, supply chain incentives, and financing options, including on-bill financing and property-assessed financing (e.g. Property Assessed Clean Energy/Local Improvement Charges),
  - Pursue opportunities to leverage private capital through innovative mechanisms such as revolving loan funds, loan guarantees or other credit enhancements and consider creating a national green bank to administer such financing, or supporting other jurisdictions to do so, and
  - Reform tax policy to stimulate investment in efficiency, for example through tax credits and federal changes to deductibility rules to stimulate retrofitting.
- Lead by example and use public sector investments in public buildings to accelerate demand and innovation. The federal government owns or occupies over 27 million square meters of floor space, providing opportunities to model the pathway to deep emissions reductions across a range of building types and regions. The federal government should:
  - Require benchmarking and disclosure of public building performance.
  - Require new publicly-owned buildings to be built to near zero-energy, effective in 2017.
  - Upgrade public buildings through deep energy retrofits (>30 per cent energy reduction) at a rate that reduces total federal building emissions by 30 per cent by 2030.

### **Methane regulations<sup>10</sup>**

Methane, a climate pollutant with significantly worse short-term climate effects than carbon dioxide, currently represents 15 per cent of Canada's emissions inventory.<sup>11</sup> Of those emissions, approximately 48 per cent are generated in the energy sector. In fact, 40 per cent of these emissions are fugitive emissions from the oil and natural gas sector alone.<sup>12</sup> Recent analysis from ICF International demonstrates that the Canadian oil and gas industry can achieve a 45 per cent reduction in emissions of

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<sup>10</sup> This section adapted from Pembina Institute. (2016). Building a Pan-Canadian Climate Plan: Policy options to meet or exceed Canada's 2030 emissions target." Accessed at <https://www.pembina.org/reports/submission-pan-canadian-climate-change-working-groups.pdf>

<sup>11</sup> Environment and Climate Change. (2016). "National Inventory Report 1990-2014: Greenhouse Gas Sources and Sinks in Canada 2016." Part 3, Table A9-3.

<sup>12</sup> *Ibid.*



methane using low-cost, readily available control measures.<sup>13</sup> In addition, Canada has committed (with the U.S.) to regulate existing and new sources of methane in their oil and gas sectors to reduce emissions by 40 to 45 per cent below 2012 levels by 2025.<sup>14</sup>

Given this, the federal government should:

- **Introduce federal regulations that require methane reductions of 45 per cent below 2012 levels by 2025 for upstream oil and gas operations in Canada.** We recommend the federal government work with provincial and territorial governments to develop and implement a methane reporting system that tracks emissions from facilities by 2018
- **Work with provincial and territorial governments to ensure robust regulations are implemented.** The federal government should work with the provinces to ensure provincial regulations are robust, tailored to the strengths of each province, aligned across regulating jurisdictions, and implemented in a timely manner.
- **Re-assert Canada's global leadership.** Building on domestic policy commitments, discussions between Canada, the U.S. and Mexico are ongoing regarding a North American methane reduction goal. Were North America able to secure country-specific methane goals, backed by regulations, it would set an important example for global action to reduce oil and gas methane pollution. As such, we recommend Canada continue to demonstrate leadership in international fora by highlighting oil and gas methane reductions as an important global climate opportunity, and continue to advocate for comparable regulatory action in other oil and gas producing countries.

### Ensuring that infrastructure investment is green<sup>15</sup>

The federal government has initiated an ambitious new infrastructure program, with an emphasis on investments that will help Canada's economy transition to a low-carbon, climate resilient future. The government will need to develop new criteria to govern all infrastructure investments if its objectives are to be met. While some will advocate a business-as-usual or incremental approach to the federal infrastructure program, we firmly believe there are tremendous economic, social, and environmental opportunities associated with a transformational approach that draws on existing tools and decision-making models.

The federal government should therefore implement a three-screen approach for all infrastructure investments:

- **Full economic lifecycle cost assessment:** Remarkably, many government infrastructure projects fail to consider full lifecycle costs. Lifecycle costing should consider expected maintenance costs as well as the impacts of climate change such as more extreme weather. An approach that integrates natural infrastructure (wetlands, sloughs/swales, trees) with built infrastructure can mitigate the impact and cost of extreme weather such as flood and storm waters. And infrastructure built to

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<sup>13</sup> Environmental Defense Fund and Pembina Institute. (2015). "Economic Analysis of Methane Emission Reduction Opportunities in the Canadian Oil and Natural Gas Industries." Prepared by ICF International. Accessed at: <https://www.pembina.org/reports/edf-icf-methane-opportunities.pdf>

<sup>14</sup> The White House. (2016). "U.S.-Canada Joint Statement on Climate, Energy, and Arctic Leadership." Press release: March 10, 2016. Accessed at: <https://www.whitehouse.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>.

<sup>15</sup> This section adapted from Freeman, A. (2016). "New Economy Infrastructure: Proposal by representatives of Canada's clean-tech, agriculture and cement sectors."

accommodate uncertainty with respect to a future of changing and more extreme weather could save governments billions in repair and re-building costs. MIT, the Institute of Catastrophic Loss Reduction, and Engineers Canada, among others, are developing important tools to help decision makers integrate these considerations into the lifecycle costing of buildings and infrastructure investments.

- **Full carbon cost assessment:** Full lifecycle carbon accounting can minimize the climate impacts at each phase of a project's life. Accounting for carbon in any given infrastructure project would include:
  - Embodied carbon: carbon emitted as a result of material production, construction processes and waste,
  - Operational carbon: carbon emitted as a result of the functional use and maintenance of a project over its useful life, including how emissions are impacted by design considerations,
  - End of life carbon: carbon emitted as a result decommissioning, reuse, recycling and/or disposal, and
  - Carbon sequestered: through the restoration and enhancement of natural features (e.g. wetlands, sloughs, swales, buffers) for water quality and flood/storm water mitigation.
- "Best Available Solutions" assessment: Based on the Alternative Land Use Services model, project proponents should be required to undertake an analysis of whether the need associated with the infrastructure project can be met through a different type of infrastructure that performs better under one or both of the first two screens, using the analysis of a qualified expert. To name just a few examples drawn from recent government procurements:
  - An energy storage system would be a more cost-effective and less polluting option for back-up power than a diesel generating plant. Storage may offer similar types of savings as an alternative to building new transmission.
  - The cost of a water treatment facility may be reduced or avoided by employing less expensive natural infrastructure, such as maintaining wetlands upstream or paying farmers to use less polluting land management practices.<sup>16</sup> There are similar examples in the area of flood mitigation.<sup>17</sup>

While there is now an abundance of lifecycle data and tools, a lack of consistency in boundaries, methodologies and robustness can impede credible full lifecycle carbon assessments and sow confusion in the marketplace. These challenges could be overcome with a modest investment to integrate, refine and standardize a lifecycle carbon platform and fill in remaining lifecycle inventory information gaps. Work underway at MIT, the Athena Sustainable Materials Institute, the Risk Sciences Institute, among others, is already helping to amass lifecycle costing data and tools, making it easier to accommodate uncertainty around the impacts of any given project.

In terms of incorporating the three screens, the assessment should generally be undertaken through the Asset Management Plan process, according to consistent methodology that draws on the above-

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<sup>16</sup> For example, in 2010, Halifax Water avoided a \$150,000 upgrade at the Middle Musquodoboit Water Treatment Plant (built in 2009-2010 for \$2.2M) by working with a farmer. The farmer is compensated \$300 on an annual basis for modifying agricultural practices and for maintaining a wider riparian buffer. According to a World Resources Institution study, 6 U.S. cities saved 60% on water infrastructure by integrating natural and built infrastructure.

<sup>17</sup> World Resources Institute. (2017). "Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection in the United States."

mentioned sources. Assistance to undertake the three-screen assessment should be provided by the federal government, particularly for smaller municipalities.

### **Protecting biodiversity<sup>18</sup>**

One strategy that is often forgotten in the fight against climate change is the role that biodiversity protection can play in reducing GHG emissions, storing carbon, and increasing the resilience of natural and human systems in adapting to climatic changes. An important opportunity for reducing emissions in the near term is to reduce the emissions that result from the degradation of both marine and terrestrial ecosystems, and ensure that the significant carbon stocks remain stored. A longer term solution is to restore degraded ecosystems so that they can sequester and store more carbon. To achieve these goals, the federal government should work with its provincial counterparts to:

- Create a nationally consistent GHG accounting system that captures the emissions incurred when we degrade our ecosystems, and
- Implement regulatory practices that recognize the real emissions from all human activities, and create the right incentives for change.

The federal government should also implement nature conservation measures that give our ecosystems, and the species they contain, the best chance of adapting to climate change over time. Nature conservation measures will not only help our species and ecosystems adapt, but will also have benefits for Canadians. By protecting our ecosystems from degradation they will be better able to buffer the impacts of climate change, for example by ensuring that ecosystems continue to provide services related to air and water quantity and quality. Likewise, Canadian estuaries, shores and coastal waters provide a range of critical ecosystem services, such as providing habitat for marine species and supporting productive fisheries, while also providing flood defenses and shoreline protection from wave and storm damage.

Finally, governments should develop and implement policies that encourage all decision-makers to consider nature-based solutions when developing mitigation and/or adaptation strategies.

There are a number of more specific recommendations for how the federal government can protect biodiversity for both the significant benefits that that creates for Canada and the world, while also helping to help climate change. It should:

- Develop high level principles for the Pan-Canadian Climate Change Strategy on protecting biodiversity, Indigenous peoples' rights, and good governance,
- Include emissions from terrestrial and marine ecosystem degradation into GHG accounts and regulatory programs across Canada:
  - Improve GHG accounting rules to better capture and regulate emissions caused by ecosystem degradation,
  - Include emission reduction and biodiversity conservation goals into Environmental Impact Assessments, Strategic Environmental Assessments and/or Cumulative Effect Assessments,
  - Phase out subsidies that drive unnecessary land and marine use emissions, and instead use this funding to promote sustainable management practices and protect ecosystems, and

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<sup>18</sup> This section adapted from Canadian Parks and Wilderness Society. (2016). Letter to Environment Minister Catherine McKenna.

- Do not assume carbon neutrality when looking at biomass for energy.
- As an adaptation measure, protect and restore our terrestrial and marine ecosystems:
  - Plan and implement a well-designed, well-managed interconnected network of protected areas on land and sea to enable ecosystems and people to adapt to climate change,
  - Earmark adaptation funding for conserving ecosystems and creating connectivity,
  - Incorporate climate change considerations into all species at risk activities, including the development of recovery plans for species at risk, as well as other management plans for native species, and implement them,
  - Improve the resilience of ecosystems and increase their adaptation and mitigation potential by keeping working land and seascapes closer to their natural conditions,
  - Identify and incorporate support for adaptation measures on working forest landscapes,
  - Implement marine industry mitigation and adaptation activities, and
- Promote the use of nature-based adaptation measures.

## **Conclusion**

There are clearly many measures that can be taken in a number of areas and sectors to combat climate change. Though the list may be daunting, the recommendations provided in this brief are based on significant research and lessons learned from best-practices implemented elsewhere. A comprehensive approach to fight climate change—addressing all the major sources of GHG emissions and seizing the many opportunities for adapting to the impacts of climate change—is the surest way to achieve success.

Many measures will actually save money for individual Canadians and the country as a whole, even before one considers the positive impact on climate change and environmental protection. That includes the reduction of government subsidies for coal, oil, and natural gas; all the measures to improve the energy efficiency of our buildings and decrease fuel consumption in transportation; and many of the measures to move towards cleaner sources of energy. And there is a significant body of research that clearly shows that the costs of taking action on climate change far outweigh the costs of doing nothing, because of the incredible costs and impacts of climate change.

The federal government has an opportunity over the coming months to be ambitious in its approach to climate change. After a decade of lost opportunities, Canada can finally get on track to addressing this most urgent of global issues while also improving the quality of life for Canadian and ensuring that we are not leaving this tremendous burden on our children and grandchildren.

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