



# Acting on Climate Change: Extending the Dialogue Among Canadians

A collection of texts in response to

*Acting on Climate Change:  
Solutions from Canadian Scholars*,

a consensus document released in March 2015





## ABOUT THE ORGANIZATION

# WWF-CANADA

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WWF (World Wildlife Fund) is Canada's largest international conservation organization with the active support of more than 150 000 Canadians. We connect the power of a strong global network to on-the-ground conservation efforts across Canada, with offices in Vancouver, Prince Rupert, Toronto, Ottawa, Montreal, Halifax, St. John's, Iqaluit and Inuvik. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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DESCRIPTION: SOLAR PANELS AT STUDENTS ON ICE BASE CAMP, LABRADOR, CANADA

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# Transitioning to a Renewable Energy Economy

That Respects Nature and Supports Community Well-being

WWF-Canada supports the policy recommendations in the Sustainable Canada Dialogues *Acting on Climate Change: Solutions from Canadian Scholars* report, which provide economically viable solutions for controlling climate change in Canada. To avoid the very worst impacts of climate change, the world needs to shift from an unsustainable energy paradigm to a future powered entirely by renewable energy. Global greenhouse gas (GHG) emissions need to be cut by at least 80% by 2050 as the world transitions to 100% renewable energy. Making such a transition is not only achievable, technically and economically, but will be instrumental in reducing risk and the costs of adaptation to climate change<sup>1</sup>.

Energy is a key driver of any economy, and renewable energy is a fundamental component of a low-carbon economy. At WWF-Canada we fully support the transition to a low-carbon economy and are intent

on identifying and supporting renewable energy options that have the least possible impact on natural systems. Moving away from fossil fuels presents an opportunity to ensure that renewable energy installations not only drastically reduce carbon emissions but also support the ecological integrity of freshwater, terrestrial and marine systems in Canada from coast, to coast, to coast. This approach is referred to as "habitat-friendly renewables".

Three operational requirements should shape the transition to a low-carbon economy based on the transition to 100% renewable sources of energy.

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## 1. Making the essential shift to habitat-friendly renewable energy in Canada

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It is counterproductive and misleading to assume that safeguarding nature and building economic prosperity are mutually exclusive objectives. Investing in development pathways that protect nature and secure a resilient supply of ecological goods and services contributes to social and econo-

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<sup>1</sup> WWF International (2011). The Energy Report: 100% Renewable by 2050, [http://wwf.panda.org/what\\_we\\_do/footprint/climate\\_carbon\\_energy/energy\\_solutions22/renewable\\_energy/sustainable\\_energy\\_report/](http://wwf.panda.org/what_we_do/footprint/climate_carbon_energy/energy_solutions22/renewable_energy/sustainable_energy_report/)

mic stability. It does this by increasing the range of response options society has when change and uncertainty require adaptive action to the threats of climate change.

Due to the relatively low density of renewable energy sources compared to fossil fuels, the area of land and water required to generate equivalent energy production is much greater. Potential landscape effects of renewable energy development should be a primary consideration when planning where and how new energy projects should proceed. Additionally, how we protect nature and retain elements such as ecosystem services, community needs, and cultural values are important factors that need to be considered.

Many jurisdictions around the world have already begun to make significant gains in renewable energy capacity, and through that progression have developed decision-making frameworks to guide where such projects should be located, including criteria to protect ecological values. Best practices for integrating biodiversity considerations in renewable energy development have been demonstrated in Scotland<sup>2,3</sup>, Rhode Island<sup>4</sup> (United States) and the Six Southwestern States initiative conducted by the Bureau of Land Management<sup>5</sup> in the United States. These jurisdictions have the most robust frameworks for identifying relevant wildlife and ecosystem values, as well as associated mapping exercises to identify areas of avoidance or concern due to overlapping values.

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2 Scottish Natural Heritage (2014). Planning for development: What to consider and include in Habitat Management Plans, <http://www.snh.gov.uk/docs/A1187660.pdf>

3 Scottish Natural Heritage (2009). Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage, <http://www.snh.gov.uk/docs/A247182.pdf>

4 Rhode Island Renewable Energy Siting Partnership (2012). Volume II - Technical Reports, [http://www.crc.uri.edu/download/resp\\_volume\\_2\\_final.pdf](http://www.crc.uri.edu/download/resp_volume_2_final.pdf)

5 Bureau of Land Management (2012). Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States, [http://solareis.anl.gov/documents/docs/Solar\\_PEIS\\_ROD.pdf](http://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf)

Another approach is the application of spatial planning using the High Conservation Value (HCV) framework, which is best known from its application in the industry-led Forest Stewardship Council (FSC) certification process for responsible management of forest resources. The HCV framework can provide a consistent methodology that addresses many of the shortfalls in current industry practice, and can defensibly be used to identify areas of significant ecological value that should be avoided by renewable energy development. Essentially this is about ensuring that renewable energy installations occur in the right place, with minimal impacts to species diversity, habitats, ecosystem services, community needs, and cultural values. For example, near the village of Chaurikharka in Nepal, WWF installed a micro-hydroelectricity system as the demand for cooking and heating wood led to deforestation in the area. Water was diverted from a stream to run a generator and back into the stream, with minimal impact. More than 100 households in six villages now use hydroelectricity for cooking, refrigeration and heating. Four more similar schemes are now operating in the area, saving hundreds of tons of fuel wood and improving daily life. Well-planned renewable energy projects such as this can alleviate pressure on natural systems, conserving forests, the biodiversity they hold and their value as carbon sinks, all while making life better for people<sup>6</sup>.

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## 2. Continue to reduce Canada's economic dependence on fossil fuel export

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Canada has benefited economically from the development of its abundant oil and gas resources, including the controversial oil sands. The oil and gas sector, including extraction, refining and transportation, accounts

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6 WWF International (2011). The Energy Report: 100% Renewable by 2050, [http://wwf.panda.org/what\\_we\\_do/footprint/climate\\_carbon\\_energy/energy\\_solutions22/renewable\\_energy/sustainable\\_energy\\_report/](http://wwf.panda.org/what_we_do/footprint/climate_carbon_energy/energy_solutions22/renewable_energy/sustainable_energy_report/)

for 10% of Canada's GDP and a quarter of the country's exports<sup>7</sup>. Can Canada's economy cope with the loss of capital investment, jobs, royalties and taxes were we to move away from fossil fuels? It's a good question.

In fact, it's an urgent question. The sector's relative share of GDP fell by 20% between 1997 and 2011. Its shares of taxable corporate income, total taxes paid and royalties as a share of the Alberta government's income has fallen by as much as 55%<sup>8</sup>. And these trends appear likely to continue, because the industry is less profitable now than it was in the past. Statistics Canada figures show that profit margins in the sector fell from 21.5% to 8.5% between 2005 and 2011<sup>9</sup>, well before the dramatic decline of the price of oil in 2014<sup>10</sup>. Canada's economy is already becoming less dependent on fossil fuels.

Fortunately, Canada is rich in renewable energy resources, and their contribution to the national economy is growing fast. Last year, for the first time, there were more direct jobs in renewable energy than in the oil sands. At the global level, the International Energy Agency (IEA) projected in 2013 that renewable energy will surpass energy generation from gas and nuclear by 2016. In fact, by 2018, renewables will comprise at least 25% of the world's energy mix<sup>11</sup>.

7 The Energy Sector [T016] accounted for \$158 399 million of \$1 653 690 million or just over 9.5% of the Canadian economy [T001] in February this year. It is just under 25% of exports: Statistics Canada. Table 379-0031. Exports of goods on a balance-of-payments basis, by product, <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/gblec04-eng.htm>

8 These figures follow the analysis by Andrew Leach, University of Alberta, presented in Canada, the Failed Petrostate? Macleans, November 2013, <http://www.macleans.ca/economy/economicanalysis/canada-the-failed-petrostate/>

9 Statistics Canada. Table 179-0004. Corporations Returns Act (CRA), major financial variables, <http://www5.statcan.gc.ca/cansim/a26?id=1790004&pattern=&p2=37&stByVal=1&p1=1&tabMode=dataTable&paSer=&csid=&retrLang=en&lang=eng>

10 West Texas Intermediate five-year price chart, <http://www.nasdaq.com/markets/crude-oil.aspx?timeframe=5y>

11 International Energy Agency (2012). Medium-Term Re-

Wind energy is one of the fastest growing major sources of new electricity around the world. Canada had an exceptional year in 2014 for wind energy development, ranking sixth globally in terms of new installed capacity. The Canadian Wind Energy Association (CanWEA) believes that at least 20% of Canada's energy production should come from wind power, which will generate \$79 billion in investment, create over 52 000 good green jobs and deliver over \$165 million annually to municipalities<sup>12</sup>.

The Canadian Solar Industry Association (CanSIA) is equally optimistic about Canada's leadership in solar capacity. The solar sector globally is outpacing every other sector and the IEA predicts a 27% energy market share by 2050. CanSIA forecasts the Canadian solar industry by 2020 will employ around 10 000 per year with "the majority in construction and manufacturing, followed by operations and maintenance jobs"<sup>13</sup>.

Accomplishments in Germany, Denmark, Norway, and other European countries provide examples of how Canada can scale up its current initiatives to meet the scale of the transition needed. For example, the energy technology sector in Denmark accounts for 11% of the country's total manufacturing economy. Design, manufacturing and service-based jobs in the country's wind sector were close to 30 000 in 2009. In Germany, renewable energy sector employment was placed at 381 600 in 2011, again in the direction of value-added design and manufacturing activities<sup>14</sup>.

newable Energy Market Report, <http://www.iea.org/newsroomandevents/pressreleases/2013/june/renewables-to-superpass-gas-by-2016-in-the-global-power-mix.html>

12 <http://canwea.ca/wind-energy/national/>

13 Canadian Solar Industry Association (2014). Roadmap 2020, Powering Canada's Future with Solar Electricity, [http://cansia.ca/sites/default/files/cansia\\_roadmap\\_2020\\_final.pdf](http://cansia.ca/sites/default/files/cansia_roadmap_2020_final.pdf)

14 Winfield, M. (2013). Understanding the Economic Impact of Renewable Energy Initiatives: Assessing Ontario's Expe-

Clearly, the inevitable transition to a low-carbon sustainable society will be a primary economic driver in Canada. For example, the province of Alberta's investment in wind energy has increased income for rural landowners, new tax revenues, and employment opportunities for trades people and contractors. These benefits increase the capacity of local communities to adapt to change by reducing their exposure to volatile fossil fuel prices as a result of demand issues, diversifying skills and knowledge of the local workforce, increasing access to local jobs (injecting local economic stability), and building family income and wealth through reduced costs to electricity consumers. In Paintearth County the area has benefited from the creation of 16-18 full time permanent jobs, and \$40 million in tax revenue generated over the 25-year life of the project. At the peak of construction 270 jobs were required and local hiring was a priority. The municipal district of Pincher Creek injected \$12 million into the local economy during construction, which contributed \$1.2 million in annual tax revenue to help fund new community services and infrastructure, \$500 000 per year in local landowner royalty payments, and eight full-time permanent jobs<sup>15</sup>.

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### **3. Replace aging and retiring fossil fuel electricity generation facilities with renewable options**

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According to the National Energy Board of Canada, between 2005 and 2035, close to 12 gigawatts of Canada's aging electricity

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rience in a Comparative Context, York University, <http://sei.info.yorku.ca/files/2012/12/Green-Jobs-and-Renewable-Energy-July-28-2013.pdf>

<sup>15</sup> Canadian Wind Energy Association (2014). Wind. For My Community. Providing clean, affordable power, new local jobs and investments for Alberta, <http://canwea.ca/wp-content/uploads/2014/01/canwea-AB-brochure-e-web-v1.pdf>

generation facilities will come offline and more than 40 gigawatts of new generation capacity will come online. As expected, the bulk of the retirements will be coal-fired power plants. Natural gas (which is, on average, only 50% cleaner than coal) is currently projected to account for the bulk of new generation capacity over the next two decades, reaching 22% of Canada's installed capacity by 2035<sup>16</sup>.

Replacing decommissioned coal-fired power plants with brand new natural gas plants will lock in fossil fuel electrical generation and carbon emissions for decades. The retirement of aging fossil fuel assets represents an exceptional opportunity for renewables. Since Canada's total electricity generation capacity is projected to increase by only 1% per year over the next two decades, it is a reasonable goal, particularly if we invest in energy conservation and efficiency.

Canada must become a model for demonstrating that it is possible to make the shift to 100% renewable. And we must do this in a way that preserves ecological integrity in freshwater, terrestrial and marine systems while maintaining economic prosperity and societal wellbeing. Canada has not made notable progress towards meeting emission reduction commitments. We now have an opportunity to take a leadership position and join other nations who are seeking a solution to climate change in Paris later this year at the World Climate Summit. Let's address this urgency and make every decision count!

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<sup>16</sup> National Energy Board (2013). Canada's Energy Future 2013 – Energy Supply and Demand Projections to 2035 – An Energy Market Assessment, <https://www.neb-one.gc.ca/nrg/ntgrtd/ftr/2013/index-eng.html>



## ABOUT THE INITIATIVE

# SUSTAINABLE CANADA DIALOGUES

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This contribution is part of a collection of texts, *Acting on Climate Change: Extending the Dialogue Among Canadians*, stemming from interactions between Sustainable Canada Dialogues, an initiative of the UNESCO-McGill Chair for Dialogues on Sustainability, and business associations, First Nations, non-governmental organizations, labour groups, institutions, organizations and private citizens.

Sustainable Canada Dialogues is a voluntary initiative that mobilizes over 60 researchers from every province in Canada, representing disciplines across engineering, sciences and social sciences. We are motivated by a shared view that putting options on the table will stimulate action and is long overdue in Canada.

Together, the contributions enrich the scope of possible solutions and show that Canada is brimming with ideas, possibilities and the will to act. The views expressed in *Acting on Climate Change: Extending the Dialogue Among Canadians* are those of the contributors, and are not necessarily endorsed by Sustainable Canada Dialogues.

We thank all contributors for engaging in this dialogue with us to help reach a collective vision of desired pathways to our futures.

FOR MORE INFORMATION, VISIT OUR WEBSITE

[sustainablecanadadialogues.ca/en/scd/acting-on-climate-change](http://sustainablecanadadialogues.ca/en/scd/acting-on-climate-change)