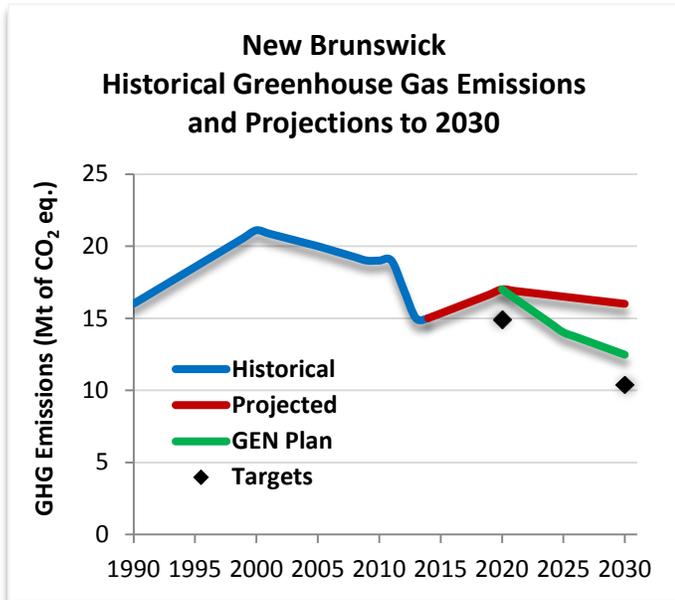


# One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

## Green Economy Network Platform: A Roadmap Toward 23,478 Jobs for New Brunswick



Source: Environment and Climate Change Canada<sup>1</sup>

The Green Economy Network (GEN) has calculated that New Brunswick could create 23,478 person-years of employment over a five-year period through a total public investment of \$1.73 billion in energy efficiency and conservation, renewable energy, and public transit. In addition, targeted public investment in these three priority areas will reduce New Brunswick's annual greenhouse gas (GHG) emissions by up to 4.5 megatonnes (Mt). This action plan will help to transition the province to a lower-carbon economy, create a healthier environment, and strengthen communities, while reducing poverty and inequality.<sup>2</sup>

### Unemployment

In 2016, New Brunswick had an annual average of 37,100 unemployed workers and an annual average unemployment rate of 9.5%, the third highest average annual unemployment rate of any province and the fourth highest in the country.<sup>3</sup>

### Emissions

New Brunswick's total GHG emissions were 14.9 Mt in 2014, which represents 2.0% of total national annual GHG emissions.<sup>4</sup> While the province's contribution to national emissions is low, New Brunswick has the fifth highest emissions per capita in Canada.<sup>5</sup>

Although there has been an overall reduction in GHG emissions in New Brunswick in recent years, industrial and transportation emissions have increased. If New Brunswick carries on "business as usual," the trend of provincial GHG reductions could reverse, resulting in an increase of almost 18 Mt by 2020, 10% higher than 1990 levels.<sup>6</sup>

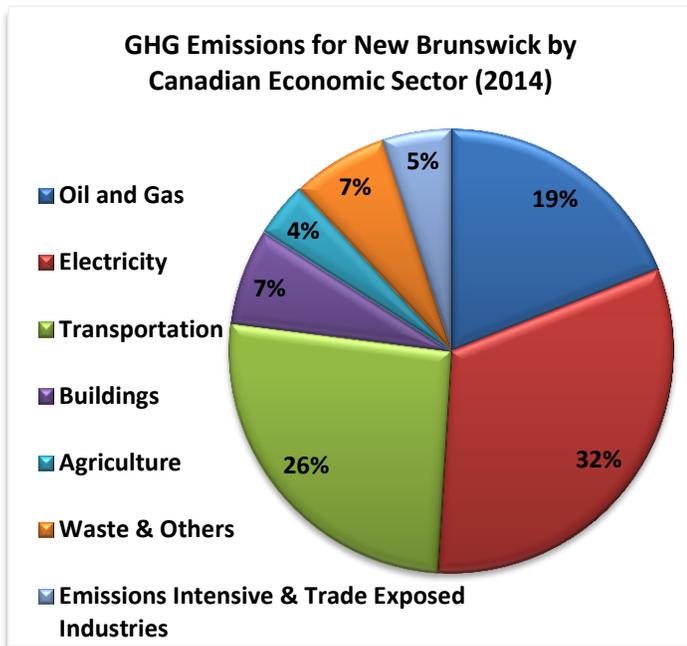
New Brunswick has committed to reducing GHG emissions over the coming decades. Under the province's climate change action plan, *Transitioning to a Low-carbon Economy*, New Brunswick has committed to achieving GHG reduction targets of 35% below 1990 levels by 2030; and 80% below 2001 levels by 2050.<sup>7</sup>

Achieving these targets is essential, as the impacts of climate change are already taking place in New Brunswick: average annual temperatures have increased by 1.5°C in the past century, with the majority of this warming occurring over the last 30 years.<sup>8</sup>

### Summary of Calculations for New Brunswick

	\$Billions Invested Over 5-Year Period	Total Person-Years Created	GHG Emission Reduction (Mt CO <sub>2</sub> eq)
Renewable Energy	\$0.779	10,019	2.6 - 3.7
Energy Efficiency (incl. building retrofits)	\$0.75	10,950	0.2 - 0.6
Public Transit (improvement and expansion)	\$0.198	2,509	0.18 - 0.23
<b>5-Year TOTALS</b>	<b>\$1.73</b>	<b>23,478</b>	<b>2.98 - 4.53</b>

## One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit



Source: Environment and Climate Change Canada<sup>9</sup>

### Energy Efficiency and Conservation

Energy efficiency and conservation are our cleanest, cheapest and most productive methods for reducing GHGs, yet the vast majority of buildings in New Brunswick have not been retrofitted. Energy efficiency is a smart investment that can be started immediately, using existing skills and technologies, to create jobs and save money.

Other than Saskatchewan and Manitoba, New Brunswick has one of the highest energy intensities in Canada.<sup>10</sup> This is likely due to the province's industrial structure and cold climate, which make it highly energy-intensive. Nearly 60% of New Brunswick's housing stock was built during the 1970s and 80s, and a significant amount (15%) was built before 1946.<sup>11</sup>

Although the Government of New Brunswick has been offering generous energy efficiency programs, such as the Smart Habits Rebate Program and the Residential Energy Efficiency Program, over 86% of the province's housing stock is still in need of retrofits.<sup>12</sup>

Over 71% of homes in need of energy efficiency retrofits were built before 1980.<sup>13</sup> Generally speaking, newer homes use less energy per square meter than older homes. Houses built between 1946 and 1980 use significantly more energy per square meter than homes built after 1996. Investing in retrofitting the province's older housing stock will save a significant amount of energy, reduce GHG emissions, create opportunities to complete apprenticeships, and generate employment.

In addition to improving energy efficiency in New Brunswick's housing stock, there are major financial savings to be gained by retrofitting the province's industrial, commercial, and public buildings. Mitigation strategies in residential and commercial buildings can avoid building-related GHG emissions. The cost of these mitigation strategies is offset by lower utility bills, and in the end, homeowners and businesses save money.

Atlantic Canada has the highest incidence of energy poverty of any region in Canada as of 2013. Almost 21% of households are considered to be energy poor based on their within-the-home energy expenditure. Energy poverty in Atlantic Canada has grown by over 20% since 2010, when 17.1% of households were energy poor.<sup>14</sup>

Investing in energy efficiency and retrofitting programs can reduce energy poverty by lowering electricity bills in response to energy savings, freeing up capital and discretionary income.

**Targeted public investment of \$750 million in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, could generate 10,950 person-years of employment in New Brunswick and reduce annual GHG emissions by up to 0.6 Mt.**

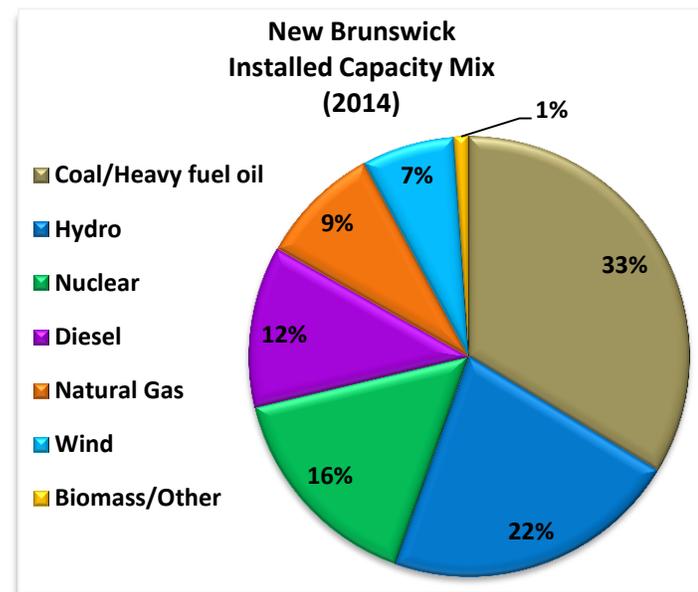
## One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

### Types of Jobs in Energy Efficiency and Conservation:

- Architect
- Boilermaker
- Carpenter
- Civil Structural Engineer
- Community and Social Services
- Construction Equipment Operator
- Construction Labourer
- Education and Health Services
- Electrical Engineer
- Electrician
- Energy Efficiency Auditor
- HVAC Installer
- HVAC Technician
- Ironworker
- Office and Administrative Support
- Pipefitter
- Plumber
- Roofer
- Service Industry Occupations
- Steelworker
- Weatherization Installer/Technician

### Renewable Energy

New Brunswick's new climate change action plan, *Transitioning to a Low-carbon Economy*, has committed to phase-out coal as a source of electricity and to invest in smart grid and renewable electricity technologies.<sup>15</sup>



Source: Natural Resources Canada<sup>16</sup>

New Brunswick has tremendous potential to develop additional renewable energy capacity and make substantial contributions to the energy supply. The province also has the opportunity to profit from additional energy exports to neighbouring markets that have also set GHG reduction targets.

New Brunswick has the third highest offshore wind potential in all of Canada, and has the fourth highest renewable potential in tidal and wave energy, totaling over 6.19 terawatt-hours a year (TWh/yr) of net capacity.<sup>17</sup> New Brunswick's proximity to the coastline and isolated ridges provide the region with an abundance of wind energy resources and the opportunity to further expand and diversify the province's energy mix.<sup>18</sup>

Although the amount of renewable energy on New Brunswick's grid hit record highs in 2015-2016, increasing from a 29% to a 42% share of total installed electrical capacity, the province has yet to take full advantage of its renewable potential. The province currently has no installed capacity in tidal and wave energy, which would help to reach New Brunswick's renewable energy and GHG emissions reduction targets while creating employment opportunities.

The majority of the increase in renewable energy capacity in 2015-2016 came from wind energy, which accounts for 7% of the province's installed electrical capacity.<sup>19</sup> In the future, wind power has the potential to play an even greater role, including through New Brunswick's aggressive strategy to produce up to 4500 MW of wind energy by 2025. An installment of 4500 MW means New Brunswick would be the sixth largest producer of wind energy in the world, according to 2007 installed capacity levels.<sup>20</sup> As of 2015, the province produced 294 MW of wind energy, accounting for only 6% of this target.

Transitioning to a lower-carbon economy will require an increase in electrification. This electricity must be derived from renewable sources to reach the level of decarbonization required for New Brunswick to meet its emissions reduction targets. The transition to a renewable energy economy must be a Just Transition that respects the rights of Indigenous Peoples, revitalizes communities, and ensures that workers in carbon-intensive industries are protected and able to support their families.

## One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

**With a total public investment of \$779 million in renewable energy – including investments in modernizing electricity infrastructure, such as smart grids and microgrids, and large-scale and small-scale energy storage systems - GEN has calculated that 10,019 person-years of employment could be created over five years. In addition, this investment will result in an annual GHG emission reduction of up to 3.7 Mt.**

### Types of Jobs in Renewable Energy:

- Boilermaker
- Community and Social Services
- Construction Worker
- Drilling Equipment Operator
- Education and Health Services
- Electrician
- Engineer
- Excavator
- Heavy Equipment Operator
- Ironworker
- Land Surveyor
- Machinist
- Mechanic
- Office and Administrative Support
- Pipefitter
- Plumber
- Service Industry Occupations
- Scientist
- Sheet Metal Worker
- Steelworker
- Surveyor
- Welder

### Public Transit

Nearly one-third of GHG emissions in New Brunswick come from the transportation sector. Encouraging greater energy efficiency for all forms of transportation and shifting more commuters from private automobiles to public transit would go a long way toward reducing those emissions and shifting New Brunswick to a low-carbon economy.

Due to the fact that New Brunswick lacks high-density urban centers, mass transit has not been a focus for the province. However, mass transit does not require particularly dense or populous conditions to be viable, and even where intra-community mass transit is not practical, inter-community mass transit can still provide an attractive option.<sup>21</sup> Creating and expanding public and active transit services will result in positive social and economic impacts including improving health, improving road safety, reducing pollution, reducing transportation costs, and supporting local economic development.

New Brunswick has one of the lowest rates of urban transit ridership in Canada. Nearly 90% of workers in Moncton and Saint John commute by personal vehicle.<sup>22</sup>

Lack of adequate and affordable transportation services in New Brunswick is due to the fact that mass transit providers cannot afford to provide a high-quality system until it has the financial support of a large number of users. Therefore, how can community transit providers in New Brunswick offer effective public transportation when they do not have significant ridership? The answer for Saint John, Fredericton, and Moncton is relatively straightforward. All three of these cities can take advantage of the annual influx of university students. This system would give transit providers the initial revenue required to increase the number of stops and routes provided, as well as lowering the cost of transit fares for the rest of the community.<sup>23</sup>

In order to attract more people to make use of public transportation, the province must ensure that public transit is affordable and accessible, especially for low-income individuals, families, and workers. Implementing these priorities as part of a public transportation strategy will ensure that underserved communities and individuals – including (but not limited to) women, people of colour, Indigenous Peoples, youth and students, seniors, and persons with disabilities – will benefit from increased access to health services, education, recreation, and employment, including the employment opportunities that are created through the creation and expansion of transit services.

**With an investment of \$198 million in public transit - including investments in transportation demand management<sup>24</sup> - GEN has calculated that 2,509 person-years of employment would be created in New Brunswick. Targeted public investment in public transit will also reduce New Brunswick's annual GHG emissions by up to 0.23 Mt, with the potential for greater emissions reductions over time.<sup>25</sup>**

## One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

**Complimentary policies and regulations to reduce emissions from freight transport will create additional employment opportunities and further reduce emissions from the transportation sector.**

### Types of Jobs in Public Transit:

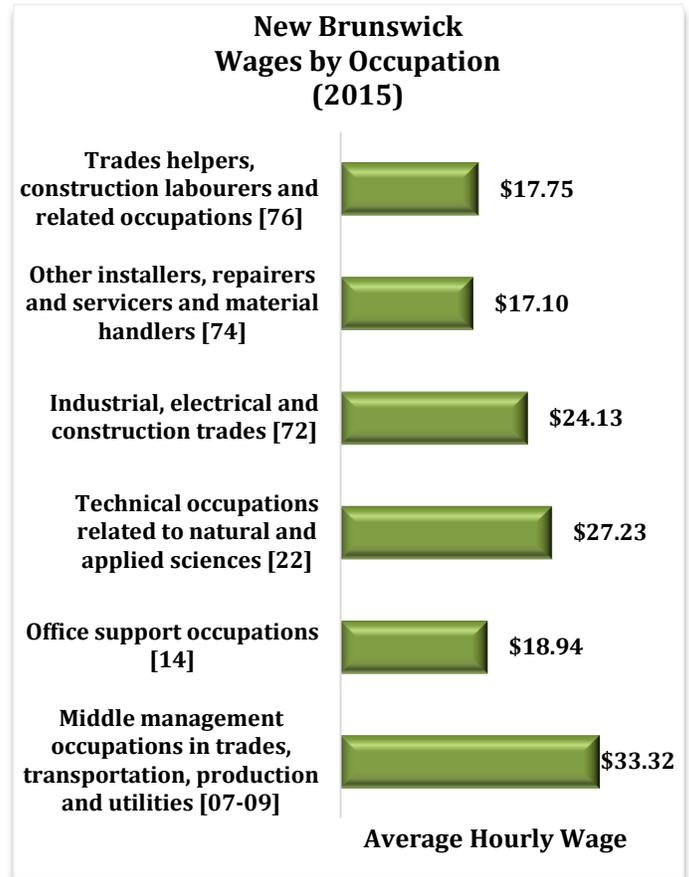
- Automotive Technician
- Bus and Transit Driver
- Civil Engineer
- Community and Social Services
- Construction Equipment Operator
- Construction Labourer
- Education and Health Services
- Electrician
- Industrial Engineer
- Machinist
- Mechanic
- Mechanical Engineer
- Metal Fabricator
- Office and Administrative Support
- Service Industry Occupations
- Transportation Planner
- Urban Planner
- Welder

### 23,478 Climate Jobs in New Brunswick

The transition to a low-carbon economy in New Brunswick could create 23,478 person-years of employment over five years while reducing annual GHG emissions by up to 4.5 Mt. The jobs that will be created from this transition are good jobs with good wages, across many sectors. The average hourly wage for a sample of these occupations is outlined in the graph to the right.

The proposals for public investment outlined in this plan must be complemented by a suite of policies aimed at reducing emissions and creating jobs. These policies should include targets for investment, GHG reductions, and job creation, and increase in ambition over time.<sup>26</sup>

The transition to a green economy in New Brunswick will require significant investments in major infrastructure projects. To ensure that the economic, environmental, and social benefits from investments in major infrastructure projects are accrued locally, Community Benefits Agreements (CBAs) should be included as part of all significant infrastructure projects. Depending on the infrastructure project, CBAs can provide benefits including employment, training, apprenticeships, local supplier and social procurement opportunities, neighbourhood improvement, and affordable housing.<sup>27</sup>



Source: CANSIM 282-0152

This plan for New Brunswick lays the foundation for tackling climate change while creating jobs. It also provides a strategy to address poverty and inequality. The proposals outlined in this plan will not only serve displaced workers from polluting industries, but will also create opportunities for workers from industries suffering the impacts of climate change, the unemployed, the working poor, as well as Indigenous Peoples, racialized communities, women, youth, LGBTI individuals, and persons with disabilities. Let's act now to make this plan for New Brunswick a reality, get people back to work, and give our children the future that they deserve.

# One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

<sup>1</sup> Government of Canada (2015). *New Brunswick : Environment Profile* <https://www.canada.ca/en/environment-climate-change/briefing/new-brunswick-environment-profile.html>

Environment and Climate Change Canada (2016). *Canada's Second Biennial Report on Climate Change* <https://www.ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1#BR-Sec5-1>;

Environment and Climate Change Canada (2016). *Greenhouse Gas Emissions by Province and Territory* <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=18F3BB9C-1>

<sup>2</sup> One person-year of employment is the equivalent of one full-time job for one year.

These are direct, indirect and induced jobs. The method for calculating job creation is based on the formula developed at the Center for American Progress, outlined in "Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy," [September, 2008]. The formula encompasses jobs created in three categories for each \$ one billion of investment: [i] direct employment in primary industries; [ii] indirect employment in secondary industries and suppliers; and [iii] induced employment in retail and service industries.

The investment of \$1.73 billion comes from a regional breakdown of the national One Million Climate Jobs Campaign, which is a total investment of \$80.9 billion over five years. The \$1.73 billion over five years (\$0.35 billion/year) cited for New Brunswick is the allocation of funding required for New Brunswick alone in relation to the total pan-Canadian investment. Green Economy Network has proposed that the annual investments be split 50/40/10 among federal, provincial, and municipal governments. The investment required for each province was calculated starting with the population as a base model and then adjusting the investment for each pillar (energy efficiency, renewable energy, and public transportation) based on regional differences.

Calculating GHG reductions is a work in progress. The calculations cited here [Mt = one million tonnes] are based on the formula used by federal government departments for every \$ one billion of public investment. Each calculation includes two figures. The first figure is based on observable evidence of GHG reductions resulting from these types of public investments so far, while the second figure is based on calculated predictions for GHG reductions in year 5 of the projects and beyond, taking into consideration numerous variables. Citing the low and the high of GHG reductions shows what could be anticipated.

<sup>3</sup> Statistics Canada (2017). *Average Annual Unemployment Rate Canada and Provinces 1976-2016* <http://www.stats.gov.nl.ca/statistics/Labour/PDF/UnempRate.pdf>; and

Statistics Canada (2017). *Labour force, employment and unemployment, levels and rates, by province* CANSIM, table 282-0002 <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/labor07a-eng.htm>

<sup>4</sup> Environment and Climate Change Canada (2016) National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada.

<sup>5</sup> Pembina Institute (2016). *Race to the Front: Tracking pan-Canadian climate progress and where we go from here* <https://www.pembina.org/reports/race-to-the-front-english-final1.pdf>

<sup>6</sup> Environment and Climate Change Canada (2015). *Canadian Provincial and Territorial Action Planning Status* - Internal Document, p.5

<sup>7</sup> Environment and Climate Change Canada (2015). *New Brunswick: Environment profile* <https://www.canada.ca/en/environment-climate-change/briefing/new-brunswick-environment-profile.html>

<sup>8</sup> Government of Canada (2016). *The Pan-Canadian Framework on Clean Growth and Climate Change*. <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html>

<sup>9</sup> Environment and Climate Change Canada (2016). *National Inventory Report 1990-2014: Greenhouse Gas Sources and Sinks in Canada*, Canada's Submission to the United Nations Framework Convention on Climate Change, Section 3.

<sup>10</sup> The Conference Board of Canada (2016). *Provincial and Territorial Ranking - Energy Intensity* <http://www.conferenceboard.ca/hcp/provincial/environment/energy-intensity.aspx>

<sup>11</sup> Canada Mortgage and Housing Corporation (2012). *Dwelling Condition by Tenure and Period of Construction, Canada, Provinces, Territories, and Metropolitan Areas, 2001, 2006, 2011* [https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data\\_008.cfm](https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_008.cfm)

<sup>12</sup> Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>; and

Canada Mortgage and Housing Corporation (2012). *Dwelling Condition by Tenure and Period of Construction, Canada, Provinces, Territories, and Metropolitan Areas, 2001, 2006, 2011* [https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data\\_008.cfm](https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_008.cfm)

<sup>13</sup> Statistics Canada (2011) *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>

<sup>14</sup> Fraser Institute (2016). *Energy Costs and Canadian Households: How much are we spending?* P.14

<sup>15</sup> Government of New Brunswick (2016). *News Release: Government releases new climate change action plan – Transitioning to a Low-carbon Economy* [http://www2.gnb.ca/content/gnb/en/news/news\\_release.2016.12.1180.html](http://www2.gnb.ca/content/gnb/en/news/news_release.2016.12.1180.html)

<sup>16</sup> Natural Resources Canada (2016). *New Brunswick's Electric Reliability Framework* <http://www.nrcan.gc.ca/energy/electricity-infrastructure/18832>

<sup>17</sup> Cornett, A. (2006). *Inventory of Canada's Marine Renewable Energy Resources*. National Research Council Canada: Canadian Hydraulics Centre <http://www.marinerenewables.ca/wp-content/uploads/2012/11/Inventory-of-Canadas-Marine-Renewable-Energy-Resources.pdf>

<sup>18</sup> Barrington-Leigh, C. P., & Ouliaris, M. (2016). *The renewable energy landscape in Canada: a spatial analysis* <http://wellbeing.ihsp.mcgill.ca/publications/Barrington-Leigh-Ouliaris-IAEE2015.pdf>

<sup>19</sup> New Brunswick Energy Institute (2015) *New Brunswick Energy Institute Hosts Round Table Meeting on Renewable Energy Opportunities*. <http://nbenergyinstitute.ca/search/node/renewable%20language%3Aen>

<sup>20</sup> Atlantica Centre for Energy (n.d.). *Wind Energy* [http://www.atlanticaenergy.org/wind\\_energy](http://www.atlanticaenergy.org/wind_energy)

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<sup>21</sup> Sodero, S. (2000). *The Potential for Mass Transit in NB* Ecology Action Centre Transportation Issues Committee <http://www.elements.nb.ca/theme/transportation/stephanie/sodero.htm>

<sup>22</sup> Statistics Canada (2011). *National Household Survey* <https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/2011003/tbl/tbl1a-eng.cfm>

<sup>23</sup> Sodero, S. (2000). *The Potential for Mass Transit in NB* Ecology Action Centre Transportation Issues Committee <http://www.elements.nb.ca/theme/transportation/stephanie/sodero.htm>

<sup>24</sup> The use of policies, programs, services and products to influence whether, why, when, where and how people travel. TDM measures help shape the economic and social factors behind personal travel decisions.

Transport Canada (2011). *Transportation Demand Management for Canadian Communities: A Guide to Understanding, Planning and Delivering TDM Programs* [https://www.fcm.ca/Documents/tools/GMF/Transport\\_Canada/TDMCanComm\\_EN.pdf](https://www.fcm.ca/Documents/tools/GMF/Transport_Canada/TDMCanComm_EN.pdf); and

Federation of Canadian Municipalities (2008). *Improving Travel Options with Transportation Demand Management (TDM)* [https://www.fcm.ca/Documents/tools/GMF/Improving\\_Travel\\_Options\\_with\\_Transportation\\_Demand\\_Management\\_EN.pdf](https://www.fcm.ca/Documents/tools/GMF/Improving_Travel_Options_with_Transportation_Demand_Management_EN.pdf)

<sup>25</sup> The emissions reductions cited here are the direct reductions. Indirect reductions from the promotion of compact development and an increase in urban density will result in up to four times the GHG reductions in the long-term

<sup>26</sup> For policy recommendation see:

Canadian Labour Congress (2016). *Green Jobs for Tomorrow*, Submission by the CLC to the Working Group on Clean Technology, Innovation and Jobs [https://d3n8a8pro7vhmx.cloudfront.net/broadbent/pages/5454/attachments/original/1480433751/Green\\_Jobs\\_For\\_Tomorrow\\_Report.pdf?1480433751](https://d3n8a8pro7vhmx.cloudfront.net/broadbent/pages/5454/attachments/original/1480433751/Green_Jobs_For_Tomorrow_Report.pdf?1480433751);

Green Economy Network (2016). *Making the Shift to a Green Economy: A Common Platform of the Green Economy Network* <http://greeneconomynet.ca/wp-content/uploads/sites/43/2014/07/GEN-Common-Platform-2016-EN1.pdf>; and

Green Economy Network (2016). *One Million Climate Jobs: A Plan for a Sustainable and Equitable Economy*, Submission to the Working Group on Clean Technology, Innovation and Jobs <http://greeneconomynet.ca/wp-content/uploads/sites/43/2016/07/GEN-Submission-Working-Group-on-Clean-Technology-Innovation-and-Jobs-July-2016.pdf>

<sup>27</sup> For more information on CBAs, see:

A. Galley (Mowat Centre, August 2015). *Community Benefits Agreements* <https://mowatcentre.ca/community-benefits-agreements/>

Toronto Community Benefits Network (2013). *Jobs and Opportunities through Community Investment* <http://www.communitybenefits.ca/>