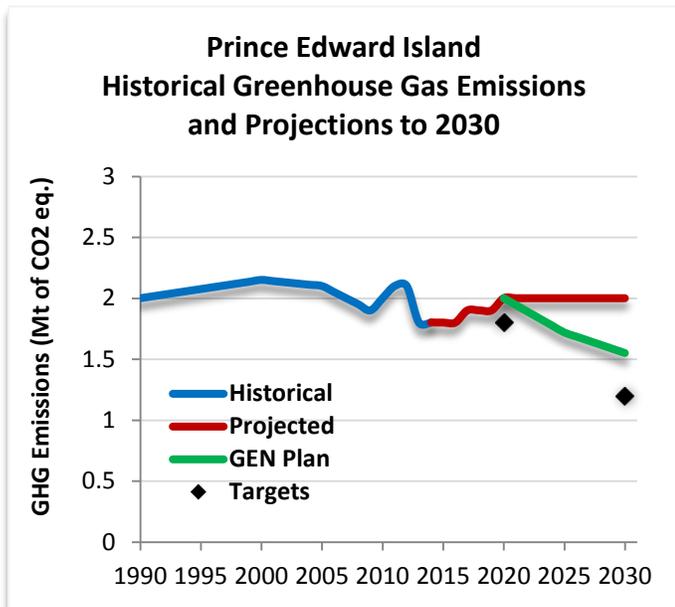


One Million Climate Jobs in Five Years: Renewable Energy, Green Buildings, and Public Transit

Green Economy Network Platform: A Roadmap Toward 9,766 Jobs for Prince Edward Island



Source: Environment and Climate Change Canada¹

The Green Economy Network (GEN) has calculated that Prince Edward Island could create 9,766 person-years of employment over five years through a total public investment of \$720 million in energy efficiency and conservation, renewable energy, and public transit. In addition, targeted public investment in these three priority areas will reduce PEI's annual greenhouse gas (GHG) emissions by up to 0.45 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.²

Unemployment

In 2016, PEI had an annual average of 8,600 unemployed workers and annual average unemployment rate of 10.7%, the second highest annual average unemployment rate of any province and the third highest in the country.³

Emissions

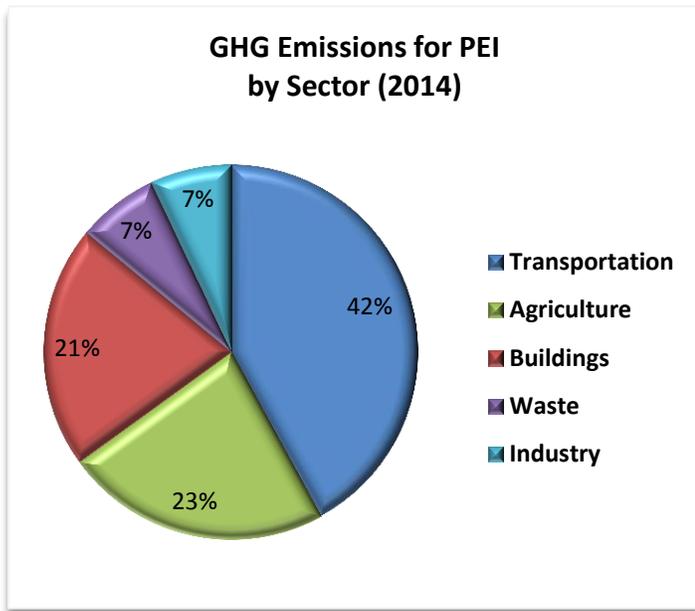
PEI's total GHG emissions were 1.8 Mt in 2014, representing 0.25% of the country's total emissions.⁴ PEI has committed to reducing GHG emissions over the coming decades. Under the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP) 2013 Climate Change Action Plan, the province has committed to achieving GHG **reduction targets of 10% below 1990 levels by 2020; and 35-45% below 1990 levels by 2030.**⁵

Climate change is an immediate concern for PEI. According to the Government of Prince Edward Island, temperatures are about 0.5 °C warmer than they were 100 years ago, with the majority of warming being observed in the winter. Concurrently, sea level has risen by 30 cm since 1911 and local scenarios suggest a sea level rise of 40 to 50 cm by 2050. Prince Edward Island has also been drier in recent years, with less rain and snow falling. Projections indicate that rain and snow precipitation will increase in intensity but decrease in frequency, which may adversely impact agriculture.⁶

Summary of Calculations for PEI

	\$Millions Invested Over 5-Year Period	Total Person-Years Created	GHG Emission Reduction (Mt CO ₂ eq)
Renewable Energy	\$354	4,550	0.06 - 0.13
Energy Efficiency (incl. building retrofits)	\$300	4,380	0.16 - 0.24
Public Transit (improvement and expansion)	\$66	836	0.06 - 0.08
5-Year TOTALS	\$720	9,766	0.28 - 0.45

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Source: PEI Dept. of Communities Land & Environment

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 Prince Edward Island 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. The cost of these mitigation strategies is offset by lower utility bills, resulting in homeowners and businesses saving money in the long term.

Buildings are one of the largest users of energy and one of the most significant contributors to PEI's GHG inventory, accounting for 21% of the province's emissions.

Although the provincial government has offered programs through Efficiency PEI, along with other rebate and incentive programs, 82% of the province's housing stock is still in need of retrofits.⁷ These retrofits would include new insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding and caulking.

Over 71% of the province's housing stock in need of retrofitting was built before 1980.⁸ In fact, most homes in PEI were built in the 1960s and 70s, with nearly 20% of homes built before 1946. Generally speaking, newer homes use less energy per square metre than older homes and houses built before 1946 use almost twice as much energy per square metre than homes built after 1996.⁹ This means a significant amount of energy can be saved by investing in retrofitting the province's older housing stock.

In addition to improving energy efficiency in PEI's housing stock, there are major financial and social gains to be made by retrofitting the province's industrial, commercial, and public buildings. Investing in building retrofits will save a significant amount of energy, reduce GHG emissions, create opportunities to complete apprenticeships, and generate employment.

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 expenditures. Energy poverty in Atlantic Canada has grown by over 20% since 2010, when 17.1% of households were energy poor.¹⁰

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 \$300 million in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, could generate 4,380 person-years of employment in PEI and reduce annual GHG emissions by up to 0.24 Mt.

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

Types of Jobs in Energy Efficiency and Conservation:

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

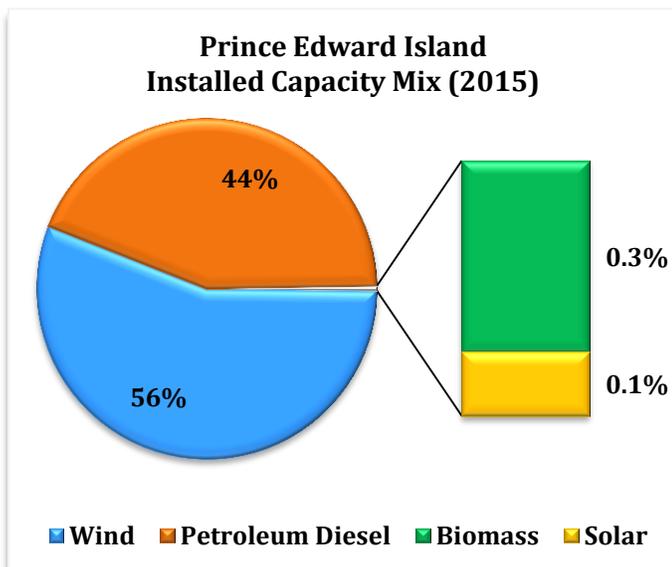
make substantial contributions to the energy supply, while reducing reliance on energy from other regions.

PEI has significant renewable potential in tidal and wave energy, totaling over 5.73 terawatt-hours a year (TWh/yr) of net capacity.¹³ PEI also has the 5th highest offshore wind potential in Canada due to the province's proximity to the coastlines and isolated ridges, which provide the region with an abundance of wind energy resources and the opportunity to further expand and diversify the province's energy mix.¹⁴

Renewable Energy

Prince Edward Island is largely dependent on imported power, with 75% of its electricity coming from New Brunswick. Of the province's installed capacity, over half comes from wind energy, while the majority of the balance comes from petroleum diesel.¹¹

There are also opportunities to integrate renewable energy into agriculture, which accounts for 23% of the province's annual emissions. Renewable energy technologies, including wind, solar, biomass, and biogas systems, can provide farmers and rural landowners with additional income, reduce emissions, and create jobs.¹⁵



Source: Natural Resources Canada¹²

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 Prince Edward Island 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.

An increase in targeted public investments in renewable energy is needed to transition the province to a low-carbon economy, where a significant number of jobs can be created in wind, tidal and wave energy, with additional jobs created in solar and biomass energy. The province has great potential to develop additional renewable energy capacity and to

With a total public investment of \$354 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 4,550 person-years of employment could be created over five years in PEI, where the majority of employment would be in the tidal, wave, and wind energy sectors. In addition, this investment will result in an annual GHG emission reduction of up to 0.13 Mt.

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

Types of Jobs in Renewable Energy:

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

Public Transit

In 2014, transportation accounted for over 42% of PEI's greenhouse gas (GHG) emissions. Prince Edward Island is more dependent on personal vehicles than any other province. PEI maintains an intensive network of highways, limited public transit infrastructure, a tourism industry that is highly automobile dependent, and a heavy reliance on the trucking industry to transport goods in the agriculture and fisheries sectors.¹⁶

A feasibility study performed by the Prince Edward Island Public Transit Coalition showed that introducing a wider range of transportation options in PEI communities would enhance the quality of life of Islanders, reduce inequality, and create employment. The study also noted that an increase in public transit services would have positive economic effects for the province, including an increase in customer accessibility for businesses and services. Further, because public transit is less expensive than personal automobile travel, a more efficient transportation system could allow for resources to be shifted to other priorities, such as education or health care.¹⁷

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.

A targeted public investment of \$66 million in public transportation - including investments in transportation demand management¹⁸ - would create 836 person-years of employment in Prince Edward Island. Investment in public transit will also reduce PEI's annual GHG emissions by up to 0.08 Mt, with the potential for greater emissions reductions over time.¹⁹ 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 | • Construction Labourer | • Metal Fabricator |
| • Bus and Transit Driver | • Education and Health Services | • Office and Administrative Support |
| • Civil Engineer | • Electrician | • Service Industry Occupations |
| • Community and Social Services | • Industrial Engineer | • Transportation Planner |
| • Construction Equipment Operator | • Machinist | • Urban Planner |
| | • Mechanic | • Welder |
| | • Mechanical Engineer | |

9,766 Climate Jobs in PEI

The transition to a low-carbon economy in Prince Edward Island could create 9,766 person-years of employment over five years while reducing annual GHG emissions by up to 0.45 Mt. The jobs that will be created from this transition are good jobs with decent wages, across many sectors. The average hourly wage for a sample of these occupations is outlined in the graph on the next page.

The proposals for public investment outlined in this plan must be complemented by a suite of

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

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.²⁰

opportunities, neighbourhood improvement, and affordable housing.²¹

This plan for PEI 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 Prince Edward Island a reality, get people back to work, and give our children the future that they deserve.



Source: CANSIM 282-0152

The transition to a green economy in Prince Edward Island 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

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¹ Environment and Climate Change Canada (2015). *Prince Edward Island: Environment Profile* <https://www.canada.ca/en/environment-climate-change/briefing/prince-edward-island-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>

² 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 \$720 million 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 \$720 million over five years (\$144 million/year) cited for PEI is the allocation of funding required for PEI 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.

³ 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>

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

⁵ Environment and Climate Change Canada (2015). *Prince Edward Island: Environment profile* <https://www.canada.ca/en/environment-climate-change/briefing/prince-edward-island-environment-profile.html>

⁶ Government of Prince Edward Island (2015). *Climate Information: Present and Future* <https://www.princeedwardisland.ca/en/information/communities-land-and-environment/climate-information-present-and-future>

⁷ 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

⁸ Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>

⁹ 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

¹⁰ Fraser Institute (2016) *Energy Costs and Canadian Households: How much are we spending?* P.14

¹¹ Maritime Electric, 2015; Canadian Wind Association, 2015

¹² Natural Resources Canada (2016). *Prince Edward Island's Electric Reliability Framework* <http://www.nrcan.gc.ca/energy/electricity-infrastructure/18845>

¹³ 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>

¹⁴ 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>

¹⁵ Government of New Brunswick (2008). *An Introduction to Renewable Energy Options for Farmers* <http://www2.gnb.ca/content/dam/gnb/Departments/10/pdf/Agriculture/RenewableEnergy.pdf>;

Canadian Biogas Association (2013). *Farm to Fuel: Developers' Guide to Biomethane as a Vehicle Fuel* http://biogasassociation.ca/resources/developers_guides; and

Union of Concerned Scientists (n.d.) *Renewable Energy and Agriculture: A Natural Fit* http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/renewable-energy-and.html#WMBVqm8rJ0z

¹⁶ Government of Prince Edward Island (2009) *A Strategy for Reducing the Impacts of Global Warming*, p. 20. http://www.gov.pe.ca/photos/original/env_globalstr.pdf

¹⁷ Prince Edward Island Public Transit Coalition (2008) *Island Wide Transit Feasibility Study – Final Report*, p.6. <http://www.cooperinstitute.ca/sitefiles/File/Island-Wide-Public-Transit-Study-Final-Report-11-06-08.pdf>

¹⁸ 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.

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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; 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

¹⁹ 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

²⁰ 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://d3n8a8pro7vymx.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>

²¹ 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/>