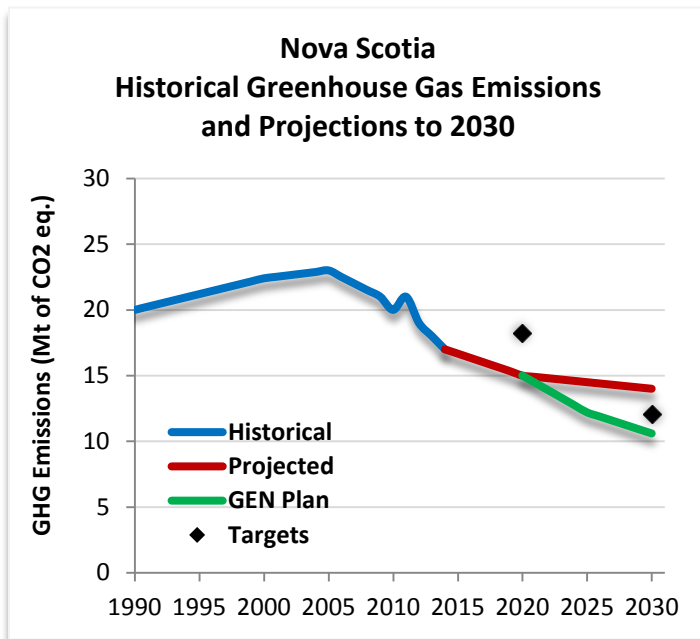


One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

Green Economy Network Platform: A Roadmap Toward 30,753 Jobs for Nova Scotia

rate of youth unemployment has dropped slightly since 2013, Nova Scotia still has the highest rate of youth unemployment in the country.⁴



Source: Environment and Climate Change Canada¹

The Green Economy Network (GEN) has calculated that Nova Scotia could create 30,753 person-years of employment over five years through a total public investment of \$2.28 billion in energy efficiency and conservation, renewable energy, and public transit. In addition, targeted public investment in these three priority areas will reduce Nova Scotia's annual greenhouse gas (GHG) emissions by up to 4.4 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 In 2016, Nova Scotia had an annual average of 40,400 unemployed workers and an annual average unemployment rate of 8.3%, the fourth highest unemployment rate of any province and the fifth highest in Canada.³

Youth have the highest unemployment rates among all age groups in Nova Scotia. While the

Emissions

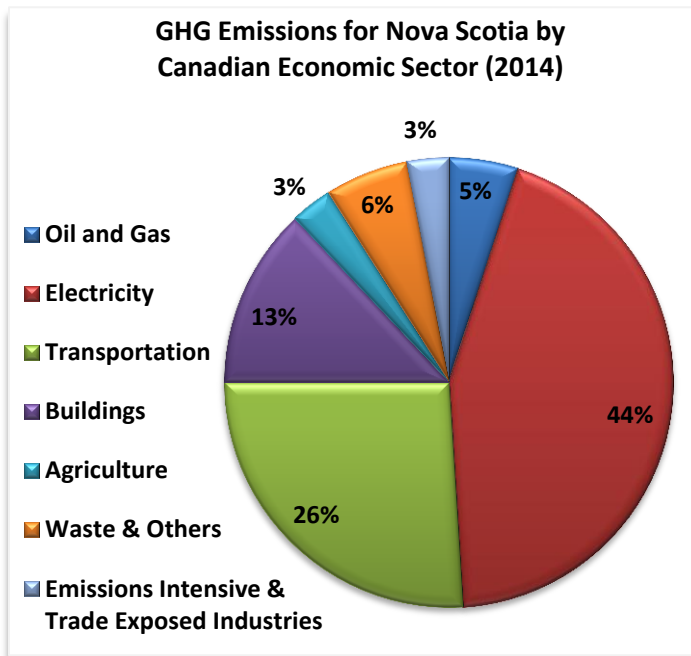
Nova Scotia's total GHG emissions were 16.6 Mt in 2014, which represents 2.3% of total national annual GHG emissions.⁵ Although Nova Scotia's GHG emissions have decreased by 17% since 1990, Nova Scotia has the sixth highest emissions per capita in Canada.⁶

Nova Scotia has committed to reducing GHG emissions over the coming decades. The *Environmental Goals and Sustainable Prosperity Act* requires the province to reduce GHG emissions to at least 10% below 1990 levels by 2020 and Nova Scotia has already surpassed this target. Under the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP) 2013 Climate Change Action Plan, the province has committed to achieving a GHG reduction target of 35-45% below 1990 levels by 2030.⁷ By 2050, the province has committed to reducing GHG emissions from human sources by up to 80% below current levels.⁸

Summary of Calculations for Nova Scotia

| | \$Billions Invested Over 5-Year Period | Total Person-Years Created | GHG Emission Reduction (Mt CO ₂ eq) |
|----------------------------------------------|----------------------------------------|----------------------------|------------------------------------------------|
| Renewable Energy | \$0.980 | 12, 595 | 1.5 - 2.6 |
| Energy Efficiency (incl. building retrofits) | \$0.900 | 13, 140 | 1.0 - 1.3 |
| Public Transit (improvement and expansion) | \$0.396 | 5, 018 | 0.3 - 0.5 |
| 5-Year TOTALS | \$2.28 | 30, 753 | 2.8 - 4.4 |

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



Source: Environment and Climate Change Canada⁹

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 Nova Scotia 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.

Out of all of the provinces, Nova Scotia has the sixth highest use of energy per household, averaging 101 gigajoules (GJ) of annual energy consumption.¹⁰ Buildings are directly responsible for 13% of Nova Scotia's annual GHG emissions, presenting a significant opportunity to reduce emissions by retrofitting homes and buildings toward greater energy efficiency. Moreover, the costs of these mitigation strategies are offset by lower energy bills, and in the end, homeowners and businesses save money.

Although the provincial government has offered programs from the province's Electricity Efficiency and Conservation Plan (2014), along with other rebate and incentive programs, 79% of the province's housing stock is still in need of energy efficiency retrofits.¹¹ This includes new

insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding and caulking.

Over half of the homes in Nova Scotia were built before 1980.¹² Generally speaking, newer homes use less energy per square metre than older built homes. Houses built between 1946 and 1980 use significantly more energy than houses 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.

Since 2008, Efficiency Nova Scotia has helped 225,000 program participants complete energy efficiency projects, saving Nova Scotians \$110 million in 2016. The energy efficiency projects have reduced electricity use by 8%, prevented the release of 0.59 Mt of GHG emissions annually, and created 1,200 jobs while contributing \$192 million to the economy each year.¹³ The energy savings, emissions reductions, and jobs created through these retrofits can be ramped up with an increase in targeted public investments.

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.¹⁴

The province currently funds the HomeWarming program, which provides no-charge energy assessments and home upgrades to for low-income households and helped 1,300 homeowners in 2015.¹⁵ In March of 2017, additional funding was announced for energy efficiency improvements in First Nations communities, which included training opportunities for community members. An additional \$4 million was also announced to supplement the current HomeWarming program, and \$2 million will be invested to create a new

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

program for affordable rental units and non-profit housing.¹⁶

Nova Scotia is a leader in providing funding for energy efficiency retrofits for low-income citizens. Expanding current services, and increased investments in recently announced programs, will provide new employment opportunities and make homes more comfortable

Additionally, increasing investment in energy efficiency and retrofit programs can reduce energy poverty by lowering utility bills in response to energy savings, freeing up capital and discretionary income.

Targeted public investment of \$900 million in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, could generate 13,140 person-years of employment in Nova Scotia while reducing annual GHG emissions by up to 1.3 Mt.

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 | |

Renewable Energy

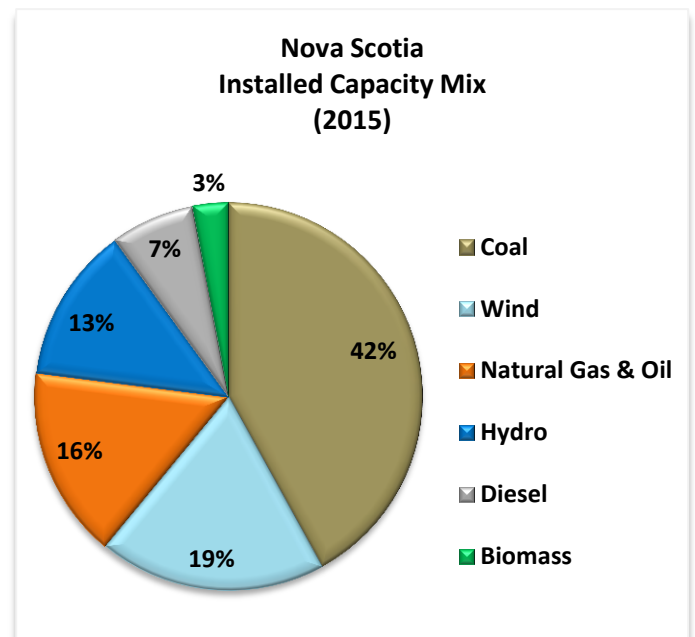
For decades, Nova Scotia's electricity came primarily from oil and coal. Oil was the main source of electricity until the 1970s when the sharp rise in price brought about a shift to coal. As recently as 2006, coal and related products met 80% of the province's electricity needs. Since then, dependence on coal has decreased. However, coal still accounts for the largest share

of the province's energy supply mix, at over 40%.¹⁷

Nova Scotia has reached an equivalency agreement with the federal government that allows the province to use coal-fired electrical plants beyond the 2030 federal deadline. Under the agreement, Nova Scotia must reduce emissions from the electricity sector by 25% by 2020, and 55% by 2030.¹⁸

Nova Scotia has tremendous potential to develop additional renewable energy capacity and meet the province's renewable energy target, with the possibility of profiting from energy exports.

Nova Scotia has the 4th highest offshore wind potential in Canada.¹⁹ Additionally, Nova Scotia has the highest renewable potential for tidal and wave energy in Canada, totaling over 7.34 terawatt-hours a year (TWh/yr) of net capacity.²⁰



Source: Natural Resources Canada²¹

According to a report by the Offshore Energy Research Association of Nova Scotia (OERA), through a continuing investment of \$3 million annually, the tidal energy industry could contribute up to \$1.7 billion to Nova Scotia's gross domestic product (GDP) and create up to 22,000 full-time jobs by 2040. Moreover, this

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investment in tidal energy would generate as much as \$815 million in labour income.²²

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 Nova Scotia 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.

With a total public investment of \$980 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 12,595 person-years of employment could be created over five years in Nova Scotia,. In addition, this investment will result in an annual GHG emission reduction of up to 2.6 Mt.

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

The transportation sector is the second largest contributor to GHG emissions in the province. In 2014, transportation accounted for over 25% of Nova Scotia’s GHG emissions, and almost 60% of these emissions came from passenger transportation.²³

Nova Scotia is investing in greener transportation services. As a result of the

Sustainable Transportation Strategy (2013) and the provinces’ Five-Year Transit Plan, Nova Scotia is working with municipalities to coordinate efforts to upgrade public transit and transit-oriented development in urban areas and also to increase funding for community transit systems in rural areas. However, an increase in public investments is required to shift more people from private automobiles to public transit and active forms of transportation.

In Halifax, over 12% of commuters use public transit, over 9% choose active transit, and over 76% commute by car, truck, or van.²⁴ While the proportion of workers choosing public or active transportation is higher in Halifax than in some Canadian cities, there is still room for improvement in Nova Scotia, including outside of urban Halifax. Transit is increasingly an issue in rural areas and investments in smaller community transit systems and active transit initiatives will make communities stronger and more inclusive. 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.

Targeted investments in public transportation will introduce more comprehensive and accessible services while making fares more affordable for low-income families. 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 \$396 million in public transit - including investments in transportation demand management²⁵ - GEN

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

has calculated that 5,018 person-years of employment would be created in Nova Scotia. Targeted public investment in public transit will also reduce the province's annual GHG emissions by up to 0.5 Mt, with the potential for greater emissions reductions over time.²⁶ 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

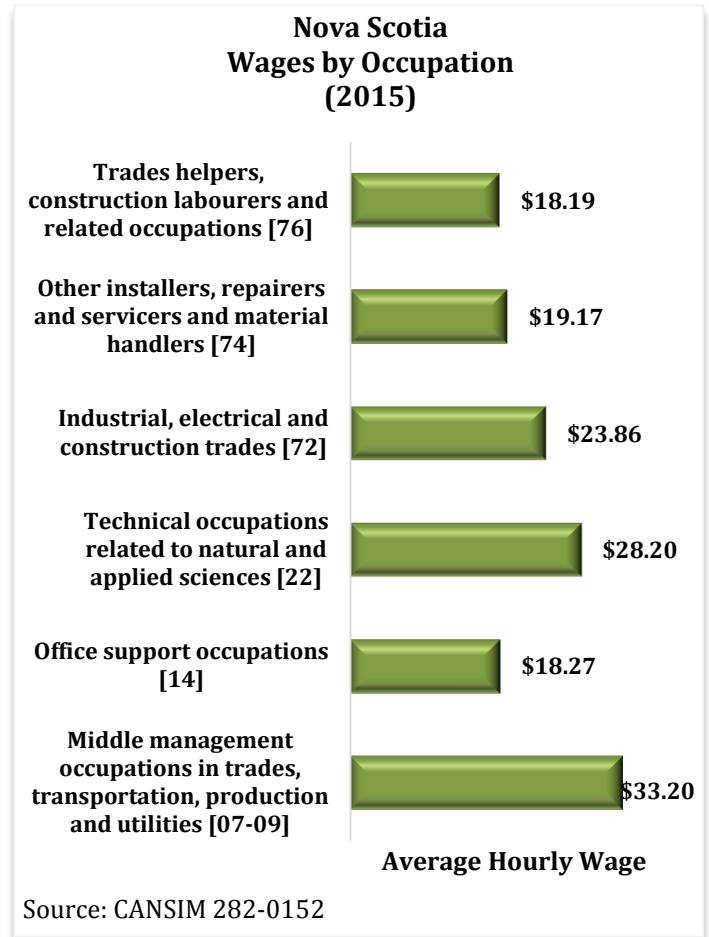
30,753 Climate Jobs in Nova Scotia

This roadmap for the transition to a low-carbon economy in Nova Scotia could create 30,753 person-years of employment over five years while reducing annual GHG emissions by up to 4.4 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 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.²⁷

The transition to a green economy in Nova Scotia 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.²⁸



This plan for Nova Scotia 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 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 Nova Scotia a reality, get people back to work, and give our children the future that they deserve.

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¹ Government of Canada (2015). *Nova Scotia : Environment Profile* <https://www.canada.ca/en/environment-climate-change/briefing/nova-scotia-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 \$2.28 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 \$2.28 billion over five years (\$0.46 billion/year) cited for Nova Scotia is the allocation of funding required for Nova Scotia 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 Nova Scotia Department of Labour and Advanced Education (2015). *Nova Scotia Labour Market Statistics 2014* https://careers.novascotia.ca/sites/default/files/LMI%20Stats%202014_FINAL.pdf

⁵ Environment and Climate Change Canada (2016) National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada.

⁶ 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>

⁷ Government of Canada (2015). *Nova Scotia : Environment Profile* <https://www.canada.ca/en/environment-climate-change/briefing/nova-scotia-environment-profile.html>

⁸ Nova Scotia Department of Environment (2009). *Toward a Greener Future: Nova Scotia's Climate Change Action Plan* <https://climatechange.novascotia.ca/sites/default/files/uploads/ccap.pdf>

⁹ 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.

¹⁰ Statistics Canada (2015). *Average household energy use, by household and dwelling characteristics, 2011*, Table 4-2 <http://www.statcan.gc.ca/pub/11-526-s/2013002/t006-eng.htm>

¹¹ 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

¹² 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

¹³ Efficiency Nova Scotia (2016). *About Efficiency Nova Scotia* <https://www.efficiencyns.ca/about-us/>

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

¹⁵ Clean Foundation (2016). *HomeWarming – Low-Income Program* <http://clean.ns.ca/programs/energy/homewarming-low-income-homeowner-energy-upgrades/>

¹⁶ Government of Nova Scotia (2017). Government Invests In Home Efficiency Program <https://novascotia.ca/news/release/?id=20170331002>; and

Government of Nova Scotia (2017). Government Works with First Nations to Create Home Efficiency Program <https://novascotia.ca/news/release/?id=20170331001>

¹⁷ Nova Scotia Power (2015). *Coal Facilities* <http://www.nspower.ca/en/home/about-us/how-we-make-electricity/default.aspx>

¹⁸ The Canadian Press (2016, November 21). *Nova Scotia exempt from coal power elimination 2030 deadline* <https://www.thestar.com/news/canada/2016/11/21/nova-scotia-exempt-from-coal-power-elimination-2030-deadline.html>

¹⁹ 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>

²⁰ 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>

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²¹ Natural Resources Canada (2016). *Nova Scotia's Electric Reliability Framework* <http://www.nrcan.gc.ca/energy/electricity-infrastructure/18836>

²² Offshore Energy Research Association of Nova Scotia (OERA), 2015 "Value Proposition for Tidal Energy Development in Nova Scotia, Atlantic Canada and Canada," xii

²³ Dalhousie Transportation Collaboratory "Tracking Progress 2015" p.2

²⁴ Statistics Canada (2011). Table 1.a Proportion of workers commuting to work by car, truck or can, by public transit, on foot, or by bicycle, census metropolitan areas.

²⁵ 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/TDMCanadianComm_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

²⁶ 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

²⁷ 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://d3n8a8pro7vbm.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>

²⁸ 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/>