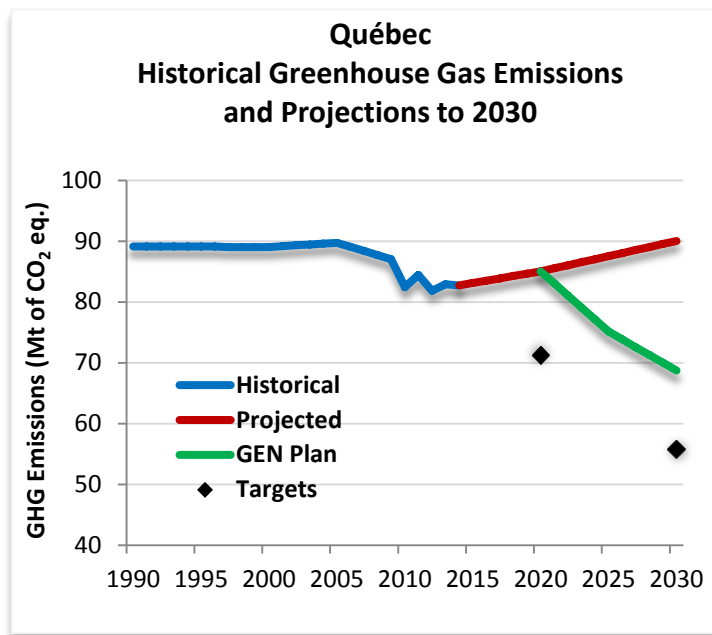


One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

Green Economy Network Platform: A Roadmap Toward 203,258 Jobs for Québec



Source: Environment and Climate Change Canada¹

The Green Economy Network (GEN) has calculated that Québec could create 203,258 person-years of employment over five years through a total public investment of \$15.2 billion in energy efficiency and conservation, renewable energy, and public transit and high-speed rail. In addition, targeted public investment in these three priority areas will reduce Québec's annual greenhouse gas (GHG) emissions by up to 16.3 megatonnes (Mt), bringing Québec much closer to achieving its emission reductions targets for 2020 and 2030, while creating jobs and strengthening communities.²

Emissions

Total GHG emissions in Québec were 82.7 Mt in 2014, which represents 11.3% of total GHG emissions in the country.³ Québec is the third largest GHG emitter in Canadian, but also has the some of the lowest emissions per capita and emissions have fallen by 7% since 1990.⁴

Québec has committed to further reducing emissions in the coming decades, setting a GHG emission reduction target of 20% below 1990 levels by 2020; and 37.5% below 1990 levels by 2030. Québec's 2030 target for GHG emission reductions is the most ambitious in Canada. Québec has also pledged to reduce emissions by 80-95% below 1990 levels by 2050.⁵

By 2020, Québec will have invested more than \$3.3 billion dollars to implement the measures set out in the *2013-2020 Climate Change Action Plan*. The main source of funding for this plan is the sale of emission allowances and all revenues go to the Québec Green Fund.⁶

Unemployment

In 2016, Québec had an annual average of 315,200 unemployed workers and a total average unemployment rate of 7.1%.⁷

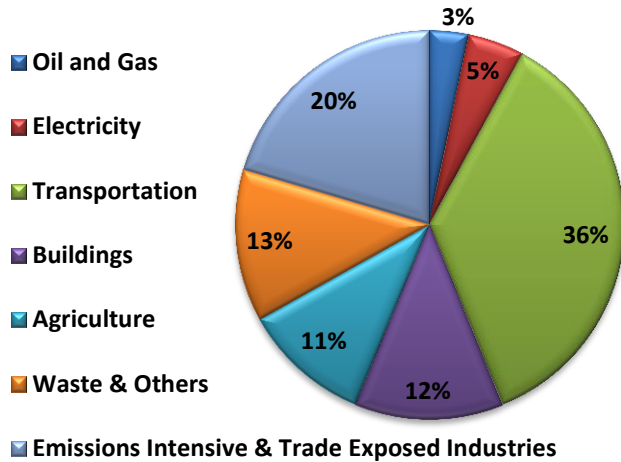
While Québec has one of the lowest unemployment rates in Canada, there is the potential for a labour shortage of 360,000 workers by 2030, due to large anticipated retirement numbers, slowing population growth and projected labour demand.⁸

Summary of Calculations for Québec

	\$Billions Invested Over 5-Year Period	Total Person- Years Created	GHG Emission Reduction (Mt CO ₂ eq)
Renewable Energy	\$ 3.54	44,364	2.4 - 4.2
Energy Efficiency (incl. building retrofits)	\$ 5.74	83,220	2.7 - 3.7
Public Transit (improvements and expansion)	\$ 3.52	51,290	3.8 - 6.6
High-Speed Rail	\$ 2.4	24,384	1.0 - 1.8
5-Year TOTALS	\$ 15.2	203,258	9.9 - 16.3

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

GHG Emissions for Québec by
Canadian Economic Sector (2014)



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 Québec have not been retrofitted.

Energy efficiency retrofits include new insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding and caulking. 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 energy bills, resulting in homeowners and businesses saving money in the long term.

Québec has the fifth highest energy consumption per square metre in Canada.¹⁰ While the emissions from residential and institutional buildings have been curbed through the transition to electric heat, there are still major opportunities to reduce energy consumption and lower bills in response to energy savings, while also creating jobs.¹¹

While the majority of the Québec's residential sector uses electricity, roughly 200,000 households still use fuel oil as the main energy source for heating.¹² There are also rural, remote, northern, and Indigenous communities that are not connected to Hydro-Québec's grid and are

reliant on diesel.¹³ These homes are often older and poorly insulated.

Homes built prior to 1980 use significantly more energy per square metre than homes built after 1996.¹⁴ Over 61% of Québec's housing stock was built before 1980, and 13% was built before 1945.¹⁵ While the majority of Québec's homes use electricity generated from renewable sources, investing in retrofitting older housing stock is still advantageous because it will save Québécois money on their utility bills and alleviate energy poverty, while creating jobs and opportunities to complete apprenticeships.

Québec households devote roughly 8% of their disposable income to energy.¹⁶ 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.

Québec's government has been offering energy efficiency programs, such as the Rénoclimat Program, to assist Québécois with reducing their energy consumption through energy audits, equipment rebates, and financing for energy efficiency retrofits.¹⁷ However, nearly 88% of Québec's housing stock is still in need of energy efficiency retrofits and over 55% of these homes in need of retrofits were built before 1970.¹⁸

While emissions from residential and institutional buildings have gone down, emissions from Québec's commercial buildings have increased significantly since 1990, in part due to the widespread use of natural gas. The government has committed to enhance energy efficiency subsidies for commercial buildings and has also committed to support the integration of renewable energy technologies into new and existing commercial buildings.¹⁹

Investing in retrofitting Québec's homes and buildings will save a significant amount of energy, reduce GHG emissions, reduce energy poverty, create opportunities to complete apprenticeships, and generate employment.

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

A total public investment of \$5.74 billion in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, would generate 83,220 person-years of employment in Québec and reduce annual GHG emissions by up to 3.7 Mt.

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

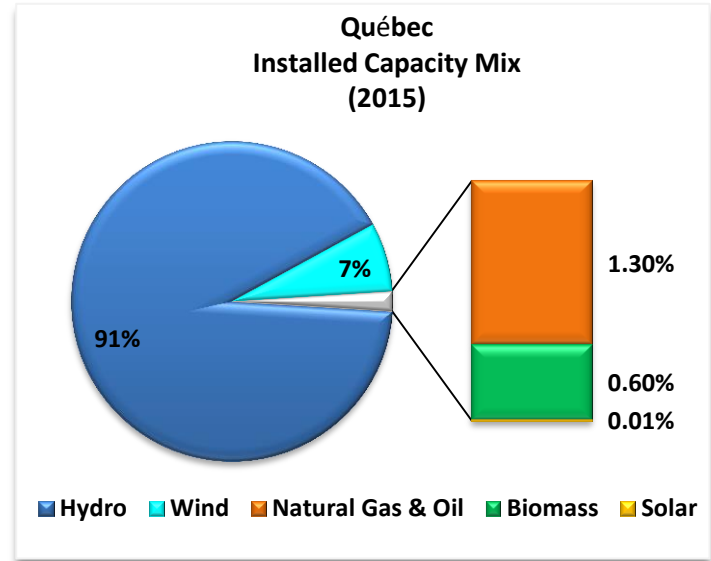
Québec has the highest installed renewable energy capacity in Canada, with over 98% of installed capacity mix generated by renewable sources. Renewable energy currently meets 47% of Québec's energy needs. In the *2030 Energy Policy*, the Québec government set ambitious targets to be achieved by 2030:

- Have renewable energy meet 61% of energy needs;
- Reduce the amount of petroleum products consumed by 40%;
- Increase overall renewable energy output by 25%; and
- Increase bioenergy production by 50%.²⁰

Québec has enormous potential to develop additional renewable energy sources to meet these targets and profit from additional energy exports to neighbouring markets that have also set GHG reduction targets.

Québec has the fourth highest onshore and offshore wind potential in all of Canada, totaling 203 terrawatt-hours a year (TWh/yr), and has the highest renewable potential in tidal energy,

totaling over 3.9 terawatt-hours a year (TWh/yr) of net capacity.²¹



Source: Natural Resources Canada²²

In addition to the renewable energy commitments in the *2030 Energy Policy*, Québec's *2013-2020 Climate Change Action Plan* made commitments to promote the instillation of geothermal systems to meet heating and cooling needs in public buildings and to find solutions to replace fuel oil and diesel for all off-grid communities.²³

Supporting renewable energy projects in rural, remote, northern, and Indigenous off-grid communities will create local employment opportunities, lower energy costs, and reduce emissions and pollutants.

For example, PowerCo, an Inuit-owned joint-venture between Makivik Corp. and the Fédération des Coopératives du Nouveau-Québec, is working to identify opportunities for renewable energy in off-grid communities. The company will develop renewable energy projects in Nunavik communities, while boosting employment and expertise among Inuit. PowerCo's profits will be reinvested in the community and used to bring down the high prices of consumer products.²⁴ 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 Québec to meet its renewable energy

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

and 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.

A total public investment of \$3.54 billion in renewable energy – including investments in modernizing electricity infrastructure, such as smart grids and microgrids, and large-scale and small-scale energy storage systems – would create 44,364 person-years of employment in Québec over a five-year period. In addition, this investment will result in an annual GHG emission reduction of up to 4.2 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 and High-Speed Rail

The transportation sector was responsible for 36% of Québec's GHG emissions in 2014 and over half of those emissions were from passenger vehicles. Encouraging greater energy efficiency for all forms of transportation and shifting more commuters from private automobiles to sustainable transportation options, such as active transit and public transit, would go a long way toward reducing emissions from the transportation sector.

The use of public and active transit by commuters varies greatly across Québec's census metropolitan areas:

- Montréal has the second highest proportion of public transit ridership in the country at 21.4%, while 7% of commuters

choose active transit, and almost 70% commute by car, truck, or van;

- In Québec City, 11.3% of commuters choose public transit, while 7.5% choose active transit, and over 80% commute by car, truck, or van;
- In Gatineau, 15.3% of commuters choose public transit, while almost 6% choose active transit, and almost 70% commute by car, truck, or van;
- In Sherbrooke, 4.2% of commuters choose public transit, while over 7% choose active transit, and 87.5% commute by car, truck, or van; and
- In Trois-Rivières, 2.3% of commuters choose public transit, while over 6% choose active transit, and over 90% commute by car, truck, or van.²⁵

Clearly, there are major opportunities to increase the use of public and active transit, especially as urban sprawl is increasing at an accelerated pace.²⁶ Québec's transit ridership, specifically in Montréal, has been slightly declining since 2013 and more public investments are needed to help with capital costs for smaller municipalities. The STM (Société de transport de Montréal) has reported that this decline reflects the growing popularity of private motor vehicles due to lower gas prices and harsh winters.²⁷

Another issue is Montréal's ageing fleet of public transit vehicles. In 2015, more than 20% of buses in Montreal were unavailable at any given time because they were undergoing repairs.²⁸ This presents an opportunity to replace ageing transit fleet vehicles with made-in-Canada electric vehicles.

Public transit is considered to be the largest clean transportation segment in terms of existing jobs in Québec and there is room for further growth. Moreover, the impact of public transit on the Québec economy is almost three times greater than equivalent expenditures for travel by car.²⁹ However, Québec's transit infrastructure is currently at capacity, and new investments are urgently required.³⁰

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

Cuts to transit services have resulted in longer commuting times in Québec, which costs Québécois time and money, in addition to increasing pollution. In fact, the overall cost of congestion in the Greater Montréal area is estimated at \$1.4 billion annually.³¹

Investing in public transit instead of infrastructure for personal automobiles just makes sense. Investments in public transit infrastructure create more jobs and cost less in the long term. In fact, a study commissioned by the federal government showed that it would cost Canadians 50% more to meet new travel demands by car than it would by public transit.³²

Access to transportation is a concern for low-income residents, especially those who live outside of metropolitan areas. Increasing transit fares, and the lack of service in the early morning, evenings, and weekends is also difficult for low-waged workers and people employed in the service industry and/or doing shift work.

Targeted investments in public transportation will introduce more comprehensive and accessible services to neighborhoods and make fares more affordable and accessible 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, youth and students, Indigenous Peoples, 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.

Québec also has an enormous opportunity to benefit from high-speed rail in the Québec City - Windsor corridor. Currently, Canada is both the only G8 country without existing high-speed rail infrastructure and the only G20 country without official plans to construct high-speed lines in the coming decades.³³ Developing high-speed rail in the Québec City - Windsor corridor would relieve freight congestion, create jobs, and decrease

greenhouse gas emissions as passengers shifted from personal automobiles and planes to electrified high-speed rail.

A total public investment of \$5.92 billion in public transit and high-speed rail - including investments in transportation demand management³⁴ - would create 75,674 person-years of employment in Québec over five years. Targeted public investment in transit will also reduce Québec's annual GHG emissions by up to 8.4 Mt, with the potential for greater emissions reductions over time.³⁵ Complimentary policies and regulations to reduce emissions from freight transport will create additional employment opportunities and further reduce emissions from the transportation sector.

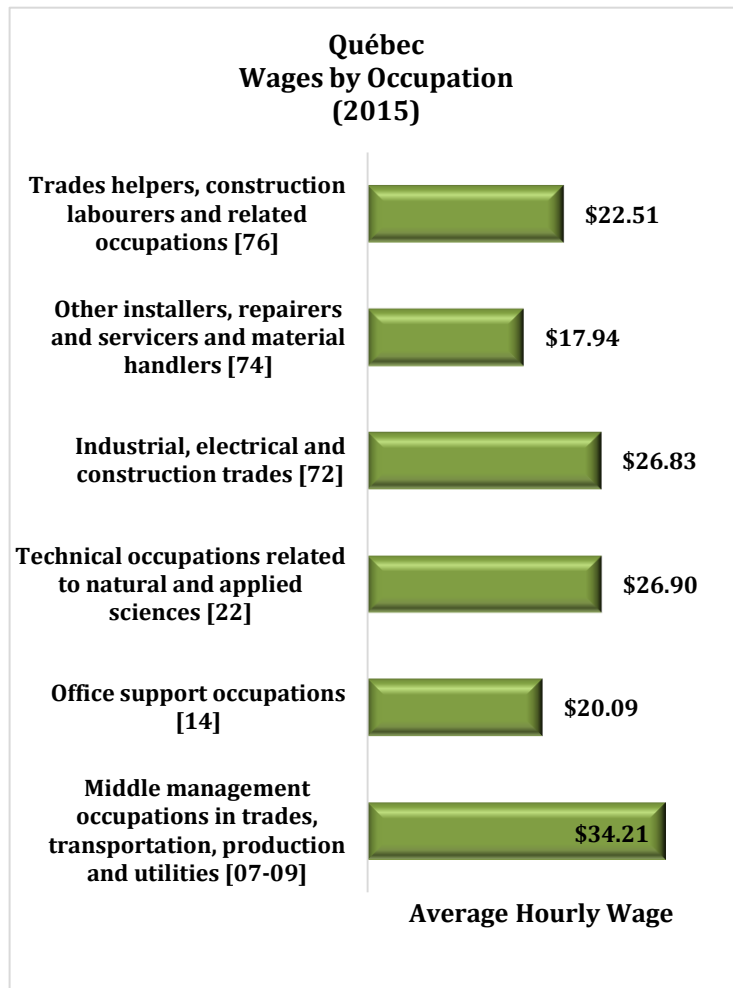
Types of Jobs in Public Transit and High-Speed Rail:

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

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

203,258 Climate Jobs in Québec

The transition to a low-carbon economy in Québec could create 203,258 person-years of employment over five years while reducing annual GHG emissions by up to 16.3 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 below.



Source: CANSIM 282-0152

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.³⁶

The transition to a green economy in Québec 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) could 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.³⁷

This plan for Québec 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 Québec a reality, make our cities stronger and more liveable, and give our children the future that they deserve.

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

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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 \$15.2 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 \$15.2 billion over five years (\$3.04 billion/year) cited for Québec is the allocation of funding required for Québec 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.

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³ Environment and Climate Change Canada (2016) *National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada*.

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

⁵ CBC News (2015, September 17). *Quebec's 2030 emissions target is most ambitious in Canada, government says* <http://www.cbc.ca/news/canada/montreal/quebec-greenhouse-gas-reduction-1.3231951>;

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⁷ 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>

⁸ The Conference Board of Canada (2007). *From Baby Boom to Labour Crunch: Quebec's Impending Labour Shortage* <http://www.conferenceboard.ca/e-library/abstract.aspx?did=2356>

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 (2011). *Households and the Environment: Energy Use*, p. 25 <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.htm>

¹¹ Government of Québec (2012). *2013-2020 Climate Change Action Plan, Phase 1 - Québec in Action: Greener by 2020* http://www.mddelcc.gouv.qc.ca/changements/plan_action/pacc2020-en.pdf

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¹³ Government of Québec (2012). *2013-2020 Climate Change Action Plan, Phase 1 - Québec in Action: Greener by 2020* http://www.mddelcc.gouv.qc.ca/changements/plan_action/pacc2020-en.pdf

¹⁴ Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>

¹⁵ 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

¹⁶ Government of Québec (2016). *The 2030 Energy Policy – Energy in Québec: A Source of Growth* <http://mern.gouv.qc.ca/english/energy/strategy/pdf/The-2030-Energy-Policy.pdf>

¹⁷ Government of Québec (2017). *Rénoclimat* http://www.efficaciteenergetique.gouv.qc.ca/en/my-home/renoclimat/#WMw6KG_yt0x

¹⁸ Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>; and

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

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²¹ 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>; and

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²⁷ Curry, B. (2016, May 27). *Where have all the transit riders gone?* The Globe and Mail <http://www.theglobeandmail.com/news/politics/drop-in-transit-ridership-has-officials-across-canadastumped/article30178600/>

²⁸ Magder, J. (2015, October 15). *Repairs, lack of drivers plague STM's bus service*, Montreal Gazette <http://montrealgazette.com/news/local-news/repairs-lack-of-drivers-plague-stms-bus-service>

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³⁰ Board of Trade of Metropolitan Montréal (2011). *Public Transit: At the heart of Montréal's economic development* http://www.ccmm.ca/~media/Files/News/2010/10_11_26_ccmm_etude-transport_en.pdf

³¹ Board of Trade of Metropolitan Montréal (2011). *Public Transit: At the heart of Montréal's economic development* http://www.ccmm.ca/~media/Files/News/2010/10_11_26_ccmm_etude-transport_en.pdf

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³⁵ 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

³⁶ For policy recommendation see:

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