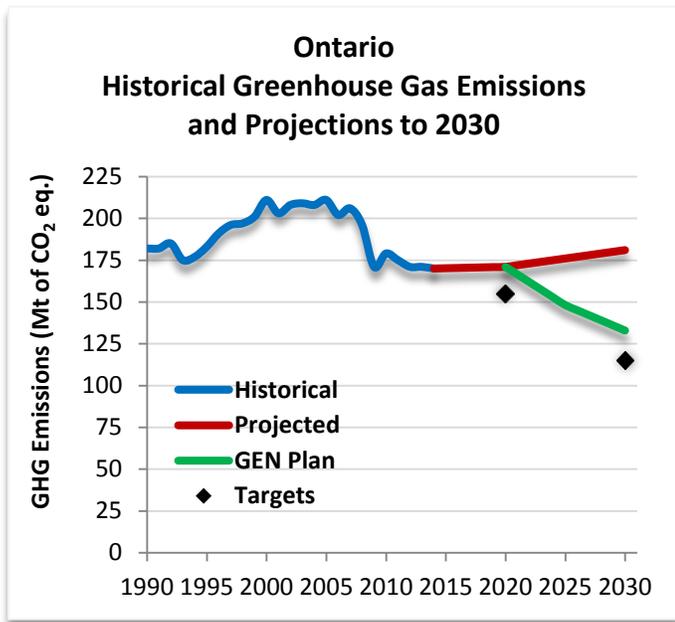


One Million Climate Jobs in Five Years: Public Transit, Renewable Energy, and Green Buildings

Green Economy Network Platform: A Roadmap Toward 379,296 Jobs for Ontario



Source: Environment and Climate Change Canada¹

The Green Economy Network (GEN) has calculated that Ontario could create 379,296 person-years of employment over a five-year period through a total public investment of \$29.19 billion in public transit and high-speed rail, renewable energy, and energy efficiency and conservation. In addition, targeted public investment in these three priority areas will reduce Ontario’s annual greenhouse gas (GHG) emissions by up to 38.1 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, Ontario had an annual average of 489,900 unemployed workers and an annual average unemployment rate of 6.5%.³

Ontario has suffered from a shrinking proportion of employed individuals, and the percentage of working poor in Ontario has grown in the past decade. In 2006, the working poor in Ontario

made up 6.8% of the working age population; in 2010 they made up 7.3%; in 2015 it was closer to 8.0%.⁴ In order to address Ontario’s decade-long increase of working poverty, combined with lagging economic growth, and a decline in the manufacturing sector, GEN proposes targeted public investments to create jobs, alleviate poverty, and to improve the well-being of all citizens.

Emissions

Total GHG emissions in Ontario were 170.2 Mt in 2014, which represents 23.2% of total GHG emissions in the country.⁵

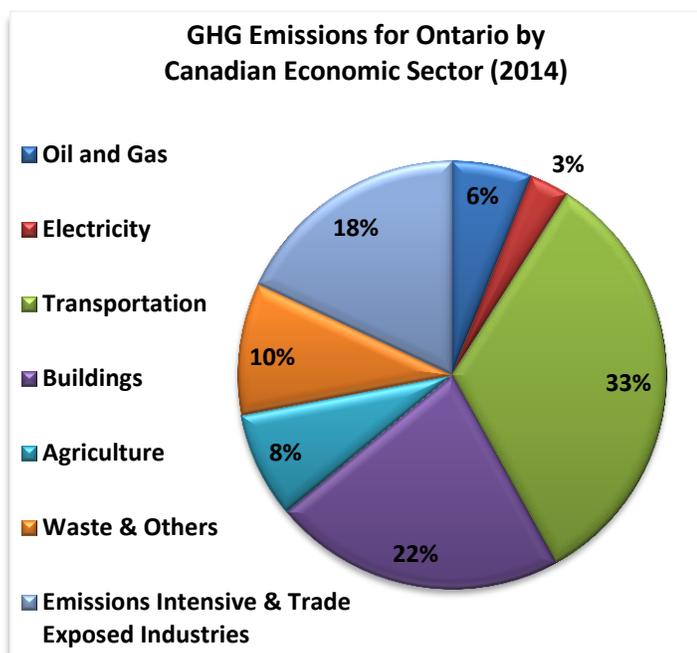
Ontario has set GHG reduction targets for the coming decades. The province has committed to reduce emissions to 15% below 1990 levels by 2020 and to reduce emissions to 37% below 1990 levels by 2030. Ontario has also set a long-term GHG reduction target, with a goal to decrease GHG emissions to 80% below 1990 levels by 2050.⁶

Ontario’s Climate Change Action Plan (2016) acknowledges that climate change is a pressing concern and that mitigating the effects of climate change can create significant economic opportunities.⁷

Summary of Calculations for Ontario

	\$Billions Invested Over 5-Year Period	Total Person-Years Created	GHG Emission Reduction (Mt CO ₂ eq)
Renewable Energy	\$ 6.47	82, 872	4.5 - 7.7
Energy Efficiency (incl. building retrofits)	\$10.26	149, 796	11.0 - 19.0
Public Transit (improvements and expansion)	\$7.96	100, 908	5.2 - 9.1
High-Speed Rail	\$ 4.5	45, 720	1.4 - 2.3
5-Year TOTALS	\$ 29.19	379, 296	22.9 - 38.1

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Source: Environment and Climate Change Canada⁸

Public Transit and High-Speed Rail

The transportation sector was responsible for one-third of Ontario's GHG emissions in 2014. 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 transportation-related emissions and moving Ontario to a low-carbon economy.

Ontario's growth dynamic over the past several decades has been predominantly low-density, automobile-dependent suburban growth. As a result of the uneven dispersal of population and employment between 1986 and 2001, the supply of new roads has increased by 53% and new highway construction has grown by 38%. At the same time, transit ridership over the last two decades declined in most regions, including the Greater Toronto Area (GTA), with the exception of the Peel Region. This decrease in transit ridership coincided with an increase in the number of Ontarians who use personal automobiles.

Ontario has the longest commuting time out of all provinces.⁹ Traffic congestion in Toronto reached an historic high at the end of 2015, when commute times were 28% longer due to traffic

and congestion, and just slightly shorter than in New York City. Toronto residents now experience the longest commuting times of any province, averaging over an hour.¹⁰

Nearly 800 million passengers use the public transit every year in Ontario, the most of any province, and over 537 million of these passengers are located in the GTA.¹¹ Public investments in transit are very cost-effective, specifically in Ontario where strong public transportation is vital to reduce the costs and undesirable impacts associated with urban sprawl.

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

- Toronto has the highest proportion of public transit ridership in the country at over 23%, while almost 6% of commuters choose active transit, and nearly 70% commute by car, truck, or van;
- In Ottawa, almost 22% of commuters choose public transit, while nearly 10% choose active transit, and over 67% commute by car, truck, or van;
- In Hamilton, about 9% of commuters choose public transit, while over 5% choose active transit, and almost 85% commute by car, truck, or van;
- In Kitchener-Cambridge-Waterloo, over 5% of commuters choose public transit, while over 5% choose active transit, and almost 90% commute by car, truck, or van; and
- In London, almost 7% of commuters choose public transit, while nearly 7% choose active transit, and over 85% commute by car, truck, or van.¹²

A study commissioned by the federal government showed that it would cost Canadians 50% more to meet new travel demands by car than by public transit.¹³ This cost differential reflects the social impacts of growing passenger travel on congestion, access to employment, the

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environment and on health related expenses, including emotional well-being. Automobile-dependent urban sprawl increases congestion along trade corridors and increases pollution, which has resulted in Ontario having the highest ground-level ozone concentration in the country. In addition, it has been estimated that congestion costs the GTA area more than \$6 billion annually.¹⁴

Access to transportation is a concern for low-income residents in Ontario, especially those who live outside of urban centres. Increasing transit prices and the lack of service in the early morning, evenings, and weekends is also problematic 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, 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.

Ontario 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.¹⁵ 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.

With an investment of \$12.46 billion in public transit and high-speed rail- including investments in transportation demand management¹⁶ - GEN has calculated that 146,629 person-years of employment could be created in Ontario, including employment in construction and manufacturing. Targeted public investment in public transit and high-speed rail will also reduce Ontario's annual GHG emissions by up to 11.4 Mt, with the potential for greater emissions reductions over time.¹⁷ 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
- 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
- Rail-Track Layer
- Service Industry Occupations
- Transportation Planner
- Urban Planner
- Welder

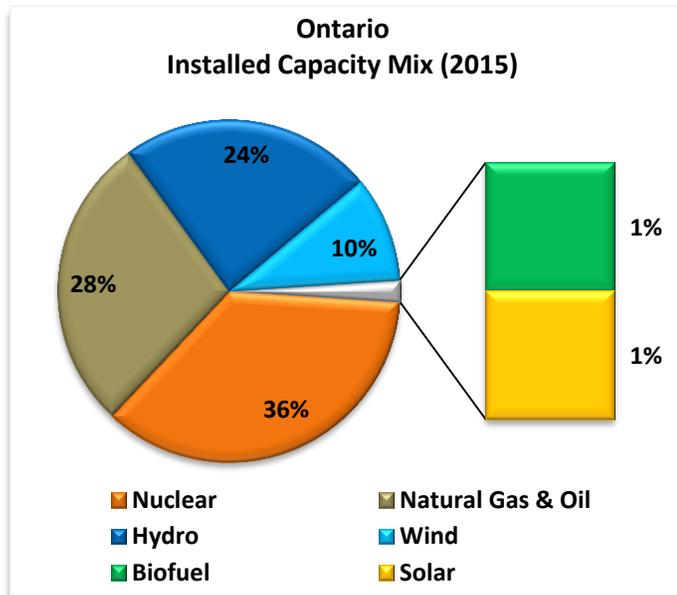
Renewable Energy

Ontario has made significant progress in improving the environmental footprint of its energy sources, including eliminating coal-fired electricity generation in 2014. Ontario is also home to more than 99% of all installed solar photovoltaic capacity and almost 40% of all installed wind capacity in Canada.¹⁸ However, there are some barriers that must still be overcome in order for Ontario to realize the maximum job creation and GHG reduction potential from renewable energy.

Ontario set ambitious renewable targets for 2025 in the province's Long-Term Energy Plan (2013), such as achieving 20,000 MW of renewable energy. However, the province recently halted procurement of over 1,000 megawatts (MW) of solar, wind, hydroelectric,

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

bioenergy and energy from waste projects.¹⁹ Ontario must continue to press forward with increasing renewable energy capacity to achieve its long-term renewable energy and GHG reduction targets.



Source: Natural Resources Canada²⁰

Ontario has also faced barriers under the World Trade Organization (WTO) and the North American Free Trade Agreement (NAFTA). Ontario's *Green Energy and Green Economy Act* (2009) required that renewable power producers purchase a minimum portion of goods and services locally. This domestic procurement provision ensured that climate jobs in the renewable energy manufacturing sector remained local and also minimized the adverse environmental impact and GHG emissions from importing renewable energy equipment, including wind turbines and solar panels. In 2013, the WTO ruled that the policy discriminated against foreign suppliers and conflicted with international trade rules. In order to achieve deep emissions reductions, we must challenge the existing global trade dynamic. It is imperative that we strengthen and prioritize domestic procurement and employment in our policies, while challenging the global trade regime, in order for Ontario and the rest of Canada to receive the maximum benefit of the One Million Climate Jobs plan.²¹

Despite these obstacles, Ontario still has an enormous opportunity to develop additional renewable energy projects and potentially profit from increased energy exports.

Other than British Columbia, Ontario has the highest renewable potential in offshore wind energy compared to any other province, totaling over 182 terawatt-hours a year (TWh/yr).²²

Ontario also maintains the highest national renewable potential for solar farming and the second highest potential in biomass. Most of the potential located in southwestern Ontario near Windsor and London.²³ The majority of biomass resources in Ontario are comprised of wood, wood wastes and agricultural and forest wastes. Currently, solar and biofuel energy only account for 2% of Ontario's installed capacity mix.

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 Ontario to meet its renewable energy 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.

With a total public investment of \$6.47 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 - GEN has calculated that 82,872 person-years of employment could be created over a five-year period, where the majority of employment would be in wind, solar, and biomass. In addition, this investment will result in an annual GHG emission reduction of up to 7.7 Mt.

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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

Energy Efficiency and Conservation

Buildings are one of the largest users of energy and one of the most significant contributors to Ontario's GHG inventory, accounting for over 20% of the province's emissions.

Energy efficiency and conservation are our cleanest, cheapest and most productive methods for reducing GHGs, yet the vast majority of buildings in Ontario 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. Although the Ontario government has offered programs from the newly announced Climate Action Plan (2016), such as the Home Energy Savings Program, along with other rebate and incentive programs through money from the Green Investment Fund, 81% of the province's homes are still in need of retrofits.²⁴ This includes new insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding, and caulking.

Other than Alberta, Ontario's single-detached homes use more energy on average than any other province.²⁵ Generally speaking, newer homes use less energy per square metre than older homes. Houses built between 1946 and 1977 use significantly more energy per square metre than homes built after 1980, and over half of Ontario's housing stock was built before 1980.²⁶

In addition to improving energy efficiency in Ontario'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 home and building retrofits will save a significant amount of energy, reduce GHG emissions, create opportunities to complete apprenticeships, and generate employment.

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

A notable example is the City of Toronto's three-year pilot program, which is offering low-cost financing for energy efficiency and water conservation retrofits for apartment buildings. The High-Rise Retrofit Improvement Support (Hi-RIS) program provides low-interest, fixed rate loans that are repaid through installments on the property tax bill using energy savings to offset costs. The financial obligation is attached to the property and transferred to the new owner at the time of sale.²⁷

Targeted public investment of \$10.26 billion in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, would generate 149,796 person-years of employment in Ontario and reduce annual GHG emissions by up to 19 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

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379,296 Climate Jobs in Ontario

The transition to a low-carbon economy in Ontario could create 379,296 person-years of employment over five years while reducing annual GHG emissions by up to 38.1 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 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.²⁸

The transition to a green economy in Ontario 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.²⁹

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



Source: CANSIM 282-0152

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¹ Environment and Climate Change Canada (2015). *Ontario: Environment Profile* <https://www.canada.ca/en/environment-climate-change/briefing/ontario-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>; and

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 \$29.19 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 \$29.19 billion over five years (\$5.84 billion/year) cited for Ontario is the allocation of funding required for Ontario 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 Canadian Centre for Policy Alternatives (2016). *Ontario's Working Poor* <https://www.policyalternatives.ca/sites/default/files/uploads/publications/Ontario%20Office/2016/07/CCPA%20ON%20OnPolicy%20Summary%202016%202.pdf>

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

⁶ Government of Ontario (2016). *Ontario's Five Year Climate Change Action Plan* http://www.applications.ene.gov.on.ca/ccap/products/CCAP_ENGLISH.pdf

⁷ Ibid

⁸ 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.

⁹ Fraser Institute (2008). *Transportation Performance of the Canadian Provinces* <https://www.fraserinstitute.org/studies/transportation-performance-of-the-canadian-provinces>

¹⁰ Toronto Foundation (2015) Annual Report on the State of the City. P 135-145.

¹¹ Ibid, p. 139

¹² Statistics Canada (2015). *Table 1.a Proportion of workers commuting to work by car, truck or van, by public transit, on foot, or by bicycle, census metropolitan areas* <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/2011003/tbl/tbl1a-eng.cfm>

¹³ Council of Ministers Responsible for Transportation and Highway Safety. Urban Transportation Task Force (2012). *The High Cost of Congestion in Canadian Cities* <http://www.comt.ca/english/utf-congestion-2012.pdf>

¹⁴ Metrolinx (2008) Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan. Toronto: Greater Toronto Transportation Authority.

¹⁵ For more details, see Ryan Katz-Rosene, 'Moving Towards Canada's Green Economy: Investments in Public Transit and Intercity Rail,' a background paper prepared for the Canadian Labour Congress and the Green Economy Network, September 2010.

¹⁶ 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; 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

¹⁷ 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

¹⁸ Ontario Ministry of Energy (2016) *News Release: Ontario Suspends Large Renewable Energy Procurement*, September 27, 2016

¹⁹ Ontario Ministry of Energy (2016) *News Release: Ontario Suspends Large Renewable Energy Procurement*, September 27, 2016

²⁰ Natural Resources Canada (2016). *Ontario's Electric Reliability Framework* <http://www.nrcan.gc.ca/energy/electricity-infrastructure/18842>

²¹ 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>

²² Natural Resources Canada (2009). *Wind Technology Roadmap Summary Report* <http://www.nrcan.gc.ca/energy/renewable-electricity/wind/7323>

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²³ Liu, T., McConkey, B., Huffman, T., Smith, S., MacGregor, B., Yemshanov, D., & Kulshreshtha, S. (2014). Potential and impacts of renewable energy production from agricultural biomass in Canada. *Applied Energy*, 130, 222-229.

²⁴ 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

²⁵ Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf>

²⁶ 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

²⁷ City of Toronto (n.d). *Financing for High-Rise Energy Retrofits* <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=ab3147e94c5b3410VgnVCM10000071d60f89RCRD>

²⁸ 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](https://d3n8a8pro7vbm.cloudfront.net/broadbent/pages/5454/attachments/original/1480433751/Green%20Jobs%20For%20Tomorrow%20Report.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>

²⁹ 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/>