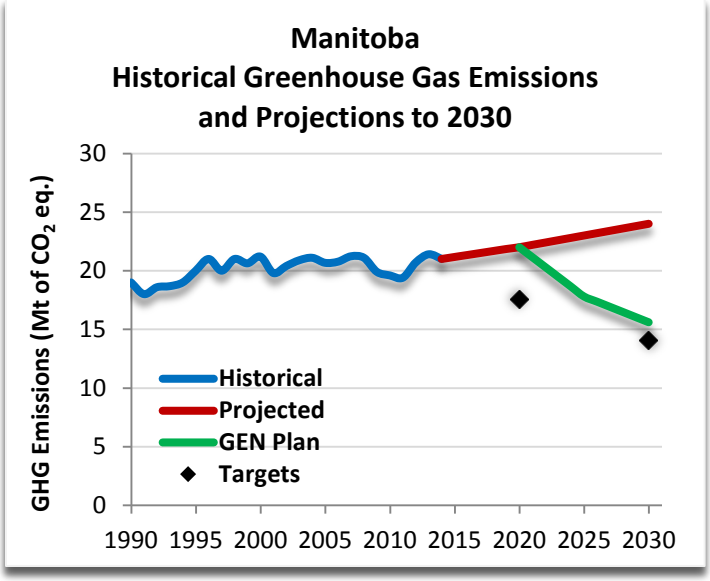
Green Economy Network Platform:
A Roadmap Toward 52,690 Jobs for Manitoba



Source: Environment and Climate Change Canada[1]

The Green Economy Network (GEN) has calculated that Manitoba could create 52,690 person-years of employment over five years through a total public investment of $3.86 billion in energy efficiency and conservation, renewable energy, and public transit. In addition, targeted public investment in these three priority areas will reduce Manitoba's annual greenhouse gas (GHG) emissions by up to 6.4 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 2016, Manitoba had an annual average of 41,400 unemployed workers and an annual average unemployment rate of 6.1%, one of the lowest average annual unemployment rates in the country. However, Manitoba's average annual unemployment rate in 2016 was the highest it has been since 1997.[3]

Emissions

Manitoba recently released its Climate Change and Green Economy Action Plan (2015), outlining projects to reduce GHG emissions through a new five-year $5 million Climate Change Action Fund with investments in transportation, green buildings, and agriculture. However, an increase in public investment is required to adequately address climate change and to create sustainable jobs for the future.

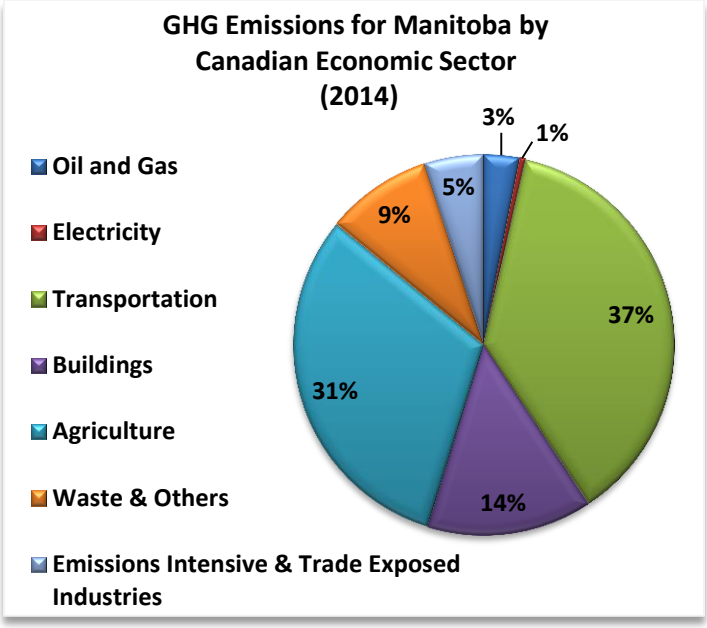
Manitoba's GHG emissions were 21.5 Mt in 2014, representing 2.9% of total annual emissions in the country. Manitoba's annual emissions have increased 15% since 1990.[4]

Manitoba's Climate Change and Green Economy Action Plan has set ambitious GHG reduction targets for the coming decades:

- Reduction of emissions by one-third over 2005 levels by 2030;
- Reduction of emissions by one-half over 2005 levels by 2050; and
- Carbon neutral by 2080.[5]

Summary of Calculations for Manitoba

	$Billions Invested Over 5-Year Period	Total Person-Years Created	GHG Emission Reduction (Mt CO_2eq)
Renewable Energy	$0.992	12, 274	1.9 – 3.3
Energy Efficiency (incl. building retrofits)	$2.1	30, 660	1.6 – 2.2
Public Transit (improvement and expansion)	$0.77	9, 756	0.7 – 0.9
5-Year TOTALS	$3.86	52, 690	4.2 – 6.4



Source: Environment and Climate Change Canada[6]

In 2014, over 60% of Manitoba's GHG emissions came from the combustion of fossil fuels, and more than half of these emissions came from the transportation sector. Manitoba's second highest source of GHG emissions is the agriculture sector at 31%, where the majority of emissions are methane (CH_4) from livestock and nitrous oxide (N_2O) from soils.[7]

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 Manitoba 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.

Nearly 15% of the province's GHG emissions are from heating and cooling buildings.[8] Mitigation strategies for residential and commercial buildings can decrease emissions, make homes more comfortable, and create jobs in Manitoba. Moreover, the costs of these mitigation strategies are offset by lower energy bills, resulting in homeowners and businesses saving money in the long term.

Manitoba has very cold winters and extremely old housing stock, resulting in a significant amount of household energy being put into heating and consequently, significant economic and environmental gains can be made from retrofitting buildings to increase energy efficiency.

Manitoba has been a national leader for retrofit financing programs and creating retrofit programs with social enterprises to train multi-barriered workers, including the Building Urban Industry for Local Development (BUILD) and the Brandon Energy Efficiency Program (BEEP).[9] To build on this success, GEN proposes an increase in targeted public investment to continue the retrofitting of Manitoba's homes and buildings.

Manitoba has some of the oldest housing stock in Canada, with over 16% of homes built before 1946. These homes have one of the highest energy uses per square metre.[10] Although the Manitoba government has been offering pay-as-you-save programs, such as the On-Metre Efficiency Improvement Program, to assist households with the upfront capital costs of energy retrofitting, over 79% of the province's housing stock is still in need of energy efficiency retrofits.[11] Energy efficiency retrofits include new insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding and caulking.

Over 76% of homes in need of energy efficiency retrofits in Manitoba are older housing stock 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. Increasing investments in energy efficiency and retrofitting programs for Manitoba's housing stock can help lower utility bills in response to energy savings, freeing up capital and discretionary income.

In addition to improved energy efficiency in Manitoba's housing stock, there are major financial and social gains to be made through energy

efficiency retrofits for the province's industrial, commercial, business, and public buildings. Investing in retrofitting the province'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.

Targeted public investment of $2.1 billion in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, could generate 30,660 person-years of employment in Manitoba and reduce annual GHG emissions by up to 2.2 Mt.

Types of Jobs in Energy Efficiency and Conservation:

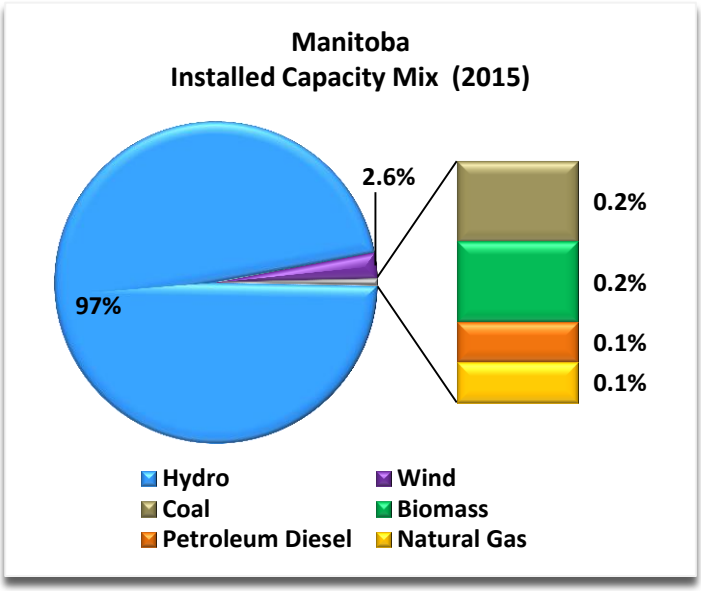
- Architect
- Boilermaker
- Carpenter
- Civil Structural Engineer
- Community and Social Services
- Construction Equipment Operator
- Construction Labourer
- Education and Health Services
- Electrical Engineer
- Electrician
- Energy Efficiency Auditor
- HVAC Installer
- HVAC Technician
- Ironworker
-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

Renewable Energy

Manitoba is already a leader in renewable energy, with 97% of electricity generated through hydroelectricity. Manitoba is also leading the country in geothermal heat pump installations and has made investments in wind power. However, the province has tremendous potential to develop additional renewable energy capacity with the potential to profit from additional energy exports.

Manitoba has one of the highest potentials for generating solar energy in all of Canada. However, the province has yet to take advantage of this potential, having performed minimal studies and development on solar energy.[13] As of 2015, solar energy accounted for less than 1% of the province's energy mix.

Although there are small residential applications, there are currently no commercial solar photovoltaic installations in Manitoba. GEN has calculated that through targeted public investments, nearly 4,700 jobs can be created in the solar industry alone.



Source: Natural Resources Canada[14]

The province also maintains significant potential for geothermal energy. Based on temperature depth profiles, high potential regions for geothermal power generation are located in parts of southwestern Manitoba near Brandon.[15] Geothermal power is an attractive option for Manitoba because geothermal has a base-load capacity that exceeds all other sources of energy, creates jobs, and generates by-product heat that can be integrated with greenhouses, fish farms, and food processing.[16]

While there are no geothermal power plants in Canada, Manitoba has established national leadership in the implementation of district, community-scale, and large-scale geothermal heat pump systems.[17] Geothermal heat pumps significantly reduce annual heating energy, space cooling, and water heating costs, and eliminate the need for separate air conditioning and heating systems.[18]

Aki Energy, a First Nations owned social enterprise, has installed geothermal heat pumps in over 200 Peguis and Fisher River First Nations homes in partnership with Manitoba Hydro. Aki Energy trains and hires First Nation Community members to install and maintain these systems, creating local jobs and a more affordable energy future.[19]

There are also opportunities to integrate renewable energy into agriculture, which accounts for 31% of annual emissions in Manitoba. Renewable energy technologies, including wind, solar, biomass, and biogas systems, can provide farmers and rural landowners with additional income, reduce emissions, and create jobs.[20]

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 Manitoba 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 $992 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 12,274 person-years of employment could be created over a five-year period. In addition, this investment will result in an annual GHG emission reduction of up to 3.3 Mt.

Types of Jobs in Renewable Energy:

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

Public Transit

The transportation sector was responsible for almost 40% of Manitoba's GHG emissions in 2014, and emissions in this sector have grown by 29% since 1990. Over half of these emissions come from passenger transportation, including personal vehicles.[21] 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.

In Winnipeg, over 13% of commuters use public transit, over 7% choose active transit, and 78% commute by car, truck or van.[22] Based on per capita numbers, Winnipeg has a significantly larger transit ridership than most Canadian cities of the same size. The province has begun developing plans for rapid and sustainable transit, which includes the construction of the Southwest Rapid Transit Corridor.

Ridership has grown by 30% in Winnipeg over the last ten years. In 2015, 45 to 50 million passengers used the public transit in Manitoba, and this number continues to rise.[23] However, Winnipeg's public transit infrastructure is at capacity and an increase in public investments is required, specifically to help with capital costs for smaller municipalities, and particularly for rural locations in the province that currently lack adequate public transit.

Access to transportation is a concern for low-income residents in Manitoba, especially for those who live outside of Winnipeg and Brandon. Increasing transit fares and the lack of service in the early morning, evenings, and weekends are also difficult for low-waged workers and people employed in the service industry and/or doing shift work. Creating and expanding public and active transit services in other municipalities 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 to rural neighborhoods and make 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, recreation, education, and employment, including the employment opportunities that are created through the creation and expansion of transit services.

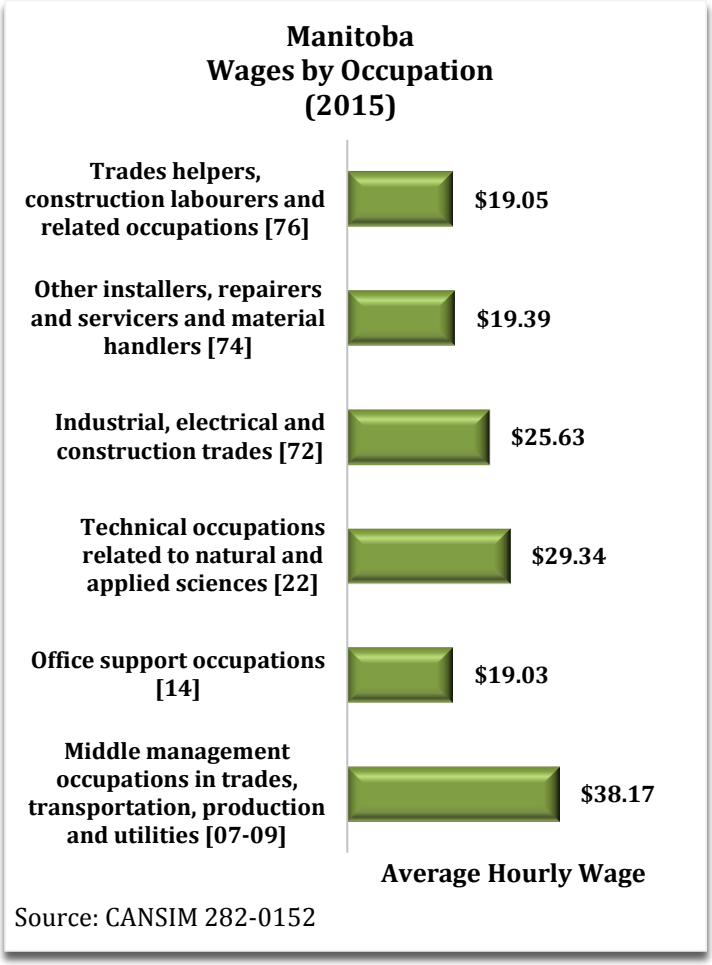
With an investment of $770 million in public transit - including investments in transportation demand management[24] - GEN has calculated that 9,756 person-years would be created in Manitoba. Targeted public investment in public transit will also reduce Manitoba's annual GHG emissions by up to 0.9 Mt, with the potential for greater emissions reductions over time.[25] 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

52,690 Climate Jobs in Manitoba

The transition to a low-carbon economy in Manitoba could create 52,690 person job years over five years while reducing annual GHG emissions by up to 6.4 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 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.[26]

The transition to a green economy in Manitoba 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.[27]

This plan for Manitoba lays the foundation for tackling climate change while also 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 Manitoba a reality, get people back to work, and give our children the future that they deserve.

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[1] Environment and Climate Change Canada (2015). *Manitoba: Environment Profile* https://www.canada.ca/en/environment-climate-change/briefing/manitoba-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 $3.86 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 $3.86 billion over five years ($0.772 billion/year) cited for Manitoba is the allocation of funding required for Manitoba 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] Government of Manitoba (2015). *Manitoba's Climate Change and Green Economy Action Plan* https://www.gov.mb.ca/conservation/climate/pdf/mb-climate-change-green-economy-action-plan.pdf

[6] 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.

[7] Climate Change Connection (2015). *GHG Emissions - Manitoba* http://climatechangeconnection.org/emissions/manitoba-ghg-emissions/

[8] The Government of Manitoba (2015) *Climate Change and Green Economy Action Plan*, p. 29

[9] Columbia Institute (2016). *This Green House II: Building Momentum on Green Jobs and Climate Action Through Energy Retrofits Across Canada* http://www.civicgovernance.ca/wordpress/wp-content/uploads/2016/03/Columbia_This_Green_House_II_web_Mar_22_final.pdf

[10] Statistics Canada (2012). *Households and the Environment: Energy Use*, p. 18 http://www.statcan.gc.ca/pub/11-526-s/11-526-s2013002-eng.pdf

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

[12] 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

[13] Natural Resources Canada (2012). *Photovoltaic potential and solar resource maps of Canada* https://www.nrcan.gc.ca/18366

[14] Natural Resources Canada (2016). *Manitoba's Electric Reliability Framework* http://www.nrcan.gc.ca/energy/electricity-infrastructure/18830

[15] Canadian Geothermal Energy Association (2016). *Geothermal Resources in different Regions of Canada* http://www.cangea.ca/where-are-canadian-geothermal-resources-found.html

[16] Canadian Geothermal Association (2016). *About geothermal energy* http://www.cangea.ca/about-geothermal.html

[17] Government of Manitoba (2013). Community scale geothermal and district geothermal energy http://www.gov.mb.ca/ia/MobilePages/energy/geothermal/districts.html

[18] Manitoba Hydro (n.d.). Geothermal heat pump systems https://www.hydro.mb.ca/your_home/geothermal_heat_pumps/index.shtml

[19] Aki Energy (n.d.) Aki Energy – Aboriginal Social Enterprise http://www.akienergy.com/geothermal-energy/

Hydro Manitoba (n.d.). Power Smart and First Nations https://www.hydro.mb.ca/your_home/first_nations/index.shtml

[20] 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

[21] 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, Part 3

[22] 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.

[23] Winnipeg Transit (2015) *Designing for Sustainable Transportation and Transit in Winnipeg.*

[24] 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

[25] 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

[26] For policy recommendation see:

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

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

[27] 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/