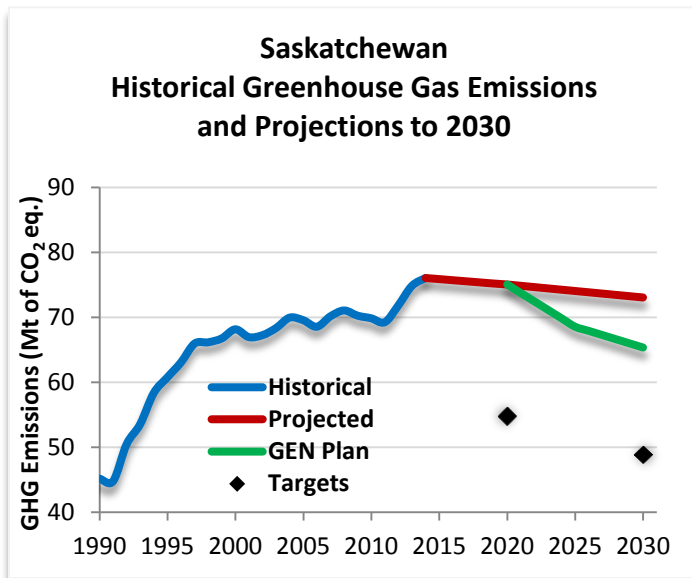


# One Million Climate Jobs in Five Years: Green Buildings, Renewable Energy, and Public Transit

## Green Economy Network Platform: A Roadmap Toward 48,029 Jobs for Saskatchewan



Source: Environment and Climate Change Canada<sup>1</sup>

The Green Economy Network (GEN) has calculated that Saskatchewan could create 48,029 person-years of employment over five years through a total public investment of \$3.62 billion in energy efficiency and conservation, renewable energy, and public transit. In addition, targeted public investment in these three priority areas will reduce Saskatchewan’s annual greenhouse gas (GHG) emissions by up to 9.7 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.<sup>2</sup>

### Emissions

Saskatchewan has the fourth highest total annual GHG emissions in Canada, totalling 75.5 Mt in 2014, which represents 10.3% of total annual GHG emissions in the country and emissions have increased by 68% since 1990.<sup>3</sup>

Saskatchewan is Canada's second-largest oil producer and growth in the oil and gas sector, combined with potash mining and the expansion of coal-fired power generation, have made it the

highest per capita GHG emitter in Canada.<sup>4</sup> One-third of the province’s GHG emissions are from the oil, gas, and mining sectors.<sup>5</sup> While most provinces have seen a decrease in emissions, Saskatchewan’s increased by 9% between 2005 and 2014, primarily due to increases from the transportation sector and activities in the oil and gas industry, as well as mining.<sup>6</sup>

The government of Saskatchewan has implemented the *Green Energy, Green Jobs and a Diversified, Sustainable Economy Act* (2015), specifying targets for growing renewable energy and promoting energy efficiency, committing to generate 40% of electricity from renewable energy sources by 2025, and 50% by 2030. However, the province has yet to outline a climate strategy stipulating how these targets will be achieved.

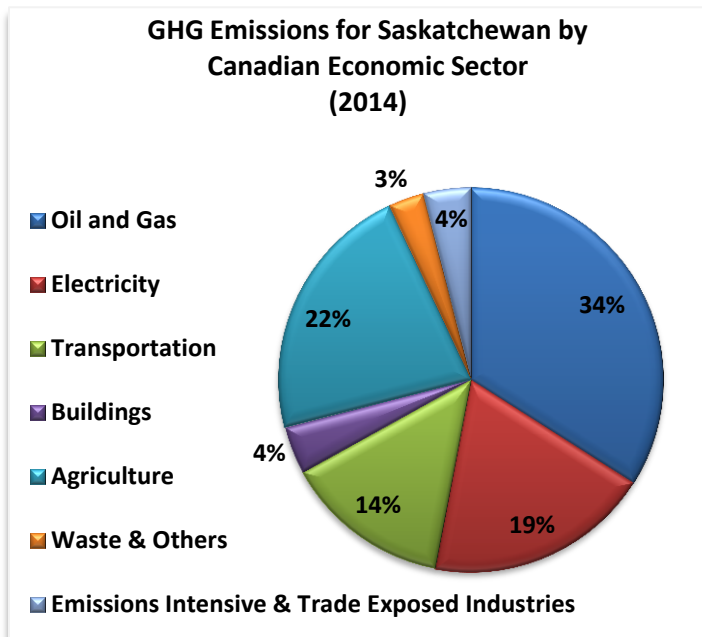
### Unemployment

In 2016, Saskatchewan had an annual average of 38,300 unemployed workers and an annual average unemployment rate of 6.3%, one of the lowest unemployment rates in Canada. However, Saskatchewan’s average annual unemployment rate in 2016 was the highest it has been since 1996.<sup>7</sup>

### Summary of Calculations for Saskatchewan

	\$Billions Invested Over 5-Year Period	Total Person-Years Created	GHG Emission Reductions (Mt CO <sub>2</sub> eq)
Renewable Energy	\$1.6	18,906	5.3 - 7.5
Energy Efficiency (incl. building retrofits)	\$1.8	26,280	1.0 - 1.9
Public Transit (improvement and expansion)	\$0.224	2,843	0.2 - 0.3
<b>5-Year TOTALS</b>	<b>\$3.62</b>	<b>48,029</b>	<b>6.5 - 9.7</b>

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



Source: Environment and Climate Change Canada<sup>8</sup>

### 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 Saskatchewan 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 energy bills, resulting in homeowners and businesses saving money in the long term.

Saskatchewan has the country's second highest rate of energy consumption per square meter, due to variations in weather and the province's old and inefficient housing stock.<sup>9</sup> Saskatchewan has a longer heating season in comparison to other provinces which means that a significant amount of household energy is put into heating, more than would be needed in a more temperate climate.<sup>10</sup> Consequently, significant economic and environmental gains can be made from retrofitting buildings to increase energy efficiency.

Nearly 60% of Saskatchewan's housing stock was built before 1977, with only 11% of the province's housing stock built after 2000.<sup>11</sup> Additionally, residential housing stock built before 1946 represents nearly 20% of the province's total housing stock and uses nearly twice the amount of energy as houses built after 1995.<sup>12</sup>

Although the government of Saskatchewan has been offering pay-as-you-save programs, such as the On-Meter Efficiency Improvement Program, to assist households with the upfront capital costs of energy retrofits, over 85% of the province's housing stock still needs to be retrofitted. In addition, over 76% of homes in need of energy efficiency retrofits were built before 1980.<sup>13</sup>

Energy efficiency retrofits include new insulation, heating, ventilation or cooling equipment, and improvements to doors, windows, exterior siding and caulking. Investing in energy efficiency and retrofitting programs can help lower utility bills in response to energy savings, freeing up capital and discretionary income.

In addition to improved energy efficiency in Saskatchewan's housing stock, there are major financial and social gains to be made by retrofitting 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 \$1.8 billion in energy efficiency and conservation over a five-year period, in combination with complementary workforce development policies, could generate 26,280 person-years of employment in Saskatchewan and reduce annual GHG emissions by up to 1.9 Mt.**

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

### Types of Jobs in Energy Efficiency and Conservation:

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

### Renewable Energy

Electricity accounts for 21% of Saskatchewan’s annual GHG emissions and over 35% of Saskatchewan’s total energy generating capacity comes from coal-fired generation.<sup>14</sup>

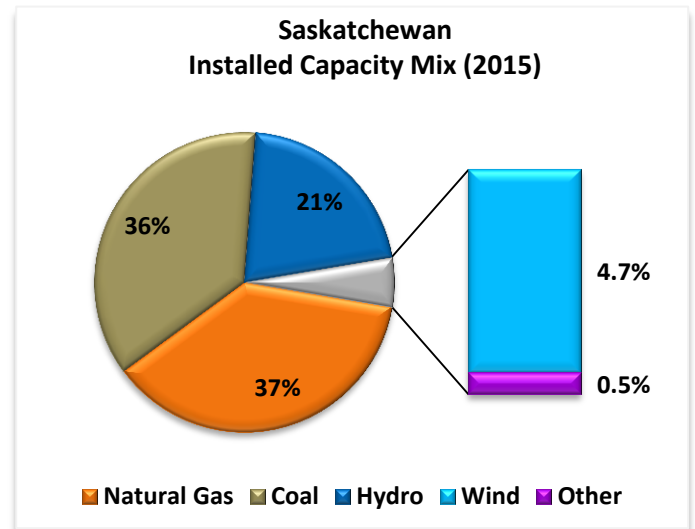
Saskatchewan has three coal-fired plants located in two communities. The federal government has announced a plan to phase-out coal-fired electricity by 2030. Saskatchewan has reached an equivalency agreement with the federal government that allows the province to make significant emission reductions elsewhere in its electricity sector in order to continue using coal past the 2030 deadline. The federal government’s coal phase-out also allows for the use of carbon capture and storage technology (CCS). Saskatchewan has already converted part of one of its coal-fired plants to use CCS technology.<sup>15</sup>

Over 25% of Saskatchewan’s installed capacity mix comes from renewable sources – 21% from hydro and 4.7% from wind - the province has tremendous potential to develop additional renewable energy sources and to make substantial contributions to the energy supply, with the possibility of profiting from energy exports.

Saskatchewan is well positioned to become a Canadian leader in renewable energy production and consumption. This plan for strategic public investment in renewable energy lays the groundwork for Saskatchewan to achieve its

renewable energy target of generating 50% of the province’s electricity from renewable energy sources by 2030.

Saskatchewan has the highest potential for solar energy in all of Canada. However, the province has yet to take advantage of this potential, with minimal studies and development on solar energy and solar power accounting for less than 1% of the province’s generating capacity. Saskatchewan also maintains the second-highest renewable energy potential for onshore wind energy in Canada. Although wind power capacity rose by 26 MW in 2011 when the Red Lily Wind Project was developed, wind power provides less than 5% of total electricity generation in Saskatchewan.<sup>16</sup>



Source: Natural Resources Canada<sup>17</sup>

There are also opportunities to integrate renewable energy into agriculture, which accounts for 22% of annual emissions in Saskatchewan. Renewable energy technologies, including wind, solar, biomass, and biogas systems, can provide farmers and rural landowners with additional income, reduce emissions, and create jobs.<sup>18</sup>

Additionally, due to the province's extensive forestry industry, there is potential for increased electricity production from biomass.<sup>19</sup> The province has vast potential to utilize the forestry residues that can be found in northern forestry communities. Using biomass for electricity

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generation also has the capacity to foster local economic development in First Nations communities.

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 Saskatchewan 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 \$1.6 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 26,280 person job years can be created in Saskatchewan over a five-year period, where the majority of employment would be in the solar and onshore wind energy sectors. In addition, this investment will result in an annual GHG emission reduction of up to 7.5 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 was responsible for 14% of Saskatchewan's GHG emissions in 2014 and emissions from the transportation sector have increased by 70% since 1990. 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 those emissions and shifting Saskatchewan to a low-carbon economy. Currently, less than 5% of people living in Regina and Saskatoon commute by public transit, while 7% choose active transit, and over 85% commute by car, truck, or van.<sup>20</sup>

Accessible and adequate transportation services have become an issue in the province, particularly in Saskatoon, a city that is rapidly growing and becoming increasingly suburban. Saskatoon's public transit ridership has increased over the last several years, and more public investments are needed to keep pace with growth, specifically to help with both operating and capital costs for municipalities. Saskatoon has been delaying increasing transit services in newly developed suburban areas because of the additional costs to expand services in areas such as Evergreen and Rosewood.

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 \$224 million in public transit - including investments in transportation demand management<sup>21</sup> - GEN has calculated that 2,843 person-years of employment will be created in Saskatchewan. Targeted public investment in public transit will also reduce Saskatchewan's annual GHG emissions by up to 0.3 Mt, with the potential for greater emissions reductions over time.<sup>22</sup> Complimentary policies and regulations to reduce emissions from freight transport will**



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

create additional employment opportunities and further reduce emissions from the transportation sector.

### Types of Jobs in Public Transit:

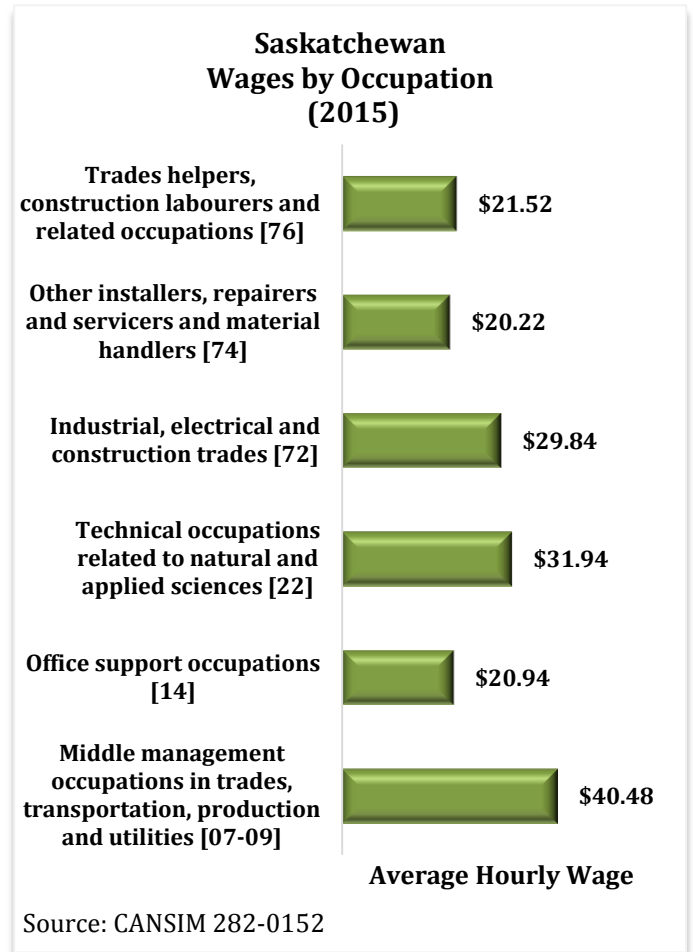
- Automotive Technician
- Bus and Transit Driver
- Civil Engineer
- Community and Social Services
- Construction Equipment Operator
- Construction Labourer
- Education and Health Services
- Electrician
- Industrial Engineer
- Machinist
- Mechanic
- Mechanical Engineer
- Metal Fabricator
- Office and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

### 48,029 Climate Jobs in Saskatchewan

The transition to a low-carbon economy in Saskatchewan would create 48,029 person-years of employment over five years while reducing annual GHG emissions by up to 9.7 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.<sup>23</sup>

The transition to a green economy in Saskatchewan 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.<sup>24</sup>



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

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

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

<sup>2</sup> Saskatchewan has not committed to a 2030 target for GHG emission reductions. The 2030 target used in this report is based on the national commitment to reduce emissions 30% below 2005 levels by 2030.

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 \$3.62 billion over five years (\$0.72 billion/year) cited for Saskatchewan is the allocation of funding required for Saskatchewan 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.

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

<sup>4</sup> Stastna, K. (2015, April 14). How Canada's provinces are tackling greenhouse gas emissions *CBC News* <http://www.cbc.ca/news/canada/how-canada-s-provinces-are-tackling-greenhouse-gas-emissions-1.3030535#SK>

<sup>5</sup> Environment Canada (2014). *National Inventory Report 1990–2012: Greenhouse Gas Sources and Sinks in Canada*.

<sup>6</sup> Ibid.

<sup>7</sup> 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>

<sup>8</sup> 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.

<sup>9</sup> 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](https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_008.cfm)

<sup>10</sup> Statistics Canada (2012). *Households and the Environment: Energy Use* <http://www.statcan.gc.ca/pub/11-526-s/2010001/part-partie1-eng.htm>

<sup>11</sup> 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](https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_008.cfm)

<sup>12</sup> Vreenegoor, R., De Vries, B., & Hensen, J. (2008). Energy saving renovation: analysis of critical factors at the building level. *WIT Transactions on Ecology and the Environment*, 117, 653–662.

<sup>13</sup> 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](https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_008.cfm)

<sup>14</sup> SaskPower (n.d.). *Capturing Carbon and the World's Attention* Chapter 3 <http://www.saskpower.com/our-power-future/innovating-today-to-power-tomorrow/capturing-carbon-and-the-worlds-attention/>

<sup>15</sup> CBC News (2016, November 28). *Saskatchewan, Canada reach equivalency deal on coal-fired power plants* <http://www.cbc.ca/news/canada/saskatchewan/saskatchewan-canada-reach-equivalency-deal-on-coal-fired-power-plants-1.3870843>; and

SaskPower (2017). *Coal with CCS Technology* <http://www.saskpower.com/our-power-future/our-electricity/supply-options/coal-with-ccs-technology/>

<sup>16</sup> SaskPower (n.d.). *Red Lily Wind Power Facility* <http://www.saskpower.com/our-power-future/our-electricity/our-electrical-system/red-lily-wind-power-facility/>

<sup>17</sup> Natural Resources Canada (2016). *Saskatchewan's Electric Reliability Framework* <http://www.nrcan.gc.ca/energy/electricity-infrastructure/18849>

<sup>18</sup> 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](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#.WMBVqm8rOz](http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/renewable-energy-and.html#.WMBVqm8rOz)

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

<sup>19</sup> 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.

<sup>20</sup> Statistics Canada (2011) 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.

<sup>21</sup> 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](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](https://www.fcm.ca/Documents/tools/GMF/Improving_Travel_Options_with_Transportation_Demand_Management_EN.pdf)

<sup>22</sup> 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

<sup>23</sup> For policy recommendation see:

Canadian Labour Congress (2016). *Green Jobs for Tomorrow*, Submission by the CLC to the Working Group on Clean Technology, Innovation and Jobs  
[https://d3n8a8pro7vymx.cloudfront.net/broadbent/pages/5454/attachments/original/1480433751/Green\\_Jobs\\_For\\_Tomorrow\\_Report.pdf?1480433751](https://d3n8a8pro7vymx.cloudfront.net/broadbent/pages/5454/attachments/original/1480433751/Green_Jobs_For_Tomorrow_Report.pdf?1480433751);

Green Economy Network (2016). *Making the Shift to a Green Economy: A Common Platform of the Green Economy Network*  
<http://greeneconomynet.ca/wp-content/uploads/sites/43/2014/07/GEN-Common-Platform-2016-EN1.pdf>; and

Green Economy Network (2016). *One Million Climate Jobs: A Plan for a Sustainable and Equitable Economy*, Submission to the Working Group on Clean Technology, Innovation and Jobs <http://greeneconomynet.ca/wp-content/uploads/sites/43/2016/07/GEN-Submission-Working-Group-on-Clean-Technology-Innovation-and-Jobs-july-2016.pdf>

<sup>24</sup> 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/>