

Making the Shift to a Green Economy:

A Common Platform of the Green Economy Network



Prepared by the Steering Committee of the Green Economy Network



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As members of Canadian-based labour, environmental, faith and social justice organizations, we have come together to form a common front for the building of a green economy in Canada. We have done so recognizing that we are living in one of those critical moments of human history wherein decisions must be made that will ultimately affect our destiny as a people, a nation, and a civilization.

We maintain that, if the plan of action outlined below were to be fully enacted during the coming five years, Canada would be well on the way to creating one million new person job years. Simultaneously, we will reduce our total national greenhouse gas emissions by a minimum of 88 megatonnes (Mt) a year by 2020, putting us on track to reduce our greenhouse gas (GHG) emissions by one third by 2025, which represents a substantial contribution towards our overall emissions reductions. Moreover, these initiatives would generate opportunities for the transition towards a more equitable as well as a more sustainable economy.

Introduction

Canada is facing a triple-E challenge relating to our environment, our economy and diversification of energy sources. We are already experiencing the ramifications of climate change; underemployment and unemployment in precarious jobs remain very high; and we must make the transition away from carbon-based energy sources. Concurrently, our economy and society are further plagued by an equity crisis marked by increasing inequalities and divisions amongst gender, race and class.

We can no longer afford an economic model that treats the planet and people as disposable goods. The time has come to chart a new economic model, one that requires a fundamental transformation in the way we produce, transport and consume goods. We need a new industrial strategy for this country. We

What is a Megatonne?

Greenhouse gas (GHG) emissions are measured and reported in megatonnes.

One megatonne (Mt) is equal to one million tonnes. Canada's total GHG emissions were 726 Mt in 2013.

One megatonne of GHG emissions is equivalent to the emissions from:
227,000 cars or more than twice the number of cars in Prince Edward Island.
The energy requirements of 86,500 homes or the total number of homes in Regina¹

must rethink the way we construct buildings, manufacture products and generate energy. We must rethink the way we transport ourselves, move goods, fuel industries, and heat our homes and businesses while ensuring there is affordable green energy for all. We must foster local sustainable economies, provide equitable job opportunities and contribute our fair share to efforts that

Person Job Year, what does it mean?

A person job year is a full-time job for one person for the duration of one year.

reduce environmental and social harm internationally. Through this transformation, we will help break our addiction to fossil fuels and overcome persistent poverty and inequalities. Ultimately, we must build a green economy and society that transforms the modes of production and consumption, ensures energy is available and affordable, and makes the jobs we have more environmentally sustainable while simultaneously

creating new decent paying climate jobs and providing “Just Transition” programs.

After the first decade of the 21st century, Canada finds itself at a crossroads. The multiple crises of our time call for fundamental decisions in the kind of economy and society we want for the future. Canadians must choose to either perpetuate the current unsustainable economic and societal model or decide to embrace a new green economic model, designed to foster a harmonious relationship between people and the planet while creating climate jobs and promoting sustainable economic development. The foundation for each option is built on energy — the energy we use to fuel our industries, heat our homes, transport materials and ourselves. Ultimately, this new economy must be fuelled not by ‘dirty’ non-renewable forms of energy that come from fossil fuels, but by ‘clean’ renewable forms of energy that are affordable for all Canadians.

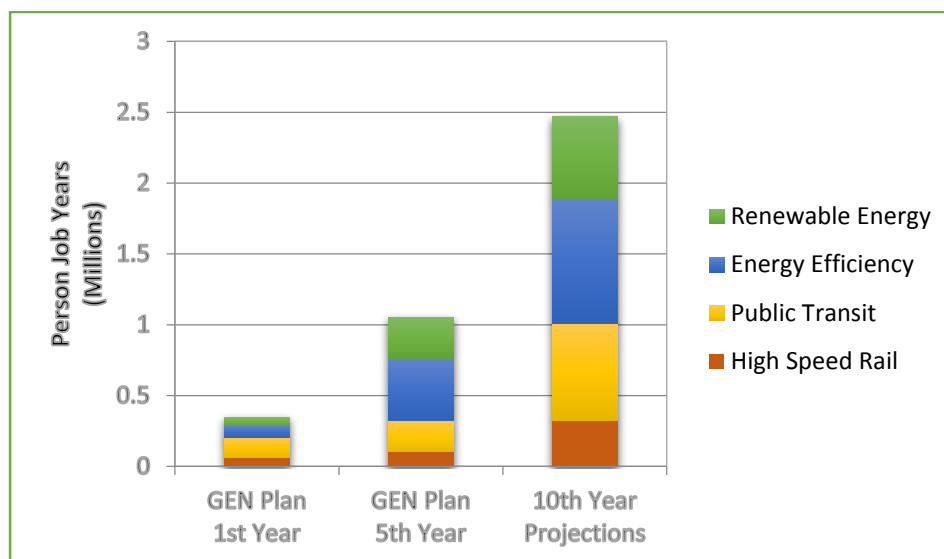
Our Three Pillar Plan prioritizes public investment in renewable energy, energy efficiency, and public transit. These three sectors alone are responsible for 81% of annual GHG emissions in Canada. Transforming just these industries away from a carbon-based economy to a green economy will create over **one million climate jobs in five years.**

What are Climate Jobs?

The term “climate jobs” refers generally to two types of employment: [1] jobs that make a direct and/or indirect contribution to the reduction of greenhouse gas emissions that cause global warming and climate change; and [2] jobs that contribute to assisting people and their communities in coping with, or adapting to, the impacts of climate change such as extreme weather events.

In addition to climate job creation, the Three Pillar Plan will **reduce annual GHG emissions by approximately 24% (175 Mt) within five years** and by approximately **36% (261 Mt) within ten years.** The GEN Three Pillar Plan will exceed Canada’s emissions reduction commitments under the Paris Agreement by 2025, five years early.ⁱⁱ

Figure 1. Person job years (in millions) created in the first and fifth year of GEN's Three Pillar Plan, and projections for the tenth year of investmentⁱⁱⁱ



We have identified three priority areas for immediate action to stimulate the transition to a green economy future. These three program priorities are based on a number of factors including our current energy use and transportation patterns, greenhouse gas emission reductions per dollar invested, and job creation per dollar invested. The three pillars are:

- **A renewable energy development strategy**
- **Improved energy efficiency of homes and buildings**
- **Expanded public transit and high-speed intercity rail transport**

All three would create a substantial number of new decent jobs, reduce greenhouse gas emissions that cause climate change, and provide opportunities for achieving greater equity in our economy. We believe all three program priorities are equally urgent and important.

The transition to a green economy future, however, must be just, sustainable and participatory. Indeed, these are its guiding principles. In developing and implementing these program priorities, decision-making processes need to be democratized through community consultations and participation. All levels of

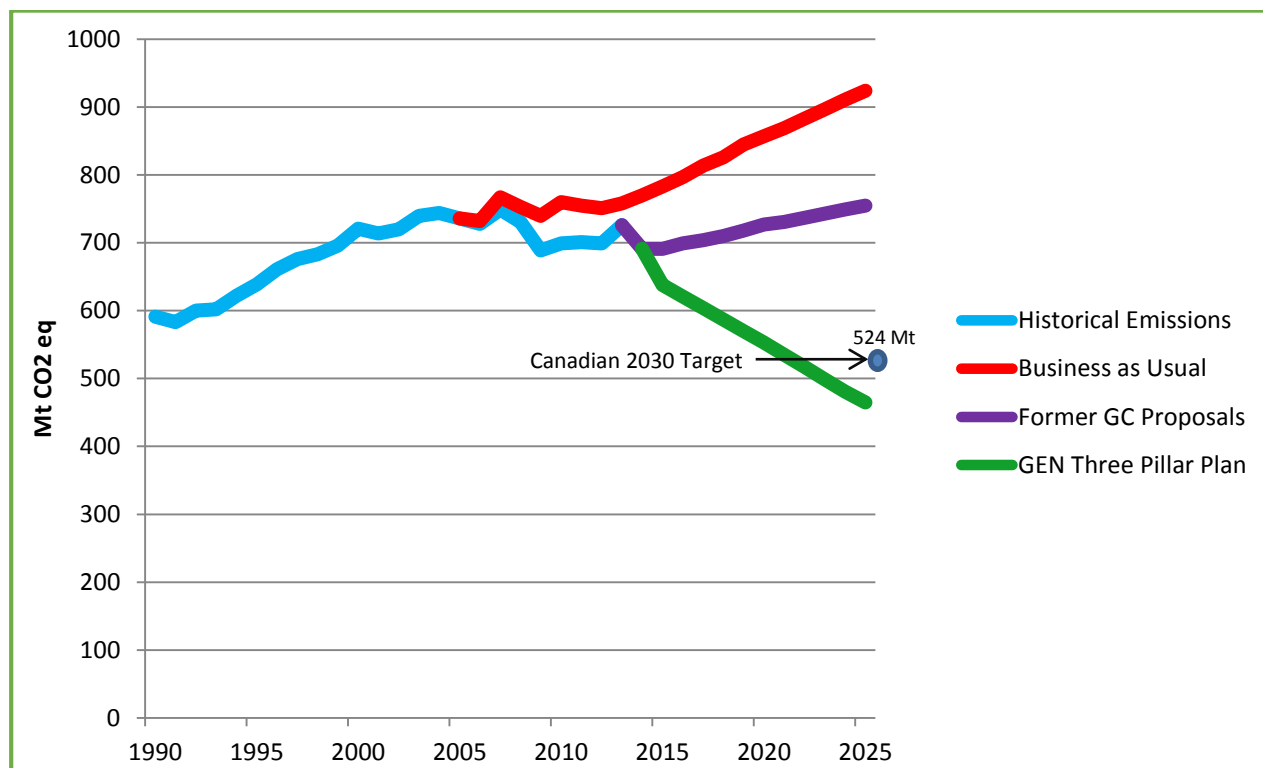
government — federal, provincial, territorial, municipal and First Nations — need to work together to deliver these program strategies in collaboration with the communities directly affected. And, whenever possible, it is important that

Why these Three Pillars?

In 2013, the most recently available official emissions trends data, Canada's total greenhouse gas (GHG) emissions were estimated to be 726 Mt. Energy, buildings, and transport were responsible for 81% or 588 Mt in 2013.^{iv}

the impetus comes from local initiatives aimed at transforming their local economies, so that people can live and work in communities that are more in harmony with nature and the environment.

Figure 2. Canada's Historical Greenhouse Gas Emissions and Projections to 2025 (Mt CO₂ eq)^v



For calculations, see Annex 1: Methodology for Calculations for Green Economy Network Common Platform.

A national carbon pricing plan must be put into effect in order for governments to acquire the additional new capital needed to finance these initiatives. The Carbon Pricing Initiative would serve to raise new government revenues that could be channeled for investments in the three strategic priorities being proposed here for the transition to a green economy, among other things.

"We believe that Canada's Intended Nationally Determined Contributions (INDC) must include a legally binding commitment to cut our domestic carbon pollution in Canada by at least one third within the next 10 years (equivalent to 37% below 2005 levels by 2025)."

Hassan Yussuff, President of the Canadian Labour Congress

In order to avoid economic and climactic disaster, the federal government must work with provinces and territories to coordinate carbon pricing efforts and ensure that a consistent floor price is implemented across the country and that industrial sectors are required to meet performance standards. In addition to a coordinated carbon pricing effort, governments must also ensure that a significant and rapid regulatory transformation is undertaken in the electricity, transportation and buildings sectors.^{vi}

"It's not fair that heavy energy users can dump their carbon pollution in the air we all breathe. Polluters should be held accountable, and should pay for the pollution that they force all of us to live with.

Pricing pollution is a fair way to share responsibility for the carbon pollution that causes climate change and to reward the companies that are most efficient and pollute the least."

Louise Comeau, Climate Action Network

The federal government, in consultation with the provinces and territories, must implement a Carbon Pricing Initiative to reach a harmonized national carbon price of a minimum of \$50 per tonne of CO₂ by 2020. The Carbon Pricing Initiative must also include incremental and predictable annual carbon price increases.



Although there has been considerable fanfare in the last decade about Canada's role as an emerging energy superpower, we believe that Canada needs to diversify its economy and place increased priority on producing forms of energy that are better suited for a new age of climate change. Canada's oil sands megaproject, for example, has already become the country's fastest growing global warming machine. Although the bitumen industry has taken steps to reduce GHG emissions intensity on a barrel-by-barrel basis, studies continue to show that GHG emissions remain substantially higher for oil sands crude bitumen (8 to 37% higher) in comparison with conventional crude production, even on a full life cycle (well to wheels) basis. The relative increase of GHG emissions from oil sands crude bitumen is due to greater production emission intensity.^{vii} The national greenhouse gas emissions from the oil and natural gas sector increased by 67% between 1990 and 2013.^{viii}

If Canada is to be an energy power in an age of climate change, then it must become a producer of *clean* and renewable forms of energy. For instance, in 2012, GHG emissions from electric power generation fell below 1990 levels,^{ix} due mainly to a decline in the use of coal, and an increase in renewable energy sources. Although only three percent of this country's energy currently comes from emerging and low-impact renewable sources,^x Canada has enormous potential for the production of electricity from clean, renewable sources of energy. Our coastal regions along with some inland areas provide major opportunities for wind power through wind farms; specific locations in this country rank amongst the best in the world in terms of direct sunlight for solar power production; and regions in the west and northwest are particularly well suited for large-scale geothermal energy. Meanwhile, Canada is one of those countries best positioned to develop tidal power; our remote rivers and lakes provide opportunities for the limited development of community-based, small-scale hydro projects, and we also have the potential to produce selected biofuels.^{xi}

The transition to the development of clean, renewable energy sources will require nothing less than committed, coordinated and effective leadership. In times like this, it is governments and the public sector that are best equipped to lead in bringing about the kind of systemic change required throughout the entire economy. While the private sector will continue to have an important role to play, governments must lead the way with a multi-pronged strategy

including public investments, ownership, regulations, programs, and infrastructure in order to bring about and signal the transition from a fossil fuel-based economy to one that is powered by renewable energy sources. The federal government, in collaboration with the provinces and territories, municipal, and First Nations' governments, along with the involvement of communities, must take the lead in generating this historic transition.

Local Benefits from Local Natural Resources

The Pukwis Community Wind Park is a 54 megawatts (MW) wind power joint venture between the Chippewas of Georgina Island First Nation and Windfall Ecology Centre. Because it is community owned, more energy dollars stay at home. Typically, 75% to 90% of every dollar paid on an electricity bill leaves our communities. But community owned power projects like Pukwis keep more money in the community to re-circulate and provide spin-off economic benefits. The first phase of the Pukwis Community Wind Park will consist of 10 community-scale windmills with a capacity of 2 MW each and will produce enough electricity to power 7,500 homes.

In order to begin making this transition over the next five years, we maintain that the federal government needs to establish a Renewable Energy Development Strategy. During this period, **public investments totalling \$23.3 billion** need to be made in order to stimulate the development of renewable energy sources with **a priority being placed on wind, solar, geothermal, and tidal power.**^{xii} The plan could also include restricted development of small-scale hydro and selected biofuels from biomass sources. Averaged out over a five year period, this public investment would amount to **an annual federal expenditure of \$4.66 billion**, which is less than 2% of the annual federal budget.^{xiii}

Public investment of these new government revenues in renewable energy development will generate thousands of new jobs in Canada. According to economic modeling developed by the Center for American Progress, an annual investment of \$4.65 billion will create **58,300 full-time jobs for a year (or person job years).**^{xiv} These projections include direct employment in renewable energy industries totalling 22,300 jobs, plus 19,500 jobs in indirect employment in secondary industries, and an additional 16,700 induced jobs generated by money spent by workers in retail and wholesale. If \$1.3 billion of these public revenues were invested in **wind** energy each year, 16,510 person job years (direct, indirect, and induced employment) would be created. Similarly, if \$1 billion were publicly invested in **solar** energy production, 13,400 jobs would be generated each year while another 8,240 jobs would result from an annual investment of \$1 billion in **geothermal** energy

production. Likewise, annual job projections could be calculated for public investments in other renewable energy developments such as **tidal** power projects, **small-scale hydro** and **biofuel** production from biomass.

Table 1. Employment Estimates from Renewable Investments

	Millions / yr	Direct*	Indirect	Induced	Total
Wind Energy	\$1,300	6,110	5,720	4,680	16,510
Solar Photovoltaic	\$1,000	5,500	4,100	3,800	13,400
Geothermal	\$800	2,400	3,520	2,400	8,240
Tidal	\$666	3,596	2,531	2,464	8,591
Hydro	\$553	2,876	2,323	2,101	7,300
Biofuel	\$333	1,798	1,265	1,232	4,296
Total	\$4,652	22,280	19,459	16,677	58,337

*Employment is measured in person job years

In order to ensure that the jobs to be created by a renewable energy development industry go to Canadians, it is imperative that this plan contains provisions for domestic procurement.

Ontario's Green Energy and Economy Act

In Ontario's *Green Energy and Economy Act*, for example, between 25 and 50 percent of the products and content used in renewable energy development must come from local or regional sources. These provisions are critically important for job creation strategies, especially for stimulating the industrial development of component parts for production here in Canada. Otherwise, the component parts of wind turbines, for instance, will be manufactured in and imported from other countries rather than being manufactured domestically by Canadian workers.

This public investment in renewable energy development could be financed through a variety of fiscal measures:

- ❖ Reviewing the mandate of and restoring the funding required for the Clean Energy Fund, thereby potentially making available \$1 billion annually for investment in renewable energy.^{xv}
- ❖ By immediately withdrawing annual subsidies to the fossil fuel sector, the federal government could free up an additional \$34.0 billion in funds for investments in renewable energy production as well as home and building retrofits and public transit.^{xvi}

- ❖ By allocating a portion of the revenues generated through a price on greenhouse gas emissions on the part of emitters in the Canadian economy (as discussed above).
- ❖ By including an additional 5% surtax on gasoline, which could be increased over time, another \$2-2.5 billion dollars in federal revenues for renewable energy development will be generated annually, coupled with a refundable tax credit measure to alleviate costs for workers and low-income earners.^{xvii}

Renewable energy development is proven to substantially offset the use of dirty energy from fossil fuels. Take, for example, the case of Denmark where carbon emissions from electricity production were reduced by 30% between 1991 and 2007, mainly because the country made a decisive move to increase reliance on wind power.^{xviii} Similarly, calculations can be made for greenhouse gas reductions resulting from the other proposed public investments in renewable energy developments, such as solar and tidal power. The GEN Renewable Energy Plan will reduce greenhouse gas emissions by a minimum of 44 Mt per year by 2020.

The transition from fossil fuels to renewable energy provides opportunities for introducing measures to ensure greater social equity and participation in our economy. These measures must include the establishment of a Just Transition Fund to assist workers in upgrading their skills for other employment, including employment in renewable energy production, energy efficiency, and public transit. These Just Transition measures must also ensure that workers in marginalized urban and rural communities have new employment opportunities in these industries. Equally essential are employment opportunities and measures to guarantee consultation with free, prior and informed consent before renewable energy projects are developed on First Nations lands. These measures must also include concrete opportunities to participate in and benefit from such developments. In all cases, the development of renewable energy should involve proper consultation with the communities affected.

**GEN Pillar 1:
Renewable Energy Reduces GHGs
and Creates Jobs**

Implementing GEN's Renewable Energy Development Strategy will reduce greenhouse gas (GHG) emissions by a minimum of 44 Mt CO₂ eq per year and will create 290,000 person job years over five years.

Sault Ste. Marie, ON – Green Energy in Action

Sault Ste. Marie, Ontario, for example, has been developing renewable power as an economic development tool to offset declining employment in steel and forestry. Sault Ste. Marie is home to the one of the largest wind energy farms in Canada, with 126 turbines producing 189 megawatts (MW) of renewable energy, enough to power about 60,000 homes, twice the number in Sault Ste. Marie. There are five hydroelectric stations in the Sault Ste. Marie area generating a total of 203 MW of renewable energy. The Sault's largest steel mill includes a cogeneration power project that produces 70 MW of electricity and reduces the firm's power needs by 50%. Sault Ste. Marie already has a 20 MW solar farm and is now working on an additional 30 MW. A city of only 75,000 residents in Northern Ontario, the Sault is well on its way to providing half a gigawatt of renewable power.

Finally, it is essential that the federal government provide leadership in advancing the GEN Renewable Energy Development Strategy. Although the implementation for such an initiative resides with provincial/territorial and municipal governments, the federal government has a key role to play in initiating, facilitating, and financing the strategic shift to a renewable energy future across Canada. Moreover, the actual transition to a renewable energy economy can only take place if there is strong and vital support from people in local communities and regions. In some cases, there will likely be outright resistance in local communities to making the transition to a renewable energy future. To ensure that the positives outweigh the negatives, governments must place priority on strengthening the incentives and benefits for community participation in renewable energy development.

GEN PILLAR # 2: Green Homes and Green Buildings Strategy

Despite having four distinct seasons with temperatures ranging from frigid cold to blistering hot, Canada's building stock is inadequately constructed to withstand these temperature extremes, resulting in inefficient energy usage. Historically, emphasis has been placed on the amount of energy that Canadians require to heat buildings in the winter. However, it should be noted that the demand for more energy-intensive cooling is expected to increase as a result of climate change. Conserving the energy that we use to regulate the temperature in our homes and buildings should be a top priority. Yet, our current housing and building stock waste a tremendous amount of energy. Most of the energy lost in homes and buildings occurs through walls, ceilings and furnaces. While governments have provided financial assistance to home and building owners in the recent past through programs like EnerGuide and EcoEnergy, little more than 8% of building stock has been retrofitted.

Energy efficiency and conservation are our cleanest, cheapest and most productive energy sources. Investing in energy efficiency and conservation boosts productivity, reduces costs, cleans our air and water, and creates jobs everywhere. An energy efficient economy is a strong, competitive economy and an economy where electricity bills can be lower in response to energy savings, freeing up capital and discretionary income. Energy efficiency is quite unique among energy sources in that it pays for itself through savings over time.

GEN Pillar 2: Energy Efficiency Reduces GHGs and Creates Jobs

Implementing GEN's Green Homes and Green Buildings Strategy will reduce greenhouse gas (GHG) emissions by a minimum of 32 Mt CO₂ eq per year and will create 438,000 person job years over five years.

In both the U.S. and the UK, federal governments have initiated bold programs to retrofit all buildings and homes over the next 15 years,^{xix} including firm targets every five years. They also provide significant weatherization grants for low-income housing.^{xx} Building retrofits have also become one of Germany's key economic and climate change programs.

In addition to improved energy efficiency in Canada's housing stock, there are major energy savings to be made in industrial, commercial, business and public buildings across the country. Surveys by the Canada Green Building Council (CaGBC) have shown that there are huge differences in energy use

among similar buildings that can be attributed to operational practices, as well as large potential gains in lighting, HVAC, and equipment technology.^{xxi}

Table 2: Energy Efficiency for Buildings in Canada^{xxii}

Building Sector	Percent of Total Energy Used	Percent of GHG Emissions
Residential	16%	14%
Commercial and Institutional	12%	11%
Total	28%	25%

Canada needs a bold plan to transform this country's housing and building stock. Drawing on the experience from both the US and the UK, we support the implementation of the National Efficiency Energy Strategy^{xxiii} for Canada, as proposed by a wide range of stakeholders.^{xxiv}

The federal government must work harmoniously with the provinces and territories to implement a national Green Homes and Green Buildings Strategy. Federal programs should be coordinated through an expansion of Natural Resources Canada's Office of Energy Efficiency.^{xxv} Funding for the expansion of the Office of Energy Efficiency will be allocated from revenues generated by the Carbon Pricing Initiative, for a total of \$1.1 billion, provided over five years.^{xxvi} To leverage additional private investment to finance energy efficiency programs, the new initiatives must include a national Green Bonds scheme of \$2.5 billion.^{xxvii} The Liberal Government's election platform highlighted the potential for Green Bonds to support both large and community-scale renewable energy projects, including home and building retrofits.

What is a Green Bond?

A bond is a way to raise money. An investor will buy a bond from a qualified organization, which promises interest and repayment when the bond matures. Green bonds are a tax-exempt bond issued by federally qualified organizations for the development of projects that reduce GHG emissions.

The Office of Energy Efficiency would also maintain energy standards, codes and benchmarking services, and support the adoption of innovative "Pay as you Save" property tax-based financing programs by municipalities and local electricity distribution companies. "Pay as you Save" programs will reduce electricity bills by a greater amount than loan repayments, so that families save money in the very first month and homes are more energy efficient. Property tax-based financing is smart policy which allows property owners to undertake

efficiency improvements to their property with low-interest loans that are repaid over time through installments. The home energy retrofit and energy savings achieved through home retrofits offset the repayment installments and guarantee energy cost savings into the future. Property tax-based financing is attached to the property and not the homeowner, so it is easy to move and the property value is raised because the repayment obligation and energy cost savings are transferred with the home ownership.^{xxviii}

An Example of “Pay as You Save”

On-Bill Repayments with Manitoba Hydro’s Power Smart Residential Loan provides financing of a minimum of \$500 up to \$7500 for energy efficiency improvements with no down payment required. The on-bill repayment system allows residents to pay instalments on their hydro bill for a maximum loan period of 5 years and starts at just \$15/month.

To develop and implement this Green Homes and Green Buildings Strategy, the federal government has a key role to play in reaching an agreement on national energy efficiency targets and in ensuring that financial institutions guarantee loans to municipal governments for property tax system financing for retrofits. The Strategy must include assistance for low-income residents by providing grants for retrofits; maintenance and expansion of national efficiency support services; and more stringent national efficiency regulations. While

most of the investments and the jobs created will occur in local communities with provincial and municipal agencies, the federal government can help to weave these activities together in a national Green Homes and Green Buildings Strategy.^{xxix}

Green Homes Program

Over the next five years, the Green Homes program would have the following objectives:

- a) retrofit **40% of Canadian homes by 2020** to an average level of 30% increased efficiency energy savings per home;
- b) upgrade **150,000 low-income homes** and **reduce energy bills** by an average of 30% by 2020; and
- c) increase the energy efficiency of new homes by 2% per year **towards 2025 when all homes built after that date will produce as much energy as they consume (net zero).**

As with the U.S. and UK programs, innovative financing arrangements would be made to raise capital through financial institutions and the property tax system, with loans being paid off through energy cost savings.

This national Green Homes program would include the following components:

- ❖ **Low-Income Housing Grants:** Targeted direct investment in housing weatherization and rebates for upgrades in low-income housing across all provinces and territories as part of a national social housing improvement program.
- ❖ **New Housing Requirements:** Inclusion of energy efficiency requirements in national and provincial building codes upgraded every three years to best practices, always moving towards homes which produce as much energy as they consume (net zero).
- ❖ **Property Tax Financing:** “Pay as you save” property tax-based financing programs by municipalities for major home retrofits and renovations for loan repayment, which can be transferred with ownership.
- ❖ **On-Bill Repayments:** “Pay as you save” financing program system for smaller retrofits run through financial institutions and utilities using utility bills (see text box on previous page).
- ❖ **Renovator Training:** A national home retrofit training and certification program to reach all types of renovators through major collaboration between governments, home builders associations and community colleges.
- ❖ **Mandatory Labelling:** Universal and easy to understand home energy labelling at time of sale or with a new rental agreement.
- ❖ **Retrofit Standards:** Minimum building and housing retrofit standards at time of sale or renovation to be phased in over 5 years in all provinces, following a national model home retrofit code.

What is Net Zero?

The amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building.

Green Buildings Program

The main objectives of the Green Buildings Program would be to improve the **technical and operational efficiency** of all buildings (industrial, commercial, business and public) across Canada **by 50% over the next five years** and require all new buildings to be **net zero by 2025**.

This Green Buildings initiative would include the following components:

- ❖ **Mandatory Labelling:** Universal building labelling at time of sale or with a new rental agreement.
- ❖ **Performance-Based Conservation Data:** National building performance database and benchmarking service.
- ❖ **Regional Efficiency Centres:** providing comprehensive “audit-to-implementation” technical assistance services to major

commercial/institutional energy users and small and medium-scale enterprises (see text box below).

- ❖ **Loan Guarantees:** Innovative financing including loan guarantees for new green buildings and major retrofits and linked to domestic procurement provisions.
- ❖ **Property Tax-Based Financing:** “Pay as you save” property tax-based financing programs for small businesses for major building retrofits and renovations.
- ❖ **Support for New Net Zero Buildings:** Through training, R&D and fiscal incentives such as tax credits tied to domestic procurement.

Targeted Technical Services: Vermont Energy Efficiency

Many successful energy efficiency organizations, like Vermont Efficiency, have found that providing targeted technical services to energy users is more effective than programs that provide financial incentives and standard solutions. Governments can play a valuable benchmarking role and provide technical service staff to help energy users in all aspects of energy efficiency, from auditing, to operational improvements, to financing and commissioning.

Public investment of \$30 billion will be required in order to achieve the target objectives outlined above for the Green Homes and Green Buildings Strategy by 2020.

An investment of \$30 billion over a five year period will result in tens of thousands of person job years being created in the Canadian economy. Applying the Center for American Progress methodology, a \$30 billion investment over five years would **generate 438,000 person job years** of employment. Of these, 189,000 would be direct employment in the building retrofit industry, 123,000 would be in secondary industries, and 126,000 would be in the form of induced jobs in communities resulting from increased retail sales and services stimulated by this investment, not including the additional funds likely invested in the economy as a result of lower electricity bills.

Achieving the target objectives for the Green Homes and Green Buildings Strategy will result in a substantial increase in the energy efficiency of Canadian buildings, due to a major decrease in energy use. As a result, Canada’s greenhouse gas emissions will be reduced by a minimum of **32 Mt per year by 2020**, with the potential for additional reductions.

Marginalized communities and marginalized individuals will benefit tremendously from special rebates for low-income housing retrofits along with renewed social housing development involving energy efficient units, paired

with job opportunities for community members and unemployed workers. It's not just about substantially reducing heating and cooling costs for poor people and seniors, it's about reducing poverty as a whole, creating jobs, and fighting for fairness.



The transportation sector was responsible for **28% of Canada's Greenhouse Gas (GHG) emissions** in 2013.^{xxx} Just over half of the energy used in this sector is specifically dedicated to transporting *people*. If Canada is to make the much-needed shift to a **green economy**, major investments will be needed to enhance our public transit and intercity rail capacity to transport people and thereby reduce the dependency on conventional private automobiles as the primary means of transportation.

For many Canadians today, transporting themselves by private automobiles, particularly in our major urban centres, has become a quality of life issue involving a great deal of personal time, stress and money. There is an urgent need, therefore, to rethink how we transport people within and between municipalities in this country. This, in turn, is integral to the need to rethink how we redesign and rebuild our cities and our workplaces for the 21st century.

**GEN Pillar 3:
Public Transit Reduces GHGs
and Creates Jobs**

Implementing GEN's National Public Transportation Strategy will reduce greenhouse gas (GHG) emissions by a minimum of 12 Mt CO₂ eq per year and will create 324,600 person job years over five years.

In the Wake of Urban Sprawl

"In its path, sprawl consumes thousands of acres of forests and farmland, woodlands and wetlands. It requires government to spend millions extra to build new schools, streets, and water and sewer lines. In its wake, sprawl leaves boarded up houses, vacant storefronts, closed businesses, abandoned and often contaminated industrial sites, and traffic congestion stretching miles from urban centres... As a result, we suffer from increased traffic congestion, longer commutes, increased dependence on fossil fuels, crowded schools, worsening air and water pollution, threatened surface and ground water supplies, lost open space and wetlands, increased flooding, destroyed wildlife habitat, higher taxes, and dying city centres."^{xxxi}

Indeed, public investment in transit is very cost effective. As a recent report shows, it “reduces the amount of public money that must be spent on everything from health care to municipal services such as water and wastewater.”^{xxxiii} In fact, in 2007 alone investments in urban transit saved Canadians \$115 million in related respiratory health costs, \$2.5 billion in traffic collision costs, and \$5 billion in household vehicle operating costs. When social costs and parking costs are taken into account, transit is actually one-third to one-half the cost of automobile use.^{xxxiv} In addition, Canadian transit systems contribute some \$10 billion to Canada’s economy each year.

Canada needs a national transportation plan designed to encourage Canadians to reduce their dependency on private automobiles as their main mode of transport. We therefore propose a **National Public Transportation Strategy** that involves a two-pronged approach:

- 1) **Public Transit Systems:** the development and/or the expansion of public transit systems within urban centres across the country;
- 2) **Intercity Rail Systems:** the development of high-speed rail systems in urban corridors (i.e. Québec City – Montréal – Toronto – Windsor; Edmonton-Calgary; Vancouver-Seattle).

To be effective, such a public transportation strategy needs to be accessible, affordable, and accountable.

Today, we have a rather piecemeal approach to the development of public transit systems in this country. Under present fiscal arrangements, provincial and federal governments help municipalities pay for capital projects in public transportation, but municipal governments still end up bearing the brunt of the combined operations and capital costs, despite the fact that all Canadians benefit from improved transit.

Currently, most operating expenses from municipal transit systems in Canada are covered at the municipal level. An average of **61%** of operating costs are covered through ridership fees; the rest is mostly covered by municipal property taxes.

In recent years, municipalities have also covered an average of **18%** of transit capital costs; provinces have covered an average of **65%** of capital costs, and the federal government contributed an average of **14%**.^{xxxv}

The current level of funding from federal and provincial governments is insufficient to meet the needs for municipal transit systems, let alone intercity rail.

Aside from paying for repeated studies demonstrating the feasibility and practicality of implementing High-Speed Rail (HSR) lines in major corridors,

\$0 have thus far been spent by the provinces and the federal government for this important initiative.

Table 3. High-Speed Rail Plans Compared^{xxxvi}

Country	Km of HSR track today	Km of HSR track planned
Canada	0	0
China	6299	7240
France	1896	2826
Germany	1285	1048
Italy	923	395
Japan	2664	961
Russia	0	650
Spain	2056	3469
United Kingdom	113	204
United States	362	900

In the short term, we propose that a public investment plan be put in place by governments to address the current needs of public transit systems across the country and also begin to enable the development of efficient low-impact rail travel between the nation's most populous urban areas and along its busiest routes. More specifically, this plan should include:^{xxxvii}

- ❖ **\$53.5 billion** for Canadian **public transit** systems over a five-year investment period (2016-2021), specifically for capital costs.
 - Of this figure, **33% (\$17.6 billion)** does not fit within existing funding plans and thus will require new funding from provincial and federal governments.^{xxxviii}
- ❖ **\$25.7 billion** to design and build three key **High-Speed Rail** (HSR) projects.
 - Of this figure, roughly **78% (\$20 billion)** would go towards building the Québec City – Montréal – Toronto – Windsor high-speed corridor; **14% (\$3.7 billion)** would go towards an HSR link between Calgary and Edmonton; and **8% (\$2 billion)** would go towards a high-speed link between Vancouver and Seattle.^{xxxix}

To be effective, such investments in public transportation also need to coincide with a **scaling down of provincial government investments in highway construction**.

In the medium term, however, additional public investments in urban public transit and intercity rail will be required to ensure that the future

transportation needs of Canada's growing population are adequately met in a sustainable manner. A 2008 study by HDR Decision Economics,^{xi} for example, shows that **\$71.3 billion** (earmarked specifically for capital expenditures) was needed to bring Canada's transit systems up to an 'optimal level' of supply and demand. Since then, about \$18.5 billion has been invested, mostly by the provinces.^{xli} This means that more than **\$52.8 billion** is likely still needed to optimize transit supply and demand in Canada.

The federal government must work jointly with the provinces and territories to initiate a national public transportation strategy that allocates major funds for these two important transportation priorities in order to ensure that the foundation is laid to sustainably meet the transportation needs of people in this country. The capital required to cover the additional investment costs outlined above would come from new government funds generated by the **Carbon Pricing Initiative**. As a study commissioned by the David Suzuki Foundation and the Pembina Institute showed, an ambitious carbon pricing program could provide new revenues to fund **\$77 billion** in new spending on public transit and intercity rail, between the years 2016 and 2026.^{xlii}

Clearly, investments in public transit and intercity rail, especially when paired with good government policies on renewable energy production, energy efficiency and domestic procurement, would continue to offer these benefits to Canadians. In fact, the HDR Decision Economics study mentioned above also notes that by investing enough funds to create an optimal supply of transit over a five-year period, Canada could acquire an economic benefit of **\$238.6 billion** over the ensuing 25 years (in the areas of affordable mobility, regional and commercial development, and congestion management).^{xliii}

More immediately, the short-term public investments outlined above would create tens of thousands of job years for Canadians. An investment of \$53.5 billion for public transit development and expansion spread over five years at **\$10.7 billion a year**, would **generate annually 136,000 person job years**. Of these, over 52,000 would be direct forms of employment in various parts of the public transit industry, close to 45,000 in secondary industries and nearly 39,000 in induced employment. In addition, an investment of \$25.7 billion for the development of intercity high-speed rail in designated urban corridors over five years at **\$5.14 billion per year**, would create **another 65,500 person job years annually**. Of these, over 25,000 would be direct employment in the rail car industry, nearly 22,000 in secondary industries and 18,500 in induced

Public Transportation and Equity

The number of Canadians using public transit for their daily commute has risen to 12% and in larger metropolitan areas the number is as high as 23%. In large metropolitan areas, a much higher percentage of immigrants commute by public transport than Canadian-born users. Women have different transit needs than men and rely more heavily on public transportation. Transit renewal and growth contributes to good jobs in unionized transit systems, and in the local manufacturing of buses, trains, and streetcars.

forms of employment. Further investments to bring Canada's public transit systems up to optimal levels would create even more job years.

A national public transportation strategy will also contribute to substantial reductions in Canada's greenhouse gas emissions. Every year, GHG emissions from transportation continue to grow, mainly because of higher rates of air travel and automobile use. Between 1990 and 2013, transportation-related emissions increased by 31% (40 Mt).^{xliv} Accordingly, investment in public transportation — particularly forms of transportation that draw upon renewable energy — will help us to reduce a large portion of our national net emissions.

A national public transportation strategy, with an investment of \$17.6 billion for public transit and \$10 billion towards developing high speed rail corridors, will result in the creation of **324,600 jobs in five years**. During that time, the direct GHG emission reductions achieved through diversion from private vehicles will be between **12 and 25 Mt per year**. Indirect GHG emission reductions from increased urban density and the avoidance of future increases in GHG emissions from a “business-as-usual” approach will result in even further GHG emission reductions in the long term.

The Lag Effect

The majority of GHG emission reductions from public transit are indirect. The direct effect of public transit on GHG emission reductions is known as the ridership effect, which is the diversion (transportation mode shift) of passengers from private vehicles to public transportation. The indirect effect of public transit on GHG emission reductions is known as the land use effect, which is the promotion of compact development and an increase in urban density through better urban planning, rather than an increase in urban sprawl. The land use effect fosters more compact communities with shorter trip distances, which results in fewer emissions from non-transit users as well. For example, a recent study by Gallivan et al. (2015) shows that indirect GHG emission reductions resulting from the land use effect are four times larger than the direct emission reductions from the ridership effect. Using this methodology, the GHG emission reductions that could be achieved through investment in public transit could be between 48 and 100 Mt annually. However, these are long-term GHG emission reductions benefits of investment in public transit, which are realized decades after implementation.^{xlv}

Indeed, the key to the success of such a transportation strategy is to ensure that more Canadians make use of public transit and intercity rail. In order to attract more Canadians to make use of public transportation, a national strategy must ensure that public transit and high-speed rail are affordable, especially for low-income people and for workers. Unless public transit can be made affordable to all through low transit fares, the chances of encouraging millions of Canadians to reduce their dependency on the automobile will be diminished. As well, a national transportation strategy like the one outlined above should have other built-in equity measures to ensure that low-income communities benefit from the jobs created, plus the economic development opportunities.

Finally, developing and implementing a national public transportation initiative along these lines will require leadership from the federal government. Both provincial and municipal governments have major roles to play. However, the effectiveness of such a strategy depends on having national targets and predictable financing arrangements in place. The federal government must play an integral role in facilitating and coordinating agreements amongst all levels of government, including incentives designed to strengthen community support for transit.

Conclusion

Canada is at a crossroads. The choices we make today will determine whether we, as a society and a country, are destined for a sustainable or an unsustainable future. GEN and its member groups have proposed a plan of action designed to put us on the road towards a sustainable future. This three-pronged plan calls for public leadership and investment in national initiatives for renewable energy development, energy efficiency through building retrofits, and public transit along with high-speed rail. As the following chart shows, the three pillars of this strategy are interrelated and interdependent.

The One Million Climate Jobs challenge will result in substantial job creation and GHG emission reductions within the first year. In the fifth year, one million climate jobs will have been created for Canadians. By year 10, Canada will be well on the way to achieving the level of GHG emission reductions required to meet the international target set in the Paris Agreement.

Table 4. Benefits from the GEN Plan

	1st Year Targets	5-Year Targets	10-Year Targets
Job Creation	349,000 person job years + an unknown number generated by “pay-as-you-save” financing for green buildings.	[cumulative] 1,052,600 person job years	[cumulative] 2,469,000 person job years
Greenhouse Gas [GHG] Reductions	53 Mt of GHG reduced per year	174.5 Mt of GHG reduced per year	261 Mt of GHG reduced per year
Public Investments ***** Innovative Private Financing for Building Retrofits	\$22.51 billion in public investments ***** Unpredictable target in first years of “pay-as-you-save” financing	[cumulative] \$80.90 billion in public investments ***** An estimated \$20 billion in “pay-as-you-save” financing for green buildings	[cumulative] \$185.8 billion in public investments ***** \$50 billion in “pay-as-you-save” financing for green buildings
Equity Measures (Samples) <ul style="list-style-type: none"> • Just Transition strategies for both EI eligible and non-EI eligible workers • Concrete opportunities for jobs in low-income communities • Rebates/tax credits and support for low-income households • Prior consultation and consent for projects on First Nations lands 			

GEN’s Three Pillar Plan lays the foundation in Canada to make the transition to a green economy future and puts us on track to meet our climate change obligations. Our three-pronged plan of action is not meant to be a panacea. Even if these three priorities were to be fully developed and implemented, there would be other initiatives that would be required to overcome the triple challenge we face as a society in terms of our economic, environmental and energy future.

Any transition strategies to a green economy future, however, must also take account of existing global trade regimes and their legal impact. Over the past 25 years or so, the liberalization of trade rules through NAFTA and the WTO has tended to undermine the confidence and capacity of governments to manage their own economies in the public interest of their peoples and the environment. Under such trade regimes, foreign governments and corporations can challenge the innovative policies of national governments on environmental and energy issues as unfair trade practices and call for retaliatory measures. In making the transition to a green economy future, we recommend maintaining a vigilant stance concerning the potential impacts of trade rules.^{xlvi}

**Challenging World Trade Organization (WTO) Restrictions:
Example of Green Energy and Economy Act**

Ontario's Green Energy and Economy Act 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 for the world to successfully reduce GHG emissions, 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 Canada to receive the maximum benefit of GEN's Three Pillar Plan.

The clock is ticking and we don't have time to waste. If we, as a country, continue to procrastinate and delay taking action, we will find ourselves paying a much heftier cost for our inaction, both economically and socially, as well as environmentally. As the Stern Report warned, allowing global warming to go unchecked could eventually result in annual declines of 5% of GDP, now and forever.^{xlvi} Canada has the fiscal capacity and tools to make this transition to a sustainable economic model for the future now. What is needed is the political imagination and courage to make this a national goal and priority.

"A significant increase in global average temperature will lead to widespread, harmful global impacts over the coming century, such the rapid deterioration of eco-systems, large-scale losses of biodiversity, rising sea levels, significant increases in extreme weather events, and trillions of dollars in economic losses. At the same time, the opportunities presented by the urgent need for economic transformation are great. We are confident that the expanded investment required to achieve a just and orderly transition to a sustainable economy will stimulate economic growth and job creation, lift the long-run competitiveness and growth potential of the Canadian economy, and improve the quality of life for Canadians well into the future."

Hassan Yussuff, President of the Canadian Labour Congress

We will work with our members and concerned citizens in communities across the country to build a strong base of popular support for the three pillars we have proposed here — renewable energy development, green building retrofits, plus a national public transportation strategy — as concrete transformative measures to ensure a more equitable and sustainable economy.

- i Based on information obtained from Statistics Canada and Natural Resources Canada, the average private vehicle emits 4.4118 tonnes of CO₂ eq. per 20,000 km (average distance travelled in one year).

Government of Alberta (2008). *Alberta's 2008 Climate Change Strategy: Responsibility/Leadership/Action* <http://environment.gov.ab.ca/info/library/7894.pdf>

Natural Resources Canada (2015). *Fuel Consumption Ratings Search Tool – Conventional vehicles* <http://www.nrcan.gc.ca/energy/transportation/personal/7469>

Statistics Canada (2012). *Greenhouse Gas Emissions from Private Vehicles in Canada, 1990 to 2007* <http://www.statcan.gc.ca/pub/16-001-m/2010012/part-partie1-eng.htm>

Statistics Canada (2015). *Motor vehicle registrations, by province and territory (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick)* <http://www.statcan.gc.ca/tables-tableaux/sum-som/101/cst01/trade14a-eng.htm>

Total annual emissions for the average residence in Canada (based on the average detached and semi-detached home) were calculated to be 11.5675 tonnes of CO₂ eq. based on housing information from Statistics Canada and emissions factor data from Environment Canada

British Columbia Ministry of the Environment (2014). *Best Practices Methodology for Quantifying Greenhouse Gas Emissions* <http://www2.gov.bc.ca/gov/content/environment/climate-change/policy-legislation-programs/carbon-neutral-government/measure>

City of Calgary (2011). *Greenhouse Gas Action Toolkit for Alberta Communities* <http://ghgtoolkit.mccac.ca/start-the-journey/calculating-emissions/chapter-6-no>

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

The calculations presented for GHG emissions from private vehicles and average residences in a Canadian context are corroborated by data from the EPA, where 1 Mt CO₂ eq is equivalent to the emissions from 210,526 passenger vehicles or 91,241 homes.

United States Environmental Protection Agency (2015). *Greenhouse Gas Equivalencies Calculator* <http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

- ii Canada's commitment under the Paris Agreement is 524 Mt by 2030

Environment and Climate Change Canada (2016). *Backgrounder: Canada's Greenhouse Gas Emissions Projections in 2020 and 2030* <http://news.gc.ca/web/article-en.do?nid=1030489>

- iii Data for Figure 1. is available in Annex 1: Methodology for Calculations

- iv Environment Canada (2015). *National Inventory Report 1990 – 2013, Section ES.2*

- v Data for Figure 2. is available in Annex 1: Methodology for Calculations

Canada's commitment under the Paris Agreement is 524 Mt by 2030

Environment and Climate Change Canada (2016). *Backgrounder: Canada's Greenhouse Gas Emissions Projections in 2020 and 2030* <http://news.gc.ca/web/article-en.do?nid=1030489>

- vi Climate Action Network (2015). *Three Big Moves Toward a 100% Renewable Energy System for Canada* <http://foecanada.org/en/files/2015/11/ThreeBigMoves.pdf>

- vii Pembina Institute (2013). *Beneath the Surface: A Review of Key Facts in the Oilsands Debate* <http://www.pembina.org/reports/beneath-the-surface-oilsands-facts-201301.pdf>

- viii Environment Canada (2015). *National Inventory Report 1990 – 2013, Section ES.4*
- ix Environment Canada (2014). *National Inventory Report 1990 – 2012, Section ES.3*
- x Excluding hydroelectric power
- xi Biofuels includes solid biomass, liquid fuels and various biogases. The two most common biofuels are bioethanol and biodiesel. Most of these fuels are made from three kinds of agricultural feedstocks, which are also used for food: Biofuels can also be made from biomass – by converting cellulose from grasses and waste wood into ethanol or by processing animal waste, fat, algae, and urban wastes into biodiesel. While biofuels are regarded as a more environmental source of fuel in comparison to oil, critique rises around the ecological effect of biofuel production as food and fuel compete for scarce resources.
- xii This is based on an annual public investment of 4.65 billion dollars which would be allocated as follows: \$1.3 billion being allocated to wind, \$1 billion for solar, \$800 million for geothermal, \$666 million for tidal, \$333 million for biofuel and \$553 million for small- scale hydroelectric. Over a five year period, this would amount to \$23.25 billion. Other formula for allocations may be proposed. Main priority for renewable energy development here is on the first three – wind, solar and geothermal.
- xiii Based on federal expenditures from the 2013-2014 fiscal year of \$280.5 billion, <http://www.budget.gc.ca/2014/docs/plan/ch4-2-eng.html>
- xiv The method used by the Green Economy Network in forecasting job creation is based on research by Robert Pollin, Heidi Garrett-Peltier, James Heintz, and Bracken Hendricks, Centre for American Progress and University of Massachusetts Amherst, “Green Growth”, September 2014. The formula covers jobs created per each billion dollars of investment in three categories: direct employment in the primary industry [ies]; indirect employment in secondary industries and suppliers; and induced employment in retail and service industries.
- The particular method for induced job creation is based on the input-output model of employment through increased demand of final products for industries. Induced job creation was estimated assuming spending is designed to generate a large induced expansion of jobs based on high levels of unemployment, spending on domestic industries over imports and the encouragement of private sector investment.
- xv Natural Resources Canada (2013). *Clean Energy Fund Renewable Energy and Clean Energy Systems Demonstration Projects* <http://www.nrcan.gc.ca/media-room/news-release/01a/2010-01/2577>
- xvi The International Monetary Fund estimates that energy subsidies in Canada exceed \$34 billion annually in direct support to producers and uncollected tax on externalized costs.
- Clements, M. B. J., Coady, D., Fabrizio, M. S., Gupta, M. S., Alleyne, M. T. S. C., & Sdralevich, M. C. A. (2013). *Energy subsidy reform: lessons and implications*. International Monetary Fund.
- xvii Natural Resources Canada (2016). *Energy Sources: Average Retail Prices for Regular Gasoline (Last 52 Weeks)* http://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm
- Transport Canada (2014). *Transportation in Canada 2013: Overview Report* https://www.tc.gc.ca/media/documents/policy/Transportation_in_Canada_2013_eng_ACCESS.pdf
- xviii Pembina Institute, *Wind Power Realities: Getting the Facts Straight*, 2007.
- xix California Energy Commission (2011). *Revised Zero Net Energy (ZNE) Definition* http://www.energy.ca.gov/2011_energy/policy/documents/2011-07-20_workshop/presentations/Revised_Zero_Net_Energy_Definition.pdf

- Department of Energy and Climate Change, UK Government (2013). *New energy infrastructure investment to fuel recovery* <https://www.gov.uk/government/news/new-energy-infrastructure-investment-to-fuel-recovery>
- xx UK Department of Energy and Climate Change (2010). *The Green Deal* http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/green_deal/green_deal.aspx
- xxi Canada Green Building Council (2014). *Canada Green Building Trends: Benefits Driving the New and Retrofit Market* <https://www.cagbc.org/cagbcdocs/resources/CaGBC%20McGraw%20Hill%20Cdn%20Market%20Study.pdf>
- xxii Natural Resources Canada (2014). *Improving Energy Performance in Canada: Report to Parliament Under the Energy Efficiency Act For the Fiscal Year 2012–2013* <http://oee.nrcan.gc.ca/publications/statistics/parliament/2012-2013/pdf/parliament12-13.pdf>
- Natural Resources Canada (2015). *Canada's GHG Emissions by Sector, End-Use and Subsector – Including Electricity-Related Emissions* <http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB§or=aaa&juris=ca&rn=3&page=0>
- xxiii Natural Resources Canada (2014). *Improving Energy Performance in Canada: Report to Parliament Under the Energy Efficiency Act For the Fiscal Year 2012–2013* <http://oee.nrcan.gc.ca/publications/statistics/parliament/2012-2013/pdf/parliament12-13.pdf>
- xxiv As per a dialogue hosted by the Canadian Energy Efficiency and the Canadian Renewable Energy Alliances
- See *A National Energy Efficiency Strategy for Canada – Supplement: Model National Energy Efficiency Initiatives*, August, 2010, Prepared by the Canadian Energy Efficiency Alliance and the Canadian Renewable Energy Alliance.
- xxv Natural Resources Canada (2015). *Office of Energy Efficiency* <http://www.nrcan.gc.ca/energy/offices-labs/office-energy-efficiency>
- xxvi With respect to Green Homes, \$500 million over 5 years would be invested in low-income housing upgrades, and \$250 million over 5 years to national training and certification programs. With respect to Green Buildings, \$250 million would be invested over 5 years in national buildings training and technical service centre. \$100 million would be used to set up and maintain the Green Bonds Scheme.
- xxvii These targets are identical to those proposed to the Council of Energy Ministers Built Environment Efficiency Working Group in 2007. Energy savings were calculated through modeling carried out by the Office of Energy Efficiency for the Working Group at that time.
- xxviii A report was prepared for Natural Resources Canada in 2005 showing how the innovative financing approach of attaching energy efficiency loans to a property instead of the owner could be used in each Province: *Using Local Improvement Charges to Finance Energy Efficiency Improvements – Applicability across Canada*. Pembina Institute, 2005 <http://www.pembina.org/pub/197>. This approach has since been used in the United States Property Assessment for Clean Energy (PACE) program and is being put into place in Halifax and Vancouver.
- xxix The role of the federal government would be:
- Providing major financial support for national low-income housing upgrades;
 - Upgrading the national building code;
 - Maintaining a home energy database and EnerGuide benchmarking system;

- Guaranteeing loans through CMHC with financial institutions and provincial municipal lending agencies to guarantee loans to municipalities for property tax system financing for home retrofits;
- National training and certification program for skilled trades to inter-provincial standards;
- National model home retrofit code setting minimum standards for home upgrade at time of sale or lease; and
- Be a leader in operations as well as policy by retrofitting the federal building stock and illustrating how investments in efficiency save money and how through domestic procurement the government can create markets for Canadian mandatory home labelling regulations;
- New regulations on minimum retrofit upgrades on sale or lease phased in over five years; and
- Revisions to legislation to allow municipalities to use the property tax system for financing energy efficient retrofits.
- Business and technology and create jobs.

The role of provincial/territorial governments would be:

- Regular upgrading of building code energy efficiency requirements to best practices;
- Delivery of low-income housing upgrade programs;
- Mandatory home labelling regulations;
- New regulations on minimum retrofit upgrades on sale or lease phased in over five years; and
- Revisions to legislation to allow municipalities to use the property tax system for financing energy efficient retrofits.

- xxx Environment Canada (2015). *National Inventory Report 1990 – 2013*, Section ES.3
- xxxi Soule, David C. *Urban sprawl: a comprehensive reference guide*. Greenwood Publishing Group, 2006.
- xxxiii Metropolitan Knowledge International, McCormick Rankin Corporation and Jeff Casello, *The Economic Impact of Transit Investment: A National Survey*, (Toronto: Canadian Urban Transit Association, 2010): 3.
- xxxiv Ibid p 3, 28.
- xxxv Canadian Urban Transit Association (2015). *Historical Canadian Government Funding Table 1980-2014*. <http://www.cutaactu.ca/en/public-transit/publicationsandresearch/resources/Gov-Funding---Historical-Data.pdf>
- xxxvi International Union of Railways (2016). *High Speed* <http://www.uic.org/highspeed>
Sedghi, Ami. (2012) “High-speed rail: how do we compare to the rest of the world?” *The Guardian*. <http://www.theguardian.com/news/datablog/2012/jan/10/high-speed-rail-hs2>
Transport Canada (2011). *Updated Feasibility Study of a High Speed Rail Service in the Québec City – Windsor Corridor* <http://www.tc.gc.ca/eng/policy/acg-acgb-high-speed-rail-2956.htm>
U.S. High Speed Rail (2015). *High Speed Rail Around the World* <http://www.ushsr.com/hsr/hsrworldwide.html>
- xxxvii 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.
- xxxviii Parliament of Canada (2015). *Updating Infrastructure in Canada: An Examination of Needs and Investments* http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=8042716&Language=E&Mode=1&Parl=41&Ses=2&File=39#_edn34
- xxxix The Canadian component of the Vancouver Seattle link would involve the portion of the tracks

from downtown Vancouver to the U.S. Border with Canadian agencies covering likely about half of the total costs between Vancouver-Seattle with the other half being carried by the various municipal, state and federal government of the United States.

Ministry of Transportation of Ontario and Transport Canada (2011). *Updated Feasibility Study of a High Speed Rail Service in the Quebec City – Windsor Corridor*

<https://drive.google.com/folderview?id=0B6QvXHw7cJQ2TUFQNmx0Zzd3WkE&usp=sharing>

Transportation Economics & Management Systems for Alberta Infrastructure and Transportation (2008). *Economic Benefits for Development of High-Speed Rail Service in the Calgary-Edmonton*

https://www.transportation.alberta.ca/Content/publications/production/Economic_Benefits_of_HST_02-2008_rev.pdf

HDR Decision Economics, *The Optimal Supply and Demand for Urban Transit in Canada*, (HDR Decision Economics, August 2008).

xli Canadian Urban Transit Association. (2014). *New Building Canada Plan, Issue Paper 44*. Figure 2: Sources of Transit Capital Investment (2001 – 2012). http://www.cutaactu.ca/en/public-transit/publicationsandresearch/resources/Issue_Paper_44_E.pdf.

xlili Pembina Institute and the David Suzuki Foundation, Climate Leadership, Economic Prosperity: *Final Report on the Economic Study of Greenhouse gas Targets and Policies for Canada*, 2009. See also the accompanying technical report by MK Jaccard and Associates Inc., *Final Report: Exploration of Two Greenhouse Gas Emission Targets*

xlili HDR Decision Economics study, *op.cit.*

xliv Environment Canada, 2015, *National Inventory Report 1990 – 2013, Section ES.4*

xlv Gallivan, F., Rose, E., Ewing, R., Hamidi, S., & Brown, T. (2015). *Quantifying Transit's Impact on GHG Emissions and Energy Use—The Land Use Component* (No. Project H-46). http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_176.pdf

xlvi In addition to global trade being a major cause of increased greenhouse gas emissions, existing multilateral, regional and bilateral trade regimes leave vulnerable and undermine the ability of governments to enact non-trade related policies and laws designed to preserve and protect the environment and natural resources. The investor-state provisions under NAFTA, for example, which allow corporations to sue countries and receive compensation for the violation of its trade rules, are of particular concern. More specifically, provisions in Ontario's Green Energy Act are currently being challenged under the World Trade Organization as an unfair trade practice. Since these new trade regimes have more legal clout than existing multilateral environmental agreements, the pursuit of green economy transition strategies may involve challenging existing trade rules.

The Globe and Mail (2013). *Ontario to change green energy law after WTO ruling* <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/ontario-to-change-green-energy-law-after-wto-ruling/article12236781/>

Sinclair, S. (2013). "Saving the Green Economy: Ontario's Green Energy Act and the WTO." *Canadian Center for Policy Alternatives* <https://www.policyalternatives.ca/publications/reports/saving-green-economy>

Spears, J. and Ferguson, R. (2013). *Ontario Green Energy Act job incentives shot down by WTO*. The Star http://www.thestar.com/business/2013/05/06/canada_loses_wto_appeal_in_renewable_energy_case_eu_says.html

xlvi Nicholas Stern, *The Stern Review: The Economics of Climate Change*, (Cambridge: Cambridge University Press, 2007): 10.