AVERTING CLIMATE CATASTROPHE

In 1988, Canada was actually in the lead in hosting the first-ever international scientific conference on climate change, "Our Changing Atmosphere: Implications for Global Security." It took place during a Toronto heat wave in the last week of June 1988.

The consensus statement from the assembled scientists was **"Humanity is conducting an unintended, uncontrolled, globally pervasive experiment, whose ultimate consequences are second only to global nuclear war."**

That same year, the United Nations established the Intergovernmental Panel on Climate Change (known as the IPCC) -- setting up a process that is essentially the world's largest peer review. Over 2,000 scientists, appointed by their governments, began meeting regularly to provide a consensus view and a special report called "advice to policy makers." By 1990, the countries of the world, through the UN, began negotiating a treaty to deal with the threat.

In 1992, at the largest ever gathering of heads of government, the Rio Earth Summit, the first legally binding climate change treaty was signed. The Framework Convention on Climate Change was agreed upon by the governments of just about every country on Earth.

Meanwhile humanity's emissions of greenhouse gases were going through the roof. In 1996, the global level reached over 6 billion tonnes of carbon from fossil fuel burning. The statistic is not meaningful in itself, but in context it is startling. The 1996 level was four-times that of the late 1950s.

By 1997, the Parties to the Framework Convention met again, this time in Kyoto, Japan, to set out binding targets and timelines for greenhouse gas reduction. Canada committed to reduce its emissions to 6% below 1990 levels between 2008-2012. It was clear that Kyoto targets were only a small first step. Even if fully implemented, including by the United States, the Kyoto reductions would not avoid an atmospheric doubling of carbon concentrations. At best, Kyoto would delay the doubling point by ten years.

We have already, irreversibly, changed the chemistry of our atmosphere. We now have more than 30% more carbon dioxide by concentration in our atmosphere than at any time in the last 650,000 years (by direct measurement of air bubbles in Antarctic ice cores), and more than twenty million years (if we work from proxy measurements.) We are changing huge areas of the planet -- quite fundamentally.

Arctic ice is shrinking. The polar bears are at risk because without ice, they have trouble hunting. But it gets worse…As ice retreats, warming is intensified. The ice bounces back the sun's rays (the *albedo* effect). Dark ocean water soaks up the sun's energy, further warming the ice.

The permafrost from Siberia to the Mackenzie Valley is melting. As it melts, whole villages face the need to relocate, and caribou sink in the mud as they try to migrate.

The glaciers, whether in the Alps, the Rockies, the Yukon, or the Andes, are all in rapid retreat.

The intensity of hurricanes is increasing. While some hurricane specialists are not yet convinced, increasingly research at MIT and Princeton demonstrate that the energy packed in the hurricane's punch has increased by 50-80% from 1950 to 2003. Warmer waters in the ocean lead to more severe hurricanes. In the fall of 2003, Hurricane Juan was the first full force tropical hurricane ever to slam into Nova Scotia. Normally, cooler

ocean water to our south would have down-graded Juan to a tropical storm, but it hit Nova Scotia as a full force tropical hurricane.

Scientists are increasingly talking about climate as being less a dial, than a switch. What is described in the literature as "non-linear perturbations" can be translated as "nasty shocks" or sudden and abrupt climate catastrophes.

A number of scientists have determined that the risk of "tipping point events" -- the loss of the Gulf Stream, the collapse of the Western Antarctic Ice Shelf, and the Greenland Ice Sheet -- is increased if global average temperature goes up by 2 degrees C above the pre-Industrial Revolution temperature. This, they estimate, could happen if concentrations of CO_2 in the atmosphere were to increase to somewhere between 400 to 450 ppm. We are 384 ppm now, up from 275 ppm in the 1800s, and now rising at 3 ppm per year.

Our responses to climate change are tepid at best. Even those who champion action are afraid to call for the targets we really need.

Canada's emissions are approaching 800 megatonnes (MT) a year. Our 1990 level was 608 MT. The Kyoto goal of 6% below 1990 is 571 MT. To avoid the "tipping point" described above, we need reductions in greenhouse gas emissions of 30% below 1990 by 2020, of 80% by 2040.

Canada's 2004 CO_2 equivalent emissions (MT)
http://www.ec.gc.ca/pdb/ghg/inventory_report/2004_report/ts_2_e.cfm

1.	Electricity and heat	130
2.	Transport – cars & light trucks	93
3.	Transport – other	89
4.	Fossil fuel industries	79
5.	Fugitive emissions oil & gas	66
6.	Agriculture	57
7.	Manufacturing	51
8.	Residential buildings	43
9.	Commercial and institutional buildings	38
10.	Industrial processes CO_2	39
11.	Industrial processes N2O	4
12.	Industrial processes halocarbons	11
13.	Landfills	29
14.	Mining	15
15.	Domestic aviation	8
16.	Construction	1
	Total	758

(758 MT CO_2 equivalent = 593 MT CO_2 + 110 MT methane + 44 MT N_2O + 11 MT halocarbons)

The tar sands, covered in rows 4 and 5, now produce 28 MT a year. This sets the stage for what is involved if we are to reduce our emissions to 80% below the 1990 level = 121 MT total.

"We are risking the ability of the human race to survive."
Dr. Rajendra Pachauri, Chair of the Intergovernmental Panel on Climate Change (IPCC)
http://www.ipcc.ch

1. Making actual reductions in CO_2 emissions

Climate change is the number one issue on Canadians' minds and the biggest crisis facing our planet. It is not just an environmental issue. It is an economic, social and global security issue. According to the World Health Organization, 150,000 people already die every year from climate change related causes. Canadians have felt the impacts in communities from coast to coast to coast: floods and firestorms; droughts and water shortages…hurricanes decimating treasured parks in Nova Scotia and BC; catastrophic wind and ice storms shutting down transport routes and power lines; insect infestations killing millions of hectares of trees.

In his report to the British Chancellor of the Exchequer, Sir Nicholas Stern, former senior economist to the World Bank, warned that, left unchecked, climate change could constitute a $7 trillion hit to the world economy, create water shortages for 1 in 6 people planet-wide, cause the extinction of up to 40 percent of species and result in up to 200 million environmental refugees.

Taking action now, says Stern, would cost just 1-3 percent of global gross domestic product annually. In Canada, based on our 2006 GDP of $1.37 trillion, 1 percent means about $13 billion—almost exactly the amount of the budget surplus last year.

Meanwhile, action on climate change can be good for our economy. Countries that improve their energy efficiency and reduce their demand for fossil fuels by utilizing renewable sources of energy will be the least negatively impacted by a future energy crunch. It makes sense for Canada, with our wealth of renewable energy sources, to be in the lead, not a laggard, in a green energy future.

Our Vision

The Green Party's priority action to achieve actual reductions in Canada's greenhouse gas emissions (GHG) is in green tax shifting. We will reduce income taxes and payroll taxes by shifting to pollution-based taxation. A carbon tax is a critical step to getting the prices right, but a Green government will not rely solely on tax-shifting. We will remove subsidies from the fossil fuel industry, cap extraction levels of coal, oil and gas, and instead offer significant tax incentives and support for energy conservation and renewable energy development. Regulations and consumer-friendly programmes will also be needed to shift Canadian society to a low-carbon future. Large industrial emitters will benefit from a cap and trade programme that puts a price on pollution so that carbon trading can work. We will regulate for improved vehicle fuel economy, improved energy productivity in large appliances, and, in cooperation with provinces, improve energy efficiency of residential and commercial buildings.

Green Solutions

With each passing year of governmental inaction, GHG emissions in Canada *increase*. As they increase, achieving our Kyoto target becomes increasingly difficult. Even with international credits, it may now be impossible. It is clearly impossible at this stage through purely domestic action. Yet, we must start now.

A good faith effort to get as close as possible to our international commitments, and our willingness to continue within a framework of hard caps and penalties for non-compliance, is essential in order to participate meaningfully in the next (post-2012) phase of global action. The commitment of the Green Party to Kyoto targets is not nullified even if full compliance is impossible. It is based on respect for international commitments and to the overwhelming scientific evidence that far deeper cuts will be required soon. We must begin…

Green Party MPs will:

* Reaffirm Canada's commitment to the Kyoto framework and further medium and long term targets:
    - 6% below 1990 by 2012 = 570 MT = 29% below today's 800 MT
    - 30% below 1990 by 2020 = 425 MT = 47% below today's 800 MT
    - 50% below 1990 by 2030 = 304 MT = 62% below today's 800 MT
    - 80% below 1990 by 2040 = 121 MT = 85% below today's 800 MT
    - 5-yearly interim targets
* Adopt carbon taxes, immediate price of $50/tonne of CO_2, equivalent (CO_{2e}), measure impact and if required to achieve target reductions then increase up to $100/tonne of CO_{2e} (the price the Stern Review put on the cost of climate change) by 2020. 1 litre of gas produces 2.34 kg of CO_2, so $50 per tonne adds 12 cents to the pump price per litre, $100 per tonne adds 24 cents. Carbon tax revenues will be used to reduce other taxes in a way that offsets any negative impact on low and middle income Canadians.
* Adopt carbon cap and trade and a carbon market. Establish a cap and trade CO_{2e} ceiling for Large Final Emitters (large industry), with a market price for carbon as soon as possible. Auction and trading of CO_{2e} allocations will be overseen by non-governmental body. The Montreal Stock Exchange has publicly indicated an interest in this role. Large Final Emitters produce around 50% of our total emissions. They include companies in mining, manufacturing, oil, gas, and thermal electricity.[1] Their contribution today is around 400 MT. Based on today's emissions, we should propose caps as follows:

    2012: 115 MT reduction (29% below today)
    2020: 186 MT reduction (47% below today)
    2030: 250 MT reduction (62% below today)
    2040: 340 MT reduction (85% below today)

* Support global verification and certification standards for carbon credits. Establish a Canadian Carbon Bank, and create a federal framework for local and provincial carbon banks to encourage the purchase of local offsets.
* Negotiate the expansion and greater creativity in Kyoto beyond 2012 to (a) meet these reduction goals, (b) include international aviation and shipping, and (c) include commitments to ramp up solar energy, electric vehicles and other low carbon technologies (see Global, below).
* Implement the following key components:
    - Launch a plan for Canada's Green Century, with a commitment to make Canada one of the most energy-efficient, sustainably powered nations in the world. Green tools to achieve this include firm legislative and regulatory measures that include firm time-lines, tax credits, direct grants and rebates and tax penalties and fines for non-compliance.

[1] "These large producers are also known as "Large Final Emitters" (LFEs) of greenhouse gases. LFE sectors are those sectors with average annual emissions per facility of at least 8 kt of CO_2 equivalent (CO_2e), and average annual emissions per $1 000 of output of at least 20 kg of CO_2e. They are large contributors to our GHG emissions—just under 50 percent of total Canadian GHG emissions. Canada's LFEs include companies in the mining and manufacturing, oil and gas, and thermal electricity sectors." (Environment Canada http://canadagazette.gc.ca/partI/2005/20050903/html/regle4-e.html)

- Reaffirm Canada's commitment to come as close as possible to Kyoto, and beyond 2012: 30% below 1990 by 2020, 80% by 2050.
- Adopt carbon taxes, carbon markets, and cap and trade.
- Apply "carbon conditionality clauses" to all federal funding to provinces, cities and institutions, requiring evidence of carbon reduction as a condition of payment.
- Require all federal buildings to be retrofit to a high level of efficiency by 2025, using a variety of green tools. Ramp up energy efficiency retrofits for residences and businesses through revolving federal loans. Fund energy retrofits for museums, universities, schools and Hospitals.
- Require all new buildings to be net zero energy (energy self-sufficient) after 2025, using a variety of green tools.
- Establish a nation-wide program to retrofit all low-income rental housing by 2025, as Germany.
- Solar hot water and pre-wiring for solar photo voltaic (PV) to be mandatory in the Building Code; require solar PV installation itself as soon as the price falls to $2 per watt.
- Require all appliances to meet Energy Star standards by 2015. Inefficient appliances and light bulbs to be phased out, some by 2010.
- Develop renewable energy sources so that by 2040, wind energy production reaches 50 GW, solar PV 25 GW, ocean energy 12 GW, geothermal 25 GW. Various policies, including carbon conditionality clauses requiring provincial adoption of Advanced Renewables Tariffs (a.k.a. Standard Offer Contract, or Feed Laws). All coal, oil, gas and nuclear power to be phased out.
- Provide strong support for walking, cycling, transit, coaches, rail, tele-working and video conferencing.
- Regulate vehicle emissions to fall by 85% by 2040, using a variety of methods.
- Require all landfills to pay a methane tax, based on emissions with regulatory mandatory methane capture after 2015.
- Ensure that federal disaster assistance is subject to carbon conditionality clauses by provinces and cities – similar to an insurance company refusing coverage on a building that does not meet the code requirements for fire safety.
- Adopt Germany's system of mandatory recycling and "design for recycling".
- Phase out Halocarbons (CFCs, HFCs, PFCs, SF6) by 2015. Make funding available to develop alternatives.
- Require all forest companies to pay a carbon tax based on carbon sources. All Forest Stewardship Council (SFC) certified companies to get a 5-year tax break. Plan for transition to 100% FSC certified forestry.
- Pay farmers for carbon sequestration in soils within a domestic carbon market. Plan for transition to 100% organic farming.
- Remove immediately all subsidies to coal, oil, gas and coalbed methane.
- Oil and gas extraction companies to capture and sequestrate an increasing percentage of released CO_2. New coal-fired plants to capture and sequestrate 100% of emissions.
- Withdraw all government funding supports and guarantees for new nuclear plants.

* Support the role of international carbon credits. Any shortfall in meeting our first phase Kyoto target will be made up as much as possible in international credits from Joint Implementation and the Clean Development Mechanism (CDM). Both of these mechanisms within Kyoto have the advantage of assisting other countries, particularly in the developing world, in re-orienting their economies and energy systems to a low-carbon future. Such credits deliver cost-effective carbon reductions and pave the way for those nations taking on commitments in future Kyoto reductions. CDM credits also have the advantage of including a small surcharge toward an Adaptation Fund for developing countries.

Because the problem is global, reductions in carbon emissions from developing countries are just as valuable in reducing the threat of climate change as those from Canada. The cost per tonne is often lower in developing countries than in advanced industrialized nations. The bottom line is: a tonne of carbon reduced in India or China or Malaysia is just as valuable in protecting Canadians from the dangerous impacts of climate change as a tonne reduced in Canada. The atmosphere doesn't care where the carbon emission reduction takes place; it only matters that it does take place.

2. Adapting to climate change

One of the binding commitments of nations signing on to the 1992 UN Framework Convention on Climate Change (UNFCCC) was to prepare adaptation strategies to cope with that level of climatic disruption that is no longer avoidable. If anything, this commitment has been ignored by Canada even more than the obligation to reduce emissions. Sectors requiring immediate attention include agriculture, forestry, fishing and tourism. Protecting vulnerable areas and population also need to be addressed. Failure to act to reduce climatic impacts has already cost the Canadian economy billions of dollars.

Our Vision

The Green Party believes that the federal government must show leadership in developing an adaptation strategy in collaboration with the provincial/territorial governments and municipalities that aims to mitigate and reduce the impacts of climate change. Even with significant global GHG reductions to stabilize the climate, it will take decades, perhaps centuries, to arrest climate change.
We must improve municipal infrastructure, especially water treatment facilities, to meet a changing water regime. We are already experiencing increased deluge precipitation patterns in which current systems allow raw sewage to bypass treatment. We must start curtailing developments in areas of high vulnerability (for example floodplains, low-elevation coastal areas, regions of permafrost, and places adjacent to forests at risk of increased fires). We must undertake greater flood control measure like raising dykes in areas made more prone to flooding because of climate change.

The most urgent community crises are in the Canadian Arctic where peoples of the North face losing their hunting culture and relocation of their communities due to the melting of permafrost, and in the interior of British Columbia as economic disaster looms for forest dependent communities due to the climate-caused pine beetle epidemic. Eighty per cent of this vast region's forests are at risk.

We must act to reduce emissions and we must prepare for the "new normal" of a destabilized climate. These are not, as often presented, mutually exclusive goals. We need both and we needed them yesterday.

Green Solutions

Green Party MPs will:
* **Establish special task forces** involving all stakeholders, all levels of government and scientific experts to prepare over the next two years area-specific climate change adaptive strategies. The first such task forces shall be set up in places particularly vulnerable to climate shift and disruptions, the Canadian Arctic, coastal zones, the Prairies, and the Interior of British Columbia.
* **Set up a Climate Change Adaptation Fund** to assist those areas hard hit by "natural" disasters linked to global warming.
* **Increase financial support to the Developing World** for adaptation strategies.

3. Leaving no stone unturned

In addition to carbon tax shifting, cap and trade and the purchase of international verified carbon credits, a Green government will leave no stone unturned to establish practical and pragmatic programs in all areas of the economy to accelerate our reduction in carbon emissions, including the following:

a) Government

Government operations. The federal government should apply the same GHG reduction goals to all its own operations. All new federally owned buildings must meet LEED Gold, leased buildings LEED Silver.

Carbon conditionality clauses. A Green government will negotiate with the provinces and other players such that every business, NGO, institution, city, province or territory that receives funding of any kind from the federal government will need to establish benchmarks and policies to reduce its emissions in accordance with Canada's goals. After 2010, 25% of all funding will come with carbon reduction strings attached. In 2015, this will rise to 50%; in 2020 to 75%; in 2025 to 100%. These carbon conditionality clauses should be a sub-set of wider sustainability conditionality clauses, reflecting other changes that are needed on the road to full sustainability.

b) Buildings

Buildings account for as much as 33% of Canada's GHG emissions when heat and power are combined. Most of today's housing stock will still be standing by 2040, when we seek an 85% overall reduction in Canada's carbon emissions, so retrofitting Canada's existing stock of buildings is all-important.

A Green government will set a goal to retrofit 100% of Canada's buildings to a high level of energy efficiency by 2025 and require all new homes and buildings be zero net energy after 2025. Tools and policies to do this include:

- Refundable tax credits for all energy retrofit costs, based on before-and-after Energuide or infrared heat tests for residential, commercial, industrial and institutional buildings;
- Tax-deductible Green Mortgages for home-owner energy retrofit costs;
- A national program to energy retrofits public sector buildings such as universities, schools, museums, and hospitals;
- 100% Accelerated Capital Cost Allowance for all businesses for energy retrofit costs; and
- Revolving federal loans for residential or business energy retrofits.

Working with the provinces, the Green Party Government will ensure a national effort to revise Building Codes to include, amongst other energy conservation and efficiency measures:

- Mandatory installation of solar hot water systems and pre-wiring for solar PV on all new buildings, and whenever a house is sold. Mandatory 2 kW solar PV system on all roofs two years after the price of solar falls to $2 per watt; and
- All buildings to be labeled for energy efficiency before they are sold or leased, by 2010.

Funding for a nation-wide program to energy upgrade all low-income rental housing on a phased, year-by-year basis by 2025, as Germany is doing.

Provide grants for 50% of the cost of solar thermal roofs or walls including solar hot water, as in Sweden; Green Mortgage loans for the remainder of the cost.

Free energy audits for large industrial companies.

Refundable tax credits increasing to $50,000 for the purchase of R-2000 and other highly efficient homes, based on Energuide or infrared assessment.

GST credits for all materials used in LEED Gold and Silver buildings.

c) Efficiency

All appliances sold in Canada must meet an Energy Star rating by 2015. Non-rated appliances will be eliminated from the market. Incandescent light bulbs, energy wasting fridges and other very inefficient appliances will be off the market by 2010.

Industrial efficiency for Large Final Emitters (LFEs) (encouraged through cap and trade) will be supported by tax-deductible Green Industrial Mortgages, based on annual energy use per unit of production.

d) Renewable energy

Power generation accounts for 17% of Canada's emissions. In 2000, Canada's generating capacity was 113 GW of power, as follows: Hydro 67 GW; Coal 18 GW; Oil 7.5 GW; Natural Gas 5.5 GW; Nuclear 13 GW; Renewables 1 GW. By 2007, power generation capacity had risen to 118 GW.

If there was major success in the efficiency and building retrofit programs, the required capacity could fall by 25% from 118 to 90 GW by 2040. Allowing for population increase, the required capacity could be 120 GW by 2040.

If we assume the primary use of Electric Vehicles (EVs) and Plug-in Hybrid Electric Vehicles (PHEVs), additional capacity will be needed, which can be met by load shifting and night time power generation.

If we assume continued power production from the large hydro plants (67 MW), we need to replace all of the coal, oil, natural gas and nuclear power generation capacity (120 minus 67 GW = 53 GW or, in round figures 60 GW) with renewables. This becomes the goal for power generation by renewables by 2040. This can be achieved by wind (25 GW), solar (20 GW), tidal/wave (10 GW) and other renewables (5 GW). Work with the provinces to phase out all power generation from coal, gas and nuclear energy, creating a generating gap of 90 GW firm power equivalent that needs to be filled. Since wind energy generates power 30% of the time, solar 20% of the time, and other renewables 30 – 50% of the time, the planned capacities from renewables need to be larger than capacities from firm power generation.

All carbon-based fuels will be subject to rising carbon taxes. Federal approvals for oil, gas or coal-fired power generation will not be granted, where such approvals are required, unless they are accompanied by 100% safe, secure, long-term underground carbon capture and sequestration (not yet technologically proven).

Work with Canada's wind industry to achieve CANWEA's (Canadian Wind Energy Association) goal of 10 GW of wind by 2015. Add further goals of 20 GW by 2025, 35 GW by 2030, and 50 GW by 2040. This is the equivalent of 17 GW of firm power.

Retain the current 1 cent/kWh support for wind energy. Increase the support to 2 cents/kWh for any province adopting the Advanced Renewables Tariffs (ART) (also known as Feed Laws, Standard Offer Contract) as in Europe with prices that deliver a return on investment sufficient to entice investors), net metering, peak power pricing, and plans for renewable grid extensions. (Call it ART Plus.)

Provide support to help local energy co-ops form in provinces adopting ART+.

Provide substantial R & D funding for ocean energy technologies in provinces adopting ART+.

Provide substantial R & D funding for electricity storage technologies in provinces adopting ART+.

Provide support for power grid extensions to bring wind and ocean power from remote areas (e.g. BC, Prairies, Quebec, Newfoundland, Labrador, Nova Scotia) in provinces adopting ART+.

Work with the solar industry to establish a goal for Canada to install 25 GW of solar PV by 2040. [33 million people = 10 million homes. Each home with a 2 kW system = 20 GW. 50% homes with 2 kW = 10 GW + other buildings 15 GW = 25 GW.] Set interim goals: 1 million solar homes by 2020. 3 million by 2030. 5 million by 2040. This is equivalent to 5 GW of firm power.

Work with renewable energy industries to produce 12 GW of ocean energy by 2040 (40 GW potential), and to set specific goals for production of biomass, and micro hydro energy.

Work with the geothermal energy industry and the oil industry (for their drilling expertise) in a well-funded R & D program to develop Enhanced Geothermal Systems (EGS), drilling down to 10 km to extract 25 GW of power by 2040. In January 2007 a major MIT study (*The Future of Geothermal Energy*) reported that the USA's extractable EGS reservoirs contained 2,000 times more primary energy than the USA uses yearly, and that with technology improvements, this could be expanded 10-fold. The resulting energy would have an energy cost in the 6-9 cents kWh range.

By 2040, if these policies are successful, Canada's power mix would be:

Hydro:		68 GW firm power
Wind:	50 GW (=	17 GW firm power equivalent)
Solar:	25 GW (=	5 GW firm power equivalent)
Ocean:	12 GW (=	4 GW firm power equivalent)
Biomass, biogas and microhydro:	3 GW (=	1 GW firm power equivalent)
Geothermal:		25 GW firm power
Total:		120 GW firm power equivalent

e) Transport

Transport accounts for 25% of Canada's emissions. When it comes to vehicle technologies, hydrogen is not going to deliver in the near term for a host of reasons, and corn or grain based biofuels pose an unacceptable challenge to farming, as well as having dubious net energy gains. Cellulosic ethanol offers real potential in fuel switching in a transition to a technological leap. During the last year, a consensus has emerged that electric vehicles are the way to go, especially Plug-in Hybrid Electric Vehicles (PHEV), which can be 100% electric for all short distance trips, but still have fuel capacity (from biofuels) for longer distances. They are also

remarkably cheaper to run than regular vehicles, averaging $10 a month for a small, lightweight EV doing 15,000 km a year.

Carbon conditionality. A Green government will establish transport-based carbon conditionality clauses affecting all federal funds or loans.

Walking and cycling. All bikes, bicycle gear, bike racks and showers will be tax deductible and GST free. All federal staff will be given a cycling allowance equal to the vehicle allowance.

A Green government will match provincial and municipal investments designed to increase walking and cycling, with a baseline contribution of 25% of the total cost, rising to 50% where provinces pay bicycle allowances to their staff and equip all government buildings with cycling facilities, and where cities do likewise, having demonstrated progress in increasing kilometers of cycling lanes and trails, and established working policies to encourage smart growth and prevent sprawl.

Transit and Light Rail Transit. A Green government will match provincial investments in transit with a baseline contribution of 25% of the total cost, rising to 75% where municipalities have established working policies to encourage smart growth and prevent sprawl and where transit authorities introduce progressive programmes designed to increase ridership such as annual U-passes for colleges, eco-passes for neighbourhoods, commuter-passes for businesses, and requirements that new developments must be served by transit and developers must provide 3 year transit passes for all residents (as Boulder, Colorado has done).

Long Distance Coaches. A Green government will liberalize the licensing for long-distance coach lines to encourage competition and greater ridership, while maintaining rigorous safety standards. It will eliminate the fuel tax (but not the carbon tax) for companies that sign a carbon conditionality agreement to upgrade their fleet to high efficient technologies and train their drivers in efficient driving. It will provide federal funding for upgrades to coach stations to a standard that would be attractive to everyone.

Rail. A Green government will re-invest in our national rail infrastructure and intermodal connections, increase joint federal-municipal light rail investments, as well as improve VIA rail service across Canada. We will restore VIA rail service to all major regional cities and create a national clean rail freight initiative that uses both regulatory means and financial incentives to improve fleet efficiency and safety.

Teleworking. A Green government will pay a no-trip vehicle allowance to all federal staff working from home, give a tax credit for the cost of establishing a home office, and establish a parking cash-out system (cash to employees not using a company parking space) to encourage reduced use of cars and parking.

f) Vehicles

Work with the motor industry, the province and other partners to develop a sustainable vehicles strategy, leading to an 85% reduction in emissions below today's level by 2040.

Adopt California standards requiring a 30% reduction in CO_2 emissions from new vehicles sold in Canada by 2015. It will require a 50% reduction by 2020, 90% by 2025. This will drive the manufacture of zero emission vehicles. It will also create fuel efficiency standards in line with leading US states for the 2011 model year.

Accelerate the market arrival of Plug-in Hybrid Electric Vehicles (PHEVs) or electric vehicles by signing the Plug-In Partners advanced purchasing agreement with a commitment to buy large numbers of PHEVs as

soon as they are available (creating a federal buying pool). Carbon conditionality clauses will include a requirement for the purchase of PHEVs as soon as they are available.

Work with all governments and businesses in Canada to join a Canadian green car buying pool and to join the Plug-In Partners buying pool.

Scale-based rebates of up to $5,000 for the purchase of efficient vehicles, and fees on the purchase of inefficient vehicles.

Even with EVs and PHEVs, we will still require some liquid fuel, though possible as much as 80% less. A Green government will provide continued R&D to develop cellulosic ethanol from farm and forest wastes, rather than ethanol from crops grown directly for this purpose. It will establish a 10% ethanol and 10% biodiesel standard by 2010 (as Liberals), phasing this up to 100% cellulosic ethanol and biodiesel by 2040, thereby eliminate the use of oil.

Mandatory vehicle fuel efficiency labeling, adopting the European system.

Reduced taxes for more efficient company cars, instead of a blanket benefit.

All federal vehicles to become super-energy efficient, moving to EVs or PHEVs.

Incentives for Canadian manufacturers of super-efficient vehicles, EVs and PHEVs.

New authority to establish a just transition fund for the automobile sector, funded by an additional fee on all fuel inefficient car sales in Canada.

Trucks: A Green government will work with the trucking industry and other partners to develop a sustainable trucking strategy, leading to an 85% reduction in overall emissions by 2040.

All trucking companies, taxis and other commercial transport operators will be required to charge a federally set fuel surcharge, updated regularly, that reflects the price of oil (including carbon taxes and other charges). This will eliminate the cut-throat competition among small businesses, which drives some to bankruptcy.

Trucking companies will receive Accelerated Capital Cost Allowances and other incentives for the purchase of hybrid trucks.

All trucks sold in Canada will be subject to scale-based rebates for the purchase of efficient vehicles, and fees for the purchase of inefficient vehicles.

Aviation: A Green government will work with the aviation industry to develop a sustainability strategy, leading to an 85% reduction in overall emissions by 2040.

All aviation fuel will carry both a regular fuel tax and the carbon tax. The carbon tax will be rated for the carbon equivalency of aviation impact. Long-distance flights at high altitude and night flights will pay a carbon tax at up twice the regular rate to cover the climate impact of nitrous oxide emissions (which convert to tropospheric ozone, a greenhouse gas) and high level cloud cover (which traps heat).

Video-conferencing facilities for meetings and conferences will be free of GST and will qualify for an Accelerated Capital Cost Allowance. The federal government will achieve a 50% reduction in meetings that

would otherwise involve flying by 2010, and an 80% reduction by 2015. MPs with rural ridings will be encouraged to meet constituents by video-link.

The government will work with business partners to secure the installation of video-conferencing facilities in every community larger than 1,000 people by 2015.

g) Communities

Landfill gas accounts for 4% of Canada's emissions. All landfills will be charged a methane tax, based on emissions. After 2012, the tax will increase by 50% a year, and after 2015 no landfill will be allowed to operate without methane capture.

All federal support for municipalities will be subject to carbon conditionality clauses. All current federal funding that encourages urban sprawl and greater vehicle use will be eliminated. The existing Green Infrastructure Fund, gas tax, and other funding will continue.

Support will be given to local non-profits and associations to encourage carbon reduction programs. Street, community and business contests will be encouraged.

Federal disaster assistance will be available to help communities cope with climate change impacts (floods, storms, disasters), subject to carbon conditionality clauses. Provinces and communities that do not satisfy the clauses will not be eligible for federal disaster assistance. This is similar to an insurance company refusing fire insurance on a building that does not meet code requirements for fire safety.

h) Industry

Industry (Large Final Emitters) account for 50% of Canada's emissions. Large Final Emitters will be subject to the carbon tax and cap and trade policies described above.

All industrial buildings will be eligible for incentives to become more energy efficient, as above.

Use of the greenhouse gas halocarbons CFCs, HFCs, PFCs and SF6 will be phased out by dates between 2012 and 2015. There will be federal support for R&D to develop climate-friendly, non-toxic alternatives.

A Nitrous Oxide Task Force will be established to recommend ways to reduce Canada's N_2O emissions by 85% by 2025.

All federal grants and loans to industry will be subject to carbon conditionality clauses designed to steer all industry and manufacturing to 100% sustainability (the Interface approach).

Megastore retail outlets which depend on customer use of cars will be encouraged to adopt parking charges, combined with transit access and the home delivery of purchases by means of conditionality clauses signed with municipalities seeking federal funds.
Introduce legislation that requires all manufactured goods, including vehicles, to be designed for easy dismantling, re-use and/or recycling, and that they contain 90% recycled materials by 2025 (as in Germany).

Introduce legislation that requires all appliance and equipment retail outlets to receive broken and dead goods they have sold for recycling or repair. Industry will be helped to establish a national deposit system, recycling systems and third party management to help them fulfill the obligation (like Germany's Recycling Law).

i) Forestry

If Canada's GHGs from forest sources (73 MT) were included in the Inventory total, they would represent 9% of Canada's emissions.

All forest companies will pay a carbon tax to reflect the net loss of carbon storage from their lands, or a carbon rebate to reflect net gain of carbon sinks, based on a 5-yearly independent audit.

All forest companies managing FSC certified lands will be granted a 5-year tax break for those lands upon certification.

j) Agriculture

Agriculture (55 MT) accounts for 7% of Canada's emissions. 43% comes from dairy and beef herds emitting methane; 40% from poor soil fertilization practices releasing N2O; and 15% from poor manure management from penned livestock herds. Because of the multiple benefits of organic farming methods, a Green government will work to assist non-organic farmers who wish to transit to organics to make the switch. Local food production will be encouraged to reduce emissions from transport.

Urban agriculture will be encouraged to provide more local food, as well as more green roofs, reducing air conditioning demand and run-off in deluge rains.

k) Fossil fuels

Fossil fuel industries (146 MT) account for 20% of Canada's emissions. All subsidies and supports to the oil, coal, gas and coalbed methane industries in Canada will be removed.

The appropriate carbon taxes will be applied to all CO_2, methane, N2O, fugitive, and other GHG emissions.

All members of the fossil fuel industry will participate in the LFE cap and trade system, as above.

Oil and gas extraction companies will be obliged to capture and sequestrate an increasing volume of released CO_2 beyond that used for enhanced oil recovery. This will start with 10% in 2012, 25% in 2020, 50% in 2023 and 85% in 2040. Enhanced oil recovery through CO_2 sequestration is not seen as a solution, since the storage of CO_2 for this purpose facilitates greater production of oil and gas.

Where any federal permits are required for new coal plants, the Green Party Government will not approve such permits. Most new electrical transmission facilities will fall outside federal jurisdiction. Where any federal-provincial funding agreements are negotiated, closing coal plants and committing not to build any new plants will be a condition of funding. Existing coal–fired plants will be required to capture and sequestrate 25% of their emissions by 2015, 50% by 2025 and 85% by 2040. All coal will be sold with a carbon tax.

Federal funding will be available for clean coal R&D focused on achieving full capture and sequestration of CO_2 emissions, and 99.99% reduction of mercury, particulates, and sulfur dioxide emissions.

A carbon tax will be imposed on all export of all coal, oil and gas from Canada, except to countries that impose their own carbon tax.

l) Nuclear power

All subsidies and supports to the nuclear industry will be withdrawn. Federal insurance will no longer cover the risk of nuclear accidents.

m) Global

Under a Green government, Canada will work with other nations to achieve the development of a new global Kyoto Treaty (Kyoto 2) with the targets outlined above in part 1.

Canada will work with other nations to include a series of Solutions Uptake Clauses in Kyoto 2 designed to accelerate the uptake of carbon-reducing technologies, using annual commitments by member countries to purchase or require the increasing use of solar PV, solar hot water, electric vehicles, PHEVs, carbon capture and sequestration, efficient light bulbs and appliances, and other technologies.

Canada will support the extension of Kyoto to cover international aviation and shipping.

Canada will support the development of Kyoto's clean development mechanisms focused on verifiable greenhouse gas reductions in developing nations.

Canada will work to include China, India, the United States and all other nations in Kyoto 2.