# Green Paper on Energy and Climate Change

**(List of CEN Members Signing on to Paper)**

**November 2005**

# About the Authors

**Roger Peters, PEng., The Pembina Institute**
Roger is a professional chemical and environmental engineer with 30 years of experience in energy efficiency and renewable energy. At The Pembina Institute, Roger guides the organization's work on national renewable energy and energy efficiency policy, and has authored several reports on the innovative financing of energy efficiency improvements. He has also gained substantial expertise on climate change, providing assessment and technical assistance to project developers in using the Clean Development Mechanism (CDM) and other sources of carbon financing. Roger has significant international experience in Asia, Latin America and Africa, working on energy efficiency and rural energy projects funded by the World Bank, the Global Environmental Facility and the Canadian International Development Agency (CIDA).

**Nashina Shariff, The Toxics Watch Society of Albterta**
Nashina has a BSc in Physics and is the Associate Director of The Toxics Watch Society of Alberta. Nashina is co-chair of the Canadian government's Stakeholders Advisory Committee on Greenhouse Gas Reporting, and has taken part in consultations and discussions on the proposed large final emitters greenhouse gas emissions-trading system. Nashina was an NGO representative on the Canadian delegation to the Tenth Conference of the Parties of the United Nations Framework Convention on Climate Change. Nashina is a participant or co-chair of several teams of the Clean Air Strategic Alliance's Electricity Project Teams, which prepared recommendations accepted by the Alberta government in March 2004.

**Johanne Whitmore, The Pembina Institute**
Johanne Whitmore is a Climate Change Policy Analyst with Pembina's Policy Group. Her research focuses on the ability of Canadian climate change policies to meet Kyoto objectives, on national and provincial renewable energy measures, and on the design of domestic greenhouse gas emissions trading systems. Johanne also has experience as a climate researcher with the Laboratory for Paleoclimatology and Climatology at the University of Ottawa, where she developed a Geographical Information System framework to host paleoclimate proxy data for use in Quaternary research. Mrs. Whitmore has a Masters of Science in geography from the University of Ottawa.

## Preface

The global environment and all the living species it supports are threatened by changes in climate brought about by human activities in industrialized countries. Energy policies implemented during the next 10 years will determine whether these changes can be minimized.

This paper was prepared for use by members of the Canadian Environmental Network (RCEN) during the First Meeting of the Parties to the Kyoto Protocol in Montreal, November 28 to December 9, 2005. It is designed to provide a background on climate change and energy issues, especially on the long-term role and strategy Canada should take on these issues beyond 2012. The paper also supports the Declaration on Climate Justice and the Montreal Climate Change Summit prepared by the Climate Action Network-Canada.

This paper begins with an overview of recent climate science and the stabilization scenarios needed to prevent dangerous climate change. This is followed by a review of global energy trends working for and against action to prevent climate change. The next section is a reality check on the Kyoto Protocol: how well Canada and the rest of the world are doing. The final two sections set out the options for a post-2012 climate regime and the strategies Canada could and should take globally and nationally to assume its responsibilities. Conclusions and/or recommendations are provided at the end of each section.

## List of Acronyms

| | |
|---|---|
| CAN | Climate Action Network |
| CDM | Clean Development Mechanism |
| COP | Conference of the Parties (to the UNFCCC) |
| (C)ER | (Certified) Emissions Reduction |
| ENGO | Environmental Non-Government Organization |
| EU-15 | European Union—15 Annex 1 countries |
| GEF | Global Environmental Facility |
| GHG | Greenhouse Gases |
| GVEP | Global Village Energy Partnership |
| IEA | International Energy Agency |
| IPCC | Intergovernmental Panel on Climate Change |
| JI | Joint Implementation |
| LFE | Large Final Emitter |
| MOP | Meeting of the Parties (to the Kyoto Protocol) |
| REEEP | Renewable Energy and Energy Efficiency Partnership |
| SD-PAMS | Sustainable Development Policies and Measures |
| UNFCCC | United Nations Framework Convention on Climate Change |

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# Executive Summary

Current trends in increasing anthropogenic greenhouse gas (GHG) emissions will very likely result in further serious threats to human and animal species as a result of climate change. If action is not taken immediately to stabilize concentrations, necessary stabilization levels may be out of reach. There is a consensus forming that global temperatures must not be allowed to rise more than 2°C above pre-industrial levels and that any long-term stabilization target must include accompanying short-term targets aimed at easing significantly the adaptation stresses that will be borne by ecosystems.

Although it will be difficult to achieve international agreement, some fossil fuels will need to be left unused in the ground if adequate GHG emission reductions are to be achieved. Stabilization of GHG concentrations also cannot be achieved without the United States transforming itself into a renewable-energy-based economy, and without large economies such as those of China, India and Brazil leapfrogging a fossil-fuel-based economy to one based on renewable energy.

Renewable energy and energy efficiency must play a central role in future climate change regimes, achieving a global transition through international co-operation on climate change, development and the alleviation of poverty. All nations need comprehensive national renewable energy strategies based on the Bonn policy recommendations. The world's population is stabilizing, so energy efficiency and renewable energy could ultimately meet all global energy needs while providing everyone with a decent standard of living. GHG reductions cannot be expected without addressing poverty and universal access to energy services at the same time.

Nuclear power cannot be considered as an option to reduce GHGs for reasons including cost, security, long-term waste disposal, fuel-cycle health and safety, reliability and unsuitability to meet non-electrical needs. Carbon capture and storage is also not a permanent solution to climate change, and would prolong the fossil-fuel era. Until other methods have been proven to be effective and permanent, only deep aquifer storage should be allowed and strict conditions should be put in place on any capture and storage technology.

Hydropower can play a complementary role in a grid optimized to maximize renewable energy. However, only new low-impact hydro would have a place in a low-carbon future. Power grids can be designed and optimized to allow base and peak loads to be met primarily with renewable energy power sources.

A viable global framework for stabilizing GHG concentrations must build on the current regimes of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto protocol. The principles of equity, historic responsibility and capacity and ability to act should form the basis of any future framework.

A future framework will involve differentiated responsibilities. Richer industrialized nations must take the lead by pursuing absolute reductions and providing assistance to developing nations for mitigation and adaptation to climate change. Developing nations must be helped to contribute to the global mitigation effort by pursuing low-carbon-intensity development paths.

Developed nations must also recognize that one of the most significant barriers facing developing nations in combating climate change and growing economically is the considerable debt burden that many of these nations face. Any effective climate change policy must also address the economic barriers faced by developing nations, particularly the debt burden and the

effects that the policies of international financial institutions and aid-delivery agencies have on climate.

The eventual goal of any future global framework should be equity in quality of life and the reduction of emissions in an increasingly equitable manner.

## Recommendations

1. Canada can still meet its Kyoto commitments, but only if there is effective and timely implementation of measures in the 2005 Plan "Project Green: Moving Forward on Climate Change" as follows:
   - Further weakening and the opening of loopholes in the national large final emitter (LFE) system must be prevented at all costs.
   - An effective domestic offset system needs to be in place as soon as possible. It would purchase only incremental reductions, mostly from energy efficiency and renewable energy projects.
   - The Climate Fund must purchase international credits that are low-risk and have high sustainable development value.
   - The Partnership Fund should focus on demand-side management, energy efficiency and renewable energy projects and programs. It should not include carbon capture and storage or cross-country transmission lines—except to increase access for renewable power sources.
   - There must be a major supplementary federal budget allocation to these Funds during 2005 if there is to be enough time for funded projects to be implemented by 2008.
2. If Canada is to harmonize its LFE system with those of the European Union (EU) and other Kyoto-compliant emissions-trading systems, it must move away from the current intensity-based approach to a full cap-and-trade system.
3. If Canada is to meet its Kyoto targets, energy efficiency and renewable energy programs need to be significantly expanded and include distributed energy. Long-term energy efficiency and renewable energy strategies need to be developed and adopted by multi-government and multi-stakeholder entities such as the Council of Energy Ministers and the Renewable Energy and Energy Efficiency Partnership (REEEP). Favourable investment environments need to be created for energy efficiency and renewable energy.
4. The oil and gas industry is reaping record profits, so subsidies and tax credits for these industries are waste of public money that would be better used to support the deployment of energy efficiency and renewable energy instruments.
5. Carbon capture and storage through enhanced oil recovery has not yet been proven an effective method of GHG storage and will not contribute to Canada's Kyoto commitments. Tight conditions on the use of carbon capture and storage are needed (see Appendix 2).
6. Nuclear power has no place in Canada's Kyoto climate change plans because of its cost, safety concerns, security risk, and waste disposal problems.
7. The Clean Development Mechanism (CDM) system needs to be strengthened to produce the volume and quality of Certified Emissions Reduction (CER) credits that Canada and other industrialized countries will need to purchase in the 2008-2012 period.

8. At the Conference of the Parties 11 to the UNFCCC (COP 11) and subsequent negotiations on global climate, Canada should show leadership and advocate that members of the UNFCCC countries put in place a post-2012 climate regime whose objective is to stabilize GHG concentrations at safe levels. This "Montreal Mandate" should:
   - Affirm—with a view of meeting the UNFCCC objective of avoiding dangerous climate change—the goal of keeping temperatures to within 2°C of pre-industrial levels.
   - Recognize that meeting this goal will require major cutbacks in the production and use of fossil fuels through a variety of means. Recognize that "just transition" policies will be needed to minimize the local impact of a fossil-fuel phase-out.
   - Recognize historic responsibility and capacity to act as key considerations when allocating responsibility for necessary emission reductions.
   - Be based on an equitable solution, with the aim of eventually distributing similar GHG per-capita allocations in the long term to all citizens.
   - Be based on a global transition to renewable energy—including serious action to improve energy efficiency, and mobilization of the capital investments needed.
   - Include significant assistance to developing regions to help them bypass fossil fuels in favour of an economy based on sustainable energy, while at the same time increasing the quality of life.
   - Include significant and appropriate assistance to help those most vulnerable to the effects of climate change in all parts of the world.
   - Recognize that the nuclear fuel cycle continues to have major safety, security, and waste-disposal problems, and that therefore nuclear power has no place in any future climate change strategy.
9. Canada should take on a national target for the reduction of GHG emissions consistent with the objectives of the stabilization of GHG at safe levels.
10. Outside of the UNFCCC mandate, Canada should take bilateral and multilateral action to supplement and support the Mandate:
    - Increase the level of support for community renewable energy in Canada's official development assistance.
    - Take a major role in international co-operation on a global renewable energy transition through international conferences, the Conference on Sustainable Development, the REEEP, the Global Village Energy Partnership (GVEP) and others. Participate in and support any new agency established to co-ordinate this transition.
    - Negotiate bilateral agreements with foreign buyers of Canadian oil and gas regarding their efficient use.
11. Canada should remove all subsidies for the fossil fuel industry (including carbon capture and storage, and $CO_2$ pipelines), allow only temporary and limited use of carbon capture and storage, and ultimately reduce the economic role of the oil and gas industry through a just transition policy.
12. Canada should strive to maximize energy efficiency and renewable energy by building an effective delivery infrastructure, setting targets, and mobilizing capital. The components of a

national renewable energy strategy should be developed by entities that involve all governments and stakeholders, such as the Council of Energy Ministers and the REEEP.

13. Canada's energy policy should specifically address the energy efficiency and renewable energy needs of low-income and First Nations families, who are most vulnerable to both energy costs and the effects of climate change.
14. Canada needs a regime for Large Final Emitters that attaches a sufficiently large financial liability to GHG emissions, in order to drive major changes in energy production and consumption. Canada should also develop a national offset system that favours energy efficiency and renewable energy.
15. All energy decisions should be made on a full cost accounting basis, taking into account all environmental and social impacts. The wide range of benefits of renewable sources of energy—including reliability, fixed costs, security benefits and environmental attributes—should be explicitly included in the energy market through regulation, targets, tax measures, certificate programs, and other measures.
16. Nuclear power and the nuclear fuel cycle continue to have major safety, security, and waste disposal problems and have no place in any future Canadian energy or climate change strategy.
17. In summary, Canada's domestic energy strategy over the next decade should include:
    - A regulatory regime for major energy producers and users (i.e., Large Final Emitters) incorporating progressively lower GHG emission targets, set in terms of absolute emissions, and an increasing degree of auctioning of emission permits.
    - Elimination of all subsidies and other support for the fossil-fuel and nuclear fuel-cycle and power industries.
    - Implementation of a long-term transition strategy focusing on the development of new economic opportunities for the work force, communities and businesses in regions currently dependent on the fossil-fuel and nuclear industries.
    - Adoption of a national renewable energy strategy, including the mobilization of investment in renewable energy and energy efficiency, and the building of a comprehensive renewable energy industry.
    - Implementation of a national energy conservation and efficiency strategy that addresses the basic design of our urban infrastructure, manufacturing industries and services met by energy, as well as the equipment used to meet them. Support of this strategy with an explicit plan to continually raise minimum efficiency standards and codes.
    - Conversion to the use of organic agricultural techniques and more sustainable forest practices that both minimize the use of fossil fuels and provide biofuels for transport, power and heating in an environmentally and socially acceptable fashion.
    - Implementation of an urban design and land-use strategy that minimizes sprawl and the use of fossil fuels.

The Climate Action Network-Canada Declaration on Climate Justice and the Montreal Climate Summit, provided as Appendix 4, reflects many of above recommendations.

# 1. Climate Change Science

This section presents the current thinking among the scientific and environmental non-governmental organization (ENGO) communities as to the level of global temperature increase that can be endured by the earth before it begins to experience catastrophic levels of climate change. It includes current discussions among ENGOs through the Climate Action Network (CAN) and includes recommendations on the required global emissions reductions that will be needed to keep global temperatures to within 2°C above pre-industrial levels.

The current impacts of climate change can be observed globally. The casualties of climate change are mounting. They include the victims of the hurricanes on the United States Gulf Coast this past summer, and the 20,000 people who died across Europe in the summer of 2004. In the South Pacific, whole nations are disappearing. Tuvalu, a small island state, is expected to migrate its 11,300 people to New Zealand at a rate of 75 per year. The island, whose highest point is 4.5 metres above sea level, has been experiencing increasingly high waves, reaching as high as three metres last February, making it increasingly uninhabitable.[1] In the Arctic, the warming of the globe has caused the reduction of Arctic sea ice by 15% to 20%, causing the forced relocation of coastal communities.[2]

The "ultimate objective" of the United Nations Framework Convention on Climate Change (UNFCCC) is "to achieve . . . stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."[3] The UNFCCC entered into legal force in March 1994 and has now been ratified by 189 countries—almost the entire international community.[4]

The Intergovernmental Panel on Climate Change (IPCC), the body charged with advising governments on this issue, has demonstrated that to meet the UNFCCC's objective, global greenhouse gas (GHG) emissions from human activities will require deep and long-lasting cutbacks in emissions from their current levels.[5] The longer it takes to achieve those reductions, the higher the level at which GHG concentrations will stabilize, and the greater the amount of global warming and consequent environmental impacts.[6]

## 1.1 Climate Change Measurement, Impacts and Trends

The atmospheric concentration of carbon dioxide ($CO_2$) has risen from 280 parts per million (ppm) in 1750 to over 379 ppm today—a level that has not been exceeded during the past 420,000 years, and likely not during the past 20 million years.[7] About 75% of the increase in atmospheric $CO_2$ during the 1990s was caused by the burning of fossil fuels, with land-use change (notably deforestation) responsible for the rest.[8] The average global temperature has increased by approximately 0.6°C over the 20$^{th}$ century.[9] In the Arctic, the temperature increases are even more severe; they have risen twice as fast as those in most of the rest of the world in the past few decades.[10]

From collective evidence, there is "high confidence" that recent regional changes in temperatures already have affected many physical and biological systems.[11] According to the IPCC, "examples of observed changes include shrinkage of glaciers, thawing of permafrost, later

freezing and earlier break-up of ice on rivers and lakes, lengthening of mid- to high-latitude growing seasons, poleward and altitudinal shifts of plant and animal ranges, declines of some plant and animal populations, and earlier flowering of trees, emergence of insects, and egg-laying in birds. . . . There is [also] emerging evidence that some social and economic systems have been affected by the recent increasing frequency of floods and droughts in some areas… ."

Under the range of the IPCC's "business as usual" scenarios, $CO_2$ concentrations are projected to rise to between 485 and 1250 ppm during the 21st century. This increase is projected to lead to global average temperature rises of about 1.4-5.8°C by 2100. [12] According to the IPCC, a global temperature rise in the range of 2-4°C will likely bring more extreme weather events, threaten sensitive ecosystems and lead to rises in sea level, while the 4-6°C range would exacerbate all of the previous adverse impacts and significantly increase the risk of irreversible damage to natural systems, including the melting of glaciers, the interference of weather patterns and the slowdown of the thermohaline circulation that is responsible for maintaining Western Europe's mild climate.

In the Arctic, the impacts are expected to be more severe than in much of the rest of the world. Over the next 100 years, temperatures are projected to increase by between 4°C and 7°C. This increase may push some species, including polar bears, walrus, and seals, toward extinction and may challenge the survival of some northern cultures.[13] According to the IPCC, "stakes associated with projected changes in climate are high."[14] Examples of projected impacts associated with increases in global average surface temperature are provided in Appendix 1.

## 1.2 Requirements for Long-term Stabilization Targets

A recent study by the Center for International Climate and Environmental Research (CICERO) identified four major issues to be addressed when assessing the need for long-term emission reduction targets: [15]

(i) The stabilization of GHG concentrations at any level will require that global emissions be reduced to a fraction of their current levels. For example, even if stabilization concentrations of 1000 ppm CO2—more than twice today's levels—were sought, global greenhouse gases would eventually need to be reduced to less than half of today's levels.[16]

(ii) The long-term stabilization of GHG concentrations at lower levels may be out of reach if, in the short term, GHG emissions rise above certain levels. Work done by the IPCC has shown that to achieve $CO_2$ stabilization levels of less than 590 ppm, global emissions would need to peak by 2015, and then decrease to below 1990 levels by 2040, demonstrating the need for urgent action.[17]

(iii) Regardless of the levels at which GHG concentrations are stabilized, the world is already committed to some level of climate change for centuries to come. Recent work by the Hadley Institute found that even if GHG concentrations are maintained at current levels, the average surface temperature of the Earth is expected to increase (R-please check that following is correct:) by 1.1°C by 2100 and by up to 1.6°C over many centuries.[18]

(iv) The rate at which the temperature increases is of concern, as it drives ecosystem impacts and possibly other effects such as non-linear, abrupt climate change. Recent research has found that "if a 2°C increase occurs over 1000 years (i.e. 0.02°C per

> decade), most affected ecosystems can probably adapt, while when it happens over 50 years (i.e. 0.4°C … per decade) most ecosystems will probably rapidly deteriorate.[19]

The four key considerations identified by the CICERO report provide useful guidelines for establishing long-term targets. To stabilize GHG emissions at any level, it is imperative that major action be taken immediately to significantly reduce global GHG emissions. It is also clear that some amount of environmental damage is associated with all levels of stabilization. Because of past emissions, the world is already committed to temperature increases of up to 1°C in the next century; thus setting long-term targets at lower levels is unrealistic. Conversely, short-term targets to ensure that the rate of warming does not reach dangerous levels must complement any long-term target.

## 1.3 Stabilization at 2°C

Much attention has focused on long-term stabilization targets quantified in terms of maximum temperature limits. The European Council (comprising the governments of all the member states of the (EU) has confirmed, "with a view to achieving the ultimate objective of the UN Framework Convention on Climate Change, the global annual mean surface temperature increase should not exceed 2ºC above pre-industrial levels."[20]

The emerging consensus on the 2ºC target was recently reinforced, in the fall of 2004, when the European Climate Forum convened more than 60 scientists to define what constitutes "dangerous climate change." They reported that "a key outcome of the symposium was the collection of new evidence supporting the view that dangerous climate change is constituted by global warming of more than 2 ºC over pre-industrial levels for a long period of time."[21]

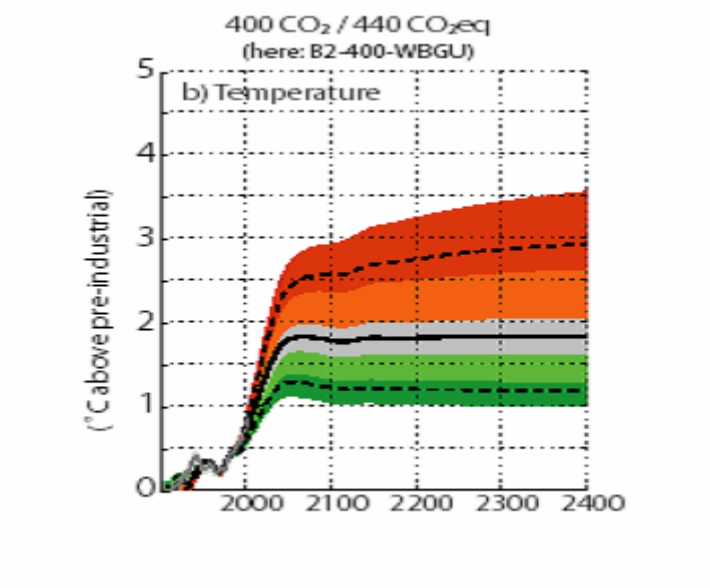
The Climate Action Network has also argued, in its recent discussion paper *Preventing Dangerous Climate Change*, that "climate action must be driven by the aim of keeping global warming as far below 2ºC as possible." [22] The CAN paper goes on to say that "the rate of warming should be brought below a ceiling of 0.1°C temperature change per decade as soon as possible in order to allow ecosystems to adapt." [23]

For any long-term temperature limit not to be exceeded in practice, it is necessary to convert it into GHG concentration levels and then into GHG emission reduction targets that can be implemented by individual countries. These targets for individual countries may be based on concentrations of $CO_2$ equivalent to take into account the radiative forcing (greenhouse effect) due to all the major GHGs, not just $CO_2$.

Recent work done by the Potsdam Institute indicates that stabilization of $CO_2$ equivalent concentrations at around 450 ppm would result in a medium likelihood of this 2ºC target being met. It was "only for stabilization levels of 400ppm $CO_2$ equivalent and below [that] the possibility that warming of more than 2°C will occur could be classified as "unlikely."[24]

Figure 1 demonstrates the risks of overshooting a 2°C target if stabilization at 440ppm $CO_2$ equivalent is targeted.

**Figure 1: Risks of missing the 2-degree target**




It is important to stress that these values are in $CO_2$ equivalent—if just $CO_2$ concentrations were considered, stabilization levels would be lower. Changes in other GHGs are likely to contribute an additional 50–150 ppm of $CO_2$ equivalent to the warming. Therefore, if modelling that considers only $CO_2$ shows that we need to stabilize $CO_2$ concentrations at 440 ppm, we will in reality need to stabilize $CO_2$ concentrations at lower levels (e.g., 400 ppm) when we allow for the contribution of the other GHGs.[25]

The Potsdam Institute has concluded that to reduce the risk of overshooting the 2°C threshold, with reasonable certainty, global GHG emissions would need to decrease by 30-50% below 1990 levels by 2050.[26]

Along with the 2°C limit, it will also be necessary to establish short-term targets that ensure temperatures do not increase at rates beyond the adaptive capacity of natural ecosystems. Targets must be implemented immediately following the end of the Kyoto Protocol period so that necessary stabilization levels do not become unattainable. Given that we are already committed to a certain level of global warming, adaptation efforts will be required in parallel global emission reduction efforts.

## 1.4 Conclusions

1. Current trends in increasing anthropogenic GHG emissions will very likely result in further serious threats to human and animal species as a result of climate change.
2. If action is not taken immediately to stabilize concentrations, necessary stabilization levels may be out of reach.
3. Consensus is forming that global temperatures should not rise more than 2°C above pre-industrial levels.
4. Any long-term stabilization target must include accompanying short-term targets aimed at easing significantly the adaptation stresses that will be borne by ecosystems.

# 2. International Energy Trends and Implications for Action on Climate Change

This section looks at current global energy trends working against, and in favour of, effective action on climate change.

## 2.1 Trends Working Against Action on Climate Change

Global concerns over the security of oil and gas are leading to increased demand for "safe supplies" of fossil fuels. The United States as well as major new buyers such as China are looking to Canada as a safe source of supply. At the same time, the U.S. shows no sign of transformation away from fossil fuels, at the national level at least. Many developing countries, including those that are growing rapidly like China and India, are also embracing the fossil-fuel economy and are rapidly building transport and industrial infrastructures built on fossil fuels.

While there is general agreement that oil and gas supplies are limited, there is little international support for leaving any existing supplies of fossil fuels unused in the ground for environmental reasons, let alone considering the regulations that would be required to do this. The common government and industry view is that we can continue to use fossil fuels widely but "cleanly" through the use of technologies such as carbon capture and storage. The recent "Partnership" signed between the United States, India, China, South Korea, Japan and Australia to tackle climate change through a wide variety of clean coal and clean fuel technologies (as well as nuclear power), confirms the view that these countries wish to keep producing and/or using fossil fuels while perhaps only paying lip service to environmental imperatives.

With certain exceptions (see below), another common international view is that the increasing demand for energy cannot be met by energy efficiency[i] and renewable energy alone while at the same time stabilizing GHG emissions. The majority of climate change mitigation scenarios take the view that "all mitigation options will be necessary" including nuclear power and clean fossil fuels. Even some environmentalists believe that we need all options—even nuclear power—to bring GHG emissions under control.[ii] The national energy forecasts of many countries (including that of Canada's National Energy Board) relegate renewable energy to a relatively small fraction of future energy supply.

Carbon capture and storage (separating the carbon from fossil fuels and injecting it underground or into the deep ocean as $CO_2$) is seen as a way of keeping the oil and gas industry going in Canada and around the world. So-called "clean coal" power generation also relies on the use of carbon capture and storage. Several options are being put forward and beginning to be used commercially including a) using $CO_2$ for enhanced oil recovery or coalbed methane (natural gas) production; b) storage of $CO_2$ in depleted gas wells; and c) dissolution of $CO_2$ in deep aquifers.

[i] In this report energy efficiency includes energy conservation (the reduction of demand) and efficiency (use of more efficient technologies)

[ii] In 2003, British scientist James Lovelock to become the first prominent environmentalist to endorse nuclear power as a global warming remedy, followed by Hugh Montefiore, a board member of Friends of the Earth, UK. Recently, Jared Diamond, the author of "Guns, Germs and Steel"' and "Collapse" endorsed nuclear power as a necessary response to global warming.

The last option has the lowest danger of leakage or other environmental impact, but no option has yet been given international endorsement.

Using carbon capture and storage during fuel production or coal power generation would not require any fundamentally new technologies, but costs would need to be reduced significantly, and the safeguards and monitoring systems required would be significant. A proposed ENGO position on the use of carbon capture and storage is provided in Appendix 2. Carbon capture from use of fossil fuels for transport, industrial and home energy use would have to wait until a full hydrogen- (or electricity-)based economy was in place, because capture would only be practical at a few centralized locations, which would then become distribution centres for the hydrogen (or electricity) remaining when the carbon had been separated out.

There is still very little quantification of the role that energy efficiency and dispersed sources of green heat such as solar water heaters and earth energy currently play in meeting energy demand around the world. This further diminishes the perceived roles of these measures in meeting future demand. Most scenarios assume that world economies will continue to be structured the way they are now with large material and energy-efficiency potential remaining untapped. Energy efficiency is seen by governments and many analysts as "difficult" to achieve because it means working with all energy users, and there are many non-price barriers to overcome.

Rising oil prices mean that export income from the sale of fossil fuels in countries like Canada will continue to climb. The regional economic development benefits of this continuing boom are a tempting target for exploration and development tax breaks and subsidies. The economic clout of the industry involved translates into formidable lobbying power and political influence. Provincial and federal governments in Canada will continue to support offshore and oilsands development even while they recommend global reductions in GHG emissions. This paradox will continue to affect Canada's and other oil-producing countries' negotiating positions on the international regime for the post-2012 period (see Section 5 below).

Nuclear power is being put forward as one of the key technologies in a low-carbon world. The resurgence of support for this option is disturbing many environmentalists who fought hard against nuclear power in the 1970s and early 1990s. Most of the flaws in nuclear power remain, including its cost, security problems and waste storage issues. There are also several reasons why nuclear power is not a climate-change solution. These include a lack of uranium resources to fuel the number of plants needed, and the fact a full hydrogen- (or electricity) based economy would be needed to allow nuclear to meet transport and industrial energy needs.[27] See Appendix 3 for reasons why nuclear power is not a solution to climate change.

## 2.2 Trends Working in Favour of Action on Climate Change

The concern over energy security in the United States has politicians in all parties supporting significant reductions in imported fossil fuels through the use of efficiency measures and increased use of biofuels. Vast amounts of oil are imported from the Middle East, and this has led to the CIA, Republican senators and military leaders quoting the energy-efficiency and renewable-energy policies advocated by many environmentalists.[28]

Renewable energy, the energy source ENGOs believe must be the cornerstone of climate change policy, has become an international issue. Ministers and government representatives from 154 countries gathered in Bonn, Germany from June 1–4, 2004 for the International Conference for Renewable Energies. In an political declaration they acknowledged "that renewable energies, combined with enhanced energy efficiency, can significantly contribute to sustainable

development, to providing access to energy, especially for the poor, to mitigating greenhouse gas emissions, reducing harmful air pollutants, thereby creating new economic opportunities and enhancing energy security through cooperation and collaboration." [29]

In the context of the Bonn conference, renewable energy sources and technologies include: solar energy, wind energy, hydropower, biomass energy including biofuels, and geothermal energy. There was intense discussion at the conference as to whether large hydro should be included as a renewable energy source. Some ENGOs see no role for large hydro. Others see existing large hydro as playing an important role in an integrated optimized grid, with limited or no new large hydro needed.

Renewable energy and energy efficiency also became a topic at the recent G8 summit in the U.K. Although overshadowed by real or perceived proposals to reduce poverty and tackle climate change, as in Bonn, there was general agreement that energy efficiency and renewable energy are important in their own right in reducing poverty, reducing GHG emissions and other environmental problems, and providing economic development (see box).

**Renewable Energy at the G8 Gleneagles Summit (excerpt from final communiqué)[30]**

We will promote the continued development and commercialization of renewable energy by:
(a) promoting the International Action Programme of the Renewables 2004 conference in Bonn, starting with a conference at the end of 2005, hosted by the Chinese government, and supporting the goals of the Renewable Energy Policy Network (REN 21);
(b) welcoming the work of interested parties, including in partnerships, to take forward the Johannesburg Plan of Implementation, including the Renewable Energy and Energy Efficiency Partnership (REEEP) and the Mediterranean Renewable Energy Partnership (MEDREP);
(c) working with developing countries to provide capacity-building assistance, develop policy frameworks, undertake research and development, and assess potential for renewable energy, including bioenergy;
(d) launching a Global Bioenergy Partnership to support wider, cost effective, biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent following the Rome International Workshop on Bioenergy;
(e) welcoming the establishment and further development of the range of International Energy Agency implementing agreements on renewable energy.

Other promising activities promoting and supporting renewable energy include:

- The formation and activities of the Global Village Energy Partnership that focuses on technical assistance, financing and policies needed to bring clean energy to the many villages worldwide that currently do not have access to energy.[31]
- The Renewable Energy and Energy Efficiency Partnership (REEEP), a multi-stakeholder information exchange and financing organization which Canada joined earlier in 2005.[32]
- The adoption of the Renewable Energy Law in China, which, among other policies, includes the use of advanced renewable tariffs (feed-in laws, i.e., guaranteed prices for producers) and legally binding targets for renewable energy. China has already cancelled plans for several coal power plants because of the new law. [33]
- In the US, the American Association for Renewable Energy (ACORE) has launched its "Phase 2" renewable energy initiative with a broad cross section of political support. [34] Meanwhile many U.S. States, including California, have adopted binding renewable energy targets and implemented support mechanisms.

- Brazil is hoping to cash in on increasing demand for biofuels by producing and exporting ethanol, using its 20 years of experience and cost advantage of using sugar as the source.[35]
- Increasing proof that power grids, if optimized for this purpose, can operate effectively with more than a 50% contribution from renewable sources of energy.[36]

The realization that global supplies of fossil fuels are ultimately limited is leading to increased support for renewable energy and energy efficiency. In addition, some analysts are showing that the world could stabilize GHGs at safe levels using significant improvement in material and energy efficiency and renewable sources of energy, while bringing the standard of living of all the world's population up to acceptable levels. The world population is now expected to stabilize at twice current levels by mid-century.[37] Analysts therefore now have a good idea of what the maximum global energy demand might be if everyone were to have a reasonable environmental "footprint" as well as a reasonable standard of living.

Examples of reports and analysis suggesting that the world could meet everyone's needs with efficiency and renewable energy include:

- International Network for Sustainable Energy (INFORSE) Vision 2050. In 2002, INFORSE published a study showing how improvements in efficiency and renewable energy could meet the world's expected energy needs.[38] In December 2004, INFORSE Europe published a more detailed study of how this vision could be implemented in the EU-25 group of nations.[39] The visions are based on the implementation of cost effective "factor 4"[iii] energy efficiency measures as the base for the ultimate transition to renewable energy.
- Renewable Energy Scenarios to 2040 – European Renewable Energy Council (EREC) www.erec-renewables.org

  This major study published in 2004 shows that renewable energy has the technical potential to replace fossil fuels as the mainstream global energy source and could meet 50% of world energy needs by 2040.[40] To reach this target, "advanced, reliable and intelligent policy measures must be implemented in the majority of countries worldwide." The results of this study were also presented at an International Energy Agency (IEA) workshop "Policies to Shape an Alternative Energy Future" held in May 2005 in Paris.[41]
- Prospects for Energy Efficiency Gains in an Alternative Policy Scenario—at the same IEA workshop in Paris, Skip Laitner from the U.S. Environmental Protection Agency showed that there is no reason why energy efficiency should not continue to improve significantly beyond the normal rate of improvement, if the right policy environment were put in place.
- Again at the same workshop, the IEA itself is suggesting that 32% of the world's power generation could come from renewable energy by 2050.

The key messages in all these studies are that renewable energy and energy efficiency need to be maximized whatever path the world takes, and that with the right policy environment they can replace conventional fuels (including nuclear) as the primary energy source within this century. See box for the authors' vision of what such a world might be like.

[iii] Factor 4 means four times more efficient or a 75% savings.

**What Would a World Run on Sustainable Energy Look Like?**

A society that is clean, safe, secure, productive and efficient for everyone everywhere. A society that has rid itself of smog; sprawl; congestion; poverty; dangerous climate change that affects health, life, environment and productivity; and wars and other conflicts over energy resources.

Sustainable energy sources are those that meet the following criteria:

- provide energy services to meet peoples' needs today and in the future in an accessible, equitable and most efficient manner;

- enable stabilization of atmospheric concentrations of greenhouse gases;

- protect or restore the Earth's air, land and water resources throughout their life cycles;

- are safe today and result in no burdens or risk for future generations;

- empower communities to live satisfying and healthy lives.

Continuing discussions on promoting, financing and adopting renewable energy will occur in 2005 and 2006:

- Beijing International Renewable Energy Conference 2005 – China – November 2005. This conference is a follow-up to the Bonn conference and was referenced in the recent G8 communiqué (see above). It will:
    - analyze and assess the status of renewable energy development and the problems it is facing;
    - explore the policy mechanisms for encouraging enterprises and financial sectors to become involved in renewable energy development;
    - explore the prospects and trends for the technological development of renewable energy and support its development through technology transfer;
    - strengthen South-South cooperation and promote the utilization of renewable energy in developing countries.
- 7th Renewable Energy Finance Forum – United Kingdom – September 2005
- 2006 Conference on Sustainable Development

Many countries, including Canada, are being asked to adopt and implement National Renewable Energy Strategies following the recommendations from the Bonn conference. There are also calls for the establishment of a new international agency to promote and finance renewable energy. For more on the need for a Canadian Renewable Energy Strategy see Section 5.

## 2.3 Conclusions

1. The world must agree to leave some fossil fuels unused in the ground if adequate GHG emission reductions are to be achieved.
2. Stabilization of GHG concentrations cannot be achieved without the United States transforming itself to a renewable-energy-based economy, and large economies like China, India and Brazil leapfrogging a fossil-fuel-based economy to one based on renewable energy.

3. The world's population is stabilizing, so energy efficiency and renewable energy could ultimately meet all global energy needs while providing everyone with a decent standard of living. GHG reductions cannot be expected without addressing poverty and universal access to energy services at the same time.
4. Renewable energy and energy efficiency must play a central role in future climate change regimes (see section 4 below), achieving a global transition through international co-operation on climate change, development and poverty alleviation. All nations need comprehensive national renewable energy strategies based on the Bonn policy recommendations.
5. Nuclear power cannot be considered as an option to reduce GHGs for reasons including cost, security, long-term waste disposal, fuel-cycle health and safety, reliability and unsuitability to meet non-electrical needs.
6. Carbon capture and storage is not a permanent solution to climate change and prolongs the fossil fuel era. Until other methods have been proven to be effective, only deep aquifer storage should be allowed and strict conditions put in place for any capture and storage technology.
7. Hydro power can play a complementary role in a grid optimized to maximize renewable energy. However, only new low-impact hydro would have a place in a low-carbon future.
8. Power grids can be designed and optimized to allow base and peak loads to be met primarily with renewable-energy power sources.

# 3. Reality Check on The Kyoto Protocol

## 3.1 The Status of the Protocol

The Kyoto Protocol came into force on February 16, 2005. Under the Protocol, Canada is committed to reducing emissions of greenhouse gases to an average of 6% below 1990 levels during 2008-2012. Other industrialized countries, with the exception of the United States and Australia (which have not ratified the treaty), have similar legal commitments. Developing countries do not have commitments in this first round of action on climate change in recognition that climate change has been caused by industrialization, and until industrialized countries show that development is possible without producing GHG emissions it is unfair to expect developing countries to forgo these benefits.

To minimize costs and spread the benefits of lower emissions, the Protocol allows member countries and companies that emit GHGs to meet these commitments through the purchase and trade of international carbon credits through three "flexibility mechanisms:" the Clean Development Mechanism (CDM), Joint Implementation (JI) and International Emissions Trading (IET).

It is generally agreed that it is too late for Canada and most other industrialized countries to meet their Kyoto commitments without the purchase of international credits using the Kyoto mechanisms. Canada's emissions have increased significantly from 610 megatonnes $CO_2$ equivalent in 1990 to 730 megatonnes in 2002, and it is now almost impossible to reduce emissions to the Kyoto target domestically by 2012 (especially when the glacial pace of government policy implementation is considered). Recent indications are that the 2003 emissions are still higher than 2002.

The EU has already implemented a legislated GHG reduction and emissions trading system that is showing some success. Most EU countries have also started to purchase international credits to supplement domestic action. The Netherlands, Spain, Italy and others are using the World Bank's Carbon Finance Facility to purchase these credits on their behalf.

Because of limited efforts to legislate reductions in the emissions of Large Final Emitters (LFEs) in the other two major Annex I buyers, Japan and Canada, their governments will have to purchase domestic offsets and international credits with public money to meet their commitments.

## 3.2 Canada's Plan

Canada announced its latest plan to fulfill its Kyoto commitment on April 13, 2005. The components of this plan are shown in Table 1.

**Table 1 GHG-reducing measures proposed in Canada's 2005 Kyoto plan.**

| Sectors | Measures | Reduction in annual emissions by 2010 (Mt) |
|---|---|---|
| **Industry, including electricity production** | 1. *Large final emitter system:* regulated targets and emissions trading | 36 |
| | 2. *Emerging renewable energy:* "a variety of mechanisms … including production and tax incentives" | about 15 |
| **Road transportation** | 3. *Automobile industry:* voluntary agreement | 5.3 |
| **Potentially all** | 4. *Climate Fund:* government purchase of domestic and international credits | 75–115 |
| | 5. *Partnership Fund:* shared federal-provincial investments in major projects; regulatory action by provinces (e.g., building codes) | 55–85 |
| | 6. *Programs:* other spending measures | about 40 |
| | 7. *One-Tonne Challenge:* encouragement of voluntary action by individuals | 5 |
| | *8. Greening government* | 1 |
| | 9. *New Deal for Cities and Communities:* transfer of gas tax revenues for "environmentally sustainable infrastructure" | not estimated |
| **Other** | 10. *Business-as-usual sinks:* credits for forestry and agricultural sinks under current practices | 10–30 |
| | ***Total*** | 287 (mid-range) |

The LFE targets are much lower than were originally proposed, and the targets are based on emissions intensity rather than absolute emissions. This means that as oil or gas production or power production from coal increases, LFEs only have to offset a small portion of the increased emissions. Most of the remaining increase will have to be picked up with public tax money through the Climate Fund. ENGOs are still advocating a change to a true capping of emissions.

One of the key components of the plan will be the setting up of a Canadian Emission Reduction Incentives Agency to administer the Climate Fund announced in the recent Budget 2005. An initial allocation of $1 billion of public funds was made to the Climate Fund. These funds are to be used to purchase both international and domestic GHG reduction credits. Canada's participation in the international carbon market will therefore involve purchases of credits both by government (through the Climate Fund) and by large final emitters (LFEs) such as power utilities and oil companies that will have requirements to reduce emissions under Canada's Kyoto Plan. The federal government is proposing to set up a domestic offset project registration system by the end of 2005.[42] This will be the system for the creation of domestic credits.

Some of the main ENGO concerns with the use of domestic and international credits are that:

- They deflect attention away from emissions reductions by emitters and allow increased production of fossil fuels and fossil-fuel-based power.
- There is pressure to weaken the additionality principal (i.e., not require GHG reduction projects to be incremental to business-as-usual practice) so that they are not equivalent to LFE reductions.

- There is a danger of the offset system focusing only on large industrial megaprojects, potentially including nuclear power plants, and not on projects that have co-benefits like health and sustainable development.

The demand for international credits is expected to increase rapidly with the coming into force of the Kyoto Protocol and could rapidly outstrip supply (see box). One of the key issues at COP 11 will be increasing the availability of international credits while at the same time maintaining their environmental integrity. One suggestion is the modification of the CDM to allow GHG reduction programs and policies to be eligible (currently only projects are eligible). The CDM Executive Board system also needs to be restructured and its resources increased to handle the larger flow of credits needed, while still preventing business-as-usual projects. The World Wildlife Fund has introduced a CDM Gold Standard that helps sellers and buyers of international credits recognize projects with high sustainable-development value.[43]

Another key issue is the "greening" of Assigned Allocation Units (AAUs) that can be traded under IET. There will be a large number of "hot air" AAUs available from the so-called "economies in transition" in Eastern Europe, but some system will need to be developed to ensure that the proceeds of trades would be used for GHG reduction purposes.

**The Kyoto Carbon Market —Are There Enough Credits Out There?**

While trading of GHG emission reductions (ERs) has been active for some years on a pilot basis, the market for ERs that are compliant under the Kyoto Protocol is more recent and dates from the inception of the Clean Development Mechanism in 2001. Since that time the World Bank estimates that the market has grown to over US$200 million per year.[44] With the coming into force of the Protocol this year and the advent of Joint Implementation and Emissions Trading, the Kyoto-compliant carbon market is expected to increase sharply in the period of 2006–2012.

Carbon prices in the pre-compliance carbon market ranged from US$ 0.5 to 3.00 per tonne of $C0_2$eq. Current prices for compliant ERs range from US $3 for projects with a high risk to US $7 per tonne for projects where ERs are guaranteed or have lower risk. It is expected that prices will rise to at least US $10 per tonne, and perhaps higher, over the next few years, although prices are difficult to predict, especially given their sensitivity to how Russia uses its large "hot air" surplus of credits.

It is estimated that the current compliance gap of the three largest Annex 1 potential buyers of ERs—EU15, Canada and Japan—is over 1000 Mt $CO_2$eq per year or five billion tonnes over the five-year Kyoto compliance period. Canada's compliance gap is expected to be about 270 Mt.[45] If half of these reductions are obtained domestically by these industrialized countries, and the price of carbon averages US $10 per tonne, the international carbon market will be worth up to US $25 billion.

Most industrialized countries, including Canada, have put in place or are developing domestic compliance legislation in which only a part of their national Kyoto commitments are borne by larger final emitters. The governments of industrialized countries themselves are, and will continue to be, the largest purchasers of ERs.

The federal government is also planning to ramp up renewable energy and energy efficiency incentives and is reviewing current programs with the objective of increasing their impact on emissions. However, it is putting major emphasis on megaprojects like a cross-Canada transmission line to provide provinces like Ontario and Saskatchewan with power from new large-scale hydro power plants in other provinces, and carbon capture and storage to allow power production from coal to continue unchecked. Unfortunately, the options being proposed for

carbon storage are shallow storage to enhance oil recovery or storage in depleted gas wells—both of which have the risk of leakage.[iv]

A key issue for the credibility of Canada's Kyoto plan is whether the government is able or willing to implement it quickly enough to meet the Kyoto deadline. The Pembina Institute has proposed a timeline for implementation steps in all key areas of the plan during 2005.[46] If, by the end of the year, the government has failed substantially to meet this timeline, it will become increasingly difficult for the government to affirm that it genuinely intends comply with its Kyoto target.

## 3.3 Recommendations

1. Canada can still meet its Kyoto commitments, but only if there is effective and timely implementation of measures in the 2005 Plan "Project Green: Moving Forward on Climate Change" as follows:
   - Further weakening and the opening of loopholes in the national large final emitter (LFE) system must be prevented at all costs.
   - An effective domestic offset system needs to be in place as soon as possible. It would purchase only incremental reductions, mostly from energy efficiency and renewable energy projects.
   - The Climate Fund must purchase international credits that are low-risk and have high sustainable development value.
   - The Partnership Fund should focus on demand-side management, energy efficiency and renewable energy projects and programs. It should not include carbon capture and storage or cross-country transmission lines—except to increase access for renewable power sources.
   - There must be a major supplementary federal budget allocation to these Funds during 2005 if there is to be enough time for funded projects to be implemented by 2008.
2. If Canada is to harmonize its LFE system with those of the European Union (EU) and other Kyoto-compliant emissions-trading systems, it must move away from the current intensity-based approach to a full cap-and-trade system.
3. If Canada is to meet its Kyoto targets, energy efficiency and renewable energy programs need to be significantly expanded and include distributed energy. Long-term energy efficiency and renewable energy strategies need to be developed and adopted by multi-government and multi-stakeholder entities such as the Council of Energy Ministers and the Renewable Energy and Energy Efficiency Partnership (REEEP). Favourable investment environments need to be created for energy efficiency and renewable energy.
4. The oil and gas industry is reaping record profits, so subsidies and tax credits for these industries are waste of public money that would be better used to support the deployment of energy efficiency and renewable energy instruments.

[iv] This presents one of the paradoxes of Canadian climate change policy – using an ineffective medium for the storage of CO2 from oil sands production, so that oil production for export can be increased.

5. Carbon capture and storage through enhanced oil recovery has not yet been proven to be an effective method of GHG storage and will not contribute to Canada's Kyoto commitments. Tight conditions on the use of carbon capture and storage are needed (see Appendix 2).
6. Nuclear power has no place in Canada's Kyoto climate change plans because of its cost, safety concerns, security risk, and waste disposal problems.
7. The Clean Development Mechanism (CDM) system needs to be strengthened to produce the volume and quality of Certified Emissions Reduction (CER) credits that Canada and other industrialized countries will need to purchase in the 2008-2012 period.

# 4. Options for the Post-2012 International Regime

This section includes some of the recent thinking in the ENGO community around policy options for international co-operation and agreements that would reduce GHG emissions over the next few decades. The section builds on a recent CAN proposal for a three-track global climate framework that includes continued use of individual Kyoto-like targets but including additional countries, commitments for developing nations that are less stringent than those being adopted by Annex 1 nations, for example GHG "intensity" targets, and assistance for nations most vulnerable to the impacts of climate change. It also advocates for a global transition to renewable energy and the eventual convergence towards an equitable and environmentally sound GHG per capita target.[47]

It can be generally stated that stabilization will not be achieved unless:

- The United States becomes engaged and all major industrialized countries transform their economies away from fossil fuels (or capture and store the carbon from fossil fuels on a massive scale).
- Developing nations—especially large ones like China, India and Brazil—leapfrog the fossil fuel era.
- Global poverty eradication, a dramatic expansion of access to clean energy, and reduction of vulnerability to climate change are achieved alongside GHG reductions.

The current climate change regime under the Kyoto Protocol to the UNFCCC calls for industrialized nations to collectively reduce their emissions to around 5% below 1990 levels over the 2008-2012 period.[48] However, this initial target was set "without any discussion of a long-term, environmentally sound, collective target … exhibiting a system based on "negotiated justice."[49] The 2°C stabilization target provides an environmental basis for setting long-term international and national emission reduction targets. However, as discussed, any long-term targets will also require shorter-term targets and adaptation efforts to be applied.

## 4.1 A Framework for Long-Term Stabilization

There are many proposals that explore possible future climate regimes. For the most part, suggested future regimes build on the current UNFCCC process. However, there are some that move outside of this process. These include proposals that would have developing and developed nations negotiating commitments in separate forums, and a proposal that has certain nations, such as the United States and some developing nations, pursuing a parallel reduction approach.[50] The main concern raised by these proposals is that they may move the global climate regime away from the UNFCCC's ultimate objective of keeping global temperatures to levels where dangerous global climate change can be avoided. Climate change is a global problem; therefore the UNFCCC is also attractive because it is global in nature and can bring all nations into a future regime. Through the UNFCCC a number of mechanisms and policies have already been broadly agreed upon, and this is a solid base for any future regime.

There are a number of principles that could guide the creation of an international framework. Some of these were put forward in a the recent CAN discussion paper, and include:

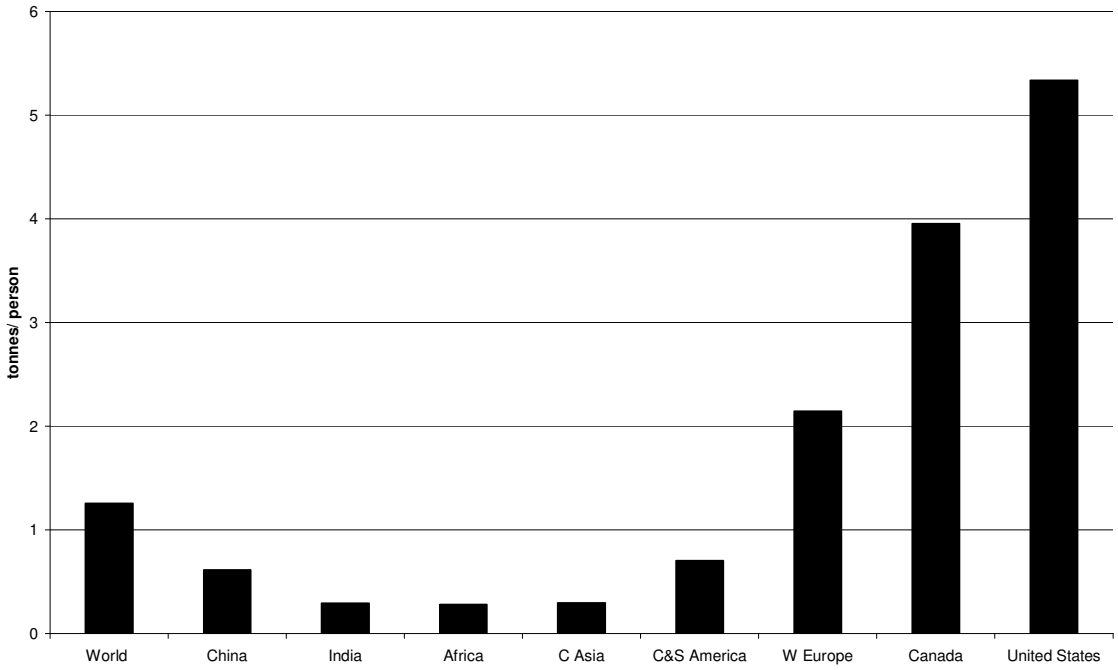
- Equity — This includes the idea that all people have an equal right to access the global atmospheric commons. Those who have taken up space in the atmosphere so far must take action to ensure that others have room to develop. An equitable global framework would also aim for an eventual per-capita emissions convergence. Intergenerational equity must also be considered in this principle, ensuring that there is space in the atmosphere for generations to come.
- Historic responsibility — Industrialized nations are the largest contributors to global climate change. Therefore, they must take the lead in solving the problem by pursuing deeper long-term reductions, enabling the transfer of low-carbon technology to developing nations and providing assistance to those that will be most affected by inevitable climate change
- Capacity to act — Developing nations should take non-punitive measures to develop in a sustainable manner and take on emission reduction commitments as their development situation allows for.
- The precautionary principle — This asks that in the face of scientific uncertainty, action should be taken as a precaution to ward off environmental risks.
- The right to sustainable development—In particular, there should be equitable access to affordable energy services, livelihoods, food security, health, water and other basic human needs.
- The basic rights to life and physical integrity — These are embodied in a number of international treaties and the Universal Declaration of Human Rights.

The UNFCCC in Article 3.1 states that: "The Parties should protect the climate system for the benefit of present and future generations, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly the developed country Parties should take the lead in combating climate change and the adverse impacts thereof." This would indicate that the world must act in such a way as to recognize the differing circumstances of nations, both in terms of historic responsibility for the impacts of climate change and their current ability to act to reduce emissions.

A wide range of commitments to emission reductions are being discussed in international forums. In addition to the strengthening of the absolute targets for industrialized countries, a global framework might include commitments by developing nations. These targets for developing nation might take the form of emissions targets. Such targets could be either absolute or based on "intensity" (emissions per unit of economic activity); binding or non-binding; and regional, national or sectoral. Commitments might also include policies and measures. Their application to nations or groups of nations could be governed by the application of the principles of equity, in particular historic responsibility and capacity to act.

Industrialized countries, which represent one-fifth of the world population, are responsible for about 63% of human-related carbon dioxide emissions, while developing countries, which represent 80% of the world's population, contribute to approximately 37%.[51] Industrialized countries also continue to take up a disproportionate amount of space in the atmosphere as can be seen in Figure 2.

**Figure 2 Global Per Capita Emissions[52]**

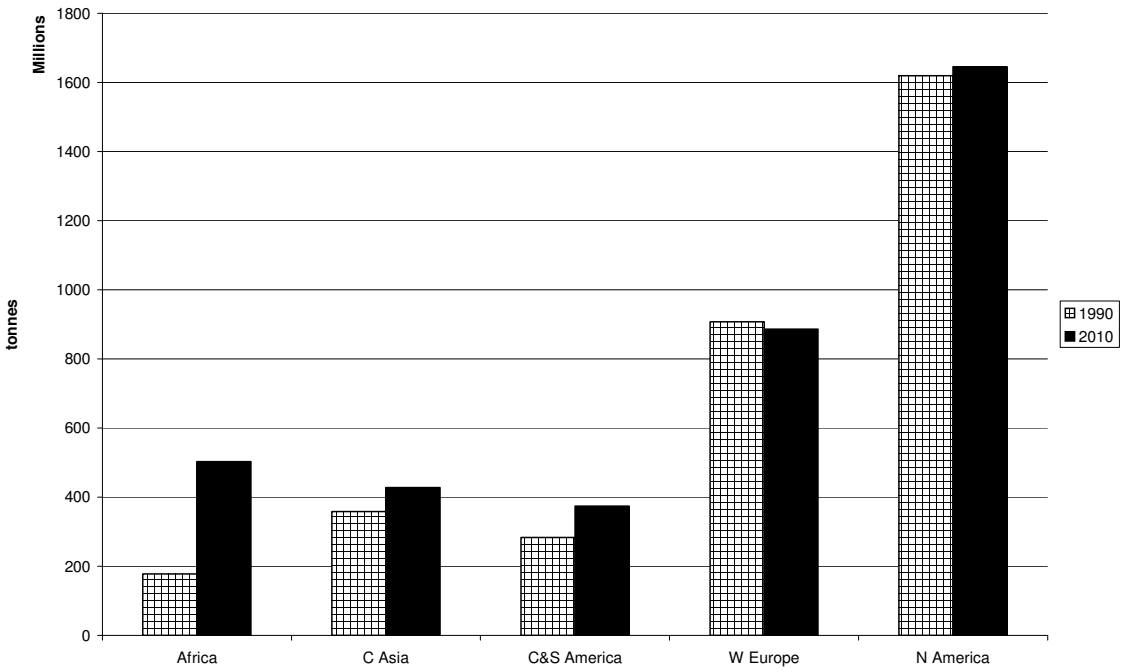



In terms of capacity to act, the industrialized nations have far more wealth than developing nations. Hence it is the industrialized world that must take the initial and most significant steps in the fight against climate change. This should include taking on deeper absolute emission reduction commitments as well as providing assistance to developing nations so that they can industrialize in a non-carbon intensive manner and adapt to the impacts of climate change.

Developing nations, while not primarily historically responsible for climate change, have growing economies and are expected to have rapidly rising emissions as shown in Figure 3.

Therefore, it is important that as nations begin to have the capacity to act, they take on binding emission targets or commitments. It is also important that in all stages of development nations adopt zero or negative cost emission reduction opportunities. Eventually it is expected that per capita emissions of developing and developed nations will converge, and all nations will be required to reduce emissions so that the stabilization level might be achieved.

**Figure 3 Current Emissions and Projected Increases[53]**




## 4.2 Reducing Vulnerability to Climate Change

A certain level of climate change is now unavoidable, regardless of policy action. Temperature changes that will have vast human, earth and ecosystem impacts including increased heat waves, rising sea levels (causing coastal flooding) and increased drought are inevitable. Thus an effort to reduce vulnerability to climate change is needed immediately. It is recognized that "the impacts of climate change are likely to fall disproportionately upon the poorest countries and the poorest persons within countries, and thereby exacerbate inequities in health status and access to food, clean water and resources." [54]

The UNFCCC has recognized that "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries."[55] Considering the inequity between industrialized and developing countries, it is therefore reasonable that industrialized countries take the lead to reduce global emissions and the responsibility for the costs associated with the adverse impacts of climate change, including funding for adaptation measures in developing countries.

The UNFCCC states that the "developed country parties … shall … assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects."[56] "The Adaptation Fund was established under the Kyoto Protocol to support the implementation of concrete adaptation projects and programmes"[57] and receives its funding through a levy on the Clean Development Mechanism (CDM), one of the Kyoto Protocol's emissions trading mechanisms, whereby 2% of the proceeds from this mechanism go to the Adaptation Fund. [58]

However, the reputation of the industrialized world for providing adequate funding is not commendable. The presentation by the expert from India at the UNFCCC's recent seminars for governmental experts in Bonn noted that the allocation to the Global Environment Facility (GEF), the mechanism designated by the Kyoto Protocol to provide climate change assistance to developing countries, during its 2nd replenishment period amounts to only US $648.31 million against a pledge of US $2,750 million. This expert also noted that GEF projects are overwhelmingly co-financed with money that is not new or additional to the host country and is at times sourced from the host country itself.[59]

Industrialized nations will also have to enable the transfer of emission-reducing technology from the industrialized world, where much of it is developed, to the developing world. Developed nations will need to accomplish this both through making financial assistance available for this procurement as well as through the reduction of barriers to trade in certain technologies.

## 4.3 International Regime Options

The following is an overview of options that may be included in the design of a future framework — absolute targets, intensity targets, sustainable development policies and measures (SD-PAMS), and per-capita emissions. It is expected that any future framework would build on the Kyoto Protocol, and that under such a framework developed nations would take on deeper absolute targets in the future. In addition, in order for the world to meet its stabilization goals there may also be a need for developed nations to take on emission-reduction commitments. Due to the development priorities of these nations, their targets may need to be less stringent and more flexible than the commitments imposed on developed nations.

### Absolute Targets

Based on historic responsibility and capacity to act, the majority of the mitigation efforts that are needed to respond to the impacts of climate change falls on the industrialized world. Industrialized nations must take on absolute emissions targets relative to their 1990 emissions levels that will need to become more stringent over time. The Climate Action Network is of the opinion that "targets would have to represent emission reductions in the range of 60-80% by the 2050s, with continuing declines thereafter in order to provide space for developing country emissions, while keeping global temperatures below 2ºC."[60]

The EU member state governments have to some extent adopted this position. They have stated that "reduction pathways for the group of developed countries in the order of 15-30% by 2020, compared to the baseline envisaged in the Kyoto Protocol, and beyond … should be considered."[61] And they have gone on to suggest that "reduction pathways for the group of developed countries in the order of … 60–80% in 2050 (relative to 1990) should be considered."[62]

In addition to industrialized nations, some developing nations may have to take on binding commitments in the near term as their economic situation allows it. Criteria for graduation to this level might include historic responsibility, per-capita income and per-capita emissions.[63]

## Intensity Targets

Intensity targets have been suggested in some developed nations, and their appropriateness is widely contested. NGOs globally have been extremely critical of the Bush administration's commitment to reduce emissions intensity by 18% between 2002 and 2012; they have asserted that this target will not result in emission reductions beyond business as usual. In Canada, NGOs have fought hard against a government promise to the oil and gas industry that they would be given emission intensity targets as part of Canada's plan to meet its Kyoto objectives. The LFE targets, as described in the previous section, allow large industry in Canada to grow while only picking up a small portion of the emission reductions that Canada will have to take on as a result of that growth.

However, in the case of developing nations, intensity targets may not be an entirely inappropriate mechanism for reducing emissions. In theory, intensity targets allow economic growth to occur while providing a target to improve the efficiency of the economy. While these types of targets do not encourage conservation and may not result in absolute emission reductions, they do encourage nations to grow, economically, in a less carbon-intensive manner.

According to the World Resources Institute, "Absolute caps on emissions are generally viewed, especially by developing countries themselves, as caps on development", while the UNFCCC itself recognizes that development and poverty eradication are the "first and overriding priorities of developing countries."[64] [65] The World Resources Institute believes that "A more appropriate target might be one that is compatible with sustainable development, geared toward achieving emission reductions *relative* to economic development rather than achieving absolute reductions in emissions."[66] An example of this type of emissions target is an intensity target that is measured in emissions per unit of GDP, or emissions per unit of progress, as measured by a Genuine Progress Indicator system.

Intensity targets may be preferable for the developing world since "developing country economies tend to fluctuate more than those of the industrialized world because of greater vulnerability to such factors as poor weather conditions or global economic trends. This leads to considerable uncertainty over economic growth rates and therefore emission projections. A *fixed* emission cap, even spread out over a five-year commitment period, could therefore prove unmanageable."[67]

Some have also suggested that intensity targets be applied globally to specific industry sectors to minimize distortions in competitiveness arising from different treatment of a given sector by different national governments. In this case GHG intensity would normally be measured in terms of emissions per unit of production.

## Sustainable Development Policies and Measures (SD-PAMS)

Policies and measures are common in the current UNFCCC framework; however these policies and measures differ from sustainable development policies and measures as they prioritize impacts that reduce GHG emissions. SD-PAMs instead focus on meeting a country's development needs in a more sustainable manner. This is achieved by first identifying a country's development priorities and then identifying more sustainable policies that could be implemented to help the country achieve the priorities. Once this step is completed, the SD-PAMs that both encourage sustainable development and reduce GHG emissions can be identified and encouraged. [68]

SD-PAMs will likely make good candidates for CDM projects (where industrialized countries purchase emission reductions from projects undertaken in developing countries), as furthering sustainable development objectives and reducing GHG emissions are twin objectives of the CDM. Qualification under the CDM would help to offset the costs of putting in place such measures. A larger scale CDM might also be beneficial to the application of SD-PAMs. A mechanism that is a slight variation on the current CDM mechanism could expand the project boundaries of the current CDM to allow for regional, sectoral and cross-sectoral projects to be eligible. This would allow broad sectoral policies that reduce GHGs to access the emissions trading system and may make SD-PAMs more viable. [69]

### Per Capita Emissions Targets

The most commonly known framework that advocates for per capita emissions convergence is the "contractions and convergence" (C&C) approach espoused by the Global Commons Institute.[70] This approach relies on a GHG atmospheric concentration target, which is then translated into a GHG emissions budget and distributed globally. Under this system, regions of the world would come to a global agreement on a safe and stable concentration and a resulting contraction objective. They would also agree on a rate and date by which convergence should be completed. In the negotiation within the regions or countries of distribution of burden, responsibilities for historic atmospheric accumulations could be a consideration.

There is a growing recognition that per capita emissions convergence must occur, and that nations will eventually reduce emissions at an equal rate on a per capita basis. The European Parliament has adopted a resolution on climate change, which is supported by "progressive convergence towards an equitable distribution of emission rights on a per capita basis by an agreed date in the next century." The Indian government has also repeatedly stated its support for this concept, most recently by stating that "equal per capita is an equitable norm and the per capita criterion is central to the determination of emission entitlements.[71]

## 4.4 Conclusions

1. A viable global framework must build on the current regimes of the UNFCCC and the Kyoto protocol.
2. The principles of equity, historic responsibility and capacity and ability to act should form the basis for any future framework.
3. A future framework will involve differentiated responsibilities. Richer industrialized nations must take the lead by pursuing absolute reductions and providing assistance to developing nations for mitigation and adaptation to climate change. Developing nations must be helped to contribute to the global mitigation effort by pursuing low carbon intensity development paths.
4. Developed nations must also recognize that one of the most significant barriers facing developing nations in combating climate change and growing economically is the considerable debt burden that many of these nations face. Any effective climate-change policy must also address the economic barriers faced by developing nations, particularly the debt burden and the effects that the policies of international financial institutions and aid delivery agencies have on climate.

5. The eventual goal of any future framework should be equity in quality of life and the reduction of emissions in an increasingly equitable manner.

# 5. Canada's Long-Term Climate Change and Energy Policy Options

## 5.1 Will Canada Be a Leader or Follower?

As noted above, Canada will not meet its Kyoto target without significant use of both domestic and international credit purchases using public funds. Canada is also trying to rely on major projects such as a cross-country transmission lines and carbon capture and storage to fill the gap created by weak constraints on Large Final Emitters (LFEs). The objective—if it is not to abandon meaningful action on climate change while pretending the contrary for as long as possible—appears to be to retain a long-term coal power production capacity, and major oil and gas production and export industry, by relying on carbon storage and other technologies to make these industries GHG neutral. These fossil fuels will still emit GHGs when they are used, so paradoxically Canada is increasing the availability of fossil fuels on the one hand while supposedly supporting the reduction of GHGs on the other.

Meanwhile, Canada's support for renewable energy and energy efficiency, while increasing (through production tax credits and membership in organizations such as the Renewable Energy and Energy Efficiency Partnership (REEEP)), still lags behind that of most other countries. According to the Ernst and Young Renewable Energy Attractiveness Index, Canada ranked 15 out of 20 industrialized nations in March 2005.[72]

Canada is therefore not well positioned to take on new GHG reduction commitments after 2012 that would, with similar commitments by all other countries, stabilize GHG levels at reasonable and safe levels. If the reductions required are 60% below 1990 levels this would mean Canada would have to reduce GHG emissions to about 240 Mt/year or 66% lower than 2003 emissions.

Other countries are also not well positioned to take on these commitments. Despite some positive moves like the adoption of the China Renewable Energy law, implementation of feed in tariffs for renewable energy and caps on industrial emissions in the EU, and major actions by some US states, there is no sign that industrialized countries will be ready to move significantly away from fossil fuels and leave what's left in ground. There are also few signs that developing countries will be helped to leapfrog a fossil-fuel economy and become one based on energy efficiency and renewable energy while they seek to meet the needs of those who do not yet have access to energy services.

Meanwhile, climate changes in Canada's North and in other vulnerable areas around the world are already having major impacts on local wildlife and populations. Aboriginal peoples, including those in Canada's First Nations, are among those most affected.

What is striking is that Canada does not yet have any long-term climate or GHG emissions targets. It has made no declarations as to what it believes the just eventual allocation of emission targets or rights to emit should be.

The very first Meeting of the Parties to the Kyoto Protocol will occur in Montreal this November. It will be an opportunity for Canada to show to the world whether it is or is not a global leader in climate change. This would require the country to show leadership at home by adopting the $2^{o}C$ target along with corresponding long-term emission reduction targets.

The David Suzuki Foundation's and Climate Action Network's 2002 report, *Kyoto and Beyond*, demonstrated that the emissions targets envisioned under the 2°C target are entirely possible. This report showed that an emissions reduction of 40% below 1990 levels could be achieved in Canada, at a cost savings of $30 billion, by 2030.[73] Therefore, it is important and feasible that Canada play a lead role on the global stage by committing to a 30% reduction in emissions below 1990 levels by 2020, followed by a deeper reduction of 60% below 1990 levels by 2050. The United Kingdom has already adopted a 60% reduction target in its *White Paper on Climate Change*.[74]

Canada needs to think, as a nation, about the eventual fair global climate system that it would like to see and when it believes this ought to occur. The government has asked its citizens to take on the one-tonne challenge, bringing to the people the importance of contemplating each individual's contribution to the world's problem. It must take this idea and turn it into a policy. Switzerland has a vision to see a one-tonne per-capita society,[75] while Canada is now well over 20 tonnes per capita. Canada should take on a goal like Switzerland's and put in place the appropriate strategy to meet it.

## 5.2 Canada's Climate Change and Energy Policy Options

The remainder of this section of the report looks at the options that Canada has to effectively address climate change in the post-2012 period in three ways:

1. The UNFCCC negotiations themselves.
2. International actions outside of the UNFCCC.
3. Domestic energy policy.

Action in each of these areas can contribute to reductions in global GHG emissions. The Climate Action Network has prepared a position on a "Montreal Mandate" and Canada's role that is provided in Appendix 3.

### UNFCCC Negotiations

Canada's most likely approach to post-2012 climate negotiations will be to cater to current narrow but powerful economic interests in which we:

- Make Canada's domestic interests the prime focus of international negotiations and agreements on climate change, trade and international development,
- Negotiate a new climate agreement that allows Canada to maintain oil, gas and coal power industries by reducing, in the medium term, domestic GHGs emissions from these industries through carbon capture and storage, while continuing to export fossil fuels along business-as-usual lines.
- Advocate changes to the CDM, JI and International Emissions trading that relax the guidelines on additionality and make it easier to include technologies that Canada specializes in—including the expansion of eligible sinks to include forest and soil management, carbon capture and storage, and perhaps nuclear power.
- Include a role for renewable energy and energy efficiency but not make them the cornerstone of new agreements.
- Not stand in the way of including nuclear power as an explicit player in a low carbon future

This is very similar to the approach recently adopted by the new Partnership led by the United States, described in section 3. Given past experience in the Kyoto negotiations, it is the most likely path that Canada will take unless strongly lobbied to do otherwise.

A very different path would be for Canada to take a more proactive international position, advocating international actions that will stabilize GHGs at safe levels, while at the same time helping those with unmet energy needs meet them with renewable energy sources—working both inside and outside the UNFCCC framework (see below).

At a minimum, therefore, Canada should take the following negotiating position into the next round of climate change discussions:

- The prime objective is to achieve stabilization of GHG concentrations at safe levels through equitable global action.
- The cornerstone of new action on climate change must be a global transition to renewable energy together with significant gains in energy efficiency (40% or more). All countries should develop, adopt and implement national strategies to maximize renewable energy and energy efficiency and begin a transition to a sustainable economy.
- A new agreement on climate change must explicitly include concrete plans to reduce poverty and meet energy service needs in developing economies with sustainable energy sources. It should recognize that many developing countries are already implementing sustainable development policies and measures (SD-PAMS).[76]
- Recognition that several large developing countries including China, India and Brazil have a major role to play in stabilizing GHG concentrations, and therefore major investments must be made in energy efficiency and renewable energy. A new category of flexibility mechanism to achieve this could be included in any new climate change protocol.[v]
- Recognition that near-term binding targets are essential to keep action on track towards meeting the necessary longer-term targets.
- Include flexibility mechanisms that achieve high levels of sustainable development in host countries, building on the best the CDM has achieved.
- Nuclear power must continue to be excluded from existing or any new flexibility mechanisms.
- Recognition that while fossil fuels currently meet many of the world's energy needs, ultimately some oil and coal supplies must be left in the ground unused; therefore steps must be taken to phase out use of these fuels though agreement and regulation.
- Carbon capture and storage should only be used a temporary measure and then only in deep aquifers and with strict safeguards.
- Provide assistance to reduce the vulnerability of those already affected by changes in climate, and those who will be affected in future by further inevitable changes.

[v] This would preferable to the disturbing proposal from the World Bank that it would manage the financing of nuclear power and clean coal in these countries as way of reducing emissions.

- Preserve forests and agricultural lands as sinks for GHGs and sources of sustainable livelihoods for local populations.

Under this type of agreement, Canada should take on a commitment to reduce GHG emissions in the near term (immediately post-2012) in line with the safe stabilization scenario. Canada would take action domestically that would make a serious effort to transform the economy into one based on energy efficiency and renewable energy, and reduce reliance on the oil and gas industry by removing subsidies and providing transitional assistance to industries affected (see below).

Canada should develop a strategy for using any new flexibility mechanisms in the agreement, ensuring that firstly these mechanisms make up only a limited percentage of Canada's reductions, and secondly that credits are only acquired from projects and programs that achieve the highest levels of sustainable development and are unquestionably additional.

## Actions Outside of the UNFCCC

Although ongoing agreements under the UNFCCC should form the basis for Canada's climate policies, there is much Canada can do outside those agreements by, for example:

- Working with large developing countries to develop an economy based on energy efficiency and renewable energy, utilizing Canadian technologies and services where appropriate.
- Playing a major role in helping developing countries improve access to renewable energy and energy efficiency technologies in order to reduce poverty and meet energy needs.

Canada should not support the new proposal from the World Bank that it play a major role in both financing technologies such as nuclear power and clean coal, and in mediating negotiations on climate change. This would totally undermine the UNFCCC process. For the same reasons, Canada should not join the so-called Partnership led by the United States. Many analysts observe that the Partnership approach will not lead to stabilization.[77]

Canada should instead finance the activities of REEEP and the Global Village Energy Partnership that are well positioned to achieve major adoption of renewable energy and energy efficiency while at the same time providing sustainable low-carbon livelihoods to millions of people.

Canada should increase official development assistance in the area of community-scale renewable energy. There are increasing examples of how these technologies can meet the energy needs of developing countries while also alleviating poverty by providing income opportunities, improved education, health, etc.[78]

Canada should use the Export Development Corporation (EDC) to promote and finance exports of Canadian products and services that provide energy efficiency and renewable energy.

Finally, Canada should actively participate in international co-operation on renewable energy that started with the 2004 Bonn Conference and will continue with Beijing International Renewable Energy Conference 2005 and through the Conference on Sustainable Development in 2006. Canada should support the idea of a new international agency to co-ordinate the transition to renewable energy. Renewable energy will only grow in importance, and Canada has a lot to offer.

## Canadian Energy Policy

As discussed above, to act in line with a global agreement to stabilize GHG concentrations at safe levels by 2050, Canada's actual emissions would need to be at least 60% below 2003 levels.

Several technical options exist that would allow Canada to meet these commitments. Each has several issues and/or co-benefits and costs associated with it, and there are important policy implications associated with each. A business-as-usual path by Canada would continue with current policies that:

- Promote a modest improvement in end-use energy efficiency in buildings and transport.
- Plan for and support a small contribution from renewable energy.
- Promote and support carbon capture and storage to allow continued use of coal for power production in western Canada, and the production and export of oil and gas from the offshore and from the oilsands (issues include location, leakage, safety, liability, longevity, GHG emissions from the use of the oil exported, mercury and radiation from burning coal, water use, land use).
- Support nuclear power to meet electricity needs in Ontario and heating needs in the oilsands (issues include safety, security, waste, costs).
- Build a cross-country power grid to bring power from large hydro in Newfoundland, Quebec, Manitoba and BC to other provinces (issues include land, flooding, ownership).

This approach is confirmed by recent presentations by Canada to the IEA where clean coal, nuclear, carbon capture and storage, hydrogen and cellolosic ethanol are listed as Canada's technologies of 2030 (see Table 2).

**Table 2 Canada's Technology Timeline [79]**

| Today | 2030 | Long-term |
|---|---|---|
| Wind<br>Hydro<br>Nuclear refurbishing<br>Grain-based ethanol<br>Energy efficiency<br>Non energy (e.g., landfills) | CO2 capture and storage<br>"Clean" coal<br>Next generation nuclear<br>Hydrogen<br>Cellulosic ethanol<br>Energy efficiency | ? |

An alternative sustainable energy path would be built from local and regional strategies supported by provincial and national governments:

- Redesign and optimize power grids in each province to maximize the role of green power sources and rapidly expand green power capacity (wind, small hydro, solar, biomass) to become the primary source of power (issues include land use, cost, NIMBY).
- Redesign and transform community and transportation infrastructures (goods and persons) to minimize energy demand and destructive land use, including major roles for public transit and freight transport integration.
- Maximize the use of green heat resources such as solar thermal and earth energy, metering the production of heat and providing a commercial market for this contribution.
- Transform manufacturing industries into closed-loop materials and resource systems (for example through increased producer responsibility regulations).

- Remove all subsidies and financial support for the oil and gas industry and coal-fired power plants and provide support for worker transition and alternatives for regional economic development.
- Construct dramatically more efficient, and eventually only net-zero energy buildings, and upgrade existing buildings to similar levels of efficiency.
- Transform the vehicle fleet to hybrid vehicles and/or those that use biofuels produced from biomass wastes or sustainably grown crops or forests.
- Develop an industrial infrastructure to manufacture, install and maintain energy efficiency and renewable energy products and services.
- Protect Canada's forests and agricultural lands using ecologically sound practices so that they provide sustainable livelihoods for local populations and First Nations as well as provide sinks for greenhouse gases.

With the appropriate political will and serious attempts to transform our economy to a more efficient and environmentally sound one, it should be possible to meet all of Canada's future energy demands using the sustainable energy path. We should not accept the view that we need all available energy sources to make significant reductions.

Recent studies by The Pembina Institute and the David Suzuki Foundation have shown that in at least one province, namely Ontario, there are significant renewable energy resources available and that by using today's most efficient commercially available energy efficiency technologies, coal and nuclear power could be phased out by 2020.[80] [81]

Work in Manitoba and Quebec suggests that large contributions from renewable power sources can be incorporated safely into the grid. Research at the University of Calgary shows that if the grid were properly optimized, more than 50% could be contributed from intermittent renewable energy sources.[82]

Environmentally and socially sound domestic energy policy to bring about this sustainable energy path would include the following:

- A regulatory regime for major energy producers and users (i.e., Large Final Emitters) incorporating progressively lower GHG emission targets, set in terms of absolute emissions, and an increasing degree of auctioning of emission permits.
- The elimination of all subsidies and other support for the fossil fuel and nuclear fuel-cycle and power industries.
- The implementation of a long-term transition strategy focusing on the development of new economic opportunities for the workforce, communities and businesses in regions currently dependent on the fossil fuel and nuclear industries.
- The adoption of a national renewable energy strategy, including the mobilization of investment in energy efficiency and renewable energy and the building of a comprehensive renewable energy industry.
- The implementation of a national energy-conservation and efficiency strategy that addresses the basic design of our urban infrastructure, manufacturing industries, and services met by energy, as well as the equipment used to meet them. Support of this strategy with an explicit plan to continually raise minimum efficiency standards and codes, and adopt producer responsibility regulations.

- A conversion to organic agricultural techniques and more sustainable forest practices that both minimize the use of fossil fuels and provide biofuels for transport, power, and heating in an environmentally and socially acceptable fashion.
- The implementation of an urban design and land-use strategy that minimizes sprawl and the use of fossil fuels.

Reducing our current reliance on the oil, coal and nuclear industries will be politically difficult and to satisfy regional community development interests, removal of subsidies will have to go hand-in-hand with transitional policies and new economic development based on alternative energy sources. Industry's argument is and will continue to be: "If we do not meet demand, someone else will, so there is nothing we can do about that." The counterargument and rationale for forgoing export opportunities has to be that it is hypocritical and counterproductive for Canada to support stabilization on the one hand while increasing the supply of fossil fuels on the other and that, in the long run, other economic opportunities are more stable and permanent.

The cornerstone of Canadian climate change policy over the next 20 years should be the implementation of a robust Larger Final Emitters (LFE) regime and national renewable energy and energy efficiency strategies. The new Canadian Renewable Energy Alliance (CanREA) has developed a framework for National Renewable Energy Strategy—one that builds on a base of high efficiency and comprehensively addresses all uses of energy and a major international role for Canada (see box). Components of a national strategy should be developed by entities that involve all governments and stakeholders such as the Council of Energy Ministers and Canadian members of the Renewable Energy and Energy Efficiency Partnership (REEEP).

Canada should also move quickly to adopt an ecological fiscal environment that encourages a transition to renewable energy and away from fossil fuels. Canada should move to adopt Genuine Progress Indicators as the key indicator of societal improvement.

**CanREA's Framework for a National Renewable Energy Strategy[vi]:**

The objectives of a national strategy should be to:

- Recognize the environmental, economic and social value of renewable energy in meeting Canadian and international goals of reducing environmental impacts (especially climate change), promoting economic development and improving world energy security

- Be a truly national strategy, coordinating federal and provincial targets and actions on renewable energy

- Include international commitments such as export development of Canadian RE technologies (through EDC) and official development assistance (through CIDA) to support the utilization of renewable energy to reduce poverty

- Be built on a strong foundation of energy efficiency

- Be comprehensive — including green power (both sides of the meter), green heat, and green transport in industry, businesses, homes, communities and First Nations.

The strategy should contain the following elements:

A National Energy Efficiency Plan

Any national energy strategy should support achievement of the maximum potential for energy efficiency. This should be the backbone of any renewable energy strategy and must have nationally coordinated policies and programs.

A National Green Power Plan

If Canada is to achieve its full potential for electrical generation through Green Power development, a coordinated approach to the development of strategies in each province, territory or region and the building of a national strategy on the basis of that foundation is required.

A National Green Heat Plan

Green heat is the use of renewable energies such as solar, biomass, and earth energy for space conditioning (heating & cooling) and water heating in any application. Effective quantification and support for green heat is needed in each province and territory.

A National Green Transport Plan

A sustainable transportation strategy would include changes in the design of communities and transportation services to make communities more livable and sustainable. It would also need infrastructure and policy changes to support improved fuel efficiency of the motor-vehicle fleet and promotion of the most effective biomass sources for fuels.

A Sustainable Energy Financing Plan

A coordinated national plan is needed to finance transition to a renewable-energy-based economy and support a renewable energy and energy efficiency infrastructure.

National Coordination and International Cooperation Functions

A federal/provincial/territorial/First Nations agency/secretariat is needed to coordinate national renewable energy and energy efficiency policy and the transition to a renewable-energy based economy. This agency would also lead Canada's participation in international cooperation on the renewable energy transition, working with CIDA, Foreign Affairs and the new Canadian Emission Reduction Incentives Agency.

[vi] For more information on the Canadian Renewable Energy Alliance visit www.canrea.ca

## 5.3 Recommendations

1. At the Conference of the Parties 11 to the UNFCCC (COP 11) and subsequent negotiations on global climate, Canada should show leadership and advocate that members of the UNFCCC countries put in place a post-2012 climate regime whose objective is to stabilize GHG concentrations at safe levels. This "Montreal Mandate" should:
   - Affirm—with a view of meeting the UNFCCC objective of avoiding dangerous climate change—the goal of keeping temperatures to within 2°C of pre-industrial levels.
   - Recognize that meeting this goal will require major cutbacks in the production and use of fossil fuels through a variety of means. Recognize that "just transition" policies will be needed to minimize the local impact of a fossil-fuel phase-out.
   - Recognize historic responsibility and capacity to act as key considerations when allocating responsibility for necessary emission reductions.
   - Be based on an equitable solution, with the aim of eventually distributing similar GHG per-capita allocations in the long term to all citizens.
   - Be based on a global transition to renewable energy—including serious action to improve energy efficiency, and mobilization of the capital investments needed.
   - Include significant assistance to developing regions to help them bypass fossil fuels in favour of an economy based on sustainable energy, while at the same time increasing the quality of life.
   - Include significant and appropriate assistance to help those most vulnerable to the effects of climate change in all parts of the world.
   - Recognize that the nuclear fuel cycle continues to have major safety, security, and waste-disposal problems, and that therefore nuclear power has no place in any future climate change strategy.
2. Canada should take on a national target for the reduction of GHG emissions consistent with the objectives of the stabilization of GHG at safe levels.
3. Outside of the UNFCCC mandate, Canada should take bilateral and multilateral action to supplement and support the Mandate:
   - Increase the level of support for community renewable energy in Canada's official development assistance.
   - Take a major role in international co-operation on a global renewable energy transition through international conferences, the Conference on Sustainable Development, the REEEP, the Global Village Energy Partnership (GVEP) and others. Participate in and support any new agency established to co-ordinate this transition.
   - Negotiate bilateral agreements with foreign buyers of Canadian oil and gas regarding their efficient use.
4. Canada should remove all subsidies for the fossil fuel industry (including carbon capture and storage, and $CO_2$ pipelines), allow only temporary and limited use of carbon capture and storage, and ultimately reduce the economic role of the oil and gas industry through a just transition policy.

5. Canada should strive to maximize energy efficiency and renewable energy by building an effective delivery infrastructure, setting targets, and mobilizing capital. The components of a national renewable energy strategy should be developed by entities that involve all governments and stakeholders, such as the Council of Energy Ministers and the REEEP.
6. Canada's energy policy should specifically address the energy efficiency and renewable energy needs of low-income and First Nations families, who are most vulnerable to both energy costs and the effects of climate change.
7. Canada needs a regime for Large Final Emitters that attaches a sufficiently large financial liability to GHG emissions, in order to drive major changes in energy production and consumption. Canada should also develop a national offset system that favours energy efficiency and renewable energy.
8. All energy decisions should be made on a full cost accounting basis, taking into account all environmental and social impacts. The wide range of benefits of renewable sources of energy—including reliability, fixed costs, security benefits and environmental attributes—should be explicitly included in the energy market through regulation, targets, tax measures, certificate programs, and other measures.
9. Nuclear power and the nuclear fuel cycle continue to have major safety, security, and waste disposal problems and have no place in any future Canadian energy or climate change strategy.
10. In summary, Canada's domestic energy strategy should include:
    - A regulatory regime for major energy producers and users (i.e., Large Final Emitters) incorporating progressively lower GHG emission targets, set in terms of absolute emissions, and an increasing degree of auctioning of emission permits.
    - Elimination of all subsidies and other support for the fossil fuel and nuclear fuel-cycle and power industries.
    - Implementation of a long-term transition strategy focusing on the development of new economic opportunities for the work force, communities and businesses in regions currently dependent on the fossil-fuel and nuclear industries.
    - Adoption of a national renewable energy strategy, including the mobilization of investment in renewable energy and energy efficiency, and the building of a comprehensive renewable energy industry.
    - Implementation of a national energy conservation and efficiency strategy that addresses the basic design of our urban infrastructure, manufacturing industries and services met by energy, as well as the equipment used to meet them. Support of this strategy with an explicit plan to continually raise minimum efficiency standards and codes.
    - Conversion to the use of organic agricultural techniques and more sustainable forest practices that both minimize the use of fossil fuels and provide biofuels for transport, power and heating in an environmentally and socially acceptable fashion.
    - Implementation of an urban design and land-use strategy that minimizes sprawl and the use of fossil fuels.

The Climate Action Network-Canada Declaration on Climate Justice and the Montreal Climate Summit, provided as Appendix 4, reflects many of above recommendations.

# Appendix 1: Climate Change Impacts

## Projected Environment Impacts of Increasing Global Temperatures[83]

| Temperature above pre-industrial levels | Current and Projected Earth, Ecosystem and Human Impacts at Increasing Temperatures |
|---|---|
| 0.6 °C (present) | • 27,000 additional deaths due to a heat wave in 2003 in Europe.[84]<br>• The Arctic has experienced a decrease in sea ice extent by 15 –20% and a decrease of snow cover by 10% over the last 30 years.[85] |
| 1.5 °C | • The loss of Africa's last tropical glacier Kilimanjaro.[86]<br>• 10% of the global ecosystems transformed; ecosystems will variously lose between 2–47% of their extent.[87]<br>• 20 million additional people at risk from hunger. [88]<br>• 150 million additional people at risk from malaria. [89]<br>• 500 million additional people at risk from water shortage. [90]<br>• 8 million additional people at risk due to coastal flooding.[91]<br>• 18% of species committed to extinction.[92] |
| 2.5 °C | • Some models show the near total loss of Arctic summer ice.[93]<br>• A high risk of extinction of polar bears, walrus, seals.[94]<br>• Destruction of Inuit hunting culture in the Arctic.[95]<br>• Loss of up to 10% of coastal wetlands.[96]<br>• 30-40% of nature reserves adversely affected.[97] |
| 3 °C | • 50-120 million more people at risk of hunger, [98]<br>• More than 3 billion more people at risk of water shortage. [99]<br>• 100 million more people at risk of coastal flooding.[100]<br>• It is likely that 300 million people would be at greater risk of malaria and much increased exposure to dengue fever. [101]<br>• Increasing risk of instability or decay of the West Antarctic Ice Sheet.[102]<br>• Meltdown of the Greenland ice sheet is likely and would lead to several meters sea level rise over several centuries with disastrous consequences for millions. [103]<br>• Perhaps at this increase, but inevitably at some point *the terrestrial carbon sink will convert to a carbon source*, due to temperature-enhanced soil and plant respiration overcoming $CO_2$-enhanced photosynthesis resulting in desertification of many world regions.[104] |
| 4-5 °C | • Expert opinion says that *the probability of thermohaline shutdown is up to or above 50%.*[105] Such a shutdown is likely to have global implications with precipitation declines in the northern hemisphere and particularly large and rapid changes in South America and Africa, according to one model assessment.[106] |

# Appendix 2: Carbon Capture and Storage

This appendix outlines a possible ENGO position on carbon capture and storage (CCS), which is now being promoted worldwide as a universal method of allowing continued use of fossil fuels with zero GHG emissions for all energy needs from oil production and power generation to transport and industrial heat.

The following risks are associated with the potential large-scale use of CCS to reduce $CO_2$ emissions:

- Leakage of $CO_2$ into the atmosphere from underground storage and/or pipelines (with impacts on both the environment and, potentially, public safety).
- Diversion of political leadership and financial resources away from the large-scale deployment of the more sustainable and inherently safer approaches of energy conservation, energy efficiency and renewable energy.
- Economic inefficiency if CCS is used in preference to less expensive alternatives.
- Perpetuation of the use of fossil fuels and their associated environmental impacts other than GHG emissions.

These risks raise the following question: To what extent should CCS be used as part of a portfolio of approaches to reduce $CO_2$ emissions and what policies and measures should governments implement in consequence?

- Given the uncertainty regarding future technology developments and economic factors, the optimal combination of approaches for long-term reduction of $CO_2$ emissions cannot be determined in advance.
- What is most important is for governments to implement mandatory, long-term restrictions on GHG emissions, particularly from industrial sources, commensurate with the national and global emission reduction targets needed to prevent dangerous climate change. When implemented in combination with emissions trading, or via a tax, such restrictions will translate into a "price of carbon," allowing the market to determine the development and deployment of the most economically efficient GHG emission reduction technologies. In keeping with the polluter-pays principle, the objective should be for new industrial facilities to be required to take full responsibility for their GHG emissions by paying the price of carbon for the full extent of their emissions (e.g., by purchasing credits to offset 100% of their emissions). Implementation of such restrictions will ensure a departure from "business-as-usual" production and consumption of fossil fuels.
- It is also appropriate for governments to spend public money on the development and deployment of particular GHG reduction approaches, in part because the market price of carbon will not reflect non-GHG risks and benefits of different technologies, and will not overcome non-price barriers (e.g., lack of awareness). The public funds available for this purpose are quite limited, especially when compared to the private funds that can be mobilized by mandatory restrictions on emissions and the creation of a market price of carbon. Public funds should therefore be allocated only to those approaches that meet the highest standards of sustainability and inherent safety while also making sense from both a short and long-term economic perspective. The highest priorities should be energy conservation, energy efficiency and low-impact renewable energy.
- Notwithstanding the previous point, if governments do spend public money on the development and deployment of CCS, they should do so only as part of an overall strategy to reduce GHG emissions that reflects a reasoned balance between the various GHG reduction approaches, with justification provided for the resources devoted to each approach.

- If CCS projects are implemented as a result of private investment driven by the market price of carbon, or, notwithstanding the previous two points, with government support, they must be subject to a strong regulatory framework that is properly enforced and strictly ensure the following:
    - The storage of $CO_2$ only in geological formations where the risk of leaks is at a minimum and the carbon will be eventually be sequestered in solution or the solid state (primarily deep saline aquifers.) [vii]
    - Appropriate specifications for pipelines to take account of the corrosive effects of $CO_2$
    - Comprehensive monitoring for leaks before storage starts (to provide a baseline), during the injection period and in perpetuity after closure[viii]
    - Independent verification of monitoring results
    - A clear determination of who will be liable if there are leaks
    - The responsibility for full payment for baseline studies, measurement, monitoring and remediation if there are leaks, by the entity emitting the $CO_2$ if it were not stored, unless that responsibility is contractually transferred to another entity, in keeping with the polluter-pays principle.
- It is desirable to develop at the international level a regulatory framework to ensure that CCS operations are conducted in a safe and environmentally responsible manner, [ix] although this should not be used in Canada as an excuse to deviate from the requirements of the previous point.
- Accounting for emissions avoided as a result of CCS, for purposes of emissions reporting, emission credit creation and compliance with mandatory emissions restrictions, must be done on a net life-cycle basis that fully accounts for emissions associated with the capture, transport and storage of the $CO_2$, includes discounting to allow for uncertainties in measurement and monitoring systems, and provides for adjustments when leaks are detected.
- Further research must be conducted, and supported financially by private entities wishing to implement CCS projects, to
    - Learn more about the way $CO_2$ moves underground
    - Improve monitoring techniques
    - Estimate the risk of leaks to the surface and the potential impact of such leaks.
- Governments and private entities wishing to implement CCS projects must take steps to provide full, objective public information about CCS and give citizens a meaningful opportunity to determine whether they consider the benefits of CCS outweigh the risks for each proposed CCS project.

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[vii] Deep saline aquifers (more than 1 km deep) probably provide the best storage location. Over a period of 100 to 1000 years, the $CO_2$ will dissolve in the water, so that it will not be free to migrate back to the surface. While $CO_2$ can be stored in depleted oil and gas reservoirs, the many wells drilled into those formations make them less secure for long-term storage. $CO_2$ can also be stored in salt caverns and in coal seams. In coal seams, the $CO_2$ will replace the methane gas (which will be pumped to the surface for use) and bond tightly to the coal. This process, referred to as enhanced coalbed methane recovery, is currently being evaluated by scientists, but since the process will also produce methane, the net reduction in GHG emissions will be less than that achieved through storage of $CO_2$ in deep saline aquifers.

[viii] Recognizing that such monitoring will need to continue for centuries, this means establishing an industry fund to cover the long-term costs of monitoring after the closing of individual storage projects.

[ix] The Carbon Sequestration Leadership Forum might be a suitable forum for establishing such standards, although it would be necessary to work in conjunction with the Intergovernmental Panel on Climate Change.

# Appendix 3: Nuclear Power is Not a Solution to Climate Change

**Produced by the Campaign for Nuclear Phase-out /**
**Campagne contre l'expansion du nucléaire**
**Ottawa, Ontario, Canada**
**e-mail: cnp@web.ca**
**web: www.cnp.ca**

Globally, the nuclear industry is in decline. Countries like Sweden, Germany and Switzerland are committed to phasing out nuclear power. In North America, there have been no new nuclear reactor sales since 1978. A 1999 poll taken in Ontario, Canada's largest province and where the majority of nuclear power reactors are located, showed that only nineteen percent of respondents ranked nuclear power as their preferred electricity option (Angus Reid poll, February 1999). As part of its survival strategy, the nuclear power industry is exploiting global concern over climate change and is attempting to promote nuclear power as a solution.
Over the years, several studies have shown that investment in nuclear power does not adequately address the problem of climate change. For example, the Royal Society of Canada's Canadian Options for Greenhouse Gas Emissions Reduction panel found that "improved energy efficiency is the key to stabilizing energy-related $CO_2$ emissions over the next two decades." Nuclear power is not once mentioned as a viable energy alternative to fossil fuels. Moreover, a U.S. study found that every dollar invested in energy efficiency displaces seven times as much $CO_2$ emissions as the same dollar invested in nuclear power.[3]
In spite of this, the Government of Canada has been aggressively pushing for the inclusion of nuclear energy as part of a $CO_2$ reduction strategy in various climate change forums — a strategy which deliberately ignores radioactive waste and other nuclear pollution issues.

Proponents of nuclear energy were pushing for its inclusion as part of the Clean Development Mechanism (CDM) at the 6th Conference Of the Parties (COP6) which took place in November 2000. However, a decision on what to include in the CDM was deferred when the conference ended without an agreement. The Clean Development Mechanism will allow Canada and other signatories to the 1997 Kyoto Protocol on greenhouse gas reductions to receive 'emissions credits' for projects undertaken in developing countries. While the mechanics of the Clean Development Mechanism are still being defined, the CDM would allow the Canadian government to undertake or participate in projects abroad that reduce $CO_2$ and other greenhouse emissions. Even though emissions would be reduced in a foreign country, Canada as a project participant would be entitled to a share of the total emission reduction 'credit' and could use this credit when accounting for its overall emissions reduction compliance with the Kyoto protocol.

The Clean Development Mechanism has been described as a market-based concept—essentially a variation on the idea of 'tradeable emissions'. The tradeable emissions concept has been criticized for its potential to allow states and large transnational corporations to continue undertaking highly polluting activities by moving emissions credits from one place to another. In Canada, the CDM has been used by the federal government to market Canadian nuclear reactors in developing countries as part of a $CO_2$ 'emissions reduction credit' program. There are clear alternatives to the tradeable emissions shell game that do not rely on either coal or nuclear power generation. In April 2000, the David Suzuki Foundation published a ground-

breaking study entitled "Power Shift: Cool Solutions to Global Warming". "Power Shift" describes how it is possible to reduce greenhouse gas emissions in Canada by 50% (at 1995 levels) by 2030. Solutions include commercial and residential retrofits and innovations in the transportation sector. The study authored by energy expert Ralph Torrie shows that it is possible using available technologies to shut down large-scale coal, oil and nuclear plants by 2030.

# Appendix 4: The Climate Action Network-Canada Declaration on Climate Justice and the Montreal Climate Summit

All around the world, human communities and ecosystems are already suffering from the impacts of climate change caused by greenhouse gases (GHGs) from human activities. The scientific consensus indicates that these impacts will become catastrophic in the absence of deep GHG cuts. The threat of dangerous climate change therefore demands urgent action by Canadians and the international community.

Over the next year, Canada will play a pivotal role in determining the future direction of global action to prevent dangerous climate change, as we play host to the nations of the world meeting in Montreal this December to discuss–for the first time–what happens after the first GHG reduction commitments under the Kyoto Protocol end in 2012. Canada will continue to serve as President of the UN climate change negotiations for the following twelve months, which will give us unprecedented influence over developments internationally.

The decisions to be made in Montreal are too important to leave to politicians and bureaucrats alone. Canadians must get directly involved, as they did so successfully during the struggle to ratify the Kyoto Protocol.

With the entry into force of the Kyoto Protocol in February 2005, a milestone in international cooperation to curb climate change has been reached. Canadians should take great pride in their role in achieving this victory, which was won in spite of formidable opposition from those who benefit from the status quo.

Yet the Kyoto Protocol was only a small, first step towards a just and sustainable global regime to fight climate change. Urgent and dramatic action is needed in light of the impacts of climate change that are already being felt by many vulnerable peoples and in view of the long time lags in the planet's climate system.

If the Kyoto Protocol is not soon followed by other, much more significant steps to reduce GHG emissions, we will not be able to avoid the probable–and terrible–impacts of continued warming, such as threats to water supplies and food production, increases in droughts and floods, the massive loss of species and vulnerable ecosystems, and rises in sea levels. These will put tens of millions of additional people at risk from coastal flooding and hunger, hundreds of millions from malaria, and billions from water shortage by the 2080s if the global average temperature approaches 2°C above the pre-industrial level. The current average temperature is already 0.6°C above pre-industrial levels.

To prevent dangerous climate change, the increase in warming needs to be limited to as far below 2°C as possible over pre-industrial levels. This long-term objective will require that global GHG emissions peak with the next 10-15 years and drop quickly from there.

Such a future is not only necessary, but can provide a compelling alternative vision if it is based on the principles of equity and solidarity, wherein we meet the basic needs of all without destroying the ecological and cultural systems that sustain current and future generations.

To this end, the Canadian Climate Action Network calls on Canadians to challenge their elected representatives to achieve the following:

**Canada must transform itself into a leader in implementing our Kyoto commitments.**

For too long, Canada has relied on voluntary measures to deal with climate change with the result that our GHG emissions rose by 24 % between 1990 and 2003, whereas our Kyoto Protocol commitments require us to reduce emissions to 6% below the 1990 level in the 2008-2012 period. Canada must now seek to lead the way in greening our economy and society, lest our commitment to the Kyoto Protocol and the necessary longer-term action on climate change be jeopardized.

This will require making better use of regulations such as vehicle fuel-efficiency rules and enhanced building codes, eliminating billions of dollars in annual subsidies to the fossil-fuel industry and investing these funds in energy efficiency, energy conservation and renewable sources of energy, and ensuring that large industrial polluters do their fair share. We must also implement all the elements of the federal government's April 2005 Climate Change Plan in a timely manner. For example, prior to the Montreal meeting, the federal government should announce final agreements with the provinces resulting in at least the first half of the 55-85 megatonnes of reductions called for in the Plan through the Partnership Fund. These agreements should focus on technologies such as energy efficiency and renewable energy that can deliver emissions reductions before 2012. The federal government should also accelerate the implementation of the Climate Fund and increase the funds available through it from $1 billion to at least $5 billion if it is to achieve the anticipated reductions of 75-115 megatonnes.

**Canada must also strive at the Montreal meeting to ensure that the tidying up of the details** of implementing Kyoto internationally respects the spirit of the accord and does not create new loopholes. For example, the refinement of the Clean Development Mechanism must not result in the weakening of 'additionality' requirements.

**Canada must act to protect the most vulnerable.**

Climate change exposes and aggravates unjust relationships. The 20% of the world's population that consumes 80% of the world's resources and contributed 80% to historic GHG emissions also owns 80% of the wealth. But the poor and the marginalized–who contribute the least to emissions–are the most likely to suffer the severest consequences of disasters related to climate change.

Canada must act in solidarity with those who will be hardest hit by the impacts of climate change. Internationally, this will mean ensuring that the developed countries commit in Montreal to providing adequate resources to Adaptation Funds to help developing countries deal with climate change impacts. It will also mean providing the assistance necessary for developing nations to meet their expanding social needs with maximum efficiency and renewable sources of energy.

At home, this will mean providing assistance to arctic communities that are already being hard hit by climate change. It will mean the development of comprehensive energy conservation programs for low-income and First Nations households to permanently reduce pollution and bills, dramatically increased support for public transit, and the provision of targeted energy assistance for low-income households that might otherwise have to choose between eating and heating or paying the rent.

**Canada must ensure that the Montreal meeting launches the negotiation, to be finalized by 2008, of an effective and equitable global climate policy regime that will limit warming to as far below 2°C as possible.**

The Montreal meeting must initiate a process for negotiating a post-2012 agreement, and commit to completing these negotiations by 2008 in order to allow for timely ratification and provide the certainty needed to ensure continued investments in emission reductions.

Canada must ensure that this future climate regime includes deeper mandatory absolute GHG reductions for industrialized countries; new kinds of commitments from some larger developing countries that ensure they can meet development goals while limiting the growth of GHG emissions; support for necessary adaptation measures for the least developed countries in particular; and protections for tropical forests, as proposed in the international Climate Action Network's multi-stage approach.

Such a regime should be primarily based on the Kyoto Protocol, to be amended to fit the needs of the next set of commitments. Discussions of specific provisions under the United Nations Framework Convention on Climate Change, such as those on adaptation, can contribute to the regime negotiation process.

The international community must build on the commitment that Kyoto-signatory countries have demonstrated toward tackling global warming. These countries, including at that time the United States, decided together 10 years ago that voluntary measures were not adequate and that absolute mandatory caps on emissions were needed.

In order to support future reduction commitments that are consistent with the goal of preventing dangerous interference with the climate system, Canada should commit itself to, and advocate for all industrialized countries, targets of a 25-30% reduction in GHG emissions relative to 1990 levels by 2020, and an 80% reduction by 2050, in line with what scientists, governments and civil society have agreed is necessary to prevent dangerous levels of climate change.

Building international support for an effective, equitable and justifiable global climate policy regime will require a principle-based approach to allocating global GHG emission reductions amongst nations. These basic principles include:

- The *Precautionary Principle* -- measures should be taken to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures.
- *Equity*
    - All have equal access to the atmospheric commons, so we must give increasing weight to the aim of allocating emissions rights on a per capita basis over the course of the 21st century.
    - Intergenerational equity – delaying action on climate change now would transfer large costs to future generations.

- *Common but differentiated responsibilities*
    - Historical responsibility and polluter pays: those who have already contributed most to causing the climate change problem need to act first.
    - The ability to pay and the capacity to act should be taken into consideration when deciding who should act, when and in what way.
- The *right to sustainable development*, in particular equitable access to affordable energy services, livelihoods, food security, health, water and other basic human needs.

**Canada must engage progressive U.S. states and firms in action on climate change.**

While it is clear that the United States must begin taking substantial action to reduce its emissions, it is equally clear that the best strategy to achieve this goal is not by watering down any future climate regime with the hope that the Bush Administration—which is out of step with most political and business leaders—will sign on right away.

The door should be left open, however, for the next U.S. administration to engage. Canada, and others, should undertake serious efforts to engage the progressive actors in the U.S., and explore what types of common policies and measures could occur between nations taking action under Kyoto, and forward-thinking U.S. states and companies.

While the Bush Administration continues to sit at the negotiating table, it must be engaged with in a way that does not stall the international negotiations on the post-2012 regime or erode principle in order to accommodate the current Administration. This would be devastating for the planet.

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