

Executive Summary

Global climate change has emerged as an environmental issue with potentially enormous environmental consequences. International recognition of the severity of the problem led to the emergence of an international response. The United Nations Framework Convention on Climate Change (UNFCCC) was agreed to at the Earth Summit in Rio in 1992. The Kyoto Protocol to the UNFCCC, an agreement requiring specified emission reductions from every industrialized country was negotiated in 1997. While scientific consensus on the issue has continued to grow, so to have Canada's greenhouse gas emissions.

Global climate change represents perhaps the most significant cross-cutting environmental issue that Canada has ever faced. Scientists, economists, civil society leaders and the business community have all participated in the policy process. This chapter explores four, very different, future scenarios, each of which has potentially significant implications for Canadian governance.

In a world that has become more and more globalized, Canada has increasingly become a policy taker. The climate change issue a case in point. The influence of major geo-political powers and multinational corporations over the policy agenda poses special challenges for a federal state. The provinces' desires for power may be more than is possible within a federalist state that is under such external pressures.

In a world that cares about climate change and in a world in which there is a high degree of governance, the issue of determining overall accountability for environmental performance will be critical. When the international community calls upon Canada to account for its emissions reduction performance, will the federal government be left holding the bag? Or will there be a clearly defined structure of provincial and corporate accountabilities in place? As Canada continues to develop its overall strategy for dealing with climate change, the degree to which there can be buy in from all levels of government

will determine the degree of success Canada will have in reducing its contribution to the problem.

Foreword

This Working Paper is one of six case studies on the scenarios for global and regional integration now being released by the Institute of Intergovernmental Relations. The Institute embarked in 1999 on a multi-year research program on the effects of and challenges for Canadian federalism of global and regional integration. This project proceeded from an assumption of continuing and possibly accelerating international integration and governance, and that policy matters within provincial government jurisdiction will increasingly be the subject of international negotiation. The broader objective of the project has been to examine whether the institutions and dynamics of the Canadian federal system can continue to effectively manage this change. The central issue we have been investigating is under what circumstances continued *ad hoc* adjustment to the processes and institutions of the federation would remain the appropriate course of action; and under what conditions more systemic reform would be the preferred or even the essential course to take. For more information of the research output and findings of the project overall, please consult the Institute's website at www.iiigr.ca.

Our research program has consisted of several components: the development of a set of scenarios for the world in 2015; a baseline study of Canadian federalism and international relations; a set of papers applying the scenarios and comparing integration challenges in other federal systems; and these six case studies. The case studies cover the following policy sectors: Biodiversity, Climate Change, Health and Health Care, Agriculture and Agri-foods, Aboriginal Governance, and Financial Services. They were initially prepared for discussion with the policy sector communities. Most of these discussions were sponsored by the Government of Canada through the relevant departments.

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Finally, as Director I wish to acknowledge the role that Douglas Brown, Institute fellow, has played in the overall coordination of these case study papers and in our Global and Regional Integration project as a whole.

Harvey Lazar
Director
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Climate change is not just an environmental issue. It also has aspects related to the economy, including trade and competitiveness considerations, as well as social aspects. In addition, it raises concerns about equity between generations, and among Canadian jurisdictions and sectors as well as nations and regions of the world. These considerations and competing interests have to be taken into account in deciding how to respond.

(Commissioner of Environment and Sustainable Development, 1998: 3-15)

1.0 Introduction

Through the burning of fossil fuels, and the clearing of carbon-absorbing vegetation from the land, the concentration of greenhouse gases in the atmosphere has been rising at an unprecedented rate since the start of the industrial revolution, reaching levels higher than detected for the past 200,000 years. (Environment Canada, 1997: 4) Through such activities, humanity is considered to be having a "discernible human influence on global climate," (IPCC Working Group I, 1996: 4) and more seriously, stands charged with "...conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a global nuclear war." (Toronto Conference on the

Changing Atmosphere, 1988: 1) In the past decade, national governments have accepted such concerns and have installed, by way of the United Nations Framework Convention on Climate Change (UNFCCC), an international regime with the objective of "...stabilization of atmospheric concentrations of greenhouse gases at a level that prevents dangerous anthropogenic interference with the climate system." (UNFCCC, 1992)

Climate change is an appropriate issue for consideration in a study on the future of global and regional integration. The activities that contribute to the climate change issue, and the expected impacts resulting from it, are complex and multidimensional in nature. Effective progress will therefore require coordinated efforts between national and sub-national governments. The success of the UNFCCC is entirely dependent on the strength and nature of international relationships in the coming decades. At the same time though, the climate change issue, along with other issues of global concern such as ozone depletion, biodiversity and persistent organic pollutants have themselves begun to reshape the nature of those same relationships. Further, as federal governments are tasked with action on such issues they face the realization that effective measures require committed cooperation from other domestic institutions, public and private, with or without constitutional responsibility over the factors that contribute to climate change and its abatement. Thus, the climate change issue is also highly dependent on, and can in turn act to modify, the nature of domestic governance relationships.

To develop a more complete understanding of how governments, at all levels, can act to address the important, but complex, issue of climate change a case study will be presented, whereby potential governance structures and policy responses will be analyzed, in the context of four different future scenarios; each depicting, widely divergent international regimes.

The case study will begin with a summary of the status the climate change issue under contemporary international, national and sub-national structures, focusing on Canada's engagement. The case study will then turn to an

examination of the implications of the various scenarios provided. Under each of the scenarios, the case study will identify the key driving forces that will determine the extent to which climate change would be addressed, and identify the nature of international, national, and sub-national institutions that might be established to facilitate that response. Discussion of the key features under each scenario will focus on mitigation and adaptation activities, as well as science-based activities intended to reduce remaining uncertainties.

Effective and coordinated actions to mitigate against, and adapt to, future climate change impacts are a function of the strength of international regimes and the degree of control, and number of rules, exercised by the regimes of the day. Such regimes and rules involve not only international and national governments, but also private sector entities, community organizations and other elements of the larger civil society.

Regardless of the priority assigned to the issue under any scenario, past and on-going emissions act to commit any future regimes to some degree of climate change. Even immediate and dramatic cuts in global greenhouse gas emissions are not likely to prevent significant climate change impacts on the global environment in the 21st century. Climate change may thus act to initiate exogenous shocks to the dominant institutions of power under any scenario. In some instances, these climate change-related shocks could be projected to undermine the foundations of the dominant regimes, and act as major forces leading to the rise of new world-views and institutions. Under all scenarios then there will be advantages, if not direct imperatives, for coordinated action on climate change among the various players. The immediacy for, and the nature of, such coordinated actions will be determined by the characteristics of the individual scenarios. This case study will suggest scenario specific possibilities for how such actions could be best coordinated between domestic (Canadian) social and governance institutions.

Distinct pressures are applied to Canada under each of the scenarios. The interests of

powerful foreign governments and multinational corporations, coupled with external shocks, changing public attitudes and conflicting regional interests within Canada all serve to create obstacles for the Canadian government, in its pursuit of climate change policy. In each of the scenarios detailed in this paper Canada has, to varying degrees, a reduced ability to unilaterally set its policy agenda.

While the scenarios are quite different, each presents benefits from, and imperatives for, Canada to improve its intergovernmental relations. As the level of governance required increases so too does the need for federal/provincial co-operation.

2.0 Setting the Scene in 2000

The concentration of greenhouse gases in the atmosphere has been rising at an unprecedented rate since the start of the industrial revolution. Currently, carbon dioxide levels are 30 % higher than was the case only a few hundred years ago. This increase is primarily the result of human activities, more specifically, the burning of fossil fuels and the clearing of carbon-absorbing vegetation from the land. (Canada, 1997: 4) While the theoretical possibility of an enhanced greenhouse effect from increased concentrations of carbon dioxide in the atmosphere from human activities has been known to science for well over one hundred years, advanced scientific exploration of the issue, and the accompanying policy response has been a relatively recent occurrence.

The work that has been done with respect to climate change, in recent years has focused on three key areas: increasing understanding and determining impacts; developing adaptation strategies; and emission reduction measures. Understanding of the global climate has improved at a dramatic rate over the last thirty years. Driven by both increased interest in the climate change issue and technological advancements computerized climate models have become much more accurate and reliable. Despite the complexity of the climate system a much clearer understanding of what the effects of global

warming will be needed for different countries and regions. Scientific research has been the foundation on which the policy response has been based to date. In addition to scientific research, a great deal of policy research has been focused on two main areas, mitigation which has been defined as "actions that prevent or retard the increase in atmospheric greenhouse gas concentrations by limiting current and future sources of greenhouse gases and enhancing potential sinks." (The Climate Change Secretariat, 1997) and adaptation which simply refers to policies which will improve humanity's ability to cope with the effects of rapid climate change. It is anticipated that scientific research, mitigation and adaptation policies will continue to be the three areas of interest in 2015.

2.1 The International Setting: The Scientific Basis for Action

In response to concerns linking human activities with the risk of global climate change, the United Nations established the Intergovernmental Panel on Climate Change (IPCC). Comprising 2,500 leading scientists from all parts of the globe, the IPCC has issued a series of assessments, focusing on the state of the science, and on the impacts of climate change. Through its investigation the IPCC has concluded that "... the balance of evidence suggests there is a discernible human influence on global climate." (IPCC Working Group I, 1996: 4)

While uncertainties remain with respect to the timing and rate of climate changes, modeling suggests that on average, global surface temperatures are likely to increase by between 1° and 3.5° C by the year 2100. The impacts of such change could be significant and might include: a sea level rise of half a meter, or more, which would threaten coastal areas and small island nations; significant changes to existing forests, and profound changes to the hydrological cycle could lead to increases in extreme weather events; and, adverse affects on human health and agricultural production, in addition to potentially disastrous disruptions to natural ecosystems. (IPCC Working Group I, 1996: 6) These impacts could also have substantial economic ramifications, especially as climatic variability is

the principle source of fluctuations in the production and price of agricultural commodities. (International Rice Research Institute, 1989:1)

According to the IPCC, the impacts of increased atmospheric greenhouse gas concentrations are already being felt. Observations show that 1999 represented the 21st consecutive year in which the global surface temperature was above normal. As well, seven of the 10 warmest years on record have occurred in the 1990s. The economic impacts of a changing climate are also being noted. For example, from the mid-1960s to the mid-1990s, climate-related disaster losses increased from approximately \$5 billion to \$50 billion per year worldwide (expressed in constant dollars). Within Canada alone, financial losses from severe weather events have increased at ten times the nation's rate of economic growth since the mid-1980s. (Dotto, 1999: 60) Improved scientific understanding of global warming and the extent of climate change that can be expected has been the driving force behind the public policy response.

2.2 The United Nations Framework Convention on Climate Change

The work of the IPCC led governments to issue urgent calls for a global treaty to address the problem. In 1992, the United Nations General Assembly responded by adopting the United Nations Framework Convention on Climate Change (UNFCCC). The central objective of the UNFCCC is to stabilize atmospheric concentrations of greenhouse gases at a level that prevents dangerous anthropogenic interference with the climate system. Since 1992, 180 States, including Canada, have ratified or acceded to the Convention's terms. (UNFCCC, September 29, 1999)

With the IPCC work acting to increase concern about global climate change, the Conference of the Parties (CoP) to the UNFCCC held its first session in 1995 in Berlin. There the Parties concluded that existing commitments to stabilize greenhouse gas emissions were inadequate and agreed to begin a process to negotiate new commitments for industrialized countries. The Berlin Mandate, which set the

ground rules for what emerged as the Kyoto Protocol, explicitly excluded new commitments for developing countries.

2.3 The Kyoto Protocol

At its third session, in December 1997, the Conference of Parties adopted the Kyoto Protocol, which commits developed countries to reduce their collective emissions of greenhouse gases by at least 5.2%, from 1990 levels, by the period 2008-2012. At Kyoto, Canada pledged to reduce national greenhouse gas emissions by 6% within the commitment period. Despite lacking the number of ratifications required for entry into force, the Kyoto Protocol remains the driving force behind contemporary international and domestic policies concerning global climate change.

As well as assigning responsibilities for greenhouse gas reductions, the Kyoto Protocol provides three market-based mechanisms intended to allow Annex I nations, those taking on commitments, to achieve their required reductions in a least-cost manner. The Joint Implementation mechanism allows Annex I parties to meet part of their commitments through the funding of emission reduction projects in other Annex I countries. The Clean Development Mechanism allows Annex I Parties to meet part of their commitments by funding emission reductions projects in developing countries. Finally, the Emissions Trading mechanism allows Annex I Parties to buy and sell allowances from one another in order to fulfill their obligations. Rules for all the mechanisms were debated in November 2000 and will likely be resolved in 2001.

2.4 International Alignments

Although a global problem, the responsibilities for, and impacts of, climate change will not be shared evenly throughout the nations of the world. Understandably, the most vulnerable ecological and socio-economic systems are those with the greatest sensitivity to climate change and the least ability to adapt. To formally reflect this consideration the UNFCCC and the Kyoto Protocol are based on the principle

of "common but differentiated commitments" between developed and developing countries. Resulting partly from this differentiation and partly from their own distinct national interest, a number of negotiating blocs have emerged within the international climate change negotiations. These blocs include: Alliance of Small Island States (AOSIS), Organization of Petroleum Exporting Countries (OPEC), Group of 77 (G-77) and China including most developing countries, the European Union (EU), and the Umbrella Group, which includes most of the Annex I countries who are not EU members, including Canada. This group has expanded to include the "Environmental Integrity" group including Switzerland, S. Korea and Mexico and a bloc representing the world's least developed countries.

Even within these blocs, significant differences exist with respect to national circumstances, including basic geography and climate, as well as their political and economic structures. Chief among these with respect to climate change is the extent to which a nation's economy is dependent on the extraction, production, or intensive use of fossil fuels. In addition, some regions and countries, especially northern and coastal nations, are particularly vulnerable to the effects of climate change.

Countries in the developed world have contributed a significantly higher proportion of historic GHG emissions during the past century than developing countries. For example, the United States alone contributed more than 30% of global emissions in 1995. (UNFCCC, June 20, 1999) This historical imbalance lies at the root of the debate between blocs. At the same time, developing country emissions are projected to rise exponentially in the next twenty to thirty years, and account for nearly 50% of global industrial CO₂ emissions by 2010. (UNFCCC, June 20, 1999) Such projections underline one of the recurring areas of concern within the climate change debate: the impact of climate change abatement activities on the international trade and competitiveness of individual countries or regions. Another element of intense debate, and one that is of particular importance to Canada, has been demand for the inclusion of carbon

sinks, especially the use of agricultural soils, as abatement activities through which commitments can be met. Despite significant opposition, at the November 1999 Fifth Conference of the Parties (COP-5), in Bonn, Canada also formally initiated dialogue on the potential role of nuclear energy in mitigating greenhouse gases.

2.5 Private Sector Involvement

The inclusion of market based mechanisms in the Protocol has led to a number of large multinationals taking action to limit greenhouse gas emissions from their operations. Large firms often represent considerable greenhouse gas emissions. In some cases the emissions from a single firm can exceed those of entire countries. Many large firms have taken the opportunity to reduce emissions within their own operation through a number of means. BP Amoco and the Royal Dutch Shell Group have both instituted environmental management systems, set firm emission reduction targets, established internal emissions trading systems and pursued the development of emission reduction opportunities outside of their own operations.

By acting before regulations are passed, firms are able to utilize, design and promote the use of the most flexible and cost effective means of reducing greenhouse gas emissions. In addition to contributing to the rules-setting process, such actions signal a trend within the private sector to, in essence, 'commoditize' carbon in preparation for the carbon constrained world of the future. One of the most significant motivators for unilateral, voluntary measures is the desire to manage the risks associated with the implementation of a potentially rigorous regulatory regime.

Market based approaches to pollution control did not originate with the Kyoto Protocol. Emission trading has been common in the electricity markets of a number of countries and a well-developed sulfur dioxide trading market exists in the United States. Of importance to this study however, these emissions trading systems have all developed where electricity production capital is either privately or nationally owned. In more federated states, such as Canada, where

electricity generating systems are the responsibility of sub-national governments, there has been much slower progress on the development of emission trading systems. Because a significant portion of Canada's total emissions are produced by the electricity sector, the development of an emissions trading program that targets electricity production will necessarily be an important component of the nation's greenhouse gas reduction strategy. Economic analyses project that if compliance with the Kyoto target is to be achieved at minimum costs nearly half of the total reductions would come through the use of a cap and trade system within the electricity sector. (Analysis and Modeling Group)

Several nations, including Norway, Australia, New Zealand, Denmark and the UK are actively pursuing the establishment of domestic emissions trading systems that aim to engage the private sector in least-cost mitigation activities. An emissions trading system, that was designed by a collection of private sector firms, is scheduled to begin operation in April 2001 in the U.K. While the opportunity for firms to achieve greenhouse gas reductions is substantial, and the desire to achieve emission reductions in the most flexible and cost effective manner is clear, the incentive to undertake emission reduction initiatives are limited in the absence of an international legal framework.

2.6 International Constraints

Perhaps most importantly, as the number one global emitter of greenhouse gases, the extent to which the United States implements elements of the Kyoto Protocol will impact other nations' positions and the overall success of the Protocol. At present, the United States has conditioned future ratification on the "meaningful participation" of key developing nations such as India and China. Such conditions act to create a certain crisis of logic within the UNFCCC negotiations as developing nations, in turn, have conditioned any eventual commitments on their own part to initial, and significant, emission reductions by developed nations.

The ratification of the Kyoto Protocol is only one step towards the achievement of the ultimate

objective of the UNFCCC. Achieving greenhouse gas concentrations that are double pre-industrial levels would require global emissions to fall to about 30% of their current levels. (UNFCCC, 1999) Given the expected growth in greenhouse gas emissions in developing nations, the enormity of this challenge cannot be underestimated. Emissions patterns related to ongoing and future development will be largely determined by the global population, economic, technological and social trends of the early 21st century. The range of such trends is adequately scoped in the project scenarios. The projected outlook for the climate change issue developed in this case study illustrates how much successful progress on the issue is dependent on these factors.

2.7 The Canadian Setting

2.7.1 Emissions and projections

Canada's greenhouse gas emissions in 1990 were estimated to have been 612 million tons (approximately 2% of total global emissions). (UNFCCC, 1999) By 1998, they had increased by 13% to 692 MT, or 1.8% compounded annually (EC, 2000). The greenhouse gas emission levels projected for 2010 are 764 MT (Energy Research Group, 2000). Emissions levels must therefore be reduced by more than 25% if Canada is to meet its Kyoto target of 575 MT. Canada's limited success in reducing greenhouse gas emissions to date is a product of many factors. While Canada is particularly vulnerable to climate change, particularly the Arctic and sub-Arctic regions, Canada's economy is also dependent on fossil fuels. This dependence has made Canada one of the world's highest per capita emitters of greenhouse gasses. Canada's heavy reliance on international trade makes competitiveness considerations paramount on many issues. The uneven distribution of both the emission sources and highly vulnerable areas intensifies the internal conflict between competing interests.

2.7.2 Trade Considerations

Given that the Canadian economy is reliant on import and export activity for a 75% share of GDP, there has been a reluctance to fundamentally address the trend towards ever

increasing emissions levels unilaterally. Specifically, Canada is reluctant to take action on climate change when 78% of its exports are destined for the US, which has repeatedly stated its own wariness regarding the ratification of the Kyoto Protocol.

2.7.3 Regional and Sectoral Contributions and Impacts

Within Canada, the climate change debate mimics many of the issues surrounding the international debate. As a northern nation, Canada is expected to be impacted more severely by climate change than other more-mid-latitude nations, with mean temperatures increasing by three times the global average. (Environment Canada, 1997: 5) However, as a vast and geographically diverse nation a range of impacts is expected within the country itself. Temperature increases are expected to be most significant in the western half of the country's northern regions. By contrast, temperature change is expected to be minimal, with slightly cooler temperatures in the Atlantic provinces. Crops in the Prairies are expected to benefit from longer growing seasons. Changes in available moisture due to altered precipitation patterns could potentially offset the benefits of a longer growing season in some regions, however. Southern Pacific salmon and cod populations are expected to decrease while Northern Pacific salmon populations are expected to grow. Most Atlantic fisheries are predicted to decline while harvests for Arctic fisheries may grow as a result of greater nutrient recycling as ice cover is reduced. The central regions of the country, including much of Ontario and Quebec are expected to suffer reduced precipitation, which could adversely affect the agriculture industry. (IPCC, 2000)

There are several considerations that have made climate change such a serious issue. It is not just the extent of change but the rate at which these changes are expected to occur that are a cause for concern. Even if the global average temperature increased by only one degree over the next one hundred years it would pose an unprecedented adaptation challenge for the earth's ecosystems. While this type of temperature change has occurred in the planet's

geological history, adaptation to these changes has occurred over millennia, not over the course of a single century. According to Environment Canada "while most species can migrate in response to slow climate change... studies suggest that rates of change in excess of .1 degree per decade are almost certainly too rapid to avoid major disruption." (McBean, 1997) In addition to the havoc that could result from such rapid changes, the potential exists for the magnitude of the temperature changes to be intensified by what are known as positive feedback mechanisms. Positive feedback occurs when the results of climate change cause an acceleration of the climate change process. An example would be: A warmer atmosphere would increase the rate of water evaporation and water vapor is, itself a greenhouse gas, which would further increase the rate of global warming and the extent of climate change. Perhaps the most concerning aspect of the climate change issue is the possibility that as the planet continues to warm, a threshold could be crossed, beyond which the climate could move into an altered state that could not be reversed on human time scales. Because greenhouse gases stay in the atmosphere long after they are emitted, crisis cannot be avoided at the last minute. By the time a crisis may be identified it is likely that it will be too late to avoid it.

Given the uncertainties surrounding the range of potential impacts, the federal government favors a risk management approach to climate change, based on a phased national implementation strategy that will be coordinated with the provincial and territorial policies and programs. However, provincial willingness to engage the climate change issue varies, with some provinces advocating a "go slow" approach. As a result, the issue of responsibility and contribution is also echoed in the Canadian debate. In 1996 Ontario and Alberta alone accounted for 58% of total national emissions while Quebec and British Columbia shared responsibility for 22%. The remaining 20% of emissions were distributed through the remaining 6 provinces and the territories. (Canada, 1999, 121). There are significant differences in sectoral contributions to the problem as well. In 1998 the transportation sector accounted for 26% of Canada's total, the industrial sector (15%),

electricity generation (18%), and fossil fuel production and distribution (16%). (Environment Canada, 2000) Clearly then, climate change is an issue that will require significant co-operation between provincial and federal governments, and the public and industrial sectors they are responsible for. To date, the level of cooperation achieved has not been sufficient to make meaningful progress on this issue.

2.7.4 Jurisdictional Authority in Canada (Brown, 2000)

The Constitution Act of 1867 grants the federal government the power to perform the treaty obligations of the country. The 1931 Statute of Westminster confirmed the international autonomy of the Dominions. While the state of Canada's international autonomy is clear, the character of the nation's internal political workings is not. In Canada, a distinction between treaty "formation" and treaty "performance" exists. This distinction brings the legal jurisdictions of the federal and provincial governments into question. Prior to the establishment of the Supreme Court of Canada, constitutional challenges were settled by the Judicial Committee of the Privy Council of the UK. In the 1930s the provinces launched repeated court cases challenging the legal jurisdiction of the federal government. In one case concerning labor conventions, the Judicial Committee of the Privy Council found in favor of the provinces. The most significant finding stated in the ruling was that the domestic subject matter of the treaty should determine its jurisdiction for implementation. The Judicial Committee stated that "If in the exercise of her (Canada's) functions derived from her new international status she incurs obligations they must, so far as legislation be concerned when they deal with provincial classes of subjects, be dealt with by the totality of powers, in other words by co-operation between the Dominion and the Provinces." This judgment has stood for over sixty years, long after the establishment of the Supreme Court of Canada.

This ruling has created a potential stumbling block for the federal government in its performance of treaty negotiations. While the

federal government is obliged under international law by any treaty it is a signatory to, it cannot unilaterally ensure that these obligations are met. As a result, numerous mechanisms to facilitate federal-provincial cooperation have been developed. When federal-provincial cooperation is not achieved the federal government has no legal means of forcing cooperation on the provinces. Federal/provincial conflict has been more common in the realm of environmental issues than has been the case with other areas of provincial jurisdiction. The attempt to develop an agreement on the standardization of provincial environmental standards, in the form of a harmonization accord, in the late 1990's is a good example of how federal/provincial jurisdictional conflicts can undermine environmental agreements. After considerable deliberation the agreement fell apart, largely because the federal government felt that too many powers had to be transferred to the provinces to achieve and implement the agreement. The same tensions that undermined the harmonization initiative underlie intergovernmental relations concerning climate change.

In the case of climate change, two separate sets of Ministers were given responsibility for development of Canada's National Strategy. In recognition of the important role the energy sector plays in the Canadian economy, the Ministers of Energy from all provinces have been given joint responsibility with their counterparts from Environment Ministries. The Councils of Energy Ministers and Environment Ministers meet jointly to discuss climate change and other environment and energy related issues. It is this group who are responsible for developing Canada's domestic response to Kyoto. Full consensus between the 28 ministers, each representing very divergent economies and regions of the country, is often difficult to achieve.

At the Joint Ministerial Meetings in March 2000, the Quebec delegation withdrew from the process. They expressed frustration with what they considered to be the limited achievements of the other provinces on the issue of climate change. In October 2000, the federal government, each of the territories and all of the provinces

except Ontario approved the public release of Canada's National Implementation strategy and the first National Climate Change Business Plan. While the meetings were described by many as a step forward in Canada's attempts to address climate change, the failure to achieve Ontario's endorsement of either document serves to indicate that tensions exist not only between the different levels of government, but between the provinces themselves.

Both orders of government have areas of authority in which to address the issue of climate change. However, the federal government has been traditionally reluctant to use its own levers (i.e. taxation), both with respect to climate change in particular, and environment more generally. At the same time, the provinces with their constitutional authority over the majority of the resources and energy related activities that contribute to greenhouse gas emissions, have also been reluctant to act. This reluctance on the part of the provinces to take on such responsibilities has been partially influenced by a feeling of a lack of ownership over the Kyoto targets. The feeling of a lack of ownership by the provinces stems from the fact that the federal-provincial, pre-Kyoto agreement to stabilize emissions was over ridden by the federal government's need for flexibility in the international negotiations. The resulting reduction target of 6% below 1990 levels was more rigorous than any contemplated by the provinces prior to Kyoto session. Being closer to the affected industries and resources, provinces are also more susceptible to industry and labor group pressures to maintain the status quo.

A further challenge is evident within the federal government itself. Specifically, the Departments of Environment and Natural Resources have potentially differing aims. Environment Canada is responsible for "preservation and enhancement of the natural environment," while Natural Resources Canada is charged with "promoting the sustainable development and responsible use of Canada's mineral, energy and forestry resources." While cooperation between the two ministries has increased in recent years, a level of tension remains as a result of the two very diverse

constituencies they represent. The Minister of Environment must answer to the environmental non-government organizations while the Minister of Natural Resources must represent the interests of the fossil fuel industry.

Differences of attitude toward climate change and implementation of national commitments are not restricted to only these two departments. Industry Canada is very cautious of any actions that might tend to affect the competitiveness of Canadian industry. The Department of Finance is wary of introducing potential distortions to the economy by way of directed taxes or trading schemes that may lead to windfall profits in one sector at the expense of another. The department of Foreign Affairs and International Trade, who shares the international lead on the climate change file with Environment Canada, worries about keeping Canada's response at a pace that is in step with its major trading partners. As noted by the Commissioner of Environment and Sustainable Development, climate change is very much a cross-sectoral issue encompassing human health, agriculture and trade as well. For these reasons, elaborate interdepartmental mechanisms have been established to coordinate the efforts of the federal bureaucracy and to support discussions around the Cabinet table.

2.7.5 Federal Provincial Institutions

Federal, provincial and territorial governments developed an initial strategy, entitled the National Action Strategy on Global Warming, in 1990. In 1993, a multi-stakeholder committee, the Climate Change Task Group, was formed and its report, *Options to Meet Greenhouse Gas Emissions Goals*, led to the development of the 1995 National Action Program on Climate Change (NAPCC). As part of the NAPCC, Canadian governments emphasized their support for the implementation of voluntary initiatives, and as such, the majority of measures taken by governments have been voluntary, information-related, or aimed at government operations.

Following the conclusion of the Kyoto Protocol in December 1997, First Ministers agreed that climate change is an important global

issue and that Canada must do its part to address it. They further agreed that Canada's response had to be designed in such a way as to ensure that no one region would be asked to shoulder an unreasonable burden. First Ministers directed that a process be established, in advance of Canada's ratification of the Protocol, to examine the consequences of Kyoto and to provide for full participation of provincial and territorial governments with the federal government in any implementation and management of the Protocol. Federal, provincial, and territorial Ministers of the Environment and Energy were directed to work together to jointly consider appropriate courses of action.

As a result, Energy and Environment Ministers agreed, in April 1998, to engage governments and stakeholders in a process to develop a phased, step-by-step national implementation strategy by the end of 1999. Ministers agreed that decision-making with respect to the national implementation process would be conducted through existing federal, provincial, and territorial government councils. Decisions are to be based on guiding principles that include balance, equity, comprehensiveness, and a phased approach.

National coordination and overall project management is performed by the existing National Air Issues Coordinating Committee (NAICC), which reports to Joint Meetings of Energy and Environment Ministers (JMM). A National Secretariat was also established, in April 1998, to provide overall support and coordination of the process. In addition, sixteen multi-stakeholder Issue Tables were established and given a mandate to summarize baseline information related to their sector or issue, and identify challenges and opportunities, early action measures to reduce greenhouse gas emissions, jurisdictional flexibility and longer-term potential emission reduction measures. To support the work of the committee, the Federal government provided \$33 million for analysis of the options available to Canada to meet Kyoto. Sixteen multi-stakeholder "tables" were established and have now reported their findings. The Issue Table process is now formally complete, although no roll up document has yet been made available to

the public. Actions identified in the tables' options reports have formed the basis of the First National Business Plan on Climate Change.

Canada has called for clear, effective rules for the Kyoto mechanisms that allow for unrestricted opportunities to reach domestic commitments through external investments. In support of this call, Canada has assisted in the establishment of two domestic pilot emissions trading initiatives. Canada has also been in the forefront of the establishment of an international emissions trading regime, and has established its own Clean Development Mechanism and Joint Implementation Office to facilitate Canada's private sector participation abroad under the Kyoto mechanisms.

2.7.6 Present Policies

All levels of government have taken steps to achieve emissions reductions. The programs initiated range from capacity building projects in the developing world to the promotion of sustainable energy sources. The largest of the federal government's programs has been the Climate Change Action Fund, which was designed to initiate early action on climate change through the development of appropriate technologies and science based strategies. Efforts to educate the public about the issue of climate change have also been pursued at the federal level. The federal government has also attempted to reduce emissions from their own operations, through improved energy efficiency and the use of alternative fuels.

Many of the provinces have strengthened regulations for energy efficiency within key sectors, such as the construction industry. The provinces have also targeted the transportation sector, with vehicle inspections being mandatory in British Columbia and Ontario.

One of the core components of the federal government's plan to address climate change is the Voluntary Challenge Registry program (VCR). As the name implies this program relies exclusively on the voluntary action by industry. Of those participants, many are implementing only a small portion of the recommended

measures included in the program. The VCR has attempted to provide incentives for its participants, through the establishment of a Champion Status. The VCR awards bronze, silver and gold status to participants but the allocation status is based on successfully meeting reporting requirements, not on emissions reduced. In the eyes of many the use of voluntary measures instead of more binding initiatives leaves Canada's progress quite lacking. The Pembina Institute for Appropriate Development has released a report criticizing the federal government's reliance on voluntary measures. The report entitled "Five Years of Failure: Federal and Provincial Government Inaction on Climate Change During a Period of Rising Industrial Emissions" concluded that "voluntary, educational and research measures are wholly insufficient to meet Canada's climate change challenge when they are not backed up by regulatory standards and positive financial incentives. (Hornung and Bramley, 2000 pg. 11)

The limited results that have been achieved by the VCR have been mirrored by the limited steps that have been made towards the greening of the government's own operations. According to the year 2000 report by Commissioner of the Environment and Sustainable Development, progress towards fulfilling the goals of the Federal Environmental Stewardship Initiative, which was introduced as part of the Green Plan in 1990, and the 1995 Guide to Green Government, have been slow. The Commissioner's report stated that many government departments do not have adequate information about the extent or sources of their own greenhouse gas emissions. The report asked "How can the government get its own house in order when it does not know its utility bills for water, energy and solid waste disposal, either by department or in total." (Commissioner of Environment and Sustainable Development, 2000) The National Business Plan details a number of steps that the government intends to take to make improved progress in the endeavor to put its own house in order.

As with most unresolved complex issues there are reasons to be both optimistic and pessimistic about Canada's prospects for

mitigating climate change. On the optimistic side, the Ministers of Environment and Energy made progress towards reaching a common ground on the issue. In submitting a \$1.6 Billion climate change proposal to Cabinet, Minister Goodale termed climate change "the most serious economic problem facing Canada since the Second World War." Leading corporate players in Canada, such as Suncor, TransAlta and Ontario Power Generation have made voluntary commitments to curb their emission of greenhouse gases substantially. In the case of TransAlta and Suncor, it is widely thought that their interventions were responsible for encouraging, and allowing, the Province of Alberta to begin more serious engagement with the issue.

The federal government has provided funding to support the mitigation of greenhouse gasses. The Climate Change Action Fund was replenished by a \$650 million commitment in the February 2000 budget. The Climate Change Business Plan carries with it a \$500 million commitment as well.

On the more pessimistic side, the Government of Ontario has steadfastly refused to participate in a coordinated strategy for addressing climate change. Policies undertaken to date have not been as aggressive as those undertaken by several other nations. The National Business Plan focuses on public education and outreach, pilot projects and demonstration projects. Unlike several European nations that have implemented carbon taxes, negotiated legally binding emission reduction agreements with industry and even taken steps towards the establishment of emissions trading systems, Canada is still working primarily on a voluntary basis.

2.7.7 Climate Science

In terms of Science-based research, Canada has been a major contributor to the work of the IPCC with Canadian scientists acting as lead authors and editors on both the 1990 and 1995 assessment reports. More than 30 Canadian scientists are participating as authors and editors of the Third Assessment Report, scheduled for

completion in 2001. The Canadian Climate Research Network was established, in 1994, to coordinate Canada's climate change science activities commissioned in response to both domestic and international concerns. The network consists of nine collaborative research groups, each focusing on a particular element of climate research and involving scientists from governments, universities and the private sector.

2.7.8 Canada Summary

Canada was among the world leaders in prompting action on climate change a decade ago. The 1988 Toronto Conference on the Changing Atmosphere, attended by then Prime Minister Mulroney, acted as a catalyst by bringing the issue to the media and public's attention. Canada was also instrumental in the negotiations leading up to the establishment and ratification of the UNFCCC in 1994. Since then however, Canada has focused on how to meet its commitments in such a manner as to cause minimal disruption to the economy. Leading up to Kyoto, Canada consistently sought to avoid commitments that would place the country in an uncompetitive position. Since Kyoto, Canada has assisted developing nations in capacity building exercises and has especially looked to engage developing nations' participation in the international climate regime. Such efforts have been compromised by Canada's failure to reduce greenhouse gas emissions at home.

The federal government's dilemma: having the international authority to enter and negotiate climate change agreements, but not the domestic authority to enable activities that will ensure negotiated commitments are met. The constraints imposed by the nature of the federal system itself also limit the government's capacity to address complex, international environmental problems. The NAICC has made progress in its efforts to achieve consensus amongst the federal, provincial and territorial governments but significant changes to the policies and structures of Canadian domestic institutions may need to take place if Canada is to honor existing commitments or to address the threats posed by climate change, under any future governance scenario. Within existing institutions, divisions remain between the

all levels of government, as well as between the public and private sectors. Alternate institutional arrangements may be required if the nation's commitments on climate change are to be met.

Given the uneven distribution of both areas that are vulnerable to climate change and those that are responsible for greenhouse gas emissions, actions to address climate change could invoke a heavy price by putting considerable pressure on a delicate system containing many potential fault lines. Such pressure could result in the dismantling of any functioning institutions under the various scenarios to be considered. Therefore, actions to coordinate domestic and international responses to the climate change issue are best undertaken in a planned, forward looking manner that considers the evolution of governance regimes.

3.0 Issue Status and International Governance in the Year 2015

3.1 Discussion Framework

For the purposes of this case study, four distinct scenarios have been provided, which form the context for an analysis of the state of climate change policy in the year 2015. These scenarios are known as "Global Club", "Shared Governance", "CyberWave" and "Regional Dominators." In this section the relevant players will be introduced and the decision-making process will be described for each scenario. The types of policies that will likely be pursued under each regime and the principle on which they are based will be discussed. The application of the "polluter pays" principle and the "precautionary principle" will receive particular attention. The polluter pays principle is self explanatory; the precautionary principle states, in the most general sense, that given the considerable consequences involved with climate change, where there is uncertainty, policy should err on the side of taking action now.

3.1.1 Global Club

The Global Club is a scenario in which a small group of elites, representing the world's dominant industrial nations, and their leading

multinational corporations, have come together to resolve important international issues effectively, according to their own interests. These interests are not narrowly defined, however, as the Club recognizes the extent of international interdependence and the subsequent need for global stability. The Global Club will take aggressive action, which will include the application of the polluter pays principle. Their dominance of global affairs has resulted in a world where wealth continues to be inequitably distributed but economic growth and prosperity are maintained. The Club pursues extensive but standardized regulations, which govern international affairs. The formation of these regulations is not governed by democratic institutions but by institutions that are controlled by the Club. This scenario has emerged as a result of continued and escalating crises at the turn of the millennium which existing national and international institutions were powerless to prevent. These crises lead to a growing questioning of the role of these organizations and an accompanying willingness to replace democratic but ineffective multilateral organizations with closed but effective ones. Canada is not a significant power within the Global Club.

3.1.2 Shared Governance

Under the Shared Governance Scenario, international organizations of all varieties gain credibility and influence through the development of effective rules. These multilateral institutions are inclusive and democratic. Expansions in global trade and investment are outstretched only by increases in the dispersion of knowledge. These factors are the drivers of economic prosperity. It is a complex world of rapid change but one where human rights, and transparent international rules are respected. This scenario has developed because of the growing recognition of the increasing integration of states, which has provided the impetus for successful compromise at the international level. Action on climate change is achieved through the negotiation of policies based on both the precautionary and polluter pays principles.

3.1.3 *CyberWave*

The CyberWave scenario can be described as a social structure bordering on anarchy. Continuously accelerating technological innovation has surpassed the ability of public institutions to regulate markets in anything beyond an ad hoc manner. The power and scope of governance institutions at all levels has declined. Individual liberty is preferred to the provision of market regulation and public goods. The reign of free markets results in dynamic but volatile economic growth, coupled with widening inequity both within and between nations. Individuals have access to huge amounts of, often conflicting information, with no clear arbitrator to pronounce on the validity of the information that is in circulation.

3.1.4 *Regional Dominators*

Under the Regional Dominators scenario a group of large, geo-political blocks have developed that are highly integrated internally but maintain a mercantilist and confrontational stance between each other. In the mercantilist, tradition blocks attempt to penetrate foreign markets by gaining competitive advantage through efficiency improvements. These attempts are generally met with elevated trade barriers, reduced economic growth, and a reduction in aggregate living standards. Inequity is intensified both within and between blocks as a result of these economic policies. International negotiations take place, almost exclusively at the bilateral level, and multilateral organizations have lost their relevance as a result. This scenario is seen to have developed as a result of the adoption of a neo-conservative agenda that is centered around protectionist ideologies. The Regional Dominators Scenario is not one that would adopt a precautionary approach to environmental policy.

3.2 *Driving Forces*

The four scenarios clearly differ in many significant respects. In the most general sense, the differing, and potentially conflicting, priorities that stem from the scenario ideologies point in widely divergent policy directions. The individual

optimization of the neo-liberal CyberWave Scenario, for example, stands in marked contrast to the more egalitarian nature of the Shared Governance Scenario. The extent of inclusion in the decision making process also varies widely between the different depictions of the future. The number of players in the Global Club, for example, is very limited, while decision-making under the CyberWave Scenario is at the individual level. Another important consideration is the extent of restraint imposed on the system in the form of rules and regulations. The ability of the Global Club to impose regulations and standards freely stands in marked contrast to each of the other scenarios where the ability and the willingness of the governing regimes vary considerably.

These important differences, among others, have potentially dramatic implications for the different players that affect policy formation, including governments at all levels, multinational corporations (MNCs), key industries, regions, NGOs and the general public. The distinctive characteristics of the individual scenarios and the inherent implications for the entities that shape policy, collectively serve to alter the state of climate change policy dramatically. Whether carbon is constrained, the extent to which national and sub-national governments are free to form, or at least shape, policy is a product of the defining characteristics of the scenarios. Under each of the scenarios described above, Canada has a reduced ability to set its policy agenda independent from outside influences. While the scenarios are quite different, each presents benefits from, and imperatives for, Canada as a policy taker, to improve its intergovernmental relations.

This section of the paper includes an exploration of the potential for the advancement of climate change policy through mitigation and adaptation initiatives, as well as science-based actions, within the context of each of the scenarios. In the process the implications of the unique characteristics of the individual scenarios for the players involved and governance structures themselves will be discussed.

In the following section, key forces that determine the degree to which the climate change issue will be addressed under each scenario will be identified. To the extent that the issue is dealt with, the expected key decision making bodies, and the role of national governments in responding to those bodies, will be reviewed. The following is a list of scenario defining questions, which will be addressed within this section:

- Will carbon be constrained? If so, to what extent and in what manner?
- What will be the key decision making bodies?
- Are mitigation measures likely to be enacted? If so, in what sectors?
- What are the implications for the Canadian economy?
- Are adaptation measures likely to be explored? How will climate-induced "shocks" be managed?
- Will science based research on climate change continue to be conducted?
- Will the precautionary and polluter pays principles be applied?

Regardless of the manner in which climate change is dealt in the year 2015, the world's population will continue to experience the impacts of historic, anthropogenic greenhouse gas emissions. Therefore, it will be appropriate to close the discussion of each scenario with an outlook of where the climate change issue is likely to be situated in the 2015 – 2025 period.

3.3 Global Club Scenario

3.3.1 Driving Forces

Under the Global Club Scenario, the climate change issue would receive substantial attention in the years leading up to, and beyond 2015. Carbon would likely become a constrained commodity, and as a result, the Global Club Scenario is the one in which progress on the climate change issue would be most significant in the short to medium term. Primarily, this attention would result from the proactive, interventionist stance adopted by key players in the Global Club arising from the extent that the Club recognizes the mutual interdependence of all the nations of

the world. The ill effects of a changing climate, violent weather in particular, are seen by the Club as potential impediments to normal business operations. The significant economic integration of nations, coupled with growing understanding of the extent and the scope of the effects of climate change make the proactive stance on climate change the optimal approach for the Club.

The role of large multinational corporations in the wider society would act to foster extensive global transfers of the new energy, information and communications technologies. However, radical, new technologies that are capable of virtually eliminating greenhouse gas emissions would not yet be mainstream. Therefore high levels of global economic growth projected under the scenario, accompanied by consumer desires to pursue the "suburban dream" could negate and surpass the greenhouse gas reductions desired by Club members in the longer term.

In the Global Club world of 2015, effective action on climate change could be successfully coordinated due to the level of market power exercised by the Club. The substantial levels of investment and procurement that are made by leading MNCs give them a considerable measure of influence over national governments and suppliers worldwide. The Club's member nations also constitute the world's primary donor nations. Control over bilateral aid is an important lever that can be used to influence developing nations. The sheer financial might of the Club can be exercised through the imposition of trade sanctions. Virtually no nation can endure the economic consequences of being cut off from the world's largest markets. The Club's economic powers are supported by the availability of the military might of the leading national powers. The tremendous resources available to the Club allow it to develop, staff and maintain agencies and organizations to address Club concerns. This bureaucracy is minimal in size but well funded and highly specialized. Club policies are primarily carried out through existing national or regional governments as well as through direct influence over industry associations around the world. The desire of non members to gain entry into the Global Club provides ample incentive to carry favour with the Club. The Clubs array of

both positive enticements and daunting consequences give it powerful policy levers that far exceed those possessed by any democratic government. While the Club could gain unquestioning cooperation by making an example of a nation that resisted its influence it is unlikely that this would be necessary.

3.3.2 International Regimes

All members, and in fact all nations and corporations operating in the Global Club arena would be expected to have their use of carbon based fuels constrained. Rules would also be likely in relation to land use and forestry practices. All developed nations of the Club, and all multinational corporations would be required to reduce greenhouse gas emissions through the mandatory purchase of emissions allowances made available under an international emission trading system, with an ever-tightening annual limit on allowable emissions. Given the lack of borders for merchandise and capital and the Club's unified supervision of financial and commodity exchanges, only a single, plurilateral emissions trading regime would be established as part of the global commodity market. Emissions credits would be purchased along with the greenhouse gas-emitting product. Domestic emissions trading regimes would be unnecessary, given the predominance of the Global Club within individual states.

Developing nation members of the Club would be required to limit growth of their emissions, and would also participate in the plurilateral emissions trading regime. Regardless of the reach of such an emissions trading system, Club concerns regarding environmental issues other than climate change would also lead to the Club invoking minimum technology standards in certain sectors. Due to the liberalized and globalized patterns of trade dominant in the scenario, new increasingly efficient technologies would be deployed in developing member countries solely for cost savings motives. In addition, the transfer of technologies would receive Club assistance, as proceeds from the sale of emission allowances would be used for the early retirement of the least efficient 20th century infrastructure still operational in the less

developed countries of the Club. These funds could also be used as an enticement tool for the promotion of membership to those at the periphery of the Club.

Because the Global Club world is intensely competitive, it is expected that those entities required to purchase emissions allowances would need to improve energy and material efficiency and avoid off-loading related costs to the consumer. However, the environmental regime favored by the Club would involve both producers and consumers internalizing the costs associated with environmental and health impacts resulting from the production, use and disposal of products. Specifically, consumers could expect to be confronted with a range of environmental taxes intended to change product purchase and use behavior through this forced internalization of related health and environment costs.

3.3.3 The Role of Multinational Corporations and Non-Governmental Organizations

Multinational corporations will play a key role in the Global Club world, especially within the climate change issue. In the early years of the 21st century, the number of extreme weather events seem set to increase in terms of their size and frequency of occurrence, as well as associated costs. Though Club scientists will caution that this is what had been predicted by the IPCC, they will continue to be prudent in suggesting a definitive causal link exists between the events and climate change. Nevertheless, these events will be played up by the larger non-governmental organizations and begin to generate significant public concern on the issue, which in turn will be reflected back on greenhouse gas emitting multinationals. Combining such public pressures with growing insurance industry concerns, greenhouse gas emitting multinationals will recognize that significant and coordinated action in the short term could avoid the prospect of truly draconian and economically disruptive policies in the future. Given their global reach and their own experiences with internal, voluntary emissions trading systems in the late 1990s, the largest greenhouse gas emitters will play a central role in designing and initiating the Club's international emissions trading systems.

3.3.4 Sector-Specific Mitigation Features

The electricity sector of 2015 can be expected to be vastly different than that of 2000. Rigorous enforcement of "sunset clauses" on coal and oil fired generating plants would mean that significant and increasing portions of the turn of the century electricity sector infrastructure would be retired. Building on much improved industrial energy and material efficiencies, combined cycle gas turbines should be widely deployed throughout industry, resulting in decreased external electricity purchases by industry in many of the larger, more developed Club members. As well, with expectations of fuel cells being deployed for household use in the near future, private sector investors could be reluctant to invest in large-scale generating stations of the type favored during the latter half of the twentieth century. Instead, where natural gas is available, there would be a proliferation of smaller combined cycle gas turbines, with the operators purchasing allowances on the open market.

While the larger, well-developed nations of the Club are expected to improve their energy efficiency as a whole, economic growth is anticipated in the less developed countries. Much of this growth is expected to be in energy intensive sectors. Thus, a large, emissions-free mode of electricity supply would still be required. In addition, fresh water shortages possibly resulting from climate change, but mostly from unsustainable patterns of use, would naturally lead to consideration of large-scale energy intensive desalination plants by Club members. Given such considerations, along with the technical and financial resources available to the Club, it is conceivable that nuclear-based electricity generation would experience a renaissance in the Global Club world of 2015. Overall, global emissions from electricity generation would be expected to be dramatically below those experienced in 2000.

In comparison with most advanced Western nations, Canada's economy has been defined as one with a relatively significant reliance on heavy industry; the basis of which has been the availability relatively abundant and affordable

electricity. With a progressive movement towards the use of natural gas, Canada's electricity portfolio would increasingly resemble that of other Western nations. The only remaining factor that could allow Canada to retain the electricity cost advantage would be the existence of considerable hydroelectric power sources. However, these energy supplies are unevenly distributed geographically. The potential relocation of heavy industries, either within Canada, in search of electricity based cost advantages or internationally, in search of other input cost advantages, could serve to dramatically redefine the structure of the Canadian economy. The potential exists for regional competition on the basis of electricity cost advantages and the subsequent redistribution of economic activity and wealth. This redistribution could be offset by the sale of a portion of the excess electrical capacity held by some provinces, such as Quebec to other provinces.

Canada, as a marginal member of the Club, will have little ability to influence policy in such a way as to be able to maintain existing competitive advantages. While the powerful multinationals that would own many energy intensive production facilities would wish to preserve the low input costs they have enjoyed, they would presumably be indifferent as to where these benefits were derived.

The transportation sector of 2015 would also be different to that of 2000, but the changes experienced would likely be less dramatic than those in the electricity sector. Hybrid vehicles would dominate the private automobile market in developed countries, while fuel cell vehicles would be beginning to enter the market in significant quantities. Given the substantial purchase costs and durability of automobiles, the replacement of traditional vehicles with fuel efficient hybrids could result in massive numbers of traditional, high emissions automobiles being available for export to developing countries. Club policies would need to address this issue in order to limit greenhouse gas emissions from developed countries.

As a vast and sparsely populated country, Canada's transportation sector is one of great

importance for both the issue of climate change and that of economic competitiveness. Under pressure to meet the demands of the Club, the use of carbon taxes and other economic incentive structures, such as toll roads and bridges to discourage non-commercial road transport is a probable policy outcome in Canada. Under the Global Club Scenario, rail is likely to play a more significant role. The privatization of marginal freight lines that started in the 1990's would continue. With increasing economic disincentives placed on road transport, the privatization of Via Rail and a significant upgrade of rolling stock capital would be undertaken; following the example of several European national railways. The use of rail is also likely to be increasingly integrated with other modes of transport to form a more cohesive transport system. In urban areas the linking of development sites with the existing public transit systems will be increasingly prioritized as it has been in metropolitan Toronto.

The industry sector would experience less dramatic changes in the Global Club Scenario given the significant sunk costs and remaining life in large industries, along with the trend towards corporate consolidation. Regarding climate change, industry's purchases of carbon-based fuels would include the purchase of an emissions allowance at the existing market rate. A black market in fuel transfers could be expected to emerge, particularly within the small to medium enterprise sector, and in developing countries. However, the threat of significant financial penalties, along with threats by the Club to withdraw marketplace access, would prevent the black market from flourishing. Industry would likely move from being a purchaser of electricity to an internal producer and possibly even a seller of electricity. While emissions intensity measurements would show improvements in facility emissions rates, the consolidation of industry along with widespread economic growth could mean that for the global industrial sector, overall emissions would likely increase.

3.3.5 Climate Change Adaptation

Improved forecasting systems and degree of enlightened self-interest would allow for effective responses to climate change impacts. Concerns

for human and environmental health in the Global Club would lead to improvements in the Club's ability to respond to epidemics. Should occurrences of what were formerly tropical-based diseases arise as a result of the changing climate, the Club would have the resources and initiative to act to prevent widespread epidemics. Likewise, although the Club would be unable to prevent the extreme weather events that had been predicted by scientists in the 1990's, its resources, along with its desire to stem the tide of "environmental refugees," would enable a rapid Club response to international disasters. Where the need for external relocations arose, the Club would be expected to dictate and assign refugee quotas to Club members, much like what was done for displaced Kosovars just as during the NATO campaign against Yugoslavia in the late 1990's. Finally, the extent of globalized trade along with the high degree of enlightened self-interest exercised by the Club would result in quick and effective interventions in regions where agricultural production was disrupted by changing climate patterns.

3.3.6 Climate Change Science

The Global Club's dominance of climate change policy would not be limited to just mitigation and adaptation. As the primary providers of public goods at the international level, the Club would play a significant role in the advancement of scientific research on climate change issues. Although the numerous roles of the United Nations would be eclipsed by 2015, it is likely that an international climate change bureau would be in place, closely modeled after that originated in the 1990s under the United Nations Framework Convention on Climate Change. Specifically, such a regime would consist of an ultra-national body responsible for integrating climate change science and policy. This body would also carry out compliance and enforcement activities under the auspices of the Club's sanctioning body.

Universities and research centers would be largely dependent on the Club for funding, and it could be expected that a single body of climate change science specialists, similar to the existing Intergovernmental Panel on Climate Change

would be established. This group of specialists would be mandated to provide assessments of contemporary and future greenhouse gas emissions, and their related impacts on the environment, society and the economy. The bureau would also likely establish and fund a second body responsible for policy formulation of mitigation strategies and adaptation measures to address the expected and exogenous climate change impacts.

The Global Club has considerable incentive to continue the advancement of science because scientific certainty of human induced climate change will serve as a valuable justification for the Club's actions. This scientific justification is of considerable value to the Club, given the repression of democracy under the Club scenario.

3.3.7 Conclusion

The seriousness with which the Global Club would target climate change through its science, policy and rule making body would mean that pressures for emissions reductions could be sustained in the years following 2015. The Club would effectively promote technology developments that could further reduce emissions through economic incentives, implemented through national and regional governments. The widespread application of the polluter pays principle would lead to further efficiencies in energy use and, reduced emissions. As a country that is dependent on resources, involved in energy intensive industries, whose products must be shipped over vast distances, Canada is certain to be forced to improve its performance with respect to greenhouse gas emissions. As a country that is largely relegated to policy taker status, however, the challenge under the Global Club Scenario will be to minimize the economic and social costs that are potential results of these aggressive and rapid policy measures. The pressure that will be exerted on Canada will necessitate considerably improved federal-provincial cooperation if these external shocks are to be absorbed with minimal consequences.

3.4 Shared Governance Scenario

3.4.1 Driving Forces

Much like the situation in the Global Club world, recognition of the full extent of mutual interdependence by nations under Shared Governance is the key force that leads to significant attention on the climate change issue. This recognition of interdependence results from both the significant international economic integration and the level of environmental consciousness developed by powerful and concerned non-governmental organizations. Through their work, individuals, corporations and nations have come to understand the truly global nature of environmental issues such as climate change and biodiversity. As a result key multilateral institutions have gained increased prominence and credibility. The continued development of climate science, the increased recognition of the costs associated with an altered climate, and the willingness of many large corporations to take action to reduce greenhouse gas emissions has led to an enhanced acceptance of climate change mitigation efforts. As a result of these converging forces, many issues have been resolved at the international level through successful compromise between nations and interests. The increased credibility and success of these multilateral organizations is partially spurred by the inclusion of powerful NGOs that serve to greatly improve the transparency of international debate and policy.

Under the Shared Governance scenario, the climate change issue would receive substantial attention. Carbon could be expected to become a constrained commodity, although perhaps not to the same extent as would be expected under the Global Club Scenario since the rules for trading will likely take longer to work out and there will be a tendency to try to design the most 'all inclusive' trading regime from the outset. While short to mid-term progress on reducing emissions may not be as great as under the Global Club, the Shared Governance regime of 2010 may be the one best positioned to address climate change in the longer term. This is a scenario in which emission caps could be reduced at regular intervals. The extent and pace of the reductions would be determined through the negotiations of the Conference of Parties to the UNFCCC. These

new targets would be met within the context of the framework that was negotiated for the implementation of the Kyoto Protocol and its subsequent legal instruments.

Due to the level of market liberalization achieved in the Shared Governance world of 2015, action on climate change will be coordinated. As well, the roles played by international organizations such as the United Nations and World Trade Organization encourage responsible, proactive measures on climate change. The wide reach of information and communications technologies will provide the necessary monitoring and enforcement system that would discourage free-riders on the issue, and also ensure that the world was well informed and willing to act on climate related disasters.

There will be stricter limits on enterprise and innovation due to a wider application of the precautionary principle- the appropriateness of which as a guiding principle is increasingly recognized. This emphasis on social and environmental considerations, over a purely economic focus, results in more modest economic growth than the Global Club Scenario.

As a system that places emphasis on the common good, achieved through democratic institutions and successful compromise, the Shared Governance regime is one that is expected to show more concern for those who would suffer the impacts of climate change, and those, such as the OPEC nations, who would suffer economic losses as a result of mitigation policies. Significant resources could, therefore, be expected to be targeted towards adaptation related activities, at the expense of rigorous mitigation initiatives. In the longer term, however, the more balanced approach to economic growth, the integration of economic social and environmental concerns, combined with the more egalitarian and democratic principles of the Shared Governance world could lead to a climate change regime that is equitable and based on democratic principles. Thus, Shared Governance could be the regime under which climate change is most effectively addressed in the long run.

3.4.2 *International Regimes*

Under Shared Governance, the United Nations Framework Convention on Climate Change, (UNFCCC) would remain the pre-eminent international regime for climate change activities. Under the provisions of the Kyoto Protocol, a review of progress towards the commitment period of 2008 to 2012 is scheduled for 2005. By that time, the IPCC scientists will have submitted their Third Assessment Report and will have made significant progress towards the fourth. In addition to the science-based work of the IPCC, significant policy work will also be undertaken in the period 2000 – 2010. As a result, by 2015, the commitment base would be widened to include developing nations.

It would be expected that by 2015, an international emissions trading regime would be in place with full provisions for compliance and enforcement activities. Compliance and enforcement would be established by the Conference of Parties and would be legally binding under the Kyoto Protocol. To ensure effective compliance, the UNFCCC regime will work with the reformed World Trade Organization so that non-compliance with UNFCCC commitments can be dealt with through trade sanctions.

Unlike the Global Club, the Shared Governance international emissions trading regime, under the auspices of the United Nations, would act only as the decision-making and enforcement body. Actual trading activities would be carried out through domestic or regional regimes, due to sovereignty concerns. Domestic regimes would be responsible for developing their own climate change policies, including trading and taxation.

3.4.3 *The Role of Multinational Corporations and Non-Governmental Organizations*

Multinational corporations will continue to play a central role in the Shared Governance world. However, their tendencies towards competitive ruthlessness and generally poor environmental and social performance will be dampened. Zero wastes and reduced greenhouse gas emissions would be increasingly the norm in

business practices. Wastefulness and pollution will largely be seen as a sign of poor management that could affect market positioning in a world of highly mobile capital. The trend towards longer term corporate planning will continue. The important role played by non-governmental organizations, (NGOs) with worldwide access to information and communications, would also contribute to corporations practicing more sustainable patterns of production. The transparency created by these NGO's through the use of information and communications systems would mean that sooner or later, everything a corporation did would become public knowledge. With or without this NGO induced transparency multinationals would be expected, if not legislated, to purchase emissions allowances for all of its operations.

3.4.4 Sector-Specific Mitigation Features

The electricity sector in the Shared Governance scenario would see change through slow evolution as a result of negotiated compromises. The Shared Governance world would need to make difficult decisions about the short-term benefits and long-term costs of nuclear power in a world where climate change is a serious concern. Within developed nations, it is unlikely that new nuclear power plants would be developed and that some would be retired early. In exchange for hastening the de-nuclearization of the power sector, those nations with a substantial nuclear base may be given additional emissions allowances which could lead to the refurbishment and delayed retirement of coal and oil fired power plants. Emissions from these plants may be captured for geological storage in some cases. As in the Global Club world, improved industrial energy and material efficiencies could lead to the wide deployment of combined cycle gas turbines. In addition, consumers should be able to exercise greater choice in their electricity purchases by 2015. Large non-governmental organizations then could encourage consumers to choose renewable supplies of energy.

While emissions from the power sector in developed nations will be reduced dramatically, the push towards global equity would see massive

expansion of electricity services within the developing nations of the world. How the demands for increased electricity supply can be reconciled with hardened attitudes towards nuclear power, and a desire to address the climate change issue will be a significant challenge to the policy makers. Following Shell's lead in Southern Africa in the late 1990s, solar energy systems could finally deliver electricity to the neighborhoods of the world's poor. However, it seems unlikely that industrial demand will be met by renewable means by 2015. Biofuels could potentially fill part of the demand, especially if land-use measures are incorporated into the climate change regime. Though substantial efficiency improvements per kilowatt-hour could be expected, coal, oil and natural gas would still be the likely fuels in developing nations for electricity generation in 2015. Generally, developing countries in the Shared Governance world would see domestic electricity needs met through renewable means, while industrial electricity needs would be met through the burning of fossil fuels. While the longer-term outlook for emissions growth for the electricity sector in developing nations could be well below business as usual projections, they would still be nonetheless higher than 2000 levels in the Shared Governance Scenario.

The potential exists for the demand for carbon-based fuels to be reduced considerably through improved efficiency, technology switching and the use of carbon taxes. This reduced demand for carbon-based fuels, coupled with a de-nuclearization of energy sectors throughout the Western world, could have adverse economic consequences for Canada in general, but certain regions of the country in particular. The economies of both Alberta and Newfoundland are significantly reliant on petroleum production. Uranium mining and processing is also an important contributor to the economy of Saskatchewan. Given the regional disparities of both the costs and benefits of climate change mitigation efforts, the ability to achieve political compromises through burden sharing arrangements may be a greater challenge than the task of achieving acceptable compromise at the international level.

Emissions will continue to increase rapidly in 2015 in the Shared Governance transportation sector. Within developed nations, the transport sector would look much like that described in the Global Club, with hybrid vehicles and fuel cell vehicles largely nudging traditional automobiles out of the marketplace. Like in the global Club, it would be expected that emissions from fleet vehicles would be included under required corporate emissions allowance purchases. The increased use of improved public transportation systems is expected both in urban areas and for long distance transport. This fairly modest improvement is not expected to offset the increase in the number of cars on the road by 2015.

The Shared Governance regime is perhaps the one in which the "polluter pays" principle is most widely applied. Therefore, it would be expected that a significant carbon tax would be applied to automotive fuels. By 2015 nations under Shared Governance would begin to seriously integrate transport policies with land-use planning policies. Such integration would be driven by health related concerns of automobile use, as well as productivity concerns, as developed and developing nations' cities, the engines of their economies, become increasingly gridlocked in the 2000-2010 period. Transportation policy will be an important consideration for Canada because of the need to avoid reduced competitiveness that could occur as a result of increased fuel costs in a sparsely populated nation that is exceedingly reliant on motorized personal transportation. In the longer term, such integrated planning and policy initiatives would enhance energy efficiency efforts underway in the transport sector and provide more significant movement towards climate change mitigation.

Under the Shared Governance Scenario, the industrial sector will make the most progress on emissions abatement over the short to medium term leading up to 2015. Although having an influential role, the corporate world of this scenario will need to keep one step ahead of increased regulatory initiatives. There will be little tolerance for foot-draggers and environmental naysayers promoting a business-as-usual approach. Instead, business will be more

carefully integrated with both society and the environment. The goal of short-term profits at the expense of people and the environment is a management process that will gradually be abandoned in favor of more sustainable concepts of business and development.

The somewhat slower pace of economic growth may allow domestic and international emissions trading activities to achieve emissions reductions from the industrial sector. In addition, the Shared Governance regime could be expected to be one that is not adverse to the use of significant subsidies to promote preferred behavior as well as stiff penalties to discourage unwanted behavior. Being driven by concerns other than just the economy, there would be a greater emphasis placed on replacing polluting industries with cleaner production techniques, regardless of the remaining economic life of existing assets. Environmental progress in the industrial sector would also be strongly promoted by a refocused World Trade Organization whose Committee on Trade and the Environment would have moved to permit product and process discrimination against goods and services produced from unsustainable practices. Fair discrimination would be based on detailed certification programs promoting "best practice" approaches across specific industries.

Unlike the Global Club, forestry and land use change practices that advance carbon sequestration efforts would be expected to gain prominence under Shared Governance. In addition to complementing international policies on biodiversity, carbon sequestration efforts would provide an avenue for participation in climate change abatement activities by less-developed nations. Carbon sequestration projects would play an important role in international emissions trading activities under Shared Governance. Being relatively easy to monitor and quantify, it is likely that forestry-related projects would be the first to be included in the emissions trading regime. The forestry stewardship and eco-labeling campaigns under way at the close of the 20th century could be expected to expand, perhaps with the WTO allowing for discrimination against forest products that are not certified as being sustainably harvested. By 2015 significant

research efforts would be ongoing to determine the extent of sequestration opportunities related to agricultural soils, and more importantly, for associated methods of monitoring, quantifying and certifying sequestered amounts.

3.4.5 Climate Change Adaptation

While the Shared Governance regime may lag the Global Club in climate change mitigation efforts, it would likely be superior in its adaptation efforts. Attention to adaptation would arise from recognition that mitigation efforts are likely to be less successful in the short to medium term under such a regime in which international equity and democratic principles are of great importance. As well, such a regime can be expected to be quite reactive and responsive to any natural disasters, climate related or otherwise, which occur across the globe.

Shared Governance would have substantial international health networks established to provide early warning and quick response to epidemics. Emergency assistance would reach victims of natural disasters and where necessary, internal and external relocations could be efficiently organized. The aggressive and powerful NGO community of the Shared Governance regime would be expected to also make substantial contributions in this area. This regime would also have the motivation, authority and resources to respond effectively to disruption of agricultural production and food shortages from changing climate patterns.

3.4.6 Climate Change Science

Leading up to the year 2015, scientific research on all aspects of the climate change issue will continue in much the same way, as is the case today. While international organizations have been strengthened, national sovereignty is widely respected. Scientific research would be concentrated in academia and national governments. As a country with only limited influence over international policy making, Canada would take steps to continue its significant contributions to scientific research, particularly in areas that are of strategic importance to Canada, such as carbon

sequestration in both vegetation and soils. Scientific output would continue to be peer reviewed and summarized by the IPCC.

3.4.7 Conclusion

Democratic decision making processes can be slow and protracted. Therefore, climate change mitigation efforts under the Shared Governance regime will occur at a more modest pace than in the Global Club. However, driven by concerns of equity and development, the Shared Governance regime could be expected to anticipate and respond to the impacts of climate change and avoid them where possible. Adaptation efforts may be more advanced under this scenario. The prominent role played by non-governmental organizations would ensure that the public's attention was focused on the plight of those negatively impacted by the changing climate.

The recurring challenge for Canada is to develop domestic policies that are capable of achieving the goals that are determined by international negotiations, but are also acceptable to the different regions of the country. If Canada is to succeed in this regard and contribute to the strengthening of this regime it must maintain its status at the international level. To do so, it is of primary importance that Canada avoid an international reputation as a country that makes commitments that it cannot live up to. As Canada is a federal state, the federal government must convince the provinces and territories to implement the policies necessary to meet international agreements. In the absence of a mechanism to force the Provinces to comply with federal goals the potential exists for internationally agreements to be under-implemented domestically.

3.5 CyberWave Scenario

3.5.1 Driving Forces

Despite the dangers associated with a rapidly changing climate, the climate change issue is not likely to receive much attention under a CyberWave regime by governments, which are overwhelmed by rapid technological change and further constrained by a public that has adopted

individualist and libertarian values. Governments will be more concerned with impacts of the newer biotechnologies. The public will be more interested in individual optimization and highly resistant to government intervention in the market place. As such, carbon is highly unlikely to be a constrained commodity under a CyberWave Scenario. Governments with limited power and less public support, would be, at best, able to act indirectly through conducting technological research, and perhaps promoting voluntary actions through public education and outreach activities.

Despite the inability of governments to act effectively on climate change under the CyberWave Scenario, there are factors that could, nevertheless, work towards slowing the growth of greenhouse gas emissions. The switch to smaller, less material and energy-intensive industries in developed nations, combined with advances in energy and biotechnology technologies may be beneficial in this regard. As well, while the environment *per se* is not expected to receive substantial attention, the incorporation of individualist and libertarian values may act to more strongly define property rights to air, earth and waterways. In economic theory this is considered to be a sufficient condition for addressing environmental problems that stem from the exploitation of common property, as is the case with climate change.

Perhaps, most importantly for the climate change issue, the CyberWave regime will lead to increased faith in, and reliance on, technological solutions to environmental problems. Society will be comfortable in putting off coordinated and sustained action on climate change in the belief that technological solutions will arise. However, such attitudes could contribute to even greater climate related impacts if such technological solutions do not surface in the early years of the CyberWave regime. Adding to the danger, in a relatively fast growing world economy with few restrictions and fewer initiatives for equitable distribution, developing nations are likely to be very rapidly out-pacing industrialized nations in emissions growth.

3.5.2 International Regimes

Although largely ineffective, the United Nations would remain an operational entity under the CyberWave Scenario. Therefore, it should be expected that there will remain a sole international body mandated to consider the climate change issue. Such a body however, would be dramatically different from that envisioned when the United Nations Framework Convention on Climate Change was established in 1992. Importantly, there is unlikely to be a negotiated agreement requiring on-going reductions in greenhouse gas emissions from developed nations. Facing the same obstacles that have confronted national governments, in addition to others uniquely their own, the UN would be unable to enforce an effective climate change regime. The surviving climate change entity within the United Nations would focus its few remaining resources on monitoring and observation of the global climate.

3.5.3 The Role of Multinational Corporations and Non-governmental Organizations

Any role that multinational corporations play in the climate change issue is likely to be a negative one. Given their declining importance, in the face of competitive pressures and rapidly-changing technology, multinationals will have very little concern for increased greenhouse gas emissions. Due to the absence of effective governance, the proliferation of libertarian values and the limited enforcement of regulation under CyberWave offers a greater opportunity for collusion. While individual firms may be less influential than the late 20th century behemoths of the oil and gas and computer sectors, it could be expected that networks of individuals and firms with shared commercial interests could band together to place great pressure on individuals, governments and other firms. The impact of this collusion on greenhouse gas emissions will depend on the goals of interests involved.

Like so many aspects of CyberWave, the ability of non-governmental organizations to act positively on the climate change issue is uncertain. With the relative decline of both big governments and big business, to be effective,

NGOs would need to reach the general public. While there is greater public access to information through advanced communications technologies, the public is largely unconcerned with environmental and social issues that do not affect them in more obvious and direct manners than climate change does. The potential exists for NGOs to publicize the environmental and social practices of individuals and firms, and thus perhaps influence a greater number of consumers in their arbiter role amongst suppliers. Where individuals and NGOs remain unsatisfied with such interventions, the CyberWave world might also give rise to a return of the adversarial, guerilla tactics employed by environmental NGOs in the early years of their existence in the 1970s. Tactics might include "cyber crimes" as NGOs attempt to disrupt activities of the institutions over which they no longer have influence.

The tendency towards collusion in CyberWave could very possibly be complemented by dark, counter-campaigns of misinformation. Under the laissez-faire world of CyberWave, commercial interests will have the resources to conduct effective "cyber crime" campaigns of disruption against any individual or organization that acts to inform on, or disrupt, its own activities. Given the generally rising crime rates of CyberWave and the lack of a backstop of government protection against physical and property damage, it is only a few, likely inconsequential martyrs that would push strongly against corporations and individuals responsible for emissions of greenhouse gases.

3.5.4 Sector Specific Mitigation Features

The individualist and libertarian values inherent in the CyberWave Scenario, combined with rapid advances in technology will lead to increased demands for personal power supplies, as individuals attempt to remove themselves from the larger interconnected electricity grids. This could give an important push to fuel cell technologies. Given the competitive and crowded nature of the market place, it could also be surmised that products will need to have some differentiation to encourage their selection by consumers. This differentiation would likely

focus not just on purchase price, but entire life-cycle operating costs. As a result, it could also be projected that individual household and business energy demands would decrease under the scenario, despite the absence of the environment as an issue. Uncertainty arises in the CyberWave Scenario as efficiency gains could be negated by increasing penetration of electrical devices in the home and business, as well as by the decreased importance of economies of scale in the business world.

While the trend towards undistributed generation will continue, the majority of homes and businesses will remain connected to existing grids. In CyberWave, public utilities are unlikely to exist and electricity generation mixes are likely to be determined only by the hard logic of economics. Remaining grid-based generation will likely rely on cheap, but dirty coal for its energy source. Emissions from the electricity sector in developed countries are also increased because in the absence of a coordinating government role, it is unlikely that large-scale hydroelectric projects could be developed. By 2015 several developed nations' nuclear power stations will be reaching the end of their useful life. With the ongoing trend towards undistributed electricity, and the absence of limitations on generation from coal, reinvestment in large scale nuclear power would be unlikely.

Over the longer term, the values and trends of CyberWave could lead to the widespread use of clean, personal energy sources. In the short to medium term however, emissions from the CyberWave electricity sector will be greatly increased over the Shared Governance or Global Club Scenarios, as CyberWave characteristics will lead to full and unconstrained exploitation of coal supplies for electricity generation. The environmental consequences of the wide spread use of coal would be amplified at the global level by its use in highly populated and growing countries like India and China.

The emissions trends from the CyberWave transportation sector are also uncertain. Rapid advances in the unhindered biotechnology sector could easily lead to the widespread availability of bio-fuels for transportation, both in developed

and developing countries. The increasing penetration of fuel cells will lead to decreased transportation emissions. However, in the absence of the coordinating and priority-determining role played by governments, these developments would lead to increasingly competitive petroleum prices from the major producers. This suggests that in the mid to long term, emissions from the transportation sector would fall, only as easily-accessible oil deposits could be exploited.

The values inherent in the CyberWave Scenario would discourage mass transportation modes. Therefore, in the medium term at least, the scenario would give rise to an increased number of vehicles. The decentralized nature of the economy would also contribute to increased transportation of goods. Much like the electricity sector, the short-to-mid term trend in emissions from the transportation sector will be substantially higher. In the longer term, there is the promise of decreased emissions, though there are several uncertainties and counter trends that could easily overwhelm this promise.

Emissions projections from the industrial sector are even more uncertain than the electricity and transportation sectors. While CyberWave industries will be less reliant on carbon-based fuels for energy supply over the long term, the short to mid term pricing of carbon-based fuels would lead to their wide exploitation. The contribution of non CO₂ greenhouse gases produced by industry would increase under CyberWave. At present, there are five such industrial trace gases that make significant contributions to global warming. In the absence of a climate change regime, it is unlikely that research towards substitutes for these substances would be initiated. It is equally possible that additional substances with equally destructive global warming potentials could result from the widespread biotechnology based innovations of CyberWave.

While the neo-liberal nature of the CyberWave Scenario is generally identified with unsustainable resource exploitation, demand pressures determine the resources that are exploited. The shift towards a less material and resource intensive economy would also act to

conserve forested areas for example. Increased reliance on bio-fuels and biotechnology should also contribute to more sustainable land use practices.

In each of the electricity, transportation, industrial and land use/forestry sectors, the potential for reduced greenhouse gas emissions under the CyberWave scenario exists in the long run. In the short-to-medium term, emissions from these sectors are expected to be substantially higher than in either the Shared Governance or Global Club Scenarios. In addition to being uncertain, prospects for reduced emissions in the longer term are very fragile because their emergence depends on many interconnected factors. Canada is a nation in which all the extremes of the CyberWave Scenario will be played out.

3.5.5 Climate Change Adaptation

The CyberWave Scenario is one in which very little would be done to mitigate the effects of climate change. With emissions continuing unabated, the CyberWave society could be plagued by epidemics (which were previously contained to the southern latitudes), shortages of fresh water, greatly disrupted agricultural production and the loss of arable land; all of which could be accompanied by environmental refugees and civil strife. There will therefore be a need for focused effort on adaptation measures. The socio-economic pressures and lack of coordination amongst nations, organizations and individuals in the CyberWave world would likely overwhelm efforts that might be pursued by governments. Many regions that will suffer the ill effects of climate change most extensively will, undoubtedly, mount some effort to lobby governments to take action on climate change. The individual basis of decision-making will work against these efforts however. In the Canadian case, the regions that will be most adversely affected are predicted to be Prince Edward Island, the Prairies and the northern regions. The political and economic force that can be generated within these regions is limited in comparison to the interests that would stand to lose from mitigation policies. As an individualist society, those with the means will be able to

protect themselves from the dangers of a changing climate, while those without the means will be largely powerless to adapt effectively. Action on the issue of climate change requires an effective government that can enforce measures that are determined on the basis of the public, rather than the personal good. The CyberWave society is therefore largely at the mercy of the forces of nature.

3.5.6 Climate Change Science

Research on climate change is effectively a public good. With a reduced government role there is little opportunity for the funding of scientific research that does not produce privately-enjoyed gains. The potential exists for private funding to arise, perhaps through the philanthropy of one of the new rich. If so, and given the limitations noted above, the regime would be likely to focus on scientific research and public information on the contemporary and future impacts of climate change. This focus would ensure that the climate change issue maintained a presence in the public space. The combined impacts of CyberWave's individualist and libertarian values, lack of economies of scale, proliferation of smaller enterprises, and the general ineffectiveness of governments means that it is questionable whether individual governments, the United Nations, or any other entities, would even be able to conduct the necessary greenhouse gas emissions inventories to report on the status of the issue.

On the other hand, the proliferation of information and communications technologies may assist the regime in its global temperature mapping exercises and monitoring of ambient air conditions.

An additional consideration involves the availability of scientists with expertise on the climate change issue. Under both the Global Club, and Shared Governance Scenarios, increased academic activities related to climate change could be expected. However, under CyberWave, given dwindling government revenues and influence, education, especially post-secondary education, is likely to be provided by the private sector on a system of full-cost

payment for learners. As such, given the entrepreneurial, technology-based consumer driven nature of the economy it is also likely that university based activities and research will also focus more tightly on provision of products and services for the consumer economy. It is difficult to imagine the CyberWave Scenario providing education and research opportunities in areas such as climate change, that do not result in directly quantifiable economic returns. Biotechnology and agri-forestry sectors might fund science-based research related to climate. However, any operational science-based regime will not have the capacities of the 1990s IPCC. Any remaining science regime will be extremely limited due to the decreasing availability of accurate emissions inventories, and the collapse of the climate change related academic community.

3.5.7 Conclusion

While many of the longer-term elements of the climate change issue are uncertain under CyberWave, it can be projected with reasonable certainty that the short-to-medium term outlook will give rise to increased greenhouse gas emissions. The citizens of CyberWave will be especially vulnerable to the impacts of the changing climate. These dramatic impacts, coupled with the continual replaying of the tragedy of the commons scenario, could provide some public support for government action. To have any hope of altering the complexion of this society, however, governments at all levels would have to become more nimble than has ever been previously imagined. Even if governments were able to stay abreast of the rapid and ongoing change within the society, the prospects for developing effective enforcement mechanisms that would enable the use of regulation is quite limited within the CyberWave regime.

No pattern of human behavior and organization is permanent. Perhaps of all the scenarios, CyberWave is the most transient. Just as it would have arisen from the combination of the various social, political, economic and cultural factors predominating at the end of the 20th century, new organizational structures and predominant values could, in turn, arise from

CyberWave. The increasingly disruptive impacts of climate change may deliver powerful exogenous shocks to the CyberWave regime. These shocks, coupled with the pressure exerted by the large portions of the population that have not benefited from the economic growth under the regime, could result in the CyberWave era being replaced by a more coordinated regime in the years immediately following 2015. While it would be too late to arrest the changes already underway, any new regime could capitalize on the potentials of CyberWave for reducing long-term emissions, and also make the necessary provisions for adaptation to the ongoing impacts of climate change. Under this scenario the challenge for governments goes beyond the need to generate effective compromise. A scenario in which governments are seemingly powerless to take action on climate change is improbable, to say the least, because common property problems such as climate change can not be resolved in the absence of an entity which uses the public good as its decision making criteria.

3.6 Regional Dominators Scenario

3.6.1 Driving Forces

Despite not directly targeting the climate change issue, several features of the Regional Dominators Scenario could lead to reduced greenhouse gas emissions, improved land use practices, and reduced climate change impacts. However, there are an equal number of factors that could just as easily lead to increased greenhouse gas emissions. The slower pace of economic growth, more restricted access to the earth's resources, the decrease in overall global transportation of goods and the growing nature of regional, if not global stewardship over resources, will all act to decrease greenhouse gas emissions over the short to medium term.

Effective action on climate change mitigation largely depends on the pace of innovation and the replacement and modernization of dated consumer, industrial and energy stocks. Due to the slower pace of economic growth, this turnover would not take place under the Regional Dominators regime. As well, any new resources that are available will be directed toward security

concerns. The increasing retrenchment of domestic governments and the subsequent decline in influence of non-governmental organizations means that the increasingly consolidated MNCs will have fewer constraints placed on their operations. In the absence of pressures from these fronts MNCs are not expected to concern themselves with the climate change issue.

An important consideration under the Regional Dominators scenario is the role that will be played by the OPEC nations. Because these nations are geographically dispersed various member states will be absorbed by different regional blocks. Some blocks will inevitably have petroleum surpluses while others will have shortages. The geographic separation of the primary oil producing and oil consuming regions of the world would indicate that some shortages of oil in large Western economies are likely. Over the longer term the factors that will result in increased emissions will undoubtedly outweigh those that lead to emission reductions. Unless it too gives way to a different scenario in the future, the Regional Dominators scenario could be expected to block meaningful progress on climate change mitigation, although it could be expected that adaptation efforts would be made in order to protect each region's own internal security and economic base.

The failure to direct attention to the climate change issue is largely a result of the resource demands that will be focused on the security and economic needs of regional blocs. In the absence of recognition of the mutual interdependence of nations, it is not surprising that a global issue of the nature of climate change would not be addressed.

3.6.2 International Regimes

The international climate change regime in place at the close of the 20th century, involving the UNFCCC and its associated Kyoto Protocol will be a distant memory under the Regional Dominators regime of 2015. There will be no agreed limits, nor coordinated efforts, to constrain emissions of carbon dioxide from individual nations. Recognizing that climate change is a problem whose contributing factors are

international in origin, regional blocs would have little incentive to pursue mitigation related activities. However, unlike under the CyberWave Scenario, regional blocs could be expected to direct attention and resources to adaptation to climate change within their respective regions.

Given the almost "war footing" nature of the Regional Dominators economy, one which contains little global trading- oil and petroleum products could conceivably be rationed within blocs under this scenario, with obvious effects for the emissions of greenhouse gases. Stewardship over other natural resources, such as forest products, may be exercised to ensure that bloc resource needs are met.

3.6.3 The Role of Multinational Corporations and Non Governmental Organizations

MNCs, which would be consolidated within the bloc and primarily based within the dominant nation, would not likely take action on climate change, considering the limited portion of the total, emissions over which these companies and the bloc itself has control. A given MNC's contribution to the public good would likely be seen as limited to the production of the products the bloc needs to maintain its strength in the face of external threats. The considerable power of these companies will serve to further the subordinate position of all but the dominant nation within the bloc. The ability of NGOs to restrain the activities and influence of these companies will be quite limited. There will be little tolerance for the actions of NGOs when there are so many perceived external threats. NGOs will find success only where their goals can be seen to overlap with the goals of the state. Where this is the case, a sense of patriotism will motivate society's support. This limitation will prevent NGOs from exuding their influence in ways that will generate appreciable change in the system.

3.6.4 Sector Specific Mitigation Features

The electricity sector of Regional Dominators in 2015 will not be substantially different from that at the turn of the century. There will be a continued, if somewhat increased reliance on coal

as the fuel source for electricity generation. Several factors could also contribute to nuclear power experiencing a renaissance under Regional Dominators. As existing plants come to the end of their useful life, there will be economic pressures to refurbish and extend their operations. Without an effective NGO community, and with an increasingly less democratic environment, such pressures will be difficult to check. Nuclear power will be seen as a necessary contribution to domestic power needs if there are restrictions on less readily available natural gas and oil. Research efforts to develop new, cleaner power supplies may be ongoing but these efforts will be dramatically scaled back.

Finally, it should be noted that the Regional Dominators Scenario is the one under which massive hydroelectric developments could also experience a renaissance. In the absence of democratic pressure, there will be little that can be done to stop the dominant governments or multinationals from flooding vast tracts of land. With the United States having long ago exploited their major hydroelectric prospects, Canada might be unable to resist American pressures to exploit available hydroelectric opportunities within their own jurisdictions.

Nuclear power and hydroelectric developments could meet any demand increase and possibly reduce some emissions from other nations within the block. There would, however, be an offsetting increase in emissions from coal sources due to the lack of penetration by new technologies, and possible restrictions on oil and gas use.

In the Regional Dominators transportation sector of 2015, emissions can be surmised to be substantially lower than what was projected at the turn of the century. This will be due to the decreased transportation of goods, and people, accompanying the collapse of the global trading system. Lower rates of economic growth also mean reduced investments in personal transportation. Finally, if as predicted, blocs impose restrictions on oil consumption, the use of carbon fuels for personal transportation could be seriously curtailed. The lower level of investment in alternative fuel research and the lower turnover

of vehicles and technologies suggest that alternative fuels are unlikely to have a significant effect on emissions by 2015. Despite the continued use of older, and dirtier vehicles, restrictions on transport would finally halt the ever-increasing trend of emissions from the transportation sector.

Greenhouse gas emissions from industry would largely offset any reductions from the transportation sector in 2015. Due to competitive concerns, coal use would increase while the use of somewhat scarcer natural gas and oil would decrease. Few restrictions would be placed on industrial operations. Concerns over siting industrial facilities near to major urban centers would be countered by efficiency concerns that require the same industries to be close to their large markets and employment centers. Wielding effective control over the economic and political machinery of the day, major corporations would not voluntarily constrain themselves in any way by restricting the use of carbon based fuels. Under the Regional Dominators Scenario, the low pace of growth and the focus on security needs also means that the dematerialization of the economy would be slowed. The growth of the consumer services sector would slow and the overall lower growth rates would lead to decreased investments in new, more efficient plant and machinery.

Lack of government capacities and lack of new investment will combine to place heavy pressures on the forestry and land use sectors of developing countries in the Regional Dominators Scenario. Recognizing the more limited areas from which their economies can draw major bloc nations will play a greater stewardship role over their regional resource bases. Regardless of which of these possibilities dominate, it can safely be projected that land use changes will not result out of concerns over climate change, and in any event will have negligible impact on overall greenhouse gas concentrations in the atmosphere.

3.6.5 Climate Change Adaptation

Self-interest may dictate that attention will be paid to adaptation efforts in regions that are threatened by climate change. In developed

nations, coastal and river valley developments will be suspended over fears of storm surges and flooding. Food reserves would be maintained in quantities sufficient for several years' demand, as any agricultural disruptions could not be offset by imports from outside the bloc. Minimal assistance could also be expected where climate related disasters strike. The bloc dominators will be eager to prevent refugee crises from arising within their regions. Bloc dominators might also be able to fend off outbreaks of what were tropical diseases as the climate changes. The capacities of the health systems themselves would be in an advanced state of decline. In many ways, the Regional Dominators Scenario would see nations, especially developed and major bloc nations, doing their best to cope with and adapt to climate change impacts, despite the limited resources available for the effort. In the absence of any significant mitigation efforts, such adaptation activities are likely to be quickly overwhelmed by the powerful impacts expected from the changing climate.

3.6.6 Climate Change Science

Like the UNFCCC and the Kyoto Protocol, it would be expected that the robust, international scientific regime built up under the IPCC would also be swept away. Climate data, like any domestic statistic or information, would fall under a web of secrecy. Resources would not be directed towards conducting detailed emissions inventories. In the face of more pressing security and economic needs, fewer resources would be spent on the academic research and investigation of the issue. The scenario is in no way compatible with the prospect of continued scientific research on an issue such as climate change.

3.6.7 Conclusions

The Regional Dominators world is one of escalating economic, security and environmental pressures. Like CyberWave, it must be considered as a predominantly transient scenario. Unlike CyberWave however, environmental concerns, and climate change specifically, will not be the significant factors which give rise to a new regime. Instead, the characteristics of the scenario suggest that either economic stagflation,

or military, inter-bloc conflict will arise as the change agents. In either case, the prospects of addressing climate change in the short or long term are equally unlikely under this scenario.

Unlike the CyberWave Scenario it is not the lack of power that negates movement toward climate change mitigation but the inability to generate global agreement to do so. Within a given bloc, policy is standardized around the dominant economy. In Canada's case, this would most certainly be the USA. Countries like Canada would cease to function as an independent entity, but rather as part of the bloc. To a considerable extent, Canada would be a policy taker. Domestic policy would have to be in alignment with the needs and goals of the USA. With the USA being historically resistant to climate change mitigation efforts, the dramatic effects of climate change are certain to have their full effect within Canada. Economically, Canada would largely be a supplier of power and natural resources to the USA economy. Just as Canada would have to fall into line, so to would the sub-national levels of government within Canada.

3.7 Scenario Summary

Coordinated actions to mitigate a changing climate through reduced emissions of greenhouse gases will only occur under a certain set of circumstances. As a common property style problem, global cooperation will be required if climate change is to be addressed effectively. The absence of this cooperation is at the heart of the inaction within the Regional Dominators and the CyberWave scenarios. Public sector empowerment will be proportional to the level of environmental awareness within the general public, the business community and civil society. To date, awareness of the climate change issue has been largely driven by advancing scientific knowledge.

Though expected under each scenario, effective and fair climate change adaptation activities are also dependent on many of the same factors. Advanced scientific knowledge is required to highlight the need for, and direct the application of, adaptation initiatives. Only strong global economies will be able to provide the

considerable resources required for adaptation and reinforce the feeling of mutual interdependence that facilitates cooperation.

As a nation that is both expected to endure particularly intense climate change but is also dependent on fossil fuels and energy intensive industries, the imperative for Canada is one of balance. The extent to which this balance can be achieved varies depending on the scenario. Clearly some scenarios are more favorable than others, from a Canadian perspective. Neither the CyberWave, nor the Regional Dominators Scenarios are particularly appealing to a nation that is attempting to address a problem that requires both extensive international cooperation and public sector empowerment. These are not the only scenarios in which Canada is relegated to the status of policy taker. However, being a policy taker presents a situation in which walking the fine line of balanced objectives is increasingly difficult. The ongoing challenge for Canada under each of the scenarios is not just to find a way to influence international agreements in order to achieve desirable outcomes, but to find a way to implement the international agreements to which Canada is committed. Regardless of the defining characteristics of a given scenario, improved intergovernmental cooperation is vitally important if Canada is to achieve its goals in an effective but balanced fashion.

4.0 The Impact of International Regimes and Issue Status on Canadian Society and Domestic Governance

4.1 Introduction

The different scenarios that have been discussed will lead to policy responses to the climate change issue that are somewhat divergent. As was noted in chapter 2, while the federal government can set the overall direction of national policy by virtue of its responsibilities to speak for all Canadians in international forums, it is the provincial governments who, on climate change, will determine the pace at which Canada can move to meet its international goals. The state of the Canadian policy position will largely be determined by the balance of power between economic, social and political interests within

Canada, which will in turn be influenced by the international regimes defined by the given scenario. Each scenario could have quite distinct economic and social ramifications for the different geographic regions of Canada, and different groups within society. The policy response within Canada will be defined by both the pressures for action that exist under each scenario and the necessity of working within the context of existing governance norms. Where these pressures are great, and particularly when they are derived from sources beyond the influence of Canadian governments, the potential exists for existing governance structures to be altered in significant ways. By the year 2015, the policy response to climate change, the intergovernmental relations that brought it about, and the institutions that are used for its implementation, will be different in significant ways from that of today, under each of the four scenarios. In each of the scenarios there is a need for improved federal/provincial relations. In general, as the level of governance goes up, so does the need for enhanced federal/provincial co-operation.

4.2 The Global Club Scenario

4.2.1 Introduction

The Global Club Scenario came into being because politicized, inclusionary multilateral negotiations repeatedly left important international issues inadequately addressed. Awareness amongst governments, the general public and the business community, in particular, that decisive action was needed to address climate change, as well as other important issues, became widespread. The Global Club, which serves as a benevolent dictator, evolved from this need for decisive action. The power that is exercised by the small and elite Club has come at the expense of smaller nations such as Canada. Under this scenario, Canada is relegated to the status of policy taker. Motivated by the desire to avoid the enormous costs associated with a changing climate, as well as those stemming from draconian policy measures that were seen as increasingly justified by many NGOs, and growing elements of the general public, the mitigation and adaptation measures undertaken

by the Global Club, by the year 2015 would be rapid and unapologetic. The policy response, which would be determined on a utilitarian basis, are the most significant of any scenario.

The aggressive policies that are pursued by the Global Club will not, however, preclude the continuation of the climate change process. Continued climate change, and severe weather in particular, coupled with the improved ability to link these events to global warming, provide ample opportunity for concerned NGOs to maintain considerable levels of public support for policy action. Under the Global Club, these actions take the form of universal carbon pricing and land use restrictions. The use of these measures has potentially severe implications for agriculture, forestry and heavy industry; all of which have been the traditional basis of the Canadian economy. The Canadian economy in general has depended on low energy prices to keep production and transportation costs down.

4.2.2 The Domestic Imperative

The response to these new regulations and market-based incentives will be continued movement toward an economy that is based on less energy intensive industries, such as the high tech and service sectors. Within industry, eco-efficiency will be widely pursued in an attempt to reduce the costs associated with emission pricing. A similar movement toward more sustainable forestry and agricultural practices can be anticipated. The transition of the Canadian economy from an energy intensive resource based economy, to a high tech service based economy, can be expected to involve both a geographic redistribution of employment and increased inequity. Those with relevant education will gain, while lower skilled positions in manufacturing and resource industries will decline. This reduction in employment will create resistance to the Global Club by labor groups. The resistance will be strongest in regions that have been particularly dependent on the industries that will be in a state of relative decline as a result climate change mitigation policies. Given the widespread public awareness of the effects of climate change, this resistance may result in little more than some measure of compensation for those affected by

mitigation policies. As a policy taker within the Global Club Scenario, Canada will be unable to alter these policies despite the opposition that is voiced.

In the Global Club Scenario, a limited number of large and sophisticated NGOs would take strides to address the issue of climate change by working with MNCs who may be members of the Global Club. The general public will be well informed and concerned about the issue. As a democratic country, all levels of Canadian government can be expected to reflect this concern. As a country that must accept policy from the powerful Global Club, however, the pressures of public opinion within the democratic system form only one of the influences that determine domestic policy. Because climate change is a priority for the Global Club it is, necessarily, a priority for Canada. The need for Canadian governments to be involved in the achievement of climate change mitigation efforts that the Global Club dictates is heightened in Canada's case because of the potentially enormous economic consequences such policies could produce.

If, as suggested, an international emission-trading regime is established, multinational and exporting companies within Canada will be required to purchase trading allowances on the international market. In this case a significant component of the emission reduction strategy will be beyond the influence of governments. With little, if any, influence of consequence over the formation and implementation of carbon pricing policies, governments within Canada will focus on reducing the economic burden, and social disruption, that these policies will produce.

4.2.3 The Policy Response

In an attempt to generate the improved efficiencies that are required to maintain competitiveness, the federal government is likely to facilitate the development, and diffusion energy and emission saving technologies via Industry Canada. DFAIT will actively assist Canadian firms by seeking out low cost emission reduction opportunities that can be taken advantage of in the developing world. Natural

Resources Canada will attempt to develop innovative ways to reduce the use of coal, and reduce the emissions that come from the combustion of coal. The capture and geological storage of carbon dioxide may form a significant component of greenhouse gas mitigation, particularly in Western Canada. The provincial governments will also seek to extend the lives of all greenhouse gas free electricity sources that have low per unit costs, such as nuclear and hydro facilities, in order to keep electricity prices competitive. Privatized or subsidized rail transport could also form a component of the governments' efforts to increase the efficiency of the Canadian economy. The need to maintain the competitiveness of Canadian industries in the open and fiercely competitive global markets of the Global Club world may induce governments to reduce both corporate, and personal income tax rates to levels that are closer to those of the United States.

Aside from policies designed to maintain the competitiveness of Canadian industries, many obligations will be placed on Canada. Environment Canada, supported by their provincial counterparts, will be responsible for the extensive monitoring activities needed to maintain an up-to-date national inventory of emissions by sources and sequestration by sinks. Additionally, detailed adaptation strategies will be required. The Department of National Defence, Health Canada, provincial governments and civil society organizations, such as the Red Cross will have to work together to develop ways of minimizing the effects of climate change induced threats, such as epidemics and extreme weather events.

4.2.4 Federal/Provincial Relations

Canada's federal government will serve as the primary implementing entity for the Global Club. When policy has been dictated to the federal government, it is their responsibility to put the policy in place and to do what is necessary to gain agreement from the provinces. The democratic and inclusionary nature of the Canadian federal system, in which jurisdiction over environmental issues is shared between the federal and provincial levels of government, is

not, however, designed for operating with the same speed as the decisive Global Club. Throughout the country the need to respond quickly and effectively to the Global Club's demands, and the costs of not doing so, will become increasingly apparent. As a result, considerable pressure for improved federal provincial relations will mount. Larger provinces, such as Ontario, Quebec, British Columbia, as well as the resource-based western provinces will be very mindful of any federal excursions into their jurisdictional domain. This pressure will be intensified by the strong desire to gain greater influence within the Club itself, and the recognition of the need to speak as one voice to do so.

Significant changes to the existing system will be necessary if the Canadian federal system is to operate effectively on the Global Club's time lines. If federal/provincial coordination is to improve in an appreciable way the structure of the system of negotiations will need to be reformed in such a way that it is a results based process. A key component of this reform will be a redefinition of who the relevant players are. The multi-stakeholder approach will be expanded to include key members of the business community in the negotiations with the first ministers. The discussion space will be very limited, as determined by the Club's decision-making and policy powers. If the federal government is to facilitate improved intergovernmental relations around the issue of climate change, greater cooperation between key federal departments such as Industry Canada, Natural Resources Canada, Environment Canada and DFAIT will be an important first step. A greater commitment to the "greening" of federal government operations will also provide an opportunity for the federal government to take the moral high ground.

The potential for improvement of intergovernmental relations over areas of shared jurisdiction in response to external pressure is not without precedent. Just as federal/provincial relations concerning economic issues improved as a result of the challenge that was presented by the negotiation of the Free Trade Agreement the potential for improved relations concerning environmental issues to emerge in response to the challenge of global climate change is

considerable. The necessity of speaking with one voice when negotiating with the United States is effectively mirrored by the same need for unity when dealing with the Global Club. (Brown, 1993: 93)

While moral suasion can serve to generate effective compromise, particularly when the recognition of the necessity of compromise is acute, it may not be an adequate arrangement in the long run. Even with the pressure that can be exuded on the Global Club hanging over the decision making process, this pressure may not be effectively translated to the provinces. To achieve effective federal/provincial agreements on a consistent basis, new decision rules such as two thirds majority will need to be applied. The Global Club may act to exude its influence over individual provinces directly to facilitate the adoption of a decision rule that will promote expediency in decision-making. The international framework is one that is arranged in a hierarchy that has the primary goal of expediency of decision-making and implementation of policy. The ability of one province to exercise an effective veto (as Ontario did in the October 2000 Joint Ministers Meeting) will simply not allow the federal government to live up to its obligations to the Global Club.

The transformation of the Canadian federal system into one that can act sufficiently quickly and effectively to satisfy the Global Club will be a substantial undertaking. While the Club may use its significant influence to promote the adoption of new decision rules there are a number of factors that could potentially complicate intergovernmental relations under the Global Club scenario.

If the economic growth in urban centers continues at its current rate, environmental policies undertaken by them may be of greater significance. The potential for intergovernmental conflict could be increased if large cities, such as Toronto, were to gain elevated status within the Club, relative to their historical status within the Canadian federalist system. The dynamics of intergovernmental relations could be dramatically altered if the federal government were to bypass

the provincial governments by dealing directly with cities or powerful municipalities.

The tactics of MNCs operating within Canada may serve to undermine efforts to improve intergovernmental co-operation. In an attempt to best serve their specific interests, MNCs will deal directly with those governments that the MNCs believe will be able to give them the best deal – be they either the federal government, provincial government or perhaps local government. As members of the Global Club, these firms have some power over all levels of government. The opportunity exists for MNCs to play one level of government against the other in order to receive the most favorable possible treatment from the public sector. This could serve to greatly intensify federal/provincial tensions in many instances.

The Global Club will rely primarily on the federal government to serve as an implementation agent but in certain circumstances the Club will deal directly with the provinces or industries. For the adoption of new standards in manufacturing or for land use there should be no need for the federal government to pass legislation to bring these standards into being. In areas of provincial jurisdiction the Club can deal with the provinces directly or the new standards may simply become a necessary condition for trade, as is the case with the mandatory purchase of emissions credits which must accompany the purchase of greenhouse gas emitting products.

4.3 Shared Governance Scenario

4.3.1 Introduction

The Shared Governance world is one where the UNFCCC is still in place and the Kyoto Protocol has been ratified. The WTO has been reformed and has a mandate to permit the use of trade sanctions for the purposes of enforcing the Kyoto commitments. In contrast to the situation under the Global Club, the Shared Governance regime is defined by an inclusive and democratic approach to decision making. While the decision making process can be considered to be more just than that of the Global Club, the pace of decision-making is considerably slower.

4.3.2 The Domestic Imperative

Under the Shared Governance scenario national sovereignty is respected. While Canada is not a major force in the international realm, it has much more influence than is the case under any of the other scenarios. Canada also has considerable freedom in the formation of its domestic policies. Emission trading is expected to take place at the national level, and the use of the Kyoto mechanisms is expected to be widespread. By responding to price signals and the desire to avoid government regulation, Canada's private sector firms are expected to be responsible for much of the emission reductions that are achieved domestically.

The federal government is ultimately responsible for meeting the commitments agreed to under the Kyoto Protocol. Because climate change policies under the Shared Governance Scenario will be domestically designed and implemented, the federal government can be expected to be the party most involved in greenhouse gas mitigation efforts. Because any climate change policies will have implications for regional industries, and therefore provincial economies, the provinces will, in all likelihood, view climate change policy as a high priority issue. Those provinces that are less dependent on industries that will be most directly impacted by mitigation policies will still be concerned about the climatic changes that will affect every province and territory. Because these climatic changes will be increasingly felt, the issue will be of the utmost concern to NGOs. These economic, social and environmental concerns, coupled with the increase of scientific confidence would suggest that the general public would be quite well informed and concerned about the issue.

4.3.3 The Policy Response

The centerpiece of national mitigation policies will be the establishment of a domestic greenhouse gas emission trading system that will be overseen by the federal government. The widespread use of the clean development mechanism provides an opportunity for DFAIT to seek opportunities for low cost emission reductions in developing countries. As was the case under the Global Club Scenario, different

federal departments are likely to pursue the goal of maintaining maximum competitiveness under a carbon-pricing regime. Because the rate of change is less rapid under Shared Governance than would be the case under the Global Club, the scale of the efforts would not be as great. Demonstration projects in the areas of public transport and subsidized research efforts could make up a notable portion of these activities. More rigid regulation leading to greater energy efficiency in key sectors, such as the construction industry, is also probable. Natural Resources Canada would also pursue efforts to reduce the greenhouse gas emissions that are produced by the burning of coal.

The design of domestic policies will largely be shared between the federal government, the provinces, industry and NGOs. Policies will take longer to be developed but will enjoy broader and deeper support than those that arise under any of the other three scenarios. Industry leaders will be able to influence "backstopping" emission reduction regulations that will in all likelihood never have to be applied to them since they will have been ahead of the curve from the outset. The obvious benefits associated with creating policies that impact their less environmentally progressive competitors will entice an increasing number of firms to adopt progressive stances on the issue of climate change.

4.3.4 Federal/Provincial Relations

The Shared Governance regime has emerged, largely because of the successful achievement of compromise at the international level. The stability of the Shared Governance regime depends on the continued resolution of international issues in what is considered to be a fair manner, through compromise. If Canada is to do its part to preserve, what is from a Canadian perspective, a very desirable international regime, and its place within it, Canada must live up to its internationally agreed commitments. Improved policy coordination with the provinces is, therefore, of the greatest importance.

In an attempt to gain the needed cooperation from all parties involved, but the provinces in particular, the multi-stakeholder approach will be

greatly expanded. The provinces, along with all the relevant representatives from the business community and civil society, will be included in the formation of the international stance to be adopted by the federal government. In all likelihood, key provincial governments and perhaps key NGOs and business leaders will be allowed to speak on behalf of their particular interests within the international negotiations. Under this scenario, the power of the federal government will be weakened.

The objective of the federal government is to achieve cooperation in the implementation of policies in which the stakeholders have played a role in developing. The federal government will run public education and outreach programs in an attempt to further engage a relatively informed public on the issue of climate change.

Public recognition of both the severity of the effects of climate change and the value that is derived from maintaining Canada's place within the international community will provide the impetus for improved cooperation. Those provinces or industries that are seen as blocking the development of a consensus view, or the implementation of policy, will be seen, in the eyes of an increasingly aware public, as being willing to embarrass the country internationally and make the country more vulnerable to the impacts of climate change in order to advance their interests. To a certain extent, this was the case for the Ontario government who refused to sign on to the first National Business Plan at the Joint Ministers Meeting in October 2000. While some public criticism was directed at the Ontario government, there was not enough to prevent the Ontario from maintaining its opposition to the Business Plan.

While public awareness may serve to temper the extent to which regional interests are pursued, the inequitable distribution of the impacts of climate change and the costs of mitigation efforts create significant divisive pressures. The extension of stakeholder inclusion may serve to overcome intergovernmental conflict on several issues but this will be an exceedingly difficult task to achieve with respect to climate change policy. The potential for levels of

intergovernmental policy coordination to actually decrease over time is quite real. This will create pressure to reform the system in order to end the artificial divisions between the provinces and the federal government. If the popularity of regional parties continues to expand, the federal parliament may, to a certain extent, serve as a proxy for regional interests.

The growth in awareness of the issue, coupled with the widespread recognition of the appeal of the Shared Governance society, will generate pressure on the different levels of government to work together more effectively. The federal and provincial governments' ability to achieve workable compromises over the long term will be reinforced by each successful agreement and set back by each failure to achieve consensus. If successful agreements are not achieved with the desired frequency and consistency than pressure to abandon consensus based decision-making in favor of a majority rule system may emerge. In the absence of external pressures such as those applied by the Global Club the provinces are unlikely to be willing to give up their effective veto powers. As the federal and provincial representatives continue to struggle to reach agreement on climate change mitigation policies, the potential exists for special side deals to be made between the Prime Minister and certain provinces in order to facilitate action on climate change.

4.4 The CyberWave Scenario

4.4.1 Introduction

The CyberWave Scenario is one that stands in marked contrast to both the Global Club and Shared Governance Scenarios. In Canada the neo-liberal agenda reigns supreme. The capacity of the public sector is inadequate to keep pace with the rate of technological change. As a consequence, tolerance for, and faith in, government intervention is greatly reduced. The role for the public sector is greatly reduced, as is their capacity to carry out their limited mandates.

4.4.2 The Domestic Imperative

Greatly aggravated levels of inequality define Canadian society. This inequality is further amplified by the inequitable distribution of the effects of a changing climate and the absence of significant publicly funded adaptation efforts. While this type of situation is one that would usually attract the attention of NGOs, as a product of public concern, these organizations are few in number and limited in influence, in a world that is dominated by individualist ideals.

What little influence NGOs can muster will be inadequate to shape public policy in any appreciable way. The governments of Canada will have little interest in undertaking the extensive mitigation policies that would be required to have any influence on the rate of climate change when there is little public capacity for doing so.

4.4.3 The Policy Response

Under the CyberWave scenario the advancement of policy is not just unsuccessful; it is sporadic in nature. The areas of policy development are determined primarily by the areas where the government has specific capacity or areas of expertise at any given point in time. Policy initiatives start and stop with the turnover of personnel. Maintaining even an inconsistent patchwork of policies is a challenge for a public service that will be struggling to retain corporate memory. The extensive federal-provincial coordinating mechanisms established in the late 1990s to deal with climate change will have evaporated in the CyberWave Canada of 2015.

Regional factions and blocs will be more influential on climate policy than will the federal or provincial governments. To the extent that anything is done about the climate change issue, there will be a patchwork of rules spread from coast to coast. There will be little accountability for Canada's performance as a whole. Rather, should there be any public interest in the issue, the majority of the action will be focused on local governments. As such, while it will be difficult to ignore the effects of climate change in Canada, it will be even more difficult for governments to implement any kind of coordinated least cost mitigation strategy. What gets done would have

been done for other reasons in any case, or, if there were any serious actions taken, such action would likely carry a large price tag. As an issue that necessitates the involvement of all greenhouse gas emitters and extensive cooperation between nations, the individual basis of decision-making throughout society will likely render climate change as a non-issue for governments and business alike.

In the CyberWave era any hope of climate change mitigation lies solely in the hands of technological advancement. Industry Canada may make some effort to steer the development and employment of climate friendly technologies, but to a considerable extent, the engines of growth will live in the entrepreneurial spirit of individuals who are motivated by profit to bring their inventions to market. Banks and venture capitalists will have more influence than will either the provincial or federal governments.

To gain support for those few initiatives the public sector is able to undertake some public education and outreach projects may need to be undertaken. In pursuit of the public good, some resources will be allocated towards the goal of responding effectively to disasters and emergency situations. The limited resources available to the government, coupled with the relative decline in volunteerism in organizations like the Red Cross make it unlikely that the response to what will inevitably be an increasing number of natural disasters will be adequate. In the absence of a realistic possibility that mitigation policies will be undertaken, the maintenance of inventories of emissions and sinks will be largely neglected.

Unlike the provinces, who are expected to take no action at all, the municipalities will likely attempt to pursue some adaptation and disaster assistance programs. The success of these programs will depend on the amount of resources available in a given municipality and the ability of municipal officials to prevent free riders from undermining the attractiveness of such programs. The federal government may attempt to work directly with the municipalities in an attempt to increase its relevance at the micro level.

4.4.4 Federal/Provincial Relations

Despite the reduced power and capabilities of all of the levels of government, the absence of policy action on climate change makes improved coordination and cooperation unnecessary. No new institutions will be created and many existing institutions will be eliminated because of the lack of available resources. Because there are no policies to be jointly implemented and, therefore, no pressure to improve intergovernmental cooperation, there will be no subsequent pressure to reform the system.

4.5 Regional Dominators Scenario

4.5.1 Introduction

The Regional Dominators Scenario is one in which rates of economic growth are assumed to be quite low. The bloc-based isolationism inherent in the scenario may mean that this will especially be true for a country such as Canada, which depends heavily on international trade. It is likely that Canada will fall increasingly under the influence of the United States. Canada's progression towards a high tech economy will be reversed, as the country will be relegated to the position of being a supplier of natural resources to the economy of the United States. Despite slower growth rates and lower income levels for Canadians, the limited pursuit of climate change policies will mean that the effects of climate change will be felt throughout the country.

4.5.2 The Domestic Imperative

In this setting some NGO's will be concerned about climate change but civil society in general will be preoccupied with other concerns. The limited power of these NGOs will translate into very little impact on the policies of the Canadian government. The Canadian government's policy-making autonomy is limited by its subservient position in relation to the United States. In this scenario the pressures applied by NGOs will be far outweighed by the pressures imposed by the region's dominant economy, that are dictated by security and other concerns of greater importance than is the issue of climate change. Because climate change is not a concern for the

government or the general public, the business sector should not be expected to voluntarily constrain the emissions of greenhouse gases. Rather, Canadian business will likely need to react to pressure from the United States to improve their efficiency to sell in the US market. Therefore, some improvements in the cost of production may be expected and with that, some slight reductions in energy use and resultant GHG emissions. However, any meaningful greenhouse gas reductions will be foregone in the race to keep economically afloat.

4.5.3 The Policy Response

The economic departments of Industry Canada, Finance Canada and Natural Resources Canada will in large part control the climate change agenda, to the extent that one exists. Foreign Affairs will focus almost exclusively on trade related issues and, because there will be limited faith placed in broad scale multilateral negotiations, attention will shift to bilateral deals with clear economic opportunities.

Canadian governments, particularly those provincial governments who feel they will have the most to lose, will circle the wagons. Cooperation between the federal and provincial governments will be pursued on a case-by-case basis, and only when it is in the best interest of both parties – likely in some sort of protectionist rally around specific threats from the USA. Federal-provincial committees will be the exception, not the norm. In essence, the policy response of all levels of government will resemble those pursued under the CyberWave Scenario. The low priority attributed to climate change at all levels of society will dictate only modest policy measures.

The need for policy coordination will arise under the Regional Dominators Scenario only in response to concerns over eroding national sovereignty. Fear of the increased influence of the United States may create pressure for a minor reform of the system of intergovernmental relations. The limited nature of the policy response to climate change, however, does not call for increased intergovernmental policy coordination. To carry out the modest climate

change initiatives, no new institutions will need to be established and in fact, many existing ones will be abolished, just as in the CyberWave Scenario.

4.5.4 Federal/Provincial Relations

The climate change issue generates very little pressure for improved federal provincial relations under the Regional Dominators scenario because there is no international agreement to be implemented and no outside pressure to act on the issue. If the Joint Ministers Meetings are still undertaken, the issue of climate change will have little or no place on the agenda. Provincial governments with resources to offer will bypass the federal government and deal directly with foreign governments. The influence of Environment departments in both the federal government and the provinces will shrivel to near nothing, with the exception perhaps of work on adaptation strategies and disaster relief programs. The need to maintain and improve federal provincial relations will be motivated not by climate change but by the need to speak with one voice when dealing with the United States.

5.0 Conclusions

Global climate change represents perhaps the most significant cross-cutting environmental issue that Canada has ever faced. The participation of scientists, economists, civil society leaders and the business community is required. In a world that has become more and more globalized, Canada has increasingly become a policy taker. This trend is evident on climate change as well. The influence of major geopolitical powers and multinational corporations over the policy agenda poses special challenges for a federal state. The provinces' desires for power may be more than is possible within a federal state that is under such external pressures.

This paper looked at four, very different, future scenarios. From this analysis several conclusions have been reached. Only the Shared Governance scenario provides an opportunity for Canada to have a significant say in what its global commitments will be with respect to the climate change issue. Within the federation, opportunities

for the provinces to speak with a unified voice are conceivable but because of the diverse nature of the economic make-up of the regions, these opportunities are likely to be rare.

In the scenarios where climate change is likely to fade from the agenda, such as CyberWave and Regional Dominators, the types of federal/provincial governance structures that will be required is likely a moot point. Under these scenarios, the onus will shift toward individuals, municipalities and the business community. Industry's role as an entrepreneur, and the provider of technology, is highlighted under each of the scenarios.

Within the federal government, the departments with an economic focus will gain increasing influence over the climate change issue. The departments of Natural Resources, Foreign Affairs and International Trade, Industry and Finance will emerge as the dominant players in the development and implementation of climate change policy within the country. Environment Canada's role will be reduced to that of a provider of scientific information and the voice of the federal government's social and environmental conscience.

Within the provinces, large emitters of greenhouse gases will have a prominent role in the near term. The inequitable distribution of both emissions and the effects of climate change will make co-operation between the provinces quite difficult to achieve or maintain. Like the federal government, the provinces are also policy takers, to varying degrees, under each of the scenarios. Under the Shared Governance and Global Club regimes there will be a need for federal/provincial mechanisms to coordinate policy responses.

Finally, in a world that cares about climate change and in a world in which there is a high degree of governance, the issue of determining overall accountability for environmental performance will be critical. When the international community calls upon Canada to account for its emissions reduction performance, will the federal government be left holding the bag? Or will there be a clearly defined structure of provincial and corporate accountabilities in

place? As Canada continues to develop its overall strategy for dealing with climate change, the degree to which there can be buy in from all levels of government will determine the degree of success Canada will have in reducing its contribution to the problem.

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