

## **The Double Eco-illogic of North American Governance: NAFTA, Energy Subsidies, and Climate Change**

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### INTRODUCTION

Subsidies are an important instrument of public policy but can become irrational when they encourage a combination of economic inefficiency, wasteful use of non-renewable resources, and a stream of associated environmental ills. In the energy sector, governments have more often than not emphasized production over efficiency. The fossil fuels industry is the third most heavily subsidized economic sector following road transportation and agriculture (Myers and Kent, 2001, p. 66). We begin this introduction with a definition of the concept of subsidy before considering energy subsidies' relationship to global climate change and international trade agreements.

A public subsidy is a (i) government payment or tax concession and/or (ii) a government intervention such as a tariff or price controls that effect market transfers from consumers to producers (or vice versa) (Steenblik, 1995, p. 483). This definition – adopted with minor variations by key international organizations<sup>1</sup> –addresses only the economic distortions produced by subsidies. It does not take into account the impacts of the “hidden” subsidies of environmental externalities, that is, the environmental costs of resource depletion and pollution borne by society and nature because they have not been internalized through government policies. Some of these costs are quantifiable, including increased health costs caused by smog, while others have nonmarket values and are not susceptible to quantification, such as harm to society related to premature mortality or increased pain and suffering from health disorders. Norman Myers and Jennifer Kent (2001, p. 22) provide a more comprehensive, total costing approach in which “perverse subsidies” are those that are detrimental to *both* the environment and economy.

Subsidies to the fossil fuel industry distort the market by fostering the overuse of fossil fuels, hindering conservation by preventing consumers from knowing the true price of energy, and biasing the market against renewable forms of energy, such as solar and wind power. These perverse subsidies also result in harmful environmental impacts by aggravating resource depletion, acid rain, urban smog, global climate change, and other environmental problems. Numerous studies by the OECD, World Bank, and other

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<sup>1</sup> The Organization for Economic Cooperation and Development (OECD) and International Energy Agency (IEA) have adopted the concept of producer subsidy equivalent (PSE) – equal to the sum of net government budgetary transfers plus market transfers flowing to production – to measure support to primary industries, such as coal. The WTO uses the aggregate measure of support (AMS) to measure countries' progress in implementing the Uruguay' Round's agricultural agreement. AMS differs from the PSE methodology “mainly in that certain types of budgetary subsidies (such as support for research and development) are excluded from the calculation and a fixed reference price is used instead of one that varies from year to year” (Steenblik, 1995, p. 483).

agencies recognize the importance of removing subsidies as a means to reduce greenhouse gas emissions. The OECD and World Bank estimate that subsidy removal would reduce carbon dioxide emissions – the most important greenhouse gas – by about 10 per cent (Maier, 2001).

The proliferating literature on energy subsidies makes a clear connection between fossil fuel subsidies and global climate change. Our concern in this paper is what happens when a third variable – trade liberalization – is added to the mix. Do international economic agreements such as NAFTA strengthen perverse energy subsidies to the fossil fuel industry thus accelerating energy consumption and the release of greenhouse gases into the Earth's atmosphere? This paper will argue in the affirmative: energy provisions of NAFTA actually promote energy subsidies, and consequently foster excessive fossil fuel use. NAFTA's energy chapter promotes the delivery of Canada's non-renewable petroleum reserves at the lowest possible prices to the US. Notwithstanding the international trade regime's strong animus against governments' industrial subsidies, NAFTA explicitly allows Canadian and Mexican governments to subsidize the discovery and development of their oil and natural gas reserves without having to fear American countervailing tariffs against the resulting exports of artificially cheapened energy to the US.

The paper is organized in four parts following the CEC Analytic Framework for Assessing the Environmental Effects of NAFTA. Section one provides an environmental, economic, policy, social, and geographic context for the subject, including efforts by Canada, Mexico and the United States to increase the free trade of energy (as well as its subsidization). Section two examines the environmental impacts of subsidies at the various stages of the fossil fuel cycle from the point of production to the point of consumption. Section three explores the implications of NAFTA's connections to the issue by looking at its rule changes, its institutions, and its resulting trade and investment impacts. The final section offers a number of recommendations on how such international trade agreements as NAFTA and the WTO can be made to promote a switch in North America's energy consumption patterns from the highest per capita energy user in the world towards a conserver society

## I. CONTEXT

### Economic Context: Eco-Illogic #1

Global subsidies for fossil fuels are estimated at US\$200 billion per year (Maier, 2001).<sup>2</sup> OECD countries account for approximately 40 per cent of global energy subsidies, much of it spent on sectoral support for ailing coal mines. Perverse subsidies keep energy prices low and artificially create upward pressure on demand. They also stifle technological

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<sup>2</sup> Other estimates of the scale of subsidies are considerably larger related to in large part to how subsidies are defined. For example, a broad definition might include U.S. military funding to secure shipping lanes in OPEC countries.

innovation that create more environmentally sustainable energy. They sustain the status quo. Low consumer prices for fossil fuels have been slowing and even preventing the adoption of less harmful energy sources, such as wind and solar, which tend to be capital intensive and cannot compete with subsidized fossil fuel. For example, without the millions of dollars they have received in Canadian grants and tax breaks, companies such as Suncor or Great Canadian Oil Sands, could not exist, and the Canadian energy sector would be forced to rely more heavily on alternative energy sources (Gallon Environment Letter, 2002b).

The removal of perverse energy subsidies offers enormous economic and environmental payoffs, such as decreasing total energy demand and displacing more polluting forms of energy with more ecologically benign forms. Not only would it increase economic efficiency by removing market distortions, it also offers what many see as a panacea for environmental degradation, mitigating everything from resource depletion to acid rain and the emission of greenhouse gases (Shelby et al., 1998; DRI, 1997, Steenblik and Coroyannakis, 1995).

#### Environmental Challenges: Eco-Illogic #2

Government policy has consistently externalized the environmental and social costs of energy production. Energy users do not pay the full environmental costs associated with the production and consumption of fossil fuels. As we will see in section two, the overconsumption of energy produces immediate and long-range effects associated with fossil fuel exploration, extraction, distribution, and use. Energy subsidies need to be re-oriented from a system of perverse subsidies (i.e., pay the polluter) to a polluter pays principle so that environmentally sustainable energy pathways [ what's an energy pathway?] are firmly established and encouraged. In addition, trade and the environment need to be better integrated in the energy sector in order to meet the targets set in the Kyoto Protocol and beyond. The deepening of trade and environment linkages implies facilitating the removal of economically distorting and environmentally damaging energy subsidies.

#### Policy Context:

Energy policy in the NAFTA countries has undergone a marked convergence over the last five years. Although distinct differences remain between Canada, Mexico and the United States, all three countries appear to be moving towards domestic deregulation and continental integration. Nevertheless, the current energy policy thrusts of the NAFTA partners clearly contradict the dictates of environmental logic. In defiance of strong national and international calls for subsidy reduction and green energy promotion, the governments of Canada, Mexico, and the United States remain committed to traditional forms of environmental and economic policy. Despite the clear signals from the OECD and UNEP, the issue of subsidy removal in the energy sector is absent from both domestic and trilateral policy discussions.

An overview of the regulatory environments of the NAFTA partners reveals three distinct policy structures. While high levels of government intervention exist in the three countries, Mexico's sector exhibits the greatest degree of state control. According to Article 27 of the Mexican Constitution, *Petróleos Mexicanos* (PEMEX) oversees the "generation, transmission, transformation, distribution, and supply of electricity as a public service" (Lady, in press). Since 1992, some private investment is permissible in storage, transportation, and distribution (including import and commercialization) activities. However, PEMEX maintains a substantial share of the installed capacity and distribution infrastructure.<sup>3</sup> Jurisdiction over energy policy in Mexico is given to the Ministry of Energy, which has the responsibility to "ensure a competitive, sufficient, high-quality, economically feasible, and environmentally sustainable supply" (NAEWG, 2001: 53).

In Canada, jurisdiction over the energy sector is shared between the provincial and federal governments. According to the Constitution Act 1982, the provinces control the exploration, development, and conservation of non-renewable natural resources, while the federal government has responsibility for interprovincial and international trade. The National Energy Board (NEB) has the responsibility for overseeing the construction and regulation of pipelines and power lines and the authorization of all fossil fuel imports and exports (Emes, 2000). This division of powers has created a more complex policy environment than exists in Mexico or the United States. Subsidies to the energy sector occur at both the provincial and federal level. Historically, provincial governments have been concerned with local economic development, and thus have focused on exploration and processing activities. Federal interests have centered on ensuring self-sufficiency, equalizing the standard of living across the country, and increasing international trade and investment. Thus, national subsidies are geared towards the transportation and distribution infrastructure, as well as the development of projects of national significance (NAEWG, 2001).<sup>4</sup>

In the United States, as in Canada, both the national and sub-national levels of government have jurisdiction over energy resources. The Federal Energy Regulatory Commission (FERC) and the U.S. Department of Energy (DOE) regulate interstate and international transportation and distribution activities. State governments are responsible for local distribution within their borders as well as the regulation and licensing of energy industries. Exploration and exploitation of fossil fuel resources is wholly performed by private companies. The federal and state governments no longer establish contract nor pricing agreements with resource owners or developers; rather market forces are used to dictate the sector's microeconomic structure.<sup>5</sup> Both levels of government provide financial incentives for the further development of the nation's energy resources. For example, the

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<sup>3</sup> PEMEX controls 85 percent of all transportation and distribution capacity (NAEWG, 2001: 52).

<sup>4</sup> The Canadian federal government funds projects such as Hibernia, which were intended to both increase incomes on the impoverished East Coast and generate revenue through increased export potential. Similar investments in energy efficiency could have resulted in higher employment levels.

<sup>5</sup> See André Plourde (2002) for the history of government intervention in pricing and contract negotiations for Canada and the U.S.

recent Energy Plan announced by the Bush administration promises millions of dollars for the development of Alaska's crude oil reserves (The Energy Foundation, 2002).

NAFTA has had important implications for the energy sectors of Canada, Mexico, and the United States. Although they continue to have distinctly different regulatory systems, there has been a definite convergence towards a neo-liberal market-oriented model. Representatives of Canada and the United States have repeatedly stated their commitment to the continued integration of the North American energy sector. In a speech to the 5<sup>th</sup> Hemispheric Energy Initiative US Secretary of Energy Spencer Abraham stated:

Today, no national energy policy is strictly national; it must look beyond borders and recognize the global nature of energy needs.... President Bush recognizes not only the need for an increased [check original?] supply of energy, but the critical role the hemisphere will play in his Administration's energy policy. He has, therefore, given me a clear mandate: to work with our neighbors to meet our energy objectives. (Abraham, 2001a).

Mexico provides a more striking example of the effects of integration. In spite of a traditional association between public control of energy resources and national sovereignty, Mexico has implemented modest, yet important, reforms over the last ten years. Beginning in 1992 with the relaxation by amendment of the language of Article 27 mandating government control of the electricity and oil industries, the country has moved to increase private and foreign investment in the sector.

A second, and somewhat more important, trend is the convergence of the policy agendas of the three countries. This movement is most obvious in the creation in 2001 [check date] of the North American Energy Working Group (NAEWG). Established by the three governments as a trilateral forum to "foster communication and cooperation" and "enhance North American energy trade and interconnections," NAEWG represents the first push by an intergovernmental group for North American energy market integration (NAEWG, 2001).

Although NAEWG and other policy initiatives are purportedly intended to address social, economic, and environmental security, they fall short of their goal. It is obvious from the speeches and comments of Energy Officials in Canada, Mexico, and the United States that efficiency and environmental sustainability are important aspects of the policy agenda. However, the most promising mechanism of conservation, subsidy reduction, is not present in any of the NAFTA partners' energy platforms. In fact, the majority of domestic and international initiatives with regard to fossil fuel consumption are focused on expanding already entrenched subsidy regimes. Despite the stated commitment by Canada, Mexico, and the United States to achieving a sustainable future, the trends in energy policy clearly contradict the logic of environmental protection.

#### Current Energy Policy Thrusts:

##### (i) The United States

Although advertised as a "comprehensive long-term strategy that uses leading edge

technology to produce an integrated energy, environmental, and economic policy,” the Bush-Cheney Energy Plan falls far short of these lofty goals (Energy Foundation, 2002). The plan, tabled in 2001, may mark the first energy policy initiative of the 21<sup>st</sup> century, but offers little advanced thinking. Rather than promote ‘green energies,’ which have been shown to be both ecologically and economically beneficial, the new policy continues to support outdated fossil fuel technology and domestic resource extraction (Energy Foundation, 2002). Renewable energies, such as wind, solar, hydroelectric, geothermal and biomass, are given short shrift, with the plan focusing on the development of new coal and oil reserves. In spite of the long-standing objections of environmentalists and resource managers, the plan promises to open federal lands, in particular Alaska’s Arctic National Wildlife Refuge, to fossil fuel exploitation. Not only do such actions threaten the ecological integrity of the protected areas, but they are economically unsustainable given the abundant foreign sources of relatively cheap crude oil and natural gas.

The Bush-Cheney Plan is not the harbinger of an environmentally sustainable energy future. With its priorities firmly focused on economic growth and supply side management, the logic of ecological protection is left by the wayside. The issue of subsidy reduction, or the lack thereof, is a particular area of note. In spite of the recommendations of international organizations such as the OECD and the UNEP, the Plan calls for an increase in federal funding for fossil fuel technology.<sup>6</sup> Compounding this eco-illogic is a \$180 million cut in to R&D and deployment programs for energy efficiency (except to low-income households). The plan also promises to roll back environmental standards for coal and nuclear power generation and opens private land to federal seizure and exploitation (Energy Foundation, 2002). Perhaps the only environmentally logical step taken by the Bush-Cheney Plan is the establishment of \$3 billion worth of tax incentives for consumer purchases of hybrid or fuel cell vehicles (Abraham, 2002b). However, given that the majority of ecological degradation occurs through commercial transportation and energy production itself, without similar measures designed to make power plants and the trucking industry cleaner, these consumer measures are extremely weak.

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<sup>6</sup> Secretary Spencer Abraham of the US Department of Energy commented in his remarks to the Detroit Economic Club in 2002: “Our current antiquated energy infrastructure is inadequate for today’s and tomorrow’s demands, and its failings are distorting market prices. We have to build the equivalent of as many as 1900 new electric power plants – about one a week – over the next 20 years to meet projected energy demands” (Abraham, 2002b). There are two things wrong with this statement. First, the Secretary does not recommend the use of alternative sources, but rather the continuation of outdated and environmentally destructive forms of energy. Second, does the current status of infrastructure distort the cost of fossil fuels? Economic logic argues that if the infrastructure needs to be replaced then the price of the commodity should reflect this and the profits should be funneled into reconstruction. However, if, as the Secretary is implying, the government finances the upgrading of technology then the price of energy is kept unnaturally low and the cost is borne by the taxpayers, not the consumers or producers of the commodity. Thus, government subsidies to the pipeline and power producers actually produce more harmful market distortions.

The U.S. Department of Energy, in response to President Bush’s call for an improvement in coal power generation, committed itself in 2001 to the subsidization of the Clean Coal Power Initiative. The Initiative costs over \$2 billion and will take over 10 years to accomplish (Abraham, 2001). Although this will spur innovation in cleaner coal-fired technology, it remains wasteful government subsidization which encourages coal use by maintaining artificially low prices.

(ii) Canada

Like the United States, Canada has stated its strong commitment to environmental sustainability. According to the federal Ministry of Natural Resources, “sustainable development provides the framework for federal energy policy, and as a result, policy formation must often take into account competing economic and environmental goals” (NRC, 2002: Online). This apparent resolve was strengthened in 2002 when the federal government announced its intention to ratify the Kyoto Protocol, which commits the country to a reduction in its greenhouse gas emissions by 6% below 1990 levels between the years 2010 and 2012. However, despite the publication of several comprehensive plans regarding Canada’s share of Climate Change mitigation, the vested interests of the petroleum and natural gas industries continue to be barriers to change. Canada’s energy sector is the second highest source of economic activity, generating approximately 8 percent of the country’s GDP (EIAb, 2002: Online). Thus, administrators and regulators face enormous pressure to maintain existing policy practices. Nowhere is this more evident than in the National Energy Board’s (NEB) reluctance to embrace, or even discuss, subsidy removal. For example, in spite of a stated commitment to “develop approaches that improve environmental protection,” the NEB continues to fund [are you sure it has its own program budget for this kind of mega expense? Sounds odd to me]the economically inefficient and ecologically disastrous exploitation of Alberta’s tar sands (NEB, 2000).

Subsidy reduction has not always been excluded from the national energy agenda. In the wake of the dramatic recession of the early 1990s, the Canadian Department of Finance undertook a study of possible reforms of federal support for oil, gas and uranium exploration and development activities. The report highlighted the government’s concern that the “structure of taxes, grants and subsidies may inadvertently disadvantage environmental objectives vis-à-vis other goals” (Department of Finance, 1996:6). At the recommendations of the Standing Committee on Environment and Sustainable Development, the Federal Government substantially reduced its support for energy mega-projects such as the New Grade Upgrader and Hibernia initiatives (Department of Finance, 1996: 6). However, recent budgets have indicated a return to older practices of intense government subsidization of fossil fuel production and development. In particular, Canada is now concerned with increasing its trade by strengthening its transportation infrastructure and developing its vast reserves of oil sands.

(iii) Mexico

Like its fellow NAFTA partners, Mexico has made a strong commitment to environmental protection and sustainable development. In particular, the country is grappling with the worst air pollution levels in North America. In July of 2001 President Vicente Fox announced an “environmental crusade” to clean up the nation’s deteriorating atmosphere and protect its threatened biodiversity (EIAa, 2001, Online). Federal tax incentives have been introduced to increase the use of pollution control equipment and cleaner fuels. In addition, catalytic converters are required on all cars in major urban centers and many drivers must refrain from traveling one day a week (EIAa, 2001, Online). Although such measures have been successful in improving the ambient air

quality in Mexico's largest cities, sustainable development will not be achieved without a reduction in fossil fuel use. Subsidy reduction and market liberalization could be important tools in Fox's campaign. However, at the moment, neither appears to be on the policy horizon.

The North American Energy Working Group:

Although NAFTA contains a comprehensive section dealing with continental energy trade, it was only with the creation of the North American Energy Working Group (NAEWG) on April 22, 2001 that energy policy became a subject of regular trilateral negotiation. NAEWG's primary goal is to:

foster communication and cooperation among governments and energy sectors of the three countries on energy related matters of common interest, and to enhance North American energy trade and interconnections consistent with the goal of sustainable development, for the benefit of all.  
(NAEWG, 2001)

However, as with the individual domestic policies of the NAFTA partners, subsidy reduction has not reached the NAEWG's radar screen. Rather, the group has concentrated on increasing integration and trade flows between the three countries. Sustainable development policies are being explored in the form of the harmonization of electricity regulation (though not necessarily increasing standards in the electricity sector), and energy efficiency standards. Nevertheless, the NAEWG presents an important opportunity for Canada, Mexico, and the United States to tackle the difficult issue of subsidy removal. Many government subsidies can be eliminated unilaterally, but some may need to be undertaken by all trade partners to insure the maintenance of sectoral competitiveness.<sup>7</sup> Such trilateral initiatives can be used to address the contradiction between trade and environmental logic.

Social Context:

Unlike Europe which is heavily dependent on imported energy, America's energy appetite has, in part, been fostered by its large energy resources. The US is the world's second largest oil producer, the second largest gas producer and the largest coal producer producing 10.5% of world oil, 23.9% of gas, and 26.4% of coal (BP Amoco, 1999). This plenitude of cheap energy supplies has helped to create a gas-guzzler consumer culture in the United States, in particular, one that makes it difficult to change energy policy (Paterson, 1996, p. 80). Special interest groups and their political lobbyists make subsidy removal in NAFTA countries a complex process, but one that is possible. Industrialized countries can take guidance from China, India, Russia, and Eastern Europe which have removed about half of their energy subsidies since 1991. For example, China reduced its energy subsidy rate by 50% between 1990 and 1996, and India 36% between 1990-91 and 1995-96 (Myers and Kent, 2001, pp. 73-76). From an international equity perspective, it could be argued that OECD countries "have a special responsibility to set the pace for reform in that they account for well over half of all subsidies" (ibid, p.197).

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<sup>7</sup> Given that countries can unilaterally introduce subsidies for fossil fuels without penalties under the NAFTA regime, the reverse is also true: states can withdraw these subsidies to correct market distortions.

Also, there are growing opportunities in the green energy sector, and public concern and citizen action surrounding the growing costs of air pollution provide support for more rational energy pricing and a reduction in energy consumption.

### Geographic Context:

The geography of North America's energy trade is characterized by a flow of resources from the periphery to the center. In 2000 the United States imported over 8 quadrillion Btus of energy from its NAFTA partners (NAEWG, 2001:12).<sup>8</sup> On average, Canada supplies 15 percent of the US's natural gas resources, and, along with Mexico, 15 percent of the country's total oil supplies (NAEWG, 2001:13). Although there is a small amount of trade in the other direction (Mexico imports gas, petroleum and electricity from the US, while Canada is a net importer of coal) the majority of exports have a distinctly centripetal character.. Figures 1 through 3 highlight the proportional dominance of US energy demand in North America. The United States accounts for 93 percent of the continent's coal consumption, 85 percent of oil consumption and 83 percent of natural gas consumption (NAEWG, 2001:14-15).

The enormity of the United States energy demand is a function of the size and affluence of its citizenry as well as the relative inefficiency of its energy use. As of 2000 the US's population was approximately 281 million with a total GDP of \$8 trillion.<sup>9</sup> Given Canada's and Mexico's populations of 31 million and 97 million, and their GDPs of \$749 billion and \$371 billion, it is not surprising that most of the continent's energy is consumed in the United States (NAEWG, 2001: 4).

Just as the consumption of energy is unequally distributed between the NAFTA partners, so to are the reserves of fossil fuels. In total, North America accounts for approximately 5 percent of global oil supply and 6 percent of natural gas (NAEWG, 2001: 7). Mexico, with an estimated 24 billion barrels, has the continent's largest reserves of petroleum, followed by the United States with 22 billion barrels and Canada with 4.4 billion barrels.<sup>10</sup> Natural gas reserves are primarily located in the United States (57.7%) and Canada (31.8%), while coal reserves are almost entirely within the United States (96%) (NAEWG, 2001:7-8).

In light of the disparity between national supply and demand across the NAFTA partners, an increasingly complex infrastructure has been established to transport energy from areas of surplus to areas of deficit.

## II. THE ENVIRONMENTAL COSTS OF FOSSIL FUEL SUBSIDIES

Energy subsidies, which are intended to stabilize or increase energy production and

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<sup>8</sup> It imported 5 quads from Canada and 3 quads from Mexico.

<sup>9</sup> All monetary amounts reported in constant U.S. dollars for 1990.

<sup>10</sup> This does not include the estimated 308 billion barrels of economically recoverable oil in Canada's tar sands.

consumption, serve to amplify a host of environmental problems. Environmental degradation occurs at every stage of the fossil fuel cycle, from exploration, extraction, and distribution to consumption, producing environmental problems related to habitat destruction and biodiversity loss; land, water, and air pollution; and resource depletion (see Figure 1).

### Energy Production and Environmental Degradation

The exploration stage can result in significant site-specific damage, including landscape scars and mining tailings. Exploration for oil, for example, involves the destruction of hundreds of hectares of land through investigative drilling and the construction of transportation routes (Colley 1997). These impacts are magnified once a viable reserve is discovered. The extraction of fossil fuels generally alters the terrestrial environment through deforestation and the restructuring of soil properties, contaminates water supplies, and creates a significant amount of solid waste. For example, the energy-intensive open pit mining operations in the Alberta tar sands<sup>11</sup> pose a significant threat to local agriculture, forests and wildlife habitat by removing biomass cover and contaminating local watersheds as a result of runoff from waste piles (Smith and MacCimmon, 1999; Gallon Environment Letter 2002a). Further, oil refining accounts for the majority of chemical releases reported by the U.S. Toxic Release Inventory (Taxpayers for Common Sense, 2001).

The environmental consequences of the distribution of fossil fuels have garnered the most media attention. Catastrophic oil spills such as the Exxon Valdez and, more recently, the disastrous oil spill reaching the Spanish coast accident have focused international attention on the dangers of transporting huge quantities of fossil fuels. Major shipping accidents like these, however, are not the primary source of environmental degradation. Routine distribution through pipelines and trucks accounts for the majority of oil contamination (Chivers, 1996). Environment Canada (1996) estimates that over 10,000 cubic meters of petroleum enter the Canadian environment annually through small spills and pipeline leakage. Crude oil and other energy products often prove toxic to wildlife and can seriously disrupt ecosystem functioning.

### Energy Consumption and Air Pollution

At the point of consumption, a series of atmospheric pollution problems appear, including acid rain, urban smog, and global climate change.

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<sup>11</sup> Tar sands consist of a combination of clay, sand, water and bitumen. Located primarily in Alberta and Saskatchewan, these reserves represent North America's last great, untapped reserve of crude oil. These reserves are estimated at 1.7 trillion barrels, of which 300 billion barrels are economically recoverable (Draper 2002; Government of Alberta 2002) assuming the present subsidy structure. However, the tar sands represent a very inefficient and environmentally destructive source of oil. Ironically, the extraction, processing and refining of oil from Alberta's tar sands consumes nearly as much energy as it creates. For every barrel of petroleum produced, approximately 125 kilograms of carbon are released (Gallon Environment Letter, 2002b; 2002c). The extraction of the sands requires large open pit mining operations, resulting in the removal of trees, bush and other vegetation that covers the deposits.

### *Acid Rain:*

The burning of fossil fuels produces oxides of sulfur and nitrogen which combine with water in the atmosphere to produce sulfuric acid and nitric acid respectively. Diluted forms of these compounds are then deposited back to the earth either as acid rain or snow or as acid gas or dust. Acid deposition contributes to the death and disease of several species of trees, kills many fish species, and harms others, results in crop failure, and causes damage to materials including monuments and buildings. Fine particle soot can cause severe lung damage, including asthma attacks, respiratory illness, and premature death. Experts estimate that, along with other contaminants from fossil fuels, these atmospheric poisons take one year off the lives of people living in U.S. cities (Myers and Kent, 2001, p. 8). The compulsory use of catalytic converters in the NAFTA countries has greatly reduced sulfur dioxide emissions from automobiles. However, nitrogen oxide emissions remain highly problematic.

### *Urban Smog:*

Nitrogen oxides are transformed into ozone smog on hot summer days. The resulting urban smog is producing public health crises across many North American cities leading to asthma attacks, emphysema, chronic bronchitis, and other long term lung damage. Air pollution puts children, who are active outdoors in the summertime, and the elderly, with cardiac or respiratory diseases, especially at risk. Coal-burning power plants are the primary source of nitrogen oxide pollution. For example, air pollution from fossil fuel consumption prematurely kills as many as 16,000 Canadians each year (David Suzuki Foundation, 2000).

### *Climate Change in the North American Context:*

Global climate change may very well “constitute the number one externality cost to be considered as an implicit subsidy from society to those sectors that are the main sources of greenhouse gases, namely, fossil fuels and road transportation” (Myers and Kent, 2001, p. 33). Global climate change, also aptly known as the greenhouse effect, results from increases in heat trapping gases in the atmosphere. Carbon dioxide, methane and nitrous oxide trap radiant solar heat, thereby raising the surface temperature of the planet. The combustion of fossil fuels is the primary source of carbon dioxide and nitrous oxide. North America bears a disproportionate responsibility for the release of greenhouse gases. Together, Canada, Mexico, and the United States account for a large portion of global CO<sub>2</sub> emissions. As of 1999 the US topped the list of producers, generating 5.6 tons per capita, while Canada was a close third, generating 4.9 tons per capita (EPA, 2002; EIA, 2001). Although not considered a major source of CO<sub>2</sub> globally, Mexico does contribute a significant amount of carbon within North America. According to the US Department of Energy’s, Energy Information Administration (EIA), Mexico produces approximately 1 metric ton per person, per year (EIA, 2001). The majority of these emissions result from fossil fuel use. According to Koplow and Dernbach (2001) 90 percent of GHG emissions in the United States are released by burning coal, oil, and natural gas. In recognition of the dramatic effects of climate change, governments across the globe have taken steps to reduce their GHG emissions. However, without a significant reduction in fossil fuel use, international targets such as those of the Kyoto Protocol are unlikely to be met. Thus, the reduction of energy subsidies provides an

important tool in the fight to stop global climate change.

According to the Intergovernmental Panel on Climate Change (IPCC) the Earth's surface temperatures have risen 0.6 degrees Celsius since the late 19th century. Although variability is characteristic of the global climate, the last hundred years have witnessed the greatest magnitude of warming over the previous thousand. In addition, average temperatures throughout the 1990s were consistently above recorded means (IPCC, 2001a). The consequences of this warming include an increase in average ocean temperature, a lengthening of the freeze-free season in mid to high latitudes, and a significant reduction in the extent and thickness of Arctic sea-ice (IPCC, 2001a).

The extra-tropical Northern Hemisphere is particularly affected by these changes. The IPCC estimates that since 1976 temperatures in this region have risen 0.17 C a decade (IPCC, 2001a). The majority of this warming has occurred during the winter and spring, resulting in a noteworthy reduction in average snow-pack and glacial extent (ICPP, 2001a). In addition, the duration of lake-ice and river-ice has been shown to be two weeks shorter than it was half a century ago. These changes have important implications for the management of North America's water and energy resources. Filion (2000) argues that an earlier and more intense spring runoff is likely to result in power shortages in late summer months because of reduced water reserves.

Climate change, however, holds more important and dramatic consequences for North America. Studies have shown an increased frequency and severity of El Niño Southern Oscillation episodes (IPCC, 2001a). Over the last decade, ENSO events have occurred at 3 to 4 year intervals rather than the usual 3 to 7 year period. In addition, the 1997/98 El Niño broke global temperature records for sixteen consecutive months. The 1990/91 episode would have similarly resulted in record-breaking temperatures, had it not been for the eruption of Mt. Pinatubo months earlier (IPCC, 2001a). As a result, studies have found an increase in the extent of wet areas across the United States.

North America has also witnessed an increase in the frequency and magnitude of severe weather events (Francis and Hengeveld 1998). Studies have shown a significant rise in the annual number of cold season cyclones in the Great Lakes region between 1900 and 1990 (Angel & Isard, 1998). Throughout the 1990s extra-tropical cyclones were also found to be far more damaging than those of previous centuries. Zhang et al. argue that sea level rise over the last 100 years has exacerbated beach erosion and flooding from modern storms (Zange et al., 1997a - IPCC). In general, there has been a widespread increase in the frequency of heavy or extreme precipitation events across North America (IPCC, 2001a).

The consequences of these changes in the North American climate are dramatic. The IPCC reports that changes in the severity, frequency, and duration of precipitation events will likely require a modification of current land-use systems and infrastructure to avoid costly damage (2001b). For example, sewage systems will need to be reinforced in order to prevent the release of contaminants into the environment through flooding. The IPCC also highlights the important impact of climate change on human health.

Accordingly, vector-borne diseases, such as malaria and dengue fever, may extend their ranges across the United States and into Canada. The incidences of other water-borne diseases may similarly increase as a result of heavy runoffs from agricultural and urban areas (IPCC, 2001b).

Economic projections of the eventual costs of climate change are difficult to make given the long-term, complex, and uncertain nature of global climate change, however most projections predict a decline by a few percentage points in the global GDP (Pearce et al., 1996; Repetto and Austin, 1997). The insurance industry is already facing growing costs related to extreme weather events and fears that if such climate trends persist the industry could face bankruptcy (Munich Re, 1998).

### III. NAFTA CONNECTIONS

#### NAFTA Rule Changes:

NAFTA's negotiators claimed they had achieved a breakthrough by creating a green trade agreement through establishing the Commission for Environmental Co-operation and entrenching the principle of no downward harmonization of environmental laws in the NAFTA countries. However, when it comes to energy the NAFTA agreement either confirms the status quo, or worse, encourages increased subsidies for fossil fuels. NAFTA introduces three important trade rules that depart from the WTO and either encourage overuse of fossil fuels or place significant constraints on governments' ability to introduce energy conservation programs.

First, NAFTA diverges from the WTO Agreement on Subsidies by exempting government subsidies for oil and gas exploration and development from trade challenges. Article 608.2 in NAFTA's Chapter Six on Energy and Basic Petrochemicals states: "The Parties agree to allow existing or future incentives for oil and gas exploration, development and related activities in order to maintain the reserve base for these energy resources." This is, as Steve Shrybman (2001, pp. 75-76) states, an "astonishing inducement to use public funds to support the extravagant fossil fuel appetites that Canada and the U.S. share."

Second, NAFTA's predecessor, the Canada-United States Free Trade Agreement (CUFTA) introduced a unique proportional sharing provision between Canada and US (but not between the U.S. and Mexico) which guarantees a proportional share of Canadian energy supplies to the US in perpetuity, or until those resources are exhausted. The proportion of Canadian energy resources to which the U.S. is entitled is equal to the relative share being exported in the most recent 36-month period that export constraints are imposed (Article 605a). [verify: is this a citation from CUFTA or NAFTA? If the latter does it simply reprint the former's text?]

Third, NAFTA rules for energy trade prohibit the imposition of an export tax on energy or a basic petrochemical that exceeds those applicable to domestic consumption

(Article 605b). Shrybman notes (2001, p. 75): “In contrast, WTO rules allow countries to establish two-price energy or resource policies. When coupled with the quantitative control prohibitions of GATT Article XI, this ban on export taxation effectively and entirely removes government control of energy exports.”

Furthermore, economic impact assessments (EIAs) are no longer required in Canada and the U.S. for export applicants (Multinational Monitor, 2001). [Is this because of NAFTA or because of domestic deregulation?]

#### Trade Flows:

Partly due to CUFTA and NAFTA, the sale of natural gas and oil from Canada to the U.S. market has increased dramatically since the 1980s., Between 1986 and 2001, Canadian exports of natural gas to the United States have more than quadrupled, to more than 100 billion cubic metres per year; and, since 1985, crude oil exports almost tripled, rising to about 80 million cubic metres in 2001. André Plourde (2002, pp. 12 and 18) notes that these changes can, in part, be attributed to policy measures in 1985 when the Canadian government effectively lifting controls on its short-term crude oil exports.

#### IV. LINKAGES TO ENVIRONMENT: PROPOSED SOLUTIONS

##### Government Policy: Subsidy Reform and Other Initiatives

One of the most important policy changes NAFTA governments can undertake to deal with global climate change is a comprehensive program of reducing and removing perverse energy subsidies. Beyond subsidy removal, additional measures need to be considered, such as the promotion of renewable sources of energy and energy conservation programs, instituting a polluter pays principle through taxes, including carbon taxes, which internalize the environmental impacts of energy production and consumption, and the introduction of cross-border energy efficiency standards. A recent UNEP report concluded that the “reform of energy subsidies – especially those that encourage fossil fuel consumption – together with rational taxation structures and other policy initiatives – could steer development in many countries onto a more sustainable path” (UNEP, 2001, 3).

Many organizations, both inside and outside government, are now pushing for the reduction or complete elimination of energy price distorting mechanisms (OECD, 1998; OECD, 1997; Taxpayers for Common Sense, 2002). Reducing government spending in the energy sector and getting energy prices right could do more than any other single initiative (Myers and Kent, 2001, p. 2020) and would greatly improve NAFTA countries’ ability to reduce greenhouse gases and, in the case of Canada, to meet its Kyoto Protocol commitments (OECD, 1997).

##### *(i) Reducing and Eliminating Perverse Energy Subsidies:*

### *Reduce Energy Demand*

Subsidy removal will reduce the environmental impacts of the energy sector by decreasing demand. Higher fuel costs increase conservation practices among consumers. A joint project by the UNEP and World Bank Energy Sector Management Assistance Program determined that the elimination of funding to Mexico's energy sector would decrease total carbon dioxide emissions by 3.4% relative to 1991 levels (UNEP/ESMAP, 2001). Subsidy removal in the US would result in a 6% reduction in total carbon emissions by 2010 and an 8% reduction by 2035 according to Shelby et al. (1997).

### *Fuel Switching*

Subsidy reform would encourage fuel switching by both industry and consumers. The elimination of perverse subsidies in the energy sector would enhance the competitive position of renewable forms of energy in the energy supply market. Without major policy reforms, including subsidy removal, the market share of fully renewable energies will not increase in the future (UNEP, 2000). Given that demand is inversely related to price, as the price of fossil fuels increases relative to other forms of energy, particularly renewable sources such as wind, solar, and hydro, demand for alternatives will increase (de Moor and van Beers, 2001). For example, when the environmental and social costs of coal production and consumption are added to the direct costs of coal generated electricity, its price would increase by roughly 2 to 4 cents per kWh in the United States (Jacobson and Masters, 2001). The price increase takes into account the health and environmental effects of emissions of coal combustion, including the payment of black lung disease benefits to coal miners which amount to \$35 billion since 1973. By contrast, wind energy can now be produced for about 3 to 4 cents/kWh. Jacobson and Masters note that replacing 59% of current American coal energy use with wind turbines would be enough to reach the US target for carbon dioxide reductions originally agreed to (but not ratified) at Kyoto.<sup>12</sup>

An additional consideration is the relative carbon emissions for oil, gas, and coal per unit of electricity produced. Compared to coal-fired power plants, combined cycle natural gas turbine plants produce about one half of the carbon dioxide emissions per unit of electricity. The three NAFTA countries have already adopted national energy policies that focus on natural gas, at least in part due to the fact that it burns more cleanly than either coal or oil, produces fewer greenhouse gas emissions, and emits fewer pollutants to terrestrial and aquatic ecosystems (Dukert, 2000). The OECD notes that the removal of coal subsidies improves the competitiveness of combined cycle gas turbine plants: "where gas is available at moderate prices (below \$5/GJ), the use of coal at prices above \$1/GJ in new generating capacity is unlikely to continue" (OECD 1997: 31). For example, if the United States would switch its coal-fired plants to natural gas plants, it could reduce its carbon dioxide emissions by 36-39 million tons in total (OECD, 1997).

### *(ii) Introducing Environmentally-Friendly Subsidies and Targets*

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<sup>12</sup> They note that this would require large land areas for wind farms for the 214,000 to 236,000 wind turbines required. They believe a more modest effort to replace 10% of US coal consumption would be more practical, and could be funded through investment markets.

Subsidies can also improve market performance by smoothing the way for new and more efficient energy technologies. Ensuring a transition to a renewable-energy economy requires both subsidies that support the environment and the creation of targets and frameworks for renewable sources of energy. Norman Myers and Jennifer Kent (2001, p. 92) argue that:

Were the U.S. Congress to fund renewable energy with the same amount in tax credits, financial incentives, and other subsidies that it provides for coal and oil, renewables would readily become competitive with fossil fuels. In fact, a near-complete transition to a renewable-energy economy could be readily achieved for about \$25 billion a year over the next ten years – a sum to be compared with the \$21 billion worth of subsidies now supplied annually by the government for fossil fuels and nuclear energy.

Further, a proposal for the World Summit on Sustainable Development's action plan called for the use of the technologies to be increased to account for 15 percent of the world's total energy production by 2010. However, the United States, Saudi Arabia, Germany, and several other nations rejected a timetable for renewable energy technologies at the Johannesburg summit (Verrengia, 2002).

In 2002, the NAFTA Commission on Environmental Cooperation funded 16 renewable energy projects, allocating US\$400,000 to community groups in Canada, Mexico and the United States from its North American Fund for Environmental Cooperation. One of the projects involves the Center for Resource Solutions setting up an integrated North American market for tradeable renewable energy certificates (TRCs) in Mexico and the U.S. that will increase new renewable development in Mexico (<http://www.cec.org/news/details/index.cfm?varlan=english&ID=2491>).

The Canadian government is spending about \$50 million a year to encourage markets for renewable energy. Since 2000, it announced new initiatives of \$350 million over several years to support technology innovation, support for producers, market development, and tax incentives for wind energy and other renewable sources (Eggerston, 2002). In 2001, Ottawa doubled an endowment fund for innovative projects at the Federation of Canadian Municipalities (FCM). Through its \$50 million Green Municipal Enabling Fund and \$200 million revolving Green Municipal Investment Fund, the FCM is supporting feasibility studies that involve renewable energy, and the installation of solar panels for thermal storage at the Biodome and Insectarium facilities in Montreal. However, Canada has no national target for wind energy nor for renewable energies. The Council of Canada's largest labour union, the Canadian Auto Workers, has unanimously adopted a position paper that calls for establishing green power targets for utilities and incentives for alternative generators, including wind power and geothermal heat pumps (Eggertson, 2002).

In the United States, the Bush administration extended for two years the wind energy production tax credit (PTC), considered vital to the continued growth in wind energy. Some of the most innovative action on subsidy reform is taking place at the U.S. state level, involving a variety of initiatives to support renewable energy, including thirteen states with renewable portfolio standards. The state of California has approved a

law that requires utilities to boost their purchase of electricity from renewable sources by 1% a year until they reach 20% by 2017 (Eggerston, 2002). Michigan has designated the “NextEnergy” Centre for alternative energy development, a tax-free zone, and is providing statewide tax incentives for companies involved in new alternative energy research, development and manufacturing (Eggerston, 2002). However, the Pew Centre on Global Climate Change notes that states have little or no funding available for climate change initiatives. A fragmented approach “will inherently be less efficient than a national policy.”

### *(iii) Energy Taxes, Regulations, and the Polluter Pays Principle*

Supplementary measures could play a role in facilitating a transition to a sustainable-energy economy. In particular, green taxes could serve to internalize the environmental costs of polluting activities. Tax shifting is one way to implement green taxes in a revenue neutral way so that competitive disadvantages are avoided. For example, in Belgium, the government cut sales taxes on energy-saving materials and imposed higher taxes on gas guzzlers than on fuel-efficient cars (Myers and Kent, 2001, p. 204).

A study by the OECD, for example, found that the subsidy removal and energy tax implementation (an ad valorem tax increase by 2% per annum for coal, 1.6% for crude oil and 1.2% for natural gas) could reduce carbon dioxide emissions by 25% by 2020 in OECD regions without imposing significant economic effects on GDP (OECD, 2001a, p. 154). The introduction of carbon taxes by only a group of countries presents the problem of carbon leakage [explain what this is]. Ways to address this problem include border tax adjustment, which is permitted under the WTO and NAFTA (Shrybman, 2001).

Energy efficiency regulations could be introduced as well as limits to resource exploitation (although NAFTA imposes numerous constraints on the latter). The OECD is studying the potential for introducing energy efficiency standards for traded products such as refrigerators and office equipment (OECD, 1998a).

### Social Organizations: Agenda Setting

One of the key areas in which the CEC can play a role is working with community group is developing information campaigns on subsidy reform. Subsidy reform is not on the continental or international agendas and this constitutes the most important barrier to progress in this area. In their comprehensive examination of perverse subsidies worldwide, Norman Myers and Jennifer Kent (2001, p. 200) note: “While discussing the issue, we found that hardly anyone ever thinks about subsidies, let alone perverse subsidies. Such questions simply do not figure in people’s everyday agendas – or in their annual agendas, for that matter.”<sup>13</sup> The CEC could play an important agenda-setting

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<sup>13</sup> For example, policymakers at the North American Energy Working Group are not even *talking* about energy subsidy removal. It is simply not on the agenda. Instead, there are discussions on how to *maintain*

function by sponsoring regular conferences and policy papers on subsidy reform.

The CEC could also increase its involvement with NGOs working on subsidy reform. Fortunately, there are a growing number of community groups that are recognizing the transnational linkages between energy subsidies, environment and public health, and international trade. Environmental, labour, and health groups and research institutes provide critical analyses of perverse subsidies, propose and implement environmentally sustainable alternatives, and have access to the public. The International Institute for Sustainable Development (IISD), based in Winnipeg Manitoba, set up a Subsidies Watch list server on which it posts monthly reports on subsidies around the world. Other Canadian organizations such as the Pembina Institute and David Suzuki Foundation are publishing reports promoting conservation and renewable energy sources. In the U.S., the Union of Concerned Scientists, Resources for the Future, World Resources Institute, and Worldwatch Institute provide analyses and offer suggestions on alternative energy policies.

By providing a continental forum for discussions on subsidy reform, the CEC could promote the creation of a transnational group of NGOs working on subsidy removal. Numerous cross-sectoral coalitions are already forming. A major US lobby group called Taxpayers for Common Sense, an umbrella group of more than 20 environmental and economic reform NGOs, including Friends of the Earth, the Sierra Club, The Wilderness Society, Citizens for Tax Justice, Taxpayers for Common Sense, and the U.S. Public Interest Research Group, has launched a Green Scissors project to promote the elimination of perverse subsidies (Cuff et al., 1996). Recently, the American Lung Association of Texas launched a market education campaign about the benefits of renewable energy, and receives a donation for each consumer that signs up for Green Mountain Energy electricity (Eggerston, 2002).

The CEC might also consider the establishment of other possible mechanisms to increase the role of civil society energy and trade discussions, in particular, ways of increasing public participation, public accountability and transparency related to energy policy directions.

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and *increase* incentives for energy production in the Bush-Cheney Energy Plan.

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