The Conflicting Economic and Environmental Logics of North American Governance:

NAFTA, Energy Subsidies, and the Environment

Prepared by

Robin Jane Roff, Anita Krajnc, and Stephen Clarkson

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Executive Summary

NAFTA promised the development of a green economy throughout North America. Provisions against downward harmonization, the respect for state autonomy in environmental regulation, and the creation of the Commission for Environmental Co-operation gave hope to North Americans that an environmentally sustainable trade regime was possible. Despite good environmental intentions, the agreement inhibits the achievement of cleaner energy trade by allowing and encouraging the subsidization of fossil fuel development, by preventing governments from regulating the rate of resource depletion, and by entrenching neo-conservative, deregulatory values favoring the priorities of transnational corporations over those of conservation and environmental protection.

Subsidies — defined as government payments or tax concessions or government interventions such as tariffs or price controls — are incentives designed to stimulate desired actions in the marketplace. “Perverse subsidies” are counterproductive, damaging *both* to the environment and the economy. Government subsidies underlie North America's unsustainable energy consumption patterns, particularly in the U.S. and Canada — among the highest per capita energy users in the world. Subsidies to the fossil fuel sector bias the market against renewable forms of energy, such as solar or wind, and produce a number of environmental costs including resource depletion, greenhouse pollution, acid rain, and urban smog.

Despite mounting criticisms from international organizations (including the OECD and UNEP) and environmental groups, the NAFTA partners continue to underwrite the development of their vast reserves of crude oil and natural gas. By locking governments into an outdated system of perverse financial incentives, NAFTA has encouraged fossil fuel development at the expense of more sustainable energy options. The current regime perpetuates an illogical situation in which governments are spending billions of dollars of taxpayer money to fund environmentally destructive projects, while at the same time paying for the mitigation of these environmental ills.

The paper recommends a combination of environmentally sensitive policy changes, including the elimination of perverse subsidies, the subsidization of environmentally friendly energy sources, and the imposition of carbon taxes and demand-side management initiatives. Subsidy reform is not on the continental or international agendas and this constitutes the most important barrier to progress in this area. The CEC can play an agenda-setting role by working with community groups in developing information campaigns on subsidy reform and through the sponsorship of conferences and position papers.

Introduction

Governments have two mechanisms to influence the neo-classical market: sticks – penalties to discourage behavior considered undesirable – and carrots – incentives to encourage behavior considered desirable. One of the most common carrots offered the market by the modern state is the subsidy. In this paper we address what kind of environment-affecting behavior is promoted by state subsidies to the energy sector – as opposed to what kind of behavior they ought to promote.

As an important instrument of public policy, subsidies can become irrational when they encourage a combination of economic inefficiency, wasteful use of non-renewable resources, and a stream of associated environmental ills. The energy sector has two facets: renewables and non-renewables. Subsidies directed towards the latter have more often than not encouraged increased production over greater efficiency, and have thus created an economically and environmentally illogical policy context. Government support of renewables, on the other hand, has been primarily directed towards research and development. This paper is concerned with the relatively high level of subsidization of non-renewable energy sources. In particular, the fossil fuels industry is the third most heavily subsidized economic sector following road transportation and agriculture (Myers and Kent, 2001, 66). In order to achieve the sustainable societies desired by North American governments, such funding should be reduced or shifted to more benign energy sources. We continue this introduction with a definition of the concept of subsidy before considering the particular relationship between fossil fuel subsidies,' international trade agreements and environmental degradation.

A public subsidy is (i) a government payment or tax concession and/or (ii) a government intervention such as a tariff or a price control that effects market transfers from consumers to producers (or vice versa) (Steenblik, 1995, 483). This definition – adopted with minor variations by key international organizations[1] – highlights the economic distortions produced by subsidies, but lacks recognition of the important associated environmental costs. Norman Myers and Jennifer Kent (2001, 22) provide a more comprehensive, total costing approach in which "perverse subsidies" such as those to the fossil fuel industry impact *both* the environment and economy. Accordingly, the full level of support granted to energy industries includes a wide range of "hidden" externalities; that is, the environmental costs of resource depletion and pollution mitigation borne by society and the biosphere at large. Some of these costs are quantifiable, including increased health costs caused by smog. However, those such as harm to society related to premature mortality or increased pain and suffering from health disorders, do not have market values and are not susceptible to quantification. This renders a full determine of the economic magnitude of fossil fuel subsidization difficult,

[1] The Organization for Economic Cooperation and Development and International Energy Agency 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, 483).

if not impossible. Thus, while we recognize the complexity and extent of the total environmental impact of government support, this analysis follows more closely the narrow economic definition offered by the OECD and UNEP.[2]

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.[3] These perverse subsidies also result in harmful environmental impacts by aggravating resource depletion, acid rain, urban smog, global climate change, and other environmental problems. The proliferating literature on energy subsidies makes a clear connection between fossil fuel subsidies and global climate change. Numerous studies by the Organization for Economic Co-operation and Development (OECD), the World Bank, and other agencies recognize the importance of removing subsidies as a means to reduce greenhouse gas emissions. The OECD and the World Bank estimate that subsidy removal would reduce carbon dioxide emissions – the most important greenhouse gas – by about 10 per cent (Maier, 2001).

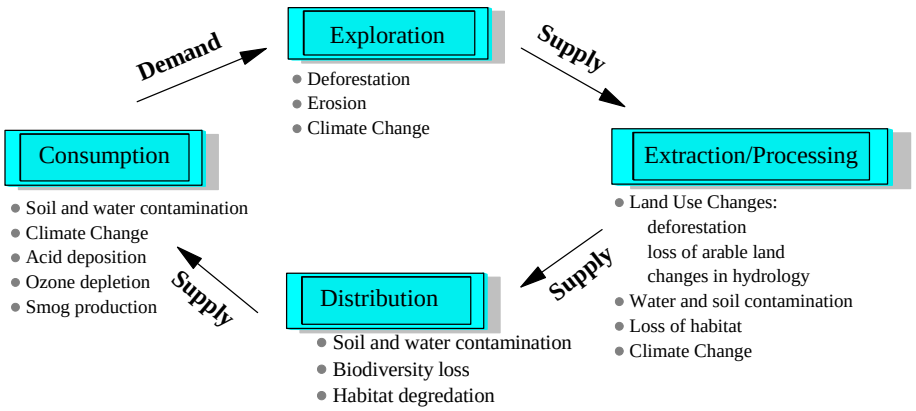
Our concern in this study is what happens when a third variable – trade liberalization – is added to the mix. Do international economic agreements such as NAFTA strengthen perverse energy subsidies regimes thus accelerating energy consumption and magnifying related environmental degradation? We will argue, that yes, the current North American subsidy regime, which is both encouraged domestically and internationally, has dramatic consequences for the biosphere.

The paper is organized in four parts following the CEC Analytic Framework for Assessing the Environmental Effects of NAFTA. Section I 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 II provides the geographic and policy contexts for the subject, including efforts by Canada, Mexico, and the United States to increase the trade of energy as well as its subsidization. Section III 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. Rather than focusing on the magnitude of economic flows resulting from the trade agreement, our primary concern is the paradigmatic influence of entrenching the use of energy subsidies in tri-lateral agreements. 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.

[2] See Appendix I and II for examples of subsidies considered in the analysis.

[3] It must be noted that the environmental effect of consumer and producer subsidies differ. However, for simplicity this paper discusses the common impact on price and subsequent consumption levels.

Figure 1: Environmental Impact of the Energy Chain



I. The Environmental Costs Of Fossil Fuel Subsidies

Environmental degradation occurs at every stage of the fossil fuel cycle, from exploration, extraction, and distribution to consumption, thereby producing environmental problems related to habitat destruction and biodiversity loss; land, water, and air pollution; and resource depletion (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 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). The high volumes of water consumed in the refining process compete with the region's agriculture, which is threatened by the exhaustion of the area's aquifers (Hurley, 2002). 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 transportation 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 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 fossil fuel 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.

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 losses, and causes damage to materials including monuments and buildings.

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).

In addition to the impact of nitrogen oxide on ozone production, fine particulate matter (PM) is a major component of smog and a direct health risk independent of ozone pollution. For example, fine sulphates can cause severe lung damage, including asthma attacks, respiratory illness, and premature death. Experts estimate that, along with other contaminants from fossil fuels (the combustion of fossil fuels also releases a significant amount of toxic substances), these atmospheric poisons take one year off the lives of people living in U.S. cities (Myers and Kent, 2001, 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.

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, 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 human source of carbon dioxide, while its

production and transportation is a major contributor to emissions of methane. 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 carbon dioxide emissions. As of 1999 the U.S. topped the list of producers, generating 5.6 metric tons of carbon 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 carbon dioxide globally, Mexico does contribute a significant amount of carbon within North America. According to the U.S. Department of Energy's, Energy Information Administration (EIA), Mexico produces approximately 1 metric ton per person, per year (EIA, 2001). A significant amount 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.

According to the Intergovernmental Panel on Climate Change (IPCC) the Earth's surface temperatures have risen 0.6° Celsius since the late 19th century. Although variability is characteristic of the global climate, the twentieth century was the warmest century of the millennium, the 1990s the warmest decade, and 1998 the warmest year. Subsequently, 2002 has become the second warmest and 2001 the third warmest. The consequences of this warming include both benefits and harmful effects. For example, warmer climates will result in longer frost-free periods, easier navigation in ice covered waters, and lower space heating costs in cold climates. Most of these are benefits are realized only in the colder climates of mod-to-high latitudes, where most wealthy countries (including Canada and the U.S.) are located. In contrast, climate change is also expected to alter the frequency and intensity of summer heat waves, severe summer drought, heavy rainfall events, and other types of extreme weather. It will cause sea levels to rise, reduce the extent and thickness of land glaciers and Arctic sea ice, and cause major shifts in ecosystem distribution, and increase the risk of extinction of vulnerable species. The larger and more rapid the changes in climate, the more that the potential harm will dominate over the potential benefits. Furthermore, the harmful consequences are disproportionately concentrated in tropical climates, where warmer climates offer few benefits, and where most poor countries are located (IPCC, 2001a).

The changes in the extra-tropical Northern Hemisphere will be particularly large, and is already apparent. The IPCC estimates that since 1976 temperatures in this region have risen 0.17°Celcius per 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 (IPCC, 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 is power shortages in late summer months because of reduced water reserves. 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).

North America has also witnessed an increase in the frequency and magnitude of some types 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 (IPCC, 2001a). Throughout the 1990s extra-tropical cyclones were also found to be far more damaging then those of previous centuries. A rise of the sea level over the last 100 years has exacerbated beach erosion and flooding from modern storms (IPCC, 2001a). In general, there has been a widespread increase in the frequency of heavy or extreme precipitation events across North America (IPCC, 2001a). Because such extreme events, by definition, seldom occur, it is and will continue to be difficult to attribute them to specific causes, whether due to natural variability or as a consequence of global climate change. However, many of the changes observed in recent decades are consistent with what climate studies suggest are likely to happen. Hence, they represent important harbingers of how further climate change will affect our weather in the future.

The expected consequences of these changes in climate on North America's ecosystems and society are potentially dramatic. The IPCC reports that 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. Vector-born 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 its long-term, complex, and uncertain nature. 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). In recognition of the dramatic effects of climate change, governments across the globe have taken steps to reduce their GHG emissions. 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 fossil fuel subsidies provides an important tool in the fight to stop global climate change.

II. The North American Context

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, 2002:12).[4] On average, Canada supplies 15 percent of the U.S.'s natural gas consumption, and, along with Mexico, 15 percent of the country's total oil supplies (NAEWG, 2002:13). Although there is a small amount of trade in the other direction (Mexico imports gas, petroleum and electricity

[4] It imported 5 quads from Canada and 3 quads from Mexico.

from the U.S., 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, 2002:14-15). Given that both the population and total GDP of Canada and Mexico are dwarfed by those of the United States, it is not surprising that the majority of energy resources are consumed in this center country.[5]

North America's energy appetite has, in part, been fostered by its large energy resources. The U.S. 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). Canada and Mexico are similarly important energy producers. 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, 2002: 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.[6] 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, 2002:7-8).

Policy Context

Global subsidies for fossil fuels are estimated at US$200 billion per (Maier, 2001).[7] In spite of the fact that many of these subsidies fund economically marginal initiatives, North America governments justify their spending by citing concerns for national sovereignty and security, and increased employment in resource dependent communities. The billions of dollars spent annually in Canada, Mexico and the United States in support of these goals is economically illogical. For example, neither Suncor nor Great Canadian Oil Sands could continue to mine Canada's tar sands without the financial support of the federal government. Simply put, it takes almost as much energy to produce a barrel of oil from the sands as the operation creates (Gallon Environment Letter, 2002b).

Although differences remain between Canada, Mexico, and the United States all three countries appear to be moving towards domestic deregulation and continental integration aimed at increasing fuel supply and consumption. Such policy agendas contradict both the domestic and international environmental commitments of North American governments, in particular those concerning the mitigation of greenhouse gas emissions. In defiance of strong international calls for subsidy reduction and green

[5] As of 2000 the US's population was approximately 281 million with a total GDP of $8 trillion. 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, 2002: 4).

[6] This does not include the estimated 308 billion barrels of economically recoverable oil in Canada's tar sands (assuming the current subsidy structure).

[7] 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.

energy promotion, the governments of Canada, Mexico, and the United States remain committed to traditional forms of environmental and economic policy. Despite clear advice from the OECD and the United Nations Environmental Program (UNEP), subsidy removal in the fossil fuel sector is absent from both domestic and trilateral policy discussions.

North American governments employ a variety of methods to subsidize their fossil fuel sectors. Canada and the United States have historically focused on direct funding and preferential tax regimes aimed at stimulating investment and increasing production. The United States has also encouraged consumption by lowering the end-use price of natural gas and oil derivatives.[8] Although such consumer subsidies have largely fallen out of favor in the U.S. they are still widely employed by the Mexican government.

Although there are slight differences between the specific environmental effects of consumer and producer funding, together such subsidies create a self-defeating barrier to developing more economically and environmentally viable energy sources. By keeping fossil fuel prices low, they both prevent the adoption of renewable technologies, such as wind and solar power, and they reduce incentives for innovation in these areas. It has been shown, that in the absence of distortionary subsidization and with a fuller social and environmental-cost accounting, alternative energy sources are more economically efficient than older fossil fuel technology.[9]

The following outlines the current regulatory environments and subsidy regimes of the NAFTA partners.

The United States

In the United States 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 or pricing agreements with resource owners and developers; rather market forces are used to dictate the sector's microeconomic structure.[10] Both levels of government provide financial incentives for the further development of the nation's energy resources.

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[8] Beginning in the late 1970s the United States began capping the end-use cost of natural gas. However, the policy, as outlined in the Natural Gas Policy Act, was neither environmentally, nor economically logical. By maintaining a low national price relative to the internal state price, the Federal Energy Regulatory Committee, stifled inter-state trade and thereby prevented the free flow of market forces. Although re-regulation has occurred at both the state and national level, the process has been slow and FERC continues to control the trade price of natural gas (Dukert, 2003).

[9] A 1998 Report by the International Center for Technology Assessment concluded that in the absence of subsidies and externalities, the price of gasoline in the United States would rise to between US$5.60 and $15.14 per gallon. In Canada, the shift would result in a per liter costs between CND $2.00 and $5.40 (Rees, 2000).

[10] See André Plourde (2002) for the history of government intervention in pricing and contract negotiations for Canada and the U.S.

Currently, of the energy sector is regulated by the National Energy Plan (a.k.a. the Bush-Cheney Energy Plan). 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 (The Energy Foundation, 2002). Tabled in 2001, this plan may mark the first energy policy initiative of the 21st century, but offers little advanced thinking. Rather than focusing on renewable energies, such as wind, solar, hydroelectric, geothermal and biomass, the plan provides billions of dollars for the development of traditional coal and petroleum resources (The Energy Foundation, 2002). The US Petroleum Research and Development Program and the US Clean Coal Power Initiative alone, are budgeted to receive $560 million and $2 billion, respectively, over the next ten years (see Appendix 1 for more details). The situation will likely worsen when the U.S. Energy Policy Act of 2003 is enacted later this year. Table 1 outlines both the direct and indirect sources of

Table 1: Subsidies to Energy Industries included in the Energy Policy Act of 2003

Type	Tax Provisions ($US)	Authorized Spending	Total (billion)
Auto efficiency and fuels	1.6 billion	1.908 million	1.601908
Energy efficiency R & D		3.198 billion	3.198
Renewables/Conservation	4.979 billion	2.433 billion	7.412
LIHEAP and Weatherization assistance		11.425 billion	11.425
Nuclear	1.462 billion	1.757 billion	3.219
Oil and Gas	8.586 billion	2.747 billion	11.333
Science Research	2.027 billion	200 million	13.56
Coal		1.925 billion	1.925
Fuel Cell Research		340.5 million	0.3405
Biomass Research		550 million	0.55
Freedom Car and Hydrogen Research		1.888 billion	1.888

Source: Roder, A. 2003. *Analysis of H.R. 6 - Energy Policy Act of 2003*. Taxpayers for Common Sense: Washington D.C.

subsidization included in the current bill. Although substantial provisions are given to renewable energy and conservation programs, the majority of funding continues to be directed towards traditional fossil fuels. In addition, despite the long-standing objections of environmentalists and resource managers, the Act promotes exploration and exploitation of oil reserves on federal lands, in particular those in Alaska's Arctic National Wildlife Refuge. Not only do such actions threaten the ecological integrity of the protected areas, they also are economically unsustainable given the abundant foreign sources of relatively cheap crude oil and natural gas.

Compounding such ecological and economic illogic is the continuation of a $180 million cut in to R&D and deployment programs for energy efficiency outlined in the original Bush-Cheney Plan. Following the original 2001 Plan, the new Act also promises to roll back environmental standards for coal and nuclear power generation and opens

private land to federal seizure and exploitation (The Energy Foundation, 2002).[11] In addition, perhaps the only environmentally logical step taken by the Bush-Cheney Plan, the establishment of a $3 billion worth of tax incentives for consumer purchases of hybrid or fuel cell vehicles, will be eliminated (Abraham, 2002b; Roder, 2003). [12]

Neither the Bush-Cheney Plan nor the Energy Policy Act are harbingers of an environmentally sustainable energy future. With their priorities firmly focused on economic growth and supply side management, the logic of ecological protection is left by the wayside. As is evident from the multi-billion dollar incentive programs, subsidy reduction is absent from the U.S. energy agenda. 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.[13]

Canada

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) oversees 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,

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[11] As part of the Energy Plan, President Bush recently rescinded on a campaign promise to increase CO_2 emission standards for coal fired electricity plants.

[12] In the recent Energy Policy Act of 2003, the House of Representatives eliminated such incentives arguing that they were no longer necessary (Roder, 2003).

[13] 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. The costs of the initiative should be borne by the private sector.

national subsidies are geared towards the transportation and distribution infrastructure, as well as the development of projects of national significance (NAEWG, 2002).[14]

Like the United States, Canada has a strong commitment to environmental sustainability. According to Natural Resources Canada, "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" (Natural Resources Canada, 2002). 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 to 6% below 1990 levels between the years 2010 and 2012. Nevertheless, despite the publication of several comprehensive plans regarding Canada's share of climate change mitigation, energy policy remains focused on traditional fossil fuel resources.

A recent report by the Pembina Institute for Appropriate Development praised Ottawa for it "leadership role in advancing LIRE [low-impact renewable energy]" research and development (Pape-Salmon et al., 2003: iv). For example, in 2002 the federal government launched a CND$260 million Wind Power Production Incentive and the $50 million Market Incentive Program (to aid renewable marketing). However, such seemingly progressive initiatives are undermined when viewed against total energy sector subsidization (Table 2). The fossil fuel industries continue to receive biased tax and royalty treatment (see Appendix 2 for detail). The Canadian Exploration Expense and the Canadian Development Expense allow companies to write off 100 percent of their pre-development and 30 percent of their development expenses in the first year. Non-energy investments can be written off through a "flow-through share" provision in the current tax system (Auditor General of Canada, 2000). Although the Canadian Renewable Energy and Conservation Expense does provide similar pre-development tax credits, there is no equal flow-through provision.

An equally biased situation exists at the provincial level. The Alberta government recently cemented a $100 million program which exempts fossil fuel companies from standard fuel taxes (CAPP, 2002). In addition, tar sand operators are allowed to deduct 25 percent of resource profits from federal income taxes. Although producers are not allowed to deduct royalties from federal taxes, Alberta maintains a minimal rent structure.[15]

[14] 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.

[15] Currently, oil sand producers must pay a monthly royalty of 1% of total gross revenue for that period. However, a complex set of exemptions and allowances generally reduces this amount significantly (Alberta Energy Ministry, 2001).

Table 2: Total Grants from the Ministry of Natural Resources (2002)

Program	Oil, Natural Gas & Tar Sands	Program	Efficiency and Alternatives
Ocean drilling	204,627	Energy Efficiency and Alternatives	17,117,397
Ocean drilling (social benefits)	77,304	New and expanded measures	423,276
Petroleum Technology Research Centre	1,200,000		
Hibernia interest assistance	20,625,126		
Infrastructure costs related to exploration, development, production or transportation of oil and gas in offshore Nova Scotia	4,259,868		
Infrastructure costs related to exploration, development, production or transportation of oil and gas in offshore Newfoundland	3,044,602		
Newfoundland Offshore Petroleum Board	1,822,955		
Nova Scotia Offshore Petroleum Board	1,575,000		
Total	**32,809,482**	**Total**	**17,540,673**

Source: Reciever General of Canada. 2003. *Public Accounts of Canada 2002.* Ottawa: Government of Canada

The total level of fossil fuel subsidization in Canada is difficult, if not impossible to quantify. In the wake of the dramatic recession of the early 1990s, the 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, direct funding has been replaced by a tax exemptions, research and development programs, and capital allowances. The complexity of these new subsidies along with their discretionary nature obscures their absolute financial value. Nevertheless, provincial and federal budgets indicate a high level of government subsidization of fossil fuel production and development, in particular concerning effort to increase trade by strengthening transportation infrastructure and developing Canada's vast reserves of oil sands (Appendix 2).

Regardless of their magnitude, such energy policies are in direct contradiction to Canada's domestic and international environmental commitments. Promotion of the tar sands is perhaps the most damaging energy policy the country could undertake. Estimates indicate that tar sand processing releases 5 to 10 times the greenhouse gas as does processing of conventional oil (Gallon, 2002). Consequently, according to the David Suzuki Foundation, if just 60 of the proposed sites were to be developed, Canada's greenhouse gas emissions would rise 400 percent by 2010 (David Suzuki Foundation, 2002).

Mexico

While Mexico's environmental commitments are similar to those of its northern NAFTA neighbours, the country's energy sector is markedly different. According to Article 27 of the Mexican Constitution, the state oversees the "generation, transmission, transformation, distribution, and supply of electricity as a public service" (Clarkson et al., 2002). Since 1992, some private investment is permissible in storage, transportation, and distribution (including import and commercialization) activities. However, the state-controlled corporation *Petroleos Mexicanos* (PEMEX) maintains a substantial share of the installed capacity and distribution infrastructure.[16] Jurisdiction over energy policy in Mexico is in the hands of the Ministry of Energy, which has the responsibility to "ensure a competitive, sufficient, high-quality, economically feasible, and environmentally sustainable supply" (NAEWG, 2002: 53).

Fossil fuel subsidies are perhaps a non-issue in Mexico as the majority of the sector remains entrenched in the state apparatus. A quantifiable level of producer subsidies is particularly absent due to a lack of information regarding the cost of refinery upgrades and development projects. Nevertheless, the federal government is committed to maintaining low end-use prices of petroleum derivatives in order to stimulate consumption (Mexican Energy Representative, 2003). The price of propane, the principle energy used in heating and cooling systems, is substantially discounted following to the average monthly income. According to a representative of the Mexican government, such subsidies have created disincentives for the adoption of alternative energy sources, in particular natural gas and hydroelectricity (Mexican Energy Representative, 2003). Such policies are economically and environment unsound. Not only do they prevent the domestic production and use of Mexico's abundant non-petroleum energy sources, but they perpetuate the consumption of a highly polluting and ecologically intensive fuel.

Over the last decade successive governments have undertaken strong efforts to liberalize the country's energy sector. Although modest, the reforms that have been achieved are important. For example, in 1992 President Ernesto Zedillo introduced an amendment to the language of Article 27 which relaxed government control of the electricity and oil industries. More recently, President Vicente Fox has committed is government to increasing the level of foreign investment in the sector in order to offset declining production.

[16] PEMEX controls 85 percent of all transportation and distribution capacity (NAEWG, 2001: 52).

Although such neo-conservative[17] reforms are promising, they are not necessary correlated with increased environmental protection. In fact, by increasing domestic production, Fox's administration could very well increase total greenhouse gas emissions. In addition, there is no necessary connection between privatization and subsidy reduction. Thus, one should look to other policy initiatives for evidence of future patterns. In particular, hope for subsidy reduction comes from recent efforts to increase air and water quality. In July of 2001 President 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 currently not on the agenda, subsidy reduction could be an important tool in Fox's campaign.

III. Free Trade and Energy Policy

CUFTA: The Beginnings of Free Trade

When, in the autumn of 1987, Canadian trade officials first presented the results of their trade negotiations with Washington, they claimed that, because the Canada-United States Free Trade Agreement (CUFTA) did not include clauses on the environment, it had no ecological implications. Ecologists, however, pointed out three problems - two general and one specific. First, CUFTA had a *bias towards growth.* Given its philosophical support for economic expansion and its hostility to government regulation, trade liberalization would intensify economic growth. This pressure would further impede the country's rather reluctant efforts to achieve ecologically sustainable growth.

Second, it aimed to stimulate *resource depletion.* Fostering unsustainable development was CUFTA's subtext as manifested in some of its significant provisions, both positive and negative. These were clearest in the energy chapter, which embodied the American desire to accelerate the delivery of Canada's non-renewable petroleum reserves at the lowest possible prices. Despite strong U.S. animus against foreign governments' industrial subsidies, CUFTA (and subsequently NAFTA) explicitly permitted Canadian governments to subsidize the discovery and development of oil and natural gas reserves without having to fear countervailing tariffs against the resulting exports of cheap energy to the United States.

Equally revelatory was the chapter's negative pressure on regulations. Not only did the agreement inadvertently encourage corporations to shed high environmental standards and adopt the lowest common denominator, but Ottawa was prohibited from taking conservation measures that would impede the flow of energy exports to the United States as it had done following the global energy crisis of 1973 and 1979. Even in

[17] Neoconservative, from a political economy perspective, is associated with such 'new right' principles a less government (not necessarily fewer subsidies but rather in terms of smaller bureaucracies), environmental deregulation, and a redistribution of wealth from the lower to the upper classes (Clarkson, 2002).

conditions of another crisis in energy supply, Canada undertook to share with the United States the same proportion of its energy production as it had been delivering, on average, over the preceding three years. (Although Mexico is geopolitically weaker than Canada, it was less compliant on energy matters when negotiating NAFTA. It refused to accept a similar restriction of the government's constitutionally entrenched monopoly control over its primary natural resource and source of comparative advantage.)

NAFTA's Green Promise

At first reading, there was good reason to agree with NAFTA's negotiators in 1993 when they claimed it to be the first international agreement frankly trying to reconcile trade and environmental issues (Rugman et al. 1997). In its preamble, the signatory states committed themselves to pursue their economic goals in a manner consistent with environmental protection and conservation, to encourage practices that led to sustainable development, and to strengthen the development and enforcement of environmental laws and regulations (Emerson et al., 1993).

To its credit, NAFTA's main text did make environmentally correct noises. It confirmed each party's right to choose its own level of environmental protection in areas concerning human, animal, or plant life within its own jurisdiction. Each was admonished against lowering health, safety, or environmental standards in order to attract foreign investment. Chapter 20's general dispute process allowed for incorporating environmental concerns into the adjudication of trade conflicts. Most important, it was the first trade agreement to recognize the juridical primacy of three existing international environmental agreements. This was taken to mean that, should a conflict arise between a member's economic obligations under NAFTA and its commitments on trade in endangered species, on the ozone layer, and on hazardous waste, the latter would take precedence over the former.

Another innovation was imposed by the Clinton administration, which, in responding to concerns expressed by its environmental supporters, had insisted that a North American Agreement on Environmental Cooperation be added to the treaty. The NAAEC's mission was to empower citizens in helping achieve sustainable development by promoting the continent-wide adoption of best environmental practices. The NAAEC's Commission for Environmental Cooperation (CEC) of North America institutionally connected ecological questions to trade issues at the continental level. NAFTA's most substantial and best-financed institution, it had a mandate to reconcile controlling protectionism with sustainable development. The CEC's capability includes mechanisms such as the Joint Public Advisory Committees (JPAC)'s conferences that bring together environmental non-governmental organizations (ENGOs) and expert, interested parties from the three countries; Article 13 reports which can investigate any matter that the CEC agrees to study; Article10 assessments of NAFTA's effects on the environment; the citizen submission process which can lead to the production of a factual record on some issue of concern; and the taking-stock reports assessing pollutant releases in North America (Tollefson, 2002). This conference is an example of the CEC's effort to generate information and so increase public understanding of the nexus between North America's economic regime and its environmental problems.

Despite all the environmental will of the Clinton administration, the CEC has been kept under a tight leash by the three member-states. Its failure to meet expectations is deepened from the use of Chapter 11's judicial arm by continental corporations against member states' environmental regulations. Such actions have limited the ability of all levels of government to use regulatory tools to mitigate environmental externalities (Shrybman, 1992). For example, through the judgments of investor-state tribunals, Canadian environmental policy, once thought to be the purview of the sovereign legislature, has been taken hostage by continental governance. Under Chapter 11's supraconstitutional aegis, the issue is no longer the classic federal question of *which* level of government – federal or state/provincial or municipal – can initiate an environmental regulation. The issue now becomes *whether any* level of government could initiate such legislation if it jeopardizes the interests of a foreign company (Schneiderman, 1996). Far from the polluter's paying to rectify the externalities that it caused, Chapter 11's expropriation clause lead to the polluter's being paid to keep on polluting.

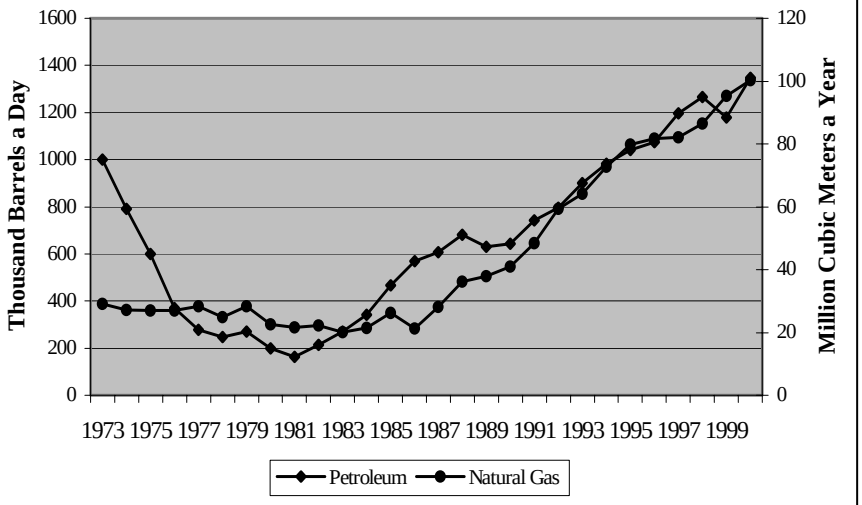
NAFTA and Energy: Encouraging the Status Quo, or Worse

NAFTA has affected the North American energy sector in two ways. First, the trade agreement has cemented a policy paradigm that runs contrary to current effort at sustainability. On the eve of NAFTA's implementation, the Canadian Environmental Law Association (CELA) prophesied that NAFTA's general bias against state activism would disable the policy tools that governments have available to favour the environment. By committing itself to NAFTA, CELA maintained, Canada abdicated its right to implement or strengthen policies that promote green industries, and counter depletion of non-renewable resources by ending their subsidization (CELA, 1993). What CELA did not see, however, was that NAFTA itself would promote the environmental illogic of current resource policy.

Chapter Six, Energy and Petrochemicals, is a disconcerting example of the eco-illogic of the free trade agreement. Unlike the WTO Agreement on Subsidies, NAFTA encourages governments to finance fossil fuel exploration and development. Article 608.2 (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." As Steven Shrybman (2001, p75-76) states, this was an "astonishing inducement to use public funds to support the extravagant fossil fuel appetites that Canada and the U.S. share."

In addition, 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, 75): "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."

Figure 2: US Energy Imports from Canada 1973-2000



Source: EIA. 2003 (A,B)

NAFTA's s second major impact on the North American energy sector stems from its dramatic alteration of trade conditions. Together, the ban on discriminatory taxation and the proportional sharing clause have reinforced the emerging continental energy market. From 1986 and 2001, Canadian exports of natural gas to the United States more than quadrupled, reaching upwards of 100 billion cubic meters per year; and, since 1985, crude oil exports almost tripled, rising to about 80 million cubic meters in 2001 (Plourde 2002). However, unlike other commodities the trade agreement has not necessarily generated this rise in cross-border flows. As Plourde notes, the substantial increases in Canadian exports of oil and natural gas to the United States began in the early to mid 1980s and can be attributed to deregulatory initiatives in Canada (including the softening of volume restrictions on cross-border transactions), increased US demand related to declining domestic crude oil production, and changes in the two countries' objectives (both Canada and the US favored greater trade in fossil fuels by the beginning of the 1980s) (Plourde, 2002). Nevertheless, while NAFTA may not have driven an enormous increases in trade, it did cement an international framework that promotes the unrestricted flow of energy throughout the continent, thus making it more difficult for future governments to alter their regulatory course (Clarkson, 2002).

In sum, NAFTA indirectly exacerbates over-consumption by entrenching neo-conservative values favoring the profits of transnational corporations over conservation and environmental protection. In particular, it eliminates the ability of Canada to regulate the extraction and export of its fossil fuels, and encourages governments to subsidize economically and ecologically wasteful initiatives. Although supposedly a 'green' agreement nothing in NAFTA's provisions have stopped jurisdictions from cutting the funding for established environmental programs, privatizing their administration, or amending legislation to make it less effective (Krajnc, 2000).

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 22 April 2001 that energy policy became a subject of regular trilateral negotiation. Established by the three governments 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, 2002). One of NAEWG's primary goals is to:

> enhance North American energy trade and interconnections consistent with the goal of sustainable development, for the benefit of all. (NAEWG, 2002)

Following this mandate, NAEWG has created four sub-committees to gather information and explore the potential for joint cooperation. These expert groups include: (1) development of a North American energy perspective on supply, demand, and infrastructure (the U.S. is the lead); (2) electricity restructuring and reliability (Canada is the lead); (3) energy efficiency, with an emphasis on standards and related issues (Mexico is the lead); and (4) science and technology, with a focus on clean technology.

Although an important first step on the road to a truly continental energy market, the groups currently do not suggest a strengthening of the environmental agenda. As with the individual domestic policies of the NAFTA partners, subsidy reduction has not on the NAEWG's agenda. In addition, although 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, the group's first document *The North American Energy Picture* makes little reference to measures to reverse or reduce existing environmental degradation (Dukert, 2002). Rather, the group has concentrated on increasing integration and trade flows between the three countries.[18]

Nevertheless, as a trilateral forum for negotiation the NAEWG has already furthered the continental energy discussion and thus presents an important opportunity for Canada, Mexico, and the United States to tackle the difficult issue of subsidy removal.[19] Many government subsidies can be eliminated unilaterally, but some may need to be undertaken by all trade partners to insure the maintenance of sectoral

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[18] The North American Air Working Group was recently established to compliment NAEWG's efforts. The NAAWG has been mandated to produce a "shared emissions inventory for electricity generating stations, a summary report of emissions, and an analysis of the availability and comparability of additional useful data by the end of 2004" (Dukert, 2002: 3). However, again, the Working Group lacks strong initiatives towards environmental protection and resource conservation.

[19] According to a representative of the NAEWG, the Group is important not as a mechanism of large-scale policy reform, but rather as a forum for furthering an understanding of the concerns and interests of the three NAFTA partners with regards to domestic and international energy supplies. Nevertheless, information exchange can be a powerful stimulus to change and thus the impact of the Working Group on domestic policy should not be dismissed.

competitiveness.[20] Such trilateral initiatives could be used to address the contradiction between trade and environmental logic.

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 run contrary to the dictates of environmental protection and thus expose the fundamental illogic of current policy agendas.

IV. Linking Trade to the Environment: Proposed Solutions

If environmentally sustainable energy pathways are to be firmly established and encouraged throughout North American, energy policies need to be re-oriented from a system of perverse subsidies, which pay the polluter, to a system in which the polluters pay the costs of environmental harms. In addition, trade and environmental policy needs to be better integrated within the energy sector in order to meet the domestic and international targets such as those of the Kyoto Protocol. The reconciliation of conflicting trade and environment priorities requires that the goals and aspirations of civil society and the wisdom of citizens be recognized within policy agendas. The following sections review these two necessary sources of change: government initiated reform and civil organization and agenda setting actions.

Government Policy: Subsidy Reform and Other Initiatives

One of the most important policy changes NAFTA governments can undertake to mitigate the effects of global climate change and other environmental ills is a comprehensive program of reducing and removing perverse energy subsidies. 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). Thus, 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 new tax systems, and the introduction of cross-border energy efficiency standards.

Reducing and Eliminating Perverse Energy Subsidies:

Many organizations, both inside and outside government, are now pushing for the reduction or complete elimination of fossil fuel price distorting mechanisms (OECD,

[20] 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.

1998; OECD, 1997; Taxpayers for Common Sense, 2002). Reducing government spending in the fossil fuel sector and getting energy prices right could do more than any other single initiative (Myers and Kent, 2001, 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).

Reduce Energy Demand:

Subsidy removal would reduce the environmental impacts of the energy sector by decreasing demand. Higher fuel costs increase conservation practices among consumers. A joint project by UNEP and the World Bank's 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 US$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.[21]

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 less 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:

[21] 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.

"where gas is available at moderate prices (below US$5/GJ), the use of coal at prices above US$1/GJ in new generating capacity is unlikely to continue" (OECD 1997: 31.

Introducing Environmentally-Friendly Subsidies and Targets

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 sustainable fuels and the creation of targets and frameworks for renewable sources of energy. Norman Myers and Jennifer Kent (2001, 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.

A proposal for the 2002 World Summit on Sustainable Development's action plan called for the use of these new technologies to be increased to account for 15 percent of the world's total energy demand and, in the case of Canada, to meet its Kyoto Protocol commitments (OECD, 1997).

Currently, progress along these lines is promising. As part of its *Action Plan 2000 on Climate Change*, the Canadian government introduced and strengthened a number of initiatives aimed at encouraging the development and stimulating the use of renewable energy sources and technologies. Among the improvements was the creation of the Renewable Energy Deployment Initiative (REDI), the Wind Power Production Incentive (WPPI), the Market Incentive Program (MIP) (for distributors of renewable electricity sources), and Government Purchases of Green Power Provision (NRCan, 2003). The latter commits the Government of Canada, as the largest organization in Canada, to purchase 20 percent of its electricity requirements from emerging renewable sources, such as wind and solar, and supporting on-site renewable energy projects. Since 2000, it announced new initiatives of C$350 million over several years for technology innovation, 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 C$50 million Green Municipal Enabling Fund and C$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 or for renewable energies. The council of Canada's largest labor 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 (Eggerton, 2002). At the same time, a combination of concerted efforts could result in significant gains in market share for renewable energy. For example, a 2003 report by Canada's National Energy Board, entitled *Canada's Energy Future: Scenarios for Supply and Demand to 2025*, notes the importance of government action in securing a greater market share for renewable energy (Eggertson, 2003). According to its "techno-

vert" scenario, a significant development of green power would occur provided there is strong public support for renewables. Such support would likely stem come from a combination of government financial/tax incentives, incentive regulations and Renewable Portfolio Standards. In this scenario, 10% of electricity in Canada would generated by renewable energies by 2025 (with renewable capacity rising from 1 GW in 2001 to 21 GW in 2025). By contrast only 2.5% of electricity would be comprised of green power if the government fails to take such action to encourage renewables.

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 in that country. However, some of the most innovative action on subsidy reform is taking place at the 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 "Next Energy" Center 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 Center on Global Climate Change notes that states have little or no funding available for climate change initiatives and that such a fragmented approach "will inherently be less efficient than a national policy."

Harmonizing Regulations, Labels and Energy Taxes

Given the significant trade in energy-consuming products throughout North America it e has become evident that continental efficiency standards are needed. The NAEWG's Energy Efficiency Working Group is thus currently pursuing the harmonization of energy labeling. A positive development in this regard is the report by the Collaborative Labeling and Appliance Standards Program (CLASP) commission by the USDOE for the NAEWG-Energy Efficiency Working Group. The 2002 report, entitled *Energy Efficiency Standards and Labels in North America: Opportunities for Harmonization*, compares the current standards, labels, and test procedure regulations in the three NAFTA countries. The minimum performance standards (MEPS) of 46 products were compared for which at least one of the three countries has energy efficiency regulations. CLASP found that the economic partners have similar or identical testing procedures and energy performance standards for major household appliances (i.e., refrigerators/freezers, split system central air conditioners, and room air conditioners). Ten products were shown to have different MEPS and test procedures, but the potential exists for the development of common test procedures, MEPS, and/or labels.

The harmonization of uniform endorsement labels such as the US Energy Star could further the goals of the NAEWG Energy Efficiency Working Group. The Energy Star label was introduced in the U.S. in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products, including new homes, the buildings sector, residential heating and cooling equipment, major appliances, office equipment, lighting, and consumer electronics. The label was extended to Canada when it signed an

administrative agreement with the USEPA and USDOE in May 2001,[22] and Mexico is currently exploring the advantages and requirements of joining the Energy Star labeling program.

In August 2002, the NAEWG Energy Efficiency Expert Group drafted a workplan for the three NAFTA countries to cooperate on energy efficiency programs in five areas: test procedures, mutual recognition of laboratory results, voluntary endorsement labels, mandatory comparative labels, and mandatory energy performance standards. The workplan recommends beginning with a focus on the first three of these elements in areas where CLASP's report found opportunities for harmonization. But the latter areas could produce stronger results and are being explored by other international agencies. For example, 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). The NAEWG Energy Efficiency Expert Group workplan made the important procedural recommendation that the three countries develop investigates ways of increasing stakeholder participation and open the process to public consultation. The Energy Efficiency Expert Group plans to draft a long-term energy efficiency harmonization plan for North America based on the results of consultations with stakeholders. Innovative demand-side management initiatives, such as the Energuide and Energy-Star eco-labels, can be used to promote energy efficiency at the consumer level. Such national programs can be effectively promoted at the trilateral level.

A third and final of government actions that could encourage the adoption of alternative energies is the creation of a 'green' tax system taxes that would internalize the environmental costs of polluting activities. Tax shifting is one means of implementing such reform in a revenue neutral way thereby avoiding competitive disadvantages. 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, 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, 154).

The introduction of carbon taxes by only a limited number of countries, however, presents the problem of carbon leakage. Carbon leakage can occur in two ways. First, the reduction in demand for fossil fuels in the countries introducing taxes may lead to a decrease in international fuel prices and thus increase the demand for fossil fuels (and subsequently carbon dioxide emissions) in other countries. Second, the energy-intensive industries of countries which introduce a carbon tax will be panelized and imports of

[22] Canada introduced its own, more detailed, comparative EnerGuide label but now will also have the Energy Star logo on the same label. While Canada's program covers most of the products covered by the US Energy Star program, Canada will be increasing the labeling of commercial and industrial type products either through the Energy Star or EnerGuide mechanism.

energy-intensive goods from countries subject to fewer or no greenhouse gas reduction obligations will be favored (Luterbacher and Norrlof, 2001). One way to address this problem is to introduce border tax adjustments, which are permitted under the WTO and NAFTA for goods and material used to make goods, though no necessarily for energy inputs not incorporated in the final product (e.g. processing and transportation costs).[23]

Social Organizations: Agenda Setting

One of the key areas in which the CEC can play a role is working with community groups in 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, 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 into people's everyday agendas – or into their annual agendas, for that matter."[24] The CEC could play an important agenda-setting function by sponsoring regular conferences and policy papers on subsidy reform.

The CEC could do this by increasing its involvement with NGOs working on subsidy reform. Fortunately, there are a growing number of community groups that are recognizing the transnational linkages between fossil fuel subsidies, environment and public health, and international trade. Environmental, labor, and health groups and research institutes provide critical analyses of perverse subsidies, propose and implement environmentally sustainable alternatives, and have access to the public through their education campaigns, publications, and websites. 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

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[23] Article II, 2(a) and III, 2 of the WTO allows for "border tax adjustments." Moreover, GATT rules allow governments to impose such taxes on materials used to make goods, not only to goods themselves. Thus government can impose import taxes on energy goods as long as they similarly tax energy goods produced domestically; conversely, government can provide tax rebates on energy goods sold abroad if they also tax the same goods sold to the domestic market. However, a major unresolved issue relates to the enormous energy inputs that are not incorporated in the final product, such as energy used to transport, process or package a product. Trade panel rulings suggest that no distinction may be made between like products – that is, products having the same physical characteristics. This is a problem when you consider that long-distance transport of goods results in major greenhouse gas emissions. Steve Shrybman (2001, p79) recommends, from an environmental perspective, that "There should only be two relevant trade conditions that would potentially restrict such import or export taxes: Is the measure part of a *bona fide* domestic program intended to accomplish environmental objectives? And is the calculation of the border tax adjustment a reasonable estimate of the taxes that would be applied to goods produced locally, and for domestic market?"

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

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 networks of NGOs and other players working on subsidy removal. Numerous cross-sectoral coalitions are already forming. For example, more than 20 environmental and economic reform NGOs, including Friends of the Earth, the Sierra Club, The Wilderness Society, Citizens for Tax Justices, Taxpayers for Common Sense, and the U.S. Public Interest Research Group, have launched a Green Scissors project to promote the elimination of perverse subsidies (Cuff et al., 1996). In January 2002, the Ontario Clean Air Alliance (a large coalition of environmental, health, and municipal groups in Ontario, Canada) asked over 100 Ontario corporations to begin to phase-out their purchases of coal-fired electricity. Husky Injection Molding Systems, a global supplier of equipment and services to the plastics injection molding industry, became the first company to respond positively to the campaign. Its manufacturing plant in Bolton, Ontario, will buy green power from Ontario Power.

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.

To sum up the argument in today's language of global politics, fossil fuel subsidies constitute a stealth weapon of quiet destruction both of the natural environment and the health of the world's population. The development of such weapons of mass destruction will continue so long as the national and provincial/state policies of the United States, Canada, and Mexico continue to favor unsustainable energy sources. The necessary solution is regime change: a shift from a regime of perverse subsidies to one characterized by environmentally and economically responsible support for more benign energy alternatives. As the most prominent trilateral environmental forum in North America, the CEC can – and should – reinforce the latter and undermine the former by fostering public consciousness in order to alter the political agenda across the continent.

APPENDIX I

Major Fossil Fuel Subsidies in the United States		
Name	Funding	Description
Immediate Expensing of Exploration and Development Costs	$200 million/year	Fossil fuel producers can immediately write off the majority of their development costs
Percentage Depletion Allowance (Oil and Nat. Gas)	$600 million/year	Oil and gas companies can deduct 15% of their sales revenue instead of the standard cost depreciation
Intangible Drilling Costs	$500 million/year	Integrated oil and gas companies can deduct 70% of their "intangible" drilling costs
Passive Loss (Oil & Gas)	$100 million/year	Allows owners to offset "passive losses" against income and thus pay lower taxes
Enhanced Oil Recovery Incentive	$100 million/year	Companies can write off tertiary costs - focuses on extraction of difficult or expensive deposits
Clean Coal Technology Program	$326 million/year	Funding to private companies for the development of cleaner coal technology
Federal Coal R&D	$100 million/year	Department of Energy program to help produce new coal technology
Federal Fossil Fuel R&D (excluding coal)	$100 million/year $238 million (2002)	Funding for private companies to conduct oil and natural gas research and development
Capital Gains Treatment of Royalties on Coal	$15 million/year	Owners who lease out coal mining rights can pay capital gains taxes on royalties, rather than higher income tax rate
Petroleum Research and Development Program	$56 million/year	Funding for exploration and exploitation of petroleum deposits
Oil and Natural Gas Income Tax Credits	$3 per barrel of oil $0.50 per 1000 $feet^2$ of Nat. Gas	Allows producers to deduct specified amounts from federal income tax

Source:

Council on Environmental Quality. 2002. *The Bush Administration's Record of Environmental Progress.* Washington D.C.: Government Printing Office

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APPENDIX II

Major Fossil Fuel Subsidies in Canada		
Name	Value	Description
Canadian Exploration Expense Program	100% of exploration expenses	Allows companies to write off their exploration and other “intangible” expenses
Canadian Development Expense Program,	30% of expense balance each year	Allows companies to write off the development of known reserves
Fuel Tax Allowance	N/A	No fuel tax paid on off-road vehicles for oil, natural gas and tar sands operations
Direct financing (1970-1999)	$40.4 billion	Loans and grants to oil and natural gas industries
Direct financing (Ministry of Natural Resources) (2002)	$32 809 482	Transfer payement and grants for oil, natural gas and tar sands development
Canadian oil and gas property expense	10% of balance/year	Allows companies to write off rents paid to resource owners (typically provinces)
Resource Allowance (oil and nat. gas)	25% of resource profits	Companies can deduct 25% of their resource profits from federal income tax
Atlantic Investment Tax Credit	10% tax credit on investments in energy production	Generally focused on offshore oil and natural gas investment
Canadian Scientific Research and Development Tax Credit	20-35% of total R&D costs	

Table B: Provincial Royalty Regimes		
Province	**Description**	**Value**
Alberta	Refundable tax credit of 25-75% of first $2 million	

	Royalty holidays to encourage new developments	
	Tar sands royalty*	1% of gross revenue
British Columbia	Reduced rates for new oil developments	
	36 month royalty holiday for new Nat. Gas developments	
Newfoundland	Royalties vary (onshore/offshore & production level)	1-7.5%
	Hibernia & Terra Nova Additional rents	$0.01 per barrel of oil plus royalty
Saskatchewan	Variable depending on production level	0-7.5%
	Royalty reductions and holidays for new projects	

* Tar sands royalty regimes are more generous than conventional oil and natural gas (See Table C). Generally the rate remains 1% until all capital and initial operating costs are covered and the Company has received a sufficient return on its investment.

Table C: Tar Sand

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