

Re-energizing the Future: Faith and Justice in a Post-Petroleum World

Developing an ecumenical response to the
fossil fuel crisis

December 2007

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Introduction

Human and other forms of life on our planet are truly at a moment of ecological crisis. Human-induced climate change and oil wars risk the present and future of humanity, other species, and the Earth itself. At stake are the lives of millions of marginalized people, and the well-being – and very survival – of many other parts of God’s Creation. It is the gravest of times.

And yet there is also a profound sense of hope – hope in the God of Faithfulness whose rainbow covenant with the Earth endures; hope in the international community as scientists and leaders coalesce around common understandings of our ecological situation; and hope in the ordinary people of our country who seem ready in increasing numbers to make personal changes to reduce our dependence on fossil fuels which most significantly contribute to our climate crisis.

KAIROS invites reflection and action, both pastoral and prophetic, as we struggle to confront the harmful impacts of fossil fuel exploitation and seek to imagine and work for a transformed future of well-being for all God’s Creation.

1. Background

In the 2006-2010 program plan, the KAIROS Board approved an area of work that integrates ecological, economic, and human rights issues. Rooted in an analysis of the damage caused by our over-dependence on fossil fuels, this work strives to achieve “a major shift toward a sustainable and just energy economy with a decrease in the human rights violations and the ecological destruction that accompany the current fossil fuel dominated energy economy.”ⁱ

Energy and its flow through ecosystems and human societies is one of the most pervasive and fundamental realities, ecologically and societally. It affects nearly every aspect of human life.

Energy issues that have emerged over the last century and a half originated with new technologies and low cost, often subsidized or government-supported, energy. These include fossil fuel prices that do not incorporate real external costs and have brought about a widespread pattern of profligate, inefficient energy use. Over time, this has created a huge new infrastructure of human settlements with consequent impacts on the environment, industry and commerce, transportation systems, and food production – all of which are dependent on relatively cheap energy. In a world of six billion people and counting, we now recognize that this infrastructure, and the energy production and use related to it, creates a myriad of extremely serious environmental, social, economic and political problems that are particularly intractable because of their scale and systemic nature.

The KAIROS work on energy justice focuses on one aspect of the global energy dilemma, namely fossil fuels. Fossil fuels are at the heart of a number of intersecting crises: changes to the global climate, resource wars, and ecological damage to our ecosystems, including the air we breathe. There are many other facets of work that are necessary to create a new energy paradigm but which are beyond the scope of KAIROS' work. We do hope, however, that our work on fossil fuels can meaningfully contribute to the larger energy challenge world wide.

Virtually every sector of the global economy, including most notably agriculture, manufacturing, and transportation, is highly dependent on the fossil fuel industry. This dependence is becoming increasingly perilous for the Earth, its ecosystems, and its people. The struggle to control oil supplies and production has fuelled some of the world's deadliest conflicts, resulting in massive human rights abuses and millions of deaths. The burning of fossil fuels has dramatically impacted global ecosystems as greenhouse gases (GHGs) concentrations have increased, to the point that climate change may be the greatest survival threat known to the planet's human, animal, and plant species.

The world's most impoverished people, especially those who live in arid and mountainous regions, tropical zones, small islands, and coastal areas or polar regions, are bearing the initial impacts of the climate crisis and will likely feel the most destructive effects as those intensify in the years ahead. Widespread health effects, including asthma, other respiratory illnesses and links to cancer, are caused by air pollution from the combustion of fossil fuels and petrochemical toxins widely used in agriculture, manufacturing and electricity generation.ⁱⁱ

Canada has one of the worst records among all the industrial countries in the Organization for Economic Cooperation and Development (OECD) with respect to per capita and total emissions of toxic substances.ⁱⁱⁱ Ozone and particulates affect the respiratory system leading to deaths from respiratory and heart disease.^{iv} In addition air pollution costs billions of dollars every year in hospital visits and worker absenteeism.

Every stage of the life cycle of oil, from exploration to daily use, can have harmful effects on humans, wildlife, and the ecosystems on which we depend.^v

Even as humanity continues to increase production and consumption of oil and gas, there are indications that we are nearing a point of peak oil^{vi} when these fossil fuels will become scarcer and more difficult to extract. If present rates of consumption are not decreased, a number of alarming scenarios could ensue, including increased oil exploration in fragile ecosystems, intensified conflict over oil, and widespread economic and social disruption from energy shortages.

KAIROS and the ecumenical coalitions that preceded it have a long history of addressing the inequitable and unsustainable production and use of fossil fuels. More than 25 years ago, GATT-Fly provided policy expertise to the Canadian churches and public regarding Canada's energy options for sustainability. The human rights coalitions, the Task Force on the Churches and Corporate Responsibility, and Project North (later the Aboriginal Rights Coalition) were leaders in opposing the activities of specific oil corporations in Canada and abroad that oppressed local populations and fanned the fires of conflict. Ten Days for Global Justice and the Inter-Church Committee on Ecology sounded the alarm on climate change in the early 1990s. Public education campaigns on the Kyoto Protocol in 1997 under the leadership of the Canadian Council of Churches and in 2000 under the Canadian Ecumenical Jubilee Initiative contributed to strong Canadian support for its ratification.

Today KAIROS attempts to bring the ecological, socio-economic and human rights dimensions of fossil fuel dependence into one framework with a renewed call for a fundamentally new energy culture and economy – one that is just, equitable, participatory and sustainable. We offer this paper as a tool to facilitate further input from KAIROS member churches and church organizations to develop this framework.

In addition, six background papers amplify various issues critical to our consideration of energy justice and will be referred to in the text at the conclusion of respective sections. These papers provide more detail and information for those seeking a deeper analysis and discussion of some of the directions proposed in this document.

[See Background Paper A: [Energy – The Lifeblood of Ecosystems](#), pp. 1-4, for more information.]

2. Theological and Ethical Principles

Our analysis of the current ecological crisis and our attempts to imagine a transformed future are rooted in our Christian faith. Throughout the Judeo-Christian tradition, there have been scriptural interpretations and theological perspectives that have affirmed an interconnected, interdependent relationship with Creation.

Some traditions particularly emphasize and give sacramental expression to God's indwelling in the natural world through the incarnation. All Creation, therefore, is a witness to the Creator. Others emphasize the giftedness of Creation, loved by God as it

should be loved by humanity. Others draw attention to the human responsibility to be custodians of Creation, not in a role of privilege, but accepting the duty to nurture and care for Creation. Still others focus on living lives of simplicity in the face of an over-consumption that damages God's world. Many North American churches, exploring a contextual theology of ecology, have been spiritually enriched through dialogue with both Aboriginal Christians and those who practice traditional Aboriginal religions.

At the same time, the research and writing of feminist, ecological and creation-centered theologians and others reveal how distorted understandings of the proper relationship between the Creator and creation has been detrimental to the Earth and to the churches over the centuries. The text from Genesis referring to humans having "dominion" over Creation (Gen. 1: 26) has been used to reinforce hierarchical power structures and has contributed to the separation of humanity from nature. The exclusive identification of the feminine with nature has led to the oppression of both.^{vii} These views, amplified by the Enlightenment and convenient to the needs of industrialization, sanctioned militarism, the military industry and an unlimited exploitation of the Earth's resources.

In response to the ecological crisis, most theologians today reject the anthropocentric concept of human domination over nature wherein the victimization of non-human species is largely ignored, given its inconsistency with fundamental insights of the Christian faith.

In imagining an ecologically just future, we will need to continue to learn from the wisdom embedded in our faith traditions. KAIROS welcomes the rich and diverse theological contributions of all of our member churches.

In the spirit of ecumenism, we affirm some core beliefs that we hold in common:

2.1 We believe that the world as God's handiwork has its own inherent worth and value.

After each act in the first Creation story (Genesis 1), God "saw that it was good." Following God's lead, we value Creation in its own right, caring for it as would God, its Creator. This teaching calls for a change of worldview from one of unrelenting exploitation of that which has value only in our use of it, to an understanding of Earth as a community of interconnected living things that are mutually dependent on each other for life and survival.

2.2 We believe that we share in God's covenanted relationship with all of Creation.

In Genesis 2: 15 we learn that when God created the Garden of Eden, God also charged humans to "till it and keep it." In Genesis 9: 8-17, we read that God makes an inter-species, inter-generational covenant out of love for all Creation. "And God said, 'this is the sign of the covenant I am making between me and you, a covenant for all generations to come: I have set my rainbow in the clouds, and it will be a sign of the covenant between me and the Earth.'" The sign of the rainbow reminds us of God's gift of sustainable life in Creation and the story of the Garden of Eden reminds us of our human responsibility to do our part in its care. The climate crisis requires an urgent renewal of this covenant through the building of *sustainable communities*

that nurture relationships within the human family and between humans and rest of the ecological community.^{viii}

2.3 We believe that the way we treat the poor and the vulnerable and all Creation is a reflection of our faithfulness to God.

The Hebrew Scriptures assert that care of those living on the margins – the widow, the orphan, the stranger – is a requirement of holiness (Exodus 22: 21-27, Deut. 10: 17, Deut. 24: 20-21, Prov. 19: 17). In the Gospels, care of the poor, the sick, or stranger is made analogous to dedication to God (Matt. 25: 31-46).

The current climate crisis disproportionately affects vulnerable peoples by destroying cultures and ways of life, whether that of peoples of the Arctic, Pacific Island peoples, those living in arid regions, or those in low-lying and coastal communities. Wars over fossil fuels have inflicted enormous suffering and death, greatly affecting marginalized people living in fossil fuel-strategic countries. As Christians we address the choices that lead to these tragic realities for vulnerable peoples and act on the principle of solidarity called for by God.

A new awareness of ecology and the interconnectedness of all life also expands our understanding of the poor and vulnerable in our day to include endangered and vanishing species that are part of Creation.

2.4 We believe that God wants people to live in mercy, compassion and mutual respect of other humans and all Creation and that this will be the basis for peace and justice.

The basic Biblical call to love our neighbours as ourselves (Lev. 19: 18, Mark 12: 31) along with the Golden Rule where we are urged to do unto others as we would have them do unto us (Mt 7: 12) counsel us against seeking our own well-being at the expense of other parts of Creation. The climate crisis has been largely precipitated by industrialized countries, with disproportionate advantages to the more wealthy within them who have reaped the benefits of globalization.

Developing countries, on the other hand, and the poorest therein, pay the price for the choices of the rich and powerful. The oil industry, dominated by a few mega-corporations, is a key vehicle for concentrating wealth for a tiny minority, even as the majority of citizens of many oil-exporting countries see no benefit from their own resources. This unjust differential is contrary to an equitable sharing based on love of neighbour. Furthermore, the richest countries, and the rich within all countries, are living on the basis of material excess. Equity, sufficiency and doing no harm need to be central principles when addressing the climate crisis and the distribution and consumption of energy.

2.5 We believe that God intends restoration through Christ, inviting our collaboration in acts of healing and transformation.

Visions of the restoration of Creation are abundant in the Scriptures, including a renewal of the covenant (Ezek. 47: 1-12, Isaiah 58: 1-12, Isaiah 61: 1-4, Isaiah 65: 11-25, Rev. 21: 1-4). While the current state of our planet represents the gravest of crises, we

are not without hope or vision; our faith does not permit the luxury of despair. The resurrected Christ restores us to a right relationship with God, one another, and the rest of God's Creation upon which we depend.

Our efforts towards a vision of ecological restoration are consistent with God's love of Creation and God's intention for faithful community. However, the Common Good can only be restored through socially just processes that ensure that all persons can participate in decisions about how to obtain sustenance and manage community life. The principle of just participation will also be important in healing the Earth.^{ix}

3. The Climate Crisis

Human-produced GHG emissions have already begun to impact on vulnerable people, including the Aboriginal peoples in the Canadian north, and on the poor, especially women, rural and resource-based communities and on ecosystems around the world.^x If emissions continue to increase, climate change will have catastrophic effects for all life on Earth. To avoid this future, fundamental changes are needed, particularly by those countries and people who have benefited most from the production and consumption of fossil fuels over the past century.

We have already waited far too long in taking serious action. It is time to pay the ecological debt to the poor, to those least responsible but most affected, and to the planet. The timing and depth of these changes need to be governed primarily by what is required to avoid dangerous levels of GHG emissions, not by what the fossil fuel economy or political strategies can bear. Delays in action are unconscionable and bequeath an ever-deepening crisis to future generations.

3.1 The countries and people that have historically been the heaviest users of fossil fuels and the largest emitters of GHGs must initially bear the largest burden in reducing GHG emissions.

We have advocated for and continue to affirm the principle embodied in the Kyoto Accord whereby Canada, the United States, European and other industrialized countries should shoulder the primary responsibility and be the first to make GHG reductions. Appropriation of a disproportionate share of the world's fossil fuel resources by this group of nations has contributed significantly to the scandalous gap between rich and poor and between the global North and South.

Notwithstanding the steep rise in fossil fuel use in countries such as China and India, on a per capita basis impoverished countries contribute less to, and suffer more from, climate change. So too, poor people within every country contribute less to the problem and suffer more from it.

Canadians and others who are initially shielded from the worst effects of climate change by their wealth and geographic location have a legal obligation under international law, as well as a moral duty, to take measures to protect those more vulnerable. Of course, in an interdependent global community, impacts on other countries will eventually have serious consequences for Canada as well. As a central

priority, the governments of Canada at all levels urgently need to develop policy coherence across all departments in their programming and budgeting to address the climate crisis.

3.2 Canada needs to forge a new, more sustainable energy path.

While Canada and many other countries are running out of known conventional oil and gas reserves, the vast oil sands in Western Canada and off-shore oil fields in Atlantic Canada are seen as a resource to make Canada a net exporter of oil for many years to come. Since the oil sands are the largest source of growth in GHG emissions in Canada, the current frenetic pace and long-term plans for their development are irreconcilable with the need to dramatically reduce Canada's overall GHGs.^{xi} The true cost of this rapid development, including the so far externalized cost to society and the environment - especially habitat destruction - is only beginning to be counted.

The vast quantities of fresh water used in oil sands production and the subsequent pollution of water resources is also a cause for deep concern. Aboriginal communities downstream from the oil sands developments are experiencing negative impacts on their health and livelihood as a result of reduced and contaminated water flows.^{xii} Surrounding communities are experiencing unsustainable pressures for housing, health and infrastructure development that are having ripple effects on the social economy as a whole. In addition, the overall ecological impact of the large-scale excavations and infrastructure being built for oil sands development is causing serious damage to species and ecosystems in the region.

The members of KAIROS have an opportunity to engage these issues at local, regional and national levels as questions that directly concern their work and ministry are examined and resolved. Discussions on these issues need to be undertaken urgently with all those involved, especially those in the regions most affected. One of the questions is whether to promote a moratorium on oil sands approvals and further development until these concerns are resolved and a realistic plan is developed to limit emissions consistent both with Canada's Kyoto obligations and to meet the further reductions that will be needed beyond Kyoto.^{xiii}

3.3 Capping and taxing carbon emissions in order to hold producers and consumers accountable and to encourage absolute reductions is essential.

Putting a price on carbon emissions is necessary in order to compel industries, businesses, organizations (including churches), and individuals to recognize the social and ecological costs of excessive fossil fuel consumption and to induce corporate and human behaviour change (conservation and efficiency measures, carbon capture and sequestration,^{xiv} and use of renewable energy alternatives).

Among the options to achieve these goals are the imposition of strictly enforceable regulations governing permissible emissions and the creation of an emission trading system in the context of an overall carbon cap. Carbon offset purchases^{xv} have not been much in use yet, nor are they very effective in curbing emissions due partly to a

lack of availability and because the cost to emitters has probably been too low. Offset schemes have sometimes had negative effects for local communities in the global South and a questionable record in terms of actual carbon sequestration.^{xvi}

While low energy prices, contemporary technology, and other facets of present-day energy systems have produced some benefits, including jobs and tax revenues, the fact remains that pricing carbon emissions, as with fossil fuel prices themselves, have not yet significantly begun to incorporate the real external costs. Making progress in this area requires political leadership in making substantive changes to the major driver of the current problems, specifically pricing and economics, including tax policies, so as to mitigate how they would otherwise disproportionately and adversely affect impoverished consumers in the global South and North.

Approximately 700 large firms in the fossil fuel extraction, electricity generation and industrial sectors are responsible for about half of Canada's greenhouse gas emissions. Recently passed legislation binds the Canadian government to set emission reduction targets that meet our Kyoto commitments (to reduce emissions to 6% below their 1990 levels) and paves the way to apply a carbon tax or a fee on emissions that exceed this target. "Intensity" targets which require industries to reduce GHG emissions per unit of production but allow absolute levels of GHGs to rise will be inadequate and ineffective. A cap and trade system will generate greater overall reductions more quickly and in keeping with international agreements.

About two-fifths of Canadian GHG emissions occur in downstream fossil fuel use by the transportation, commercial, residential and institutional sectors. Requiring end users to pay carbon taxes will discourage over-consumption. The revenues from such taxes could be invested to further cut consumption and enable the deeper reductions of GHGs that will be required in the near future.

It should be recognized, however, that carbon taxes can disproportionately affect the poor when they lead to across-the-board increases in areas such as heating costs. These costs are particularly burdensome to people with little disposable income who often live in poorly insulated housing. Moreover we should be careful that eco-subsidies and tax rebates do not benefit middle income citizens with the power to purchase eco-friendly products at the cost of diverting tax dollars away from social programs and transfers that benefit the poorest among us. Every effort should be made to ensure that carbon taxes do not lead to the further impoverishment of low-income people.

3.4 The automobile industry promotes an unsustainable car-dependent culture that must be fundamentally changed in order to address the fossil fuel crisis.

One of the most problematic fossil fuel-related energy issues in North America is the car culture: the intertwined patterns of work, human settlement and transportation that even now continue to expand and make difficult the introduction of better options.

Over the past 50 years, except in some parts of large cities, the services needed in daily living have vanished from neighbourhood and town centres. Where several decades ago, people in even small settlements could generally get to schools, medical services, libraries, post offices, drug stores, grocery stores, and other shopping destinations on foot, supplemented by service delivery, cars are now virtually essential for access.

Strong opponents of significant policy change in fossil fuel use, among them oil companies, the automobile industry, some industry-related unions, as well as royalty-dependent provincial governments, have vested interests in today's energy systems.

3.5 Adaptation to unavoidable climate change impacts is necessary but falls short as a primary strategy for addressing the overall climate change crisis.

Some negative consequences of GHG emissions are already evident in Canada and other parts of the world. Additional effects resulting from existing emissions are unavoidable. Canada needs to devote significant resources to assisting those who are experiencing these impacts, especially Aboriginal peoples in Canada's north. Canada also needs to prepare for an increase in climate crisis "refugees"^{xvii} as ecological impacts force vulnerable people to migrate. This may include redefining refugee entry requirements and raising quotas.

However Canada needs to make an immediate concerted effort to meet Kyoto targets and the far deeper emissions reductions required to avoid catastrophic effects of the climate crisis.^{xviii} It is imperative that the world community as a whole firmly agree to limit global average temperature rise to as far below 2° Celsius as possible, relative to the pre-industrial level.

3.6 KAIROS members and the broader church community can endeavour to model the changes needed in Canadian society as a whole.

KAIROS can adopt an internal energy protocol as a way of living out our commitment. As institutions, we can develop comprehensive and creative action plans to reduce dependency on fossil fuels including energy efficiencies in our buildings and new travel policies. Models of existing church programs on energy efficiency and conservation can be more widely shared and communicated to encourage others to get involved. We can invite others into a new social and economic vision of reduced fossil fuel use that affects choices we make in our transport, housing, and purchases of goods.

Churches can challenge the current economic and cultural orthodoxy of unlimited growth and consumption. Eco-theological and eco-spiritual teachings need to be rediscovered to under-gird the shift to a new consciousness of our role and responsibilities to the whole Earth Community. This will require a paradigm shift in our consciousness to understand how to protect the Earth Community by linking a redefined human security to the security of all Creation. Following a principle of integrity based on the Golden Rule as an alternative to apocalyptic and paralysing

predictions for the future, the churches can offer hope that change is possible and preferable to the status quo.

KAIROS is beginning a new three year *Re-energize* campaign that will challenge our constituency to dramatically reduce use of fossil fuels in areas ranging from purchasing more local food to changing the way we use transportation. Integrity is the currency of change and positions us to be effective advocates for larger political change.

[See Background Paper B: Climate Change and Fossil Fuels, pp.5-11, for more information on Section 3.]

4. Human Rights and Conflict

Control of, or access to, fossil fuels has been a key foreign policy objective of the world's most powerful nations as they strive to maintain power and wealth inequities. Military force has often been used to uphold, or install, regimes in fossil-fuel rich or strategic countries. These regimes, with lucrative benefits for a small governing elite, allow the exploitation of their petroleum resources by foreign corporations and the export of fuel to meet the energy needs of military powers.^{xix}

In other cases, internal conflict has erupted over control of, and profits from, petroleum, frequently leading to fresh waves of refugees, massive human rights violations, and the death and displacement of millions of people.^{xx} More often than not, women are disproportionately impacted by conflict and war. They bear responsibility for care of their families under difficult circumstances in refugee camps and are vulnerable to abuse and exploitation. Moving away from fossil fuel dependence towards a localized sustainable energy economy could potentially eliminate what has been a major source of war and human rights abuses over the past century.

4.1 The use of Canada's military, directly or indirectly, to procure or enhance access to the fossil fuels of other countries runs counter to Canadian values.

In the past few years, the Canadian military has been increasingly transformed from one that focuses primarily on peacekeeping to one engaged in the "war on terror" – a concept that is closely related to military control of fossil fuel sources. This transformation has drawn Canada into U.S. foreign policy objectives as, for example, in Afghanistan.^{xxi} As global supplies of oil and gas dwindle while demand increases, the potential for further military interventions by fossil fuel import-dependent countries will increase.^{xxii} Many have argued that Canada explicitly recognize in its foreign policy that any such military interventions be considered illegal and actively oppose them.

4.2 Canadian fossil fuel companies need to be held legally accountable when they are linked to human rights violations and ecological damage overseas.

The voluntary approach to regulating Canadian corporate behaviour abroad has clearly failed to protect human rights and ecosystems, particularly in the global South.^{xxiii} KAIROS partners there tell us that Canada is increasingly viewed by local

communities through the prism of Canadian corporate behaviour, leaving an impression of our country as less concerned about human rights and ecological sustainability than shareholder value.^{xxiv}

KAIROS has consistently advocated that the government of Canada enact legislation that requires Canadian corporations operating overseas to meet internationally recognized human rights and environmental standards, including the rights of workers and Indigenous peoples, and holds companies accountable when they are found to be complicit in human rights violations and ecological damage.^{xxv}

4.3 The government of Canada needs to support local and international efforts to hold state actors accountable for human rights violations related to oil and gas extraction.

Coupled with the activities of the oil and gas industry in resource-rich countries is a tragic legacy of egregious human rights violations committed by state actors. These include the displacement of indigenous populations and government-supported militias to quell local resistance. Governments have been involved in facilitating the efforts of oil and gas companies in ways that violate the rights of their citizenry.

KAIROS has advocated that the government of Canada increase efforts at preventing these violations from occurring or, if they do occur, to support victims using existing mechanisms such as the International Criminal Court and the UN Human Rights Council to hold accountable the perpetrators of oil and gas related human rights violations.

[See Background Paper C: Regulating Canadian Mining, Oil And Gas Companies Operating Internationally, pp. 12-14, for more information on points 4.2 and 4.3.]

4.4 The government of Canada needs to address foreign government corruption and questionable arms sales arising from oil and gas revenues.

The large revenues that flow from oil and gas exports often fuel government corruption and prop up autocratic military regimes. States and state-supported militias use “petro-dollars” to purchase small arms and other weapons that are used to quell opposition movements and harm civilians.

The government of Canada needs to actively increase its support for initiatives such as the Extractive Industries Transparency Initiative,^{xxvi} which promote transparency, accountability and good governance in how oil and gas revenues are used and ensure that these standards apply both in Canada and to the activities of Canadian companies overseas.

4.5 The human rights of Aboriginal peoples in Canada need to be vigorously promoted and protected in the extraction and development of fossil fuel resources.

Many of Canada’s oil and gas deposits are located on or near the traditional territories of First Nations and other Aboriginal peoples and are often an integral part of ongoing land claims and treaty rights negotiations. Similarly, the construction of long pipelines often involves addressing Aboriginal land rights.

Increasingly some First Nations are developing energy projects themselves. The ecological impact of northern fossil fuel mega-projects is felt most directly by Aboriginal peoples.^{xvii} Consultations and inclusion of Aboriginal peoples in decisions about oil and gas projects have been woefully inadequate. Governments and corporations involved need to ensure that energy development projects have the Free, Prior and Informed Consent (FPIC) of all Aboriginal peoples affected.

At the same time, it must be recognized that Aboriginal peoples are not of one mind in their views of the benefits and detriments of large energy projects. Furthermore, some First Nations are developing energy projects themselves in order to build their economies. KAIROS needs to deepen our dialogue and engagement with Aboriginal peoples on these issues.

[See Background Paper C: Regulating Canadian Mining, Oil And Gas Companies Operating Internationally, pp. 12-14, for more information on FPIC.]

4.6 KAIROS has a role to play in diminishing fossil fuel-related conflict and human rights violations.

Conflicts over fossil fuel are often construed as wars for democracy and freedom. KAIROS welcomes opportunities to contribute to discussions and reflections in the ecumenical community as we develop a deeper understanding of how these conflicts originate and what is at stake. KAIROS can mobilize its members to oppose wars and work for peace. We can increase our support for organizations in the South that are addressing justice issues related to fossil fuel extraction and conflict and expose the role of Canadian corporations in perpetuating fossil fuel injustice. We can support our Aboriginal partners in Canada who are resisting fossil-fuel related projects that are detrimental to their self-determination, while supporting just development activities. We can speak out with one ecumenical voice to right past wrongs and the violent history of fossil fuel exploitation in our world by seeking a new and sustainable energy path to a peaceful future.

[See Background Paper D: Fossil Fuels, Conflict and Human Rights, pp. 15-17, for more information on this point.]

5. Government Subsidies for Fossil Fuel Production

The use of public money by governments needs to reflect public priorities. Financial instruments like taxation policies, incentives and disincentives can be used to shift toward a sustainable energy economy. Government policies can be in sharp contradiction when, on the one hand, they are committed to addressing climate change and other negative impacts of fossil fuel use, and at the same time heavily subsidizing fossil fuel energy corporations.^{xviii} While some areas and sectors may need government assistance for a transition period, a new relationship with Canadian fossil fuel corporations is required, one that ends the historical preferential treatment accorded by governments to this industry.

Full public discussions are needed about these subsidies and their impact on other policy options. An in-depth review of all government subsidies that encourage fossil fuel use, such as those to vehicle manufacturers, suburban road construction, and airports, is urgently required in order to reduce fossil fuel consumption. At the same time, appropriate incentives for transportation and renewable energy technologies – as well as addressing the special needs of First Nations, and/or transitional strategies for provincial economies that are heavily dependent on fossil fuel production – need to be considered.

5.1 The government of Canada needs to substantially redirect domestic subsidies from Canadian oil and gas companies into conservation and developing renewable energy sources.

Although the largest Canadian fossil fuel companies have been earning record profits, they continue to receive large subsidies from the government of Canada.^{xxix} Not only are these subsidies economically unnecessary, many are counterproductive to the critical task of decreasing our consumption of fossil fuels and combating the climate crisis. The public funds used to subsidize fossil fuel production need to be redirected into programs that will help Canada develop conservation, energy efficiency, renewable alternatives and reduce GHG emissions. At the same time, smaller companies, including Aboriginal companies that produce for more local/regional energy demands, may require separate consideration in devising appropriate taxation policies.

5.2 Canadian government assistance programs that help corporations and governments in the global South to exploit fossil fuel resources need to be redirected towards support for conservation, energy efficiency, and renewable energy projects in these countries.

As with domestic subsidies to Canadian corporations, it is counterproductive to encourage exploitation of fossil fuels in the global South while calling for GHG emission reductions. In addition, fossil fuel development is often related to corruption, human rights violations and conflict, and seriously skews economies towards over-dependence on fossil fuel exports. The Canadian government's heavy involvement in bilateral financing for fossil fuel extraction in the South needs to be redirected towards development assistance for energy conservation and efficiency, and renewable energy projects.^{xxx}

Similarly, Canada needs to use its influence within international financial institutions such as the World Bank to end funding for fossil fuel industries.^{xxxi} Instead it needs to support an appropriate multilateral agency to fund decentralized renewable energy technologies such as bio-digestion units, small-scale hydro, geothermal, wind and solar power options and encourage the sharing and dissemination of these technologies as widely as possible. In some cases it would be more appropriate to invest in the flexible mechanisms provided under the Kyoto Protocol for such things as Clean Development Mechanism projects that are

designed and implemented with criteria to ensure sustainable development and the absolute reduction of GHGs in the global atmosphere.

5.3 The Canadian government needs to introduce a new public environmental filter for decision making that takes into consideration the imperative of a sustainable and equitable energy future for Canada and the world.

An increasing awareness of the importance of ecological integrity led to the *Canadian Environmental Assessment Act* in 1995, whereby all federal decisions regarding major projects and programs were reviewed for their environmental impacts. More recently, sustainability impact assessments are required for new projects. Today, the government of Canada needs to introduce a new mechanism so that all its major decision making would be subject to a review of a project's impacts upon climate change and energy sustainability.

[See Background Paper E: Canadian and International Subsidies to the Fossil Fuel Industry, pp. 20-25, for more information on this section.]

6. A New Energy Paradigm

The series of crises spawned by the exploitation and consumption of fossil fuels – the climate crisis, pollution, human rights violations, war, gross wealth disparities, and ecosystem destruction – require us to envision and develop a very different global energy paradigm. This visioning process needs to include those who have been most negatively impacted by the effects of fossil fuel production and consumption. The people of Sub-Saharan Africa, for example, are vulnerable to climate change effects but their voices have been largely marginalized in climate change discussions.

In Canada, KAIROS is raising the idea that a critical first step in a new vision is a comprehensive Canadian energy policy that acknowledges the problems associated with fossil fuel use and dependence, and that commits Canada to new directions. This discussion paper does not address the wide variety of alternatives and renewable energy options, which require further research. Nevertheless we briefly address two high profile and controversial options that have been raised by our southern and Canadian partners: agrofuels for transportation needs and nuclear energy for electricity generation needs. In addition to directions articulated earlier in this paper, a new energy paradigm might include the following elements:

6.1 Canada, along with the rest of the world, needs to move towards a decentralized, democratic and equitable energy paradigm.

The oil and gas industry is one of the most concentrated and non-competitive.^{xxxii} Citizens are dependent on a handful of companies to supply their oil and gas needs, a situation that could result in serious shortages and disruptions, especially as fossil fuels become increasingly scarce. Moving away from reliance on fossil fuels towards renewable and sustainable energy sources would diminish the inequities that result from energy wealth concentration and create more possibilities for local communities to generate their own power and control their local economies. We

envision a future where local communities have a much larger role in public decision-making regarding energy production, distribution and consumption.

To build a just and sustainable energy future for Canadians we need to use our remaining hydrocarbon resources more efficiently, allocating them to their most appropriate uses, while we increase conservation efforts and make the transition to reliance on renewable energy sources. To conserve our dwindling reserves of oil and gas for future generations, we need to raise the issue of removing the North American Free Trade Agreement's proportional sharing clause (Article 605) that requires Canada to continue exporting non-renewable hydrocarbons to the United States even if those exports result in domestic shortages.^{xxxiii}

6.2 Canada needs to vigorously pursue energy conservation and efficiency measures in order to lower GHG emissions and conserve scarce hydrocarbon reserves for future generations.

Market-based and technological solutions have been proposed as the key to solving the climate crisis. While these will play a role, the magnitude of the task – up to a 90% reduction in Canada of GHG emissions, for example – requires far-reaching conservation and energy efficiency strategies to be central in addressing the climate crisis.^{xxxiv}

Through consultation on this discussion paper KAIROS hopes to propose to Canadian governments – federal, provincial, territorial, municipal and First Nations – the following policy goals:

- substantially reduce fossil fuel use in heating residential and commercial buildings through such measures as retrofit programs, energy-efficient building codes, and the use of solar, geothermal and other alternative heating sources;
- regulate energy-efficient standards for a wide range of consumer appliances and products, such as furnaces, refrigerators, air conditioners, and lights. While some Canadians are able to bear the costs associated with higher ecological standards, those Canadians living in poverty cannot and therefore anti-poverty measures must be introduced in tandem with measures that make consumer products more expensive;
- regulate vehicle fuel efficiency standards that meet or exceed those of California, which are the most stringent in North America; and
- allocate massive investment in public transportation with a focus on increasing rail and bus service.

KAIROS calls on its members and other Canadians to consider fundamental changes in such areas as personal transportation, home energy use and consumer buying – especially in areas such as food – with the goal of making dramatic reductions in personal energy use.

6.3 Canada needs to vigorously pursue the development of low GHG emission energy sources as part of a fossil fuel reduction strategy.

Were the government of Canada to adopt a target of 20% renewable energy by the year 2020, it would create exciting opportunities to develop a whole new economic

emphasis, focussing on a range of alternative technologies such as wind, solar, geothermal, biogas, and other zero-to-low polluting sources of energy.^{xxxv} The adoption of that target needs to include programs that encourage the development of alternative electrical generation (e.g., wind and small scale run-of-river hydro) and vehicle propulsion systems.

No one source will be *the* solution. In imagining what a just and sustainable energy future might look like, we need to look beyond a single universal substitute for fossil fuels. Different ecological zones may use different sources appropriate to their climate and resources. It is the diversity and creativity of many initiatives rather than a single “big fix” that will likely lead to solutions and a sustainable and prosperous economy.

6.4 Agrofuels as major alternative energy sources may not be a panacea.

Small-scale agrofuel projects that are sustainably managed by local communities could be an element in a decentralized sustainable energy economy and provide much needed income for farmers. The transition from fossil-fuel dependent transportation systems will take time and agrofuels may play a role in assisting that transition.

There are, however, serious concerns about large-scale targets for agrofuels, and the corresponding changes in land-use patterns that many Western governments are adopting. These plans threaten to displace food crops thereby driving up prices and potentially increasing food shortages, especially for the poor.

Mass scale schemes for turning sugar cane and oilseeds into fuel are also of concern in terms of their impact on small farmers and agricultural workers, ecosystems and food sovereignty, particularly in the global South. Furthermore, there is considerable evidence that current agrofuel production does not significantly reduce GHGs after taking into account the energy that must be used in the complete production process.^{xxxvi}

Many social movements in the global South are opposed to large-scale agrofuel production for export that threatens to displace sustainable agricultural practices and become the new frontier in the onslaught of the Earth’s ecosystems in order to extend a pattern of unsustainable over-consumption in Northern countries.^{xxxvii}

Irrespective of scale, production of agrofuels from switchgrass, agricultural residues or from cellulose and other non-food crop based feedstocks are likely to have less negative impact but they cannot replace current petroleum energy sources.

[See Background Paper F: [Biofuels](#), pp. 26-27, for more information on this point.]

6.5 Nuclear power may not be a safe option as a replacement for fossil fuels.

While some voices within government, industry, and even the environmental movement have pointed to nuclear energy as a replacement for fossil fuels, it is not necessarily the most affordable or safest alternative. There are still serious

reservations that need to be considered about the nuclear option. Nuclear waste remains dangerous for at least 250,000 years and no verifiably safe disposal methods have been developed. The carbon emissions and contaminants associated with the mining of uranium at the outset of the process are in themselves significant issues.

Although billed as a source of zero GHG emissions, once a nuclear electricity generation plant is running, mining uranium for nuclear power is very energy intensive, as is the production of the cement and building materials needed, and the externalized costs of the water for cooling, all adding to major emissions across the full life cycle of a nuclear power plant.

The ecological and human hazards arising from the operation of nuclear reactors are unfortunately demonstrated by accidents that have occurred in the past, especially where there have been weak regulatory frameworks. For these and other reasons, questions need be asked about nuclear energy in terms of cost, safety, public accountability and transparency.

Even with large subsidies nuclear power remains far more expensive per kilowatt than renewable energy sources.^{xxxviii} Beyond treatment and long-term storage of nuclear waste, there are unsavoury correlations between nuclear power generation for peaceful use and nuclear weapons. Given this litany of problems, KAIROS raises the precautionary principle around nuclear energy as a replacement for fossil fuels and proposes further dialogue among the churches on its role.

6.6 Canadian churches have a critical role to play in envisioning and enacting a different energy reality.

Canadian churches are a critical part of any movement to a new energy future. As institutions with worship spaces, retreat centres, and offices, we can implement energy reduction strategies.

As places of theological inquiry, we explore and support new ways of thinking about humanity's rightful place within an interdependent Creation. As witnesses in the public sphere, we can contribute convictions and ideas to the development of a just and sustainable energy policy for Canada.

As shareholders, we can influence the direction and practices of fossil fuel companies with respect to environmental impacts and human rights. As places of compassion and solidarity, we can support the genuine participation of marginalized individuals and groups in the forging of a new energy policy. Connecting to partners and churches around the world, we can bring into the Canadian debate experiences and innovations from across national boundaries.

As places of education and engagement, we can share new ecological knowledge, inviting strengthened commitment to personal acts of conservation and demonstrating hope in a new energy reality based on principles of solidarity, sustainability, equity, sufficiency and just participation. As churches, we are part of the solution we so urgently need.

7. Conclusion

Current public discussions and decisions about how humanity develops and uses fossil fuels and their alternatives will have a major bearing on justice issues and ecological sustainability in the future. This ecumenical discussion paper, focused on fossil fuels, is a first step in providing a framework for KAIROS' work relating to energy justice. The issues and questions are complex and therefore this process must be seen as only one contribution in the enormous task of creating a new energy paradigm. The current signs of the times indicate that we face an unprecedented life and death challenge resulting from our use of fossil fuels. But there is also hope through collective action. KAIROS invites its member churches and agencies to jointly reflect, engage and act on issues of energy justice.

KAIROS: Canadian Ecumenical Justice Initiatives is a faithful ecumenical response to the Biblical call to do justice. KAIROS members are the Anglican Church of Canada, the Canadian Catholic Organization for Development and Peace, the Canadian Conference of Catholic Bishops, the Canadian Religious Conference, the Christian Reformed Church in North America (Canada Corporation), the Evangelical Lutheran Church in Canada, Mennonite Central Committee Canada, the Presbyterian Church in Canada, the Primate's World Relief and Development Fund, the Religious Society of Friends (Quakers), and the United Church of Canada.

Endnotes

- ⁱ KAIROS 2006 – 2010 Program Plan as approved by the KAIROS Board of Directors.
- ⁱⁱ Health Canada analyzed data from eight major cities in Canada and estimated that 5,900 deaths per year in these cities can be attributed to air pollution. See Environment Canada, Clean Air Online. May 2, 2007. Revised Mortality Estimates Due to Air Pollution in Canada. www.ec.gc.ca/cleanair-airpur/Revised_Mortality_Estimates_Due_to_Air_Pollution-WS2BFC7599-1_En.html. The World Health Organization recently estimated that 800,000 deaths per year worldwide can be attributed to urban air pollution. See World Health Organization. *Reducing risks, promoting healthy life*. World Health Report 2002. Geneva or at http://whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf
- ⁱⁱⁱ Canada's Environmental Ranking as Compared to Other Industrial Countries, www.environmentalindicators.com
- ^{iv} Last, John et. al. 1988. *Taking Our Breath Away*. Vancouver: David Suzuki Foundation. Page 9. www.davidsuzuki.org/Publications/Climate_Change_Reports
- ^v See Paul R. Epstein and Jesse Selber, eds. March 2002. *Oil: A Life Cycle Analysis Of Its Health And Environmental Impacts*. The Center for Health and the Global Environment, Harvard Medical School.
- ^{vi} "Peak oil refers to the notion that at some point in the future we will reach a peak in the rate at which we can pump oil out of the ground. Regardless of the size of the world's remaining oil reserves, limits exist to the speed with which we can actually extract the liquid from the rock. Once we hit that peak, daily production rates will decline gradually over time... Estimates of peak oil range from [now] to 2035 and beyond." Adam Stein, *Peak oil and other things to keep you up at night*. www.terrapass.com/blog/posts/2005/11/peak-oil-and-other-things-to-keep-you-up-at-night.html
- ^{vii} See Rosemary Radford Ruether ed. 1996. *Women Healing Earth*. Maryknoll, New York: Orbis Books.
- ^{viii} For a description of sustainable communities see *Justice – The Heart of the Matter: An Ecumenical Approach to Financing for Development* prepared by the Ecumenical Coalition for Economic Justice for the World Council of Churches, 2001.
- ^{ix} The beliefs articulated in Section 2 have their root in the Christian tradition. However they may resonate with principles of other faiths and those of people of conscience. The *Earth Charter* articulates common principles across great diversity, proving to be a helpful resource for church and community alike. See <http://www.earthcharter.org>.
- ^x Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Geneva: IPCC Secretariat. <http://www.ipcc.ch/SPM13apr07.pdf>
- ^{xi} Mathew Bramley, Derek Neabel, and Dan Woynillowicz. 2005. *The Climate Implications of Canada's Oil Sands Development*. Drayton Valley, Alberta: Pembina Institute.
- ^{xii} See www.tarsandstimeout.ca/index.php?option=com_content&task=view&id=30&Itemid=36
- ^{xiii} The call for a moratorium on oil sands projects has been made by several Canadian organizations including the Polaris Institute, the Parkland Institute, the Canadian Centre for Policy Alternatives and the Sierra Club of Canada as well as Fort McMurray mayor Melissa Blake. See Hugh McCullum. 2006. *Fuelling Fortress America*. Ottawa and Edmonton: Canadian Centre for Policy Alternatives, Polaris Institute and Parkland Institute. www.tarsandswatch.org
- ^{xiv} Carbon capture and sequestration is a process consisting of the separation of CO₂ from industrial and energy-related sources, transport to a storage location and long-term isolation from the atmosphere.
- ^{xv} Carbon offsetting is the process of reducing greenhouse gas emissions by purchasing credits from others through emissions reductions projects, or carbon trading schemes. The term often refers to voluntary acts, arranged by a commercial carbon offset provider.
- ^{xvi} For examples of how some offset projects have negatively affected local communities see Larry Lohmann, ed. 2006. *Carbon Trading: A Critical Conversation on Climate Change, Privatisation and Power*. London: The Corner House.
- ^{xvii} People are displaced by gradual environmental shifts, many of which may be linked to climate change – such as desertification, diminishing water supplies, and rising sea levels. Stefan Lovgren, "Climate Change Creating Millions of 'Eco Refugees,' UN Warns." *National Geographic News*, November 18, 2005.
- ^{xviii} See George Monibot. 2006. *Heat: How to stop the planet burning*. London: Penguin Press.
- ^{xix} See Thomas Homer-Dixon. 2006. *The Upside of Down: Catastrophe, Creativity and the Renewal of Civilization*. Toronto: Alfred A. Knopf. Chapter 10.
- ^{xx} Wars cannot usually be attributed to a single cause. However, petroleum has been a clear factor in conflicts such as Iraq (1.6 million deaths since 1990), Nigeria (50,000 since 1999), Sudan (300,000 since 2003), and

Colombia (up to 200,000 since 1964). The number of displaced is in the millions (4 million in Iraq alone since 2003). See Project Ploughshares. *Armed Conflict Report 2006* at www.ploughshares.ca/libraries/ACRText/ACR-Chad.html#Deaths

- ^{xxi} “There has been a significant shift in how Canada operates in the world post-9/11. We’ve moved from being a nation that has championed internationalism, the United Nations and UN peacekeeping, to being a prop to an aggressive U.S. administration operating outside the constraints of international law. ... [W]e have to give the Bush administration whatever it wants on the security side of things to protect the economic integration already achieved. ... In comes the defense lobby that says ... [w]e have to... die in Afghanistan, ... this is the new dynamic.” Steven Staples quoted in Erik Halliwell, “Canada’s Mini-Military-Industrial Complex: Interview with Steven Staples - The outspoken critic the military tried to cover up.” *Guerilla News Network*, August 2, 2007.
- ^{xxii} Today, with US troops preparing a semi-permanent stay in Iraq and moves to control global oil and energy chokepoints, the situation is far more advanced. China and India have rapidly emerged as major oil-import economies at a time when existing sources of the West’s oil, from the North Sea to Alaska and beyond, are in significant decline. Here we have a pre-programmed scenario for future resource conflict on a global scale. F. William Engdahl, “The oil factor in Bush’s ‘war on tyranny,’” *Asia Times Online*, March 3, 2005.
- ^{xxiii} “Establish clear legal norms in Canada to ensure that Canadian companies and residents are held accountable when there is evidence of environmental and/or human rights violations associated with the activities of Canadian mining companies.” Standing Committee on Foreign Affairs and International Trade (SCFAIT), *Fourteenth Report: Mining in Developing Countries and Corporate Social Responsibility*, 38th Parliament, 1st Session, June 2005.
- ^{xxiv} “Over the past several years, the Subcommittee on Human Rights and International Development has heard evidence related to the activities of Canadian mining and other resource companies in developing countries, including Colombia, Sudan and the Democratic Republic of the Congo. Most recently, it has held hearings on the activities of the Canadian mining company TVI Pacific Inc. in the Philippines.” *Ibid*.
- ^{xxv} KAIROS participated in a government-sponsored consultation process regarding Canadian corporations operating abroad. See National Roundtables Advisory Group, *Advisory Group Report for the National Roundtables on Corporate Social Responsibility and the Canadian Extractive Industry in Developing Countries*. March 2007.
- ^{xxvi} The Extractive Industries Transparency Initiative (EITI) aims to ensure that the revenues from extractive industries contribute to sustainable development and poverty reduction. At the core of the initiative is a set of Principles and Criteria that establish how EITI should be implemented. See www.eitransparency.org/.
- ^{xxvii} CBC News. *High illness rate near oil sands worrisome, says Alberta health official*. March 10, 2006. www.cbc.ca/canada/story/2006/03/10/oilsands-chipewayan06031
- ^{xxviii} Nicholas Stern, et al. 2006. *Stern Review on The Economics of Climate Change*. London: HM Treasury. The Stern Review estimates worldwide subsidies for fossil fuels at between US\$150 billion and US\$250 billion a year while only US\$10 billion was spent in 2004 on deployment of technologies for producing energy from renewable sources. In addition, Stern reports that another US\$6.4 billion is spent each year on supporting biofuels and US\$16 billion goes to support nuclear power generation. p. 367.
- ^{xxix} Amy Taylor, Mathew Bramley, and Mark Winfield. 2005. *Government Spending on Canada’s Oil and Gas Industry*. Drayton Valley, Alberta: Pembina Institute. www.pembina.org
- ^{xxx} In 2006, Canada’s Export Development Corporation provided \$8,599 million to support the oil and gas sector and just \$15 million for alternative fuels and \$9 million for renewable energy. www.edc.ca
- ^{xxxi} Between 1992 and late 2004, the World Bank approved US\$28 billion in financing for fossil fuel-related projects. This lending was 17 times as much as its financing for energy efficiency and renewable energy projects. See Jim Vallette, Daphne Wysham, and Nadia Martinez. 2004. *A Wrong Turn from Rio*. Washington: Sustainable Energy and Economy Network, Institute for Policy Studies. p. 1. In fiscal 2005 World Bank lending for renewable energy and energy efficiency exceeded lending for fossil fuels (US\$459 million versus US\$451 million). But in fiscal 2006 the pattern again reversed with lending for fossil fuels growing by 93% to US\$869 million while lending for renewable energy and energy efficiency only grew by 46% to US\$668 million. Data compiled by the Bank Information Center in Washington from World Bank reports on *Implementation of Management Response to the Extractive Industry Review*.
- ^{xxxii} Corporate concentration and uncompetitive practices in the petroleum industry have been chronicled by a number of authors. See for example, John Blair. 1976. *The Control of Oil*. New York: Vintage Books; and Linda

- McQuaig. 2004. *It's the Crude, Dude: War, Big Oil and the Fight for the Planet*. Toronto: Doubleday.
- ^{xxxiii} See John Dillon, 2006. *How NAFTA Limits our Energy Options*. Toronto: KAIROS.
- ^{xxxiv} George Monibot, 2006. *Heat: How to stop the planet burning*. London: Penguin Press. p. 16.
- ^{xxxv} According to Natural Resources Canada 15.3% of the primary energy used in Canada in 2004 was from renewable sources, mostly hydro. NRC forecasts small increases in hydro and wind power use over the next 15 years and larger increases in petroleum and natural gas consumption. In the absence of major policy changes, total renewable energy use as a percent of primary demand would fall to 14.8% by 2020. Calculated from Table 15, page 135 of Natural Resources Canada. 2006. *Canada's Energy Outlook: The Reference Case 2006*. Ottawa: Natural Resources Canada.
- ^{xxxvi} See "Are Agrofuels Alternatives to Oil?" KAIROS Briefing Paper No. 9. Toronto: KAIROS. March, 2007.
- ^{xxxvii} Joao Pedro Stedile. 2007. *Los campesinos latinoamericanos, contra Bush y los biocombustibles*. *Energia Sur: Energia, ambiente y desarrollo en America Latina*. www.energiasur.com/biocombustibles/StedileCampesinosBiocombustibles.htm
- ^{xxxviii} Between 1956 and 2000, AECL received \$16.6 billion in federal subsidies, according to the David Suzuki Foundation.