GREEN, DECENT AND PUBLIC

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ABSTRACT

This report focuses on the distinct opportunities of the public sector to play a prominent role in generating decent green jobs. This begins with a discussion of the shovel-ready capacity of the public sector and the economic growth potential of green jobs. This is followed by a closer examination of energy efficiency opportunities in the electricity sector and beyond. Focus is then shifted to the electricity sector and the tremendous potential for green job creation associated with renewable power generation. Departing from the historical pattern of public power systems, today there is a trend towards market liberalization in Canadian electricity sectors. This is problematic for a number of reasons including decreased accountability, higher electricity prices and concerns with limited reliability. Public and community ownership of renewable power generation is offered as an alternative path to further market liberalization that has distinct advantages. These advantages include retaining economic revenues, maximizing social benefits, prioritizing conservation and ensuring energy security.

Canadian Labour Congress
Congrès du travail du Canada

The Council of Canadians
Le Conseil des Canadiens

FOREWARD

The Canadian Energy Sector

Energy is at the heart of our society, whether it takes the form of the power to heat and light a home, drive a car or power factories. It is key to almost all goods and services produced and consumed, and represents 7 per cent of Canada's gross domestic product.[1] Canada's energy industries are a major source of employment, more than 298, 000 Canadians being directly employed in the sector, and they represent a significant driver for the Canadian economy.[2] The energy industries are also a significant contributor to climate change in Canada. Carbon dioxide is released in the production and consumption of fossil fuels, the leading contributor to climate change. According to Environment Canada, 80 per cent of national greenhouse gas (GHG) emissions are predominantly associated with the production or consumption of fossil fuels for energy purposes.[3] Along with the transportation sector, energy industries including both electric power and fossil fuel production accounted for most of the increase in GHG emissions between 1990 and 2007.[4] Not all provinces contribute equally; each has a unique energy profile. Significant variation also exists in both the amount of energy used and the total amount of GHG emissions per person between the provinces. The distinct qualities of the provinces in terms of weather, geography, geology and energy sources largely determine the quantity of their energy production and consumption.

The fossil fuel segment of the energy sector includes industries associated with extracting, refining and processing coal, natural gas and oil. Canada is a mid-sized coal producer globally and the third largest producer of natural gas, although production has levelled off in recent years.[5] One of the most significant features of the Canadian fossil fuel sector is the tar sands. Canada has the world's second largest oil reserves largely because of the deposits in the Fort McMurray region of Alberta (with extensions for potential production in Saskatchewan). The production of synthetic crude from these reserves involves extracting and processing bitumen – a hydrocarbon that is solid at normal temperatures and mixed in with sand, clay and water – requiring a very energy-intensive process producing up to five times the amount of GHG emissions than Canadian conventional oil production.[6]

The market liberalization path

Since former Prime Minister Brian Mulroney declared Canada "open for business" in 1984, a free-market-oriented approach has dominated the regulation of the fossil fuel sector and, increasingly, the electricity sector – the latter being a primary focus of this report. This happened at the same time as a shift towards a set of ideas underpinning the neoliberal policies championed in the 1980s by Margaret Thatcher in the U.K. and Ronald Reagan in the U.S. Put simply, the free market is in theory meant to enhance competition, improving efficiency and lowering costs.

Impacts of market liberalization in the Canadian fossil fuels sector

The market-oriented shift in the 1980s was accompanied by a powerful trade agreement, the North American Free Trade Agreement (NAFTA). NAFTA represents a continentalist vision for energy policy and has helped create an integrated North American energy market. Through NAFTA, Canadian energy resources are transformed into North American energy resources, with market forces driving Canada-U.S. trade. NAFTA includes provisions that limit the capacity of governments to affect energy trade, including chapter 6 provisions that prohibit import and export controls, as well as a two-priced system and the proportional sharing clause. Chapter 11 provides NAFTA member-country investors with a dispute mechanism to claim damages against member countries for infringements of investor rights under the Agreement. Investors have the right to sue Canada for damages before private arbitral tribunals – not democratic national courts.[7] In line with free market ideals and directed by NAFTA provisions, oil and gas exports have been deregulated, restrictions on American foreign ownership of energy resources removed, import or export restrictions undermined, and the influence of energy corporations enhanced. In 1986 natural gas–producing provinces and the federal government agreed to deregulate the wholesale price of natural gas. In 2005, the Government of Canada divested itself of its ownership of Petro-Canada.[8]

This has contributed to a pattern of export-oriented energy developments in Canada, which is having serious social and environmental impacts. The energy gold rush in the tar sands – the majority of the heavy oil produced is exported to the United States – is a clear example. First Nations communities near tar sands developments have raised concerns over unusually high rates of rare cancers and the lack of recognition of Aboriginal title and treaty rights. The mining requires large tracts of boreal forest to be destroyed. On average, two to five barrels of water are needed to produce one barrel of oil and large amounts

of toxic water are stored in massive, leaking tailings ponds.[9] The tar sands are the largest source of projected new greenhouse gas pollution in Canada; predictions are that they alone will account for 12 per cent of Canada's emissions by 2020, based on the projected growth pattern.[10]

The market-oriented shift in the fossil fuels sector, along with NAFTA, has created a disconnection between energy production and consumption of oil and gas in Canada. While 2.6 million barrels of oil are produced daily in Canada, 1.8 million barrels are exported.[11] Close to 60 per cent of natural gas produced in Canada is exported to the U.S.[12] In 2008, oil imports accounted for 75 per cent of Atlantic Canada's supply of refinery crude, and 92 per cent of Quebec's.[13] This disconnect raises a number of serious concerns about the ability of the Canadian government to ensure energy security needs in the event of a supply or market crisis.

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Andrea's passion for climate justice – seeking equitable solutions to the climate crisis – is a natural extension of her background in human rights focused on the impacts of corporate led globalization. With experiences gained as a student and community organizer and as Water Campaigner with Polaris Institute, Andrea is now working to build a movement for a Canadian Energy Strategy. This includes efforts that contribute to meeting Canadians' energy security needs and transitions communities to sustainable energy production and consumption. Research and campaigning for green jobs that are decent jobs which help maintain essential public services, is an important focus.

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Andrea Peart has been a committed environmental and political activist for all of her life. Formerly with the Sierra Club of Canada and federal New Democratic Party, Andrea has worked with the Canadian Labour Congress for 4 years working primarily in government relations, energy policy and on women's issues before setting in as the National Representative, Health Safety and Environment. She is a labour and environmental researcher and advocate who has been focusing on the need to move to a sustainable economy to achieve a sustainable environment that is local, low-carbon and toxic free. Andrea focuses on ensuring green jobs are decent family-supporting jobs, not simply wind farms on Wal-Marts.

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INTRODUCTION - OPPORTUNITY IN CRISES

Canada and the world must address the climate crisis, the most urgent issue of our times. With our current rate of fossil fuel consumption, the increase in global average temperature will lead to widespread, harmful global impacts over the coming century. It has long been understood that humanity will pay a high cost if the average global temperature increases to the "tipping point" of 2 degrees Celsius in relation to pre-industrial levels. However, scientific consensus is currently suggesting that it is inevitable that the average global temperatures will increase by 2°C.

Given this disturbing scientific reality, as a planet, we have a desperate need to stop the average global temperature from rising any more than 2°C. To have a fair chance of keeping global warming from exceeding this already dangerous level, there are demands for developed countries to reduce their emissions by at least 25%–40% below 1990 levels by 2020 and by 50%–85% by 2050. However, the science is increasingly indicating that even reductions of 25%–40% by 2020 will be inadequate, and a much deeper reduction of at least 40% by 2020 and 85% by 2050, eventually reducing carbon emissions to zero, will be necessary to stabilize the climate and stop catastrophic climate change from worsening. Action is needed. Policies must be put in place that can be quickly implemented to achieve significant reductions of greenhouse gas emissions in line with science-based targets to reduce the harmful effects of climate change and stop a global catastrophe.

We are also faced with a serious global economic crisis that requires decisive action. The mainstream media and Wall Street have reached the consensus that the current credit crisis is the worst since the postwar period, and many economists believe that the macroeconomic fundamentals today are much worse than during the Great Depression. The International Labour Organization estimated in May 2009 that global unemployment could increase by between 29 million to 59 million unemployed people in 2009 versus 2007.[14] Unfortunately, Canadians do not have the support they need to weather the crisis. Changes to the EI system have meant that despite billions of dollars paid into EI by workers it is harder and harder to qualify for benefits. Less than half of unemployed Canadians are eligible for EI benefits. Eligibility is even lower for women: less than one-third qualify. In addition to reduced eligibility, benefits are substantially lower than in previous recessions and, as a result, fail to stabilize the economy. Meanwhile, Canadian pensions have fallen dramatically with the stock market. Canadians have inadequate pension insurance with only Ontarians being covered and only to $1,000 per month while even the United States insures pensions.

There is a broad-based, growing movement to recognize opportunity in crises. This movement is identifying reducing emissions and addressing the climate crisis as an engine for decent job creation and economic growth. Decent work refers to work that is both productive and secure, ensures respect for labour rights, provides adequate income and social protection, and includes a right to collective bargaining and social protections. This approach is a fundamental change from the historic framework of pitting jobs or the economy against the environment by instead revisioning the economy. A significant body of analysis and evidence has been created around the possibilities of addressing both economic and climate crises in a way that maintains and creates jobs and income levels vital to social stability.[15]

Further opportunities are identified for addressing inequality and poverty, and the widening gap between "haves" and "have nots" through decent green job creation. The economic and climate crises do now and will continue to disproportionately impact people facing poverty, who tend to contribute the least to the causes of these crises.[16] "Green jobs" can help create a more equitable, "green," "clean" or "low carbon" economy. At its most basic level, the purpose is to use the growing recognition that our actions have led us to the current crises in order to redirect our efforts towards creating a sustainable economy with decent job opportunities that

help to reduce emissions and inequality. A green job is any job that "greens" our economy. There are three core sectors within which green jobs can be created: energy efficiency and conservation, transit and high-speed rail, and renewable energy, reflecting both electricity generation and primary energy.

Recognition of the importance of "green jobs" and building a "green energy economy" is unfolding on multiple levels. The United Nations Environment Programme (UNEP) has launched an initiative calling for a Global Green New Deal (GGND).[17] Inspired by President Roosevelt's New Deal following the Great Depression, the GGND reflects the desire to see the economic and environmental crises and social inequality addressed. A research paper commissioned by the UNEP argues that investing one per cent of global GDP investment over two years could create the green infrastructure required to set the global economy on a more sustainable trajectory.[18] Since he was elected, U.S. President Obama has repeatedly referred to the economic crisis and the need to act on climate change as intertwined, and plans to allocate significant funds to what he calls America's "clean-energy future," including $59 billion in economic stimulus funds and $150 billion from the federal budget.[19] In Canada, there have been numerous demands on the government to take climate action in its stimulus package. Canada has failed to act on this opportunity.[20] President Obama's 2009 budget outspends Canadian Prime Minister Harper's budget on energy efficiency and expansion of renewable energy by a ratio of six to one, per capita.[21]

This report focuses on the distinct opportunities of the public sector to play a prominent role in generating decent green jobs. This begins with a discussion of the shovel-ready capacity of the public sector and the economic growth potential of green jobs. This is followed by a closer examination of energy efficiency opportunities in the electricity sector and beyond. Focus is then shifted to the electricity sector and the tremendous potential for green job creation associated with renewable power generation. Departing from the historical pattern of public power systems, today there is a trend towards market liberalization in Canadian electricity sectors. This is problematic for a number of reasons including decreased accountability, higher electricity prices and concerns with limited reliability. Public and community ownership of renewable power generation is offered as an alternative path to further market liberalization that has distinct advantages. These advantages include retaining economic revenues, maximizing social benefits, prioritizing conservation and ensuring energy security.

President Obama's 2009 budget outspends Canadian Prime Minister Harper's budget on energy efficiency and expansion of renewable energy by a ratio of six to one, per capita.

PART 1 - GREEN JOB POTENTIAL, THE PUBLIC SECTOR AND ENERGY EFFICIENCY

SHOVEL-READY CAPACITY AND PROCUREMENT

In the context of the economic crisis, growth in the short to medium term will not likely occur from exports, higher household spending or private investment, all of which are quite depressed. Further, in the current economic crisis, the credit collapse has hurt the private sector's ability to raise capital for major wind and solar projects, taking away from the needed rapid expansion in the renewable energy sector. Dealing with a staggering $4 trillion in mainly unrecognized speculative losses, there is little prospect that the major U.S. or global banks are about to start lending on a large scale. However, government interest rates are very low and many parts of the economy, including construction, are slowing down, so needed investments can be undertaken at a low cost.

Given the current economic crisis and the credit collapse, the public sector has increased "shovel-ready" capacity. Even public-private partnerships, or P3's, which allow the private sector to finance, construct and operate public infrastructure projects, face substantive obstacles in accessing credit. This is currently a serious concern as Canadian governments cannot afford to waste time in getting infrastructure projects up and running so as to maintain jobs and incomes. In this moment of economic crisis, P3s cannot build infrastructure projects, including the much-needed expansion of renewable energy, faster or at lower costs to taxpayers. This is particularly true of capital-intensive projects such as large wind and tidal projects. This not to suggest that there are not private companies ready to establish renewable energy projects. Instead, public utilities are more likely to be able to get access to large amounts of credit needed for such projects.

As a result of the economic crisis, Canadian families and communities need solutions that help everyone, not just the banks and corporations that created these problems. Canadians need something to stimulate the economy; they also need decent jobs to be created and protected. Although a short-term economic stimulus in the public sector is quicker than in the private sector, the economy is also in need of medium-term investment from the public sector, which requires planning. Now is the time to launch a major medium- and long-term public investment program to drive job creation, and also to create new investment opportunities for an industrial sector in deep crisis.

The key elements of such a program are well known. We must create and protect jobs. We must address the huge and long-standing deficit in investment in basic municipal infrastructure, rebuild urban and inter-city transportation systems, invest in energy conservation through retrofits and other means, dramatically expand renewable energy, and expand basic public services such as not-for-profit child care and elder care. We know that all of these investments – especially those in public services and energy retrofits – are labour-intensive and create many more jobs than personal and corporate tax cuts. They also simultaneously promote our environmental, community development and social justice goals. It is not a matter of public or private investment so much as public investment–led growth for the whole economy.

When investments are tied to a percentage of Canadian content inputs, as in the case of steel or wind turbines manufacturing, we expand both jobs and economic growth here in Canada.

The key to Canada's future prosperity is to add more value to our resources before they are exported and, by investing more in innovation and skills, build the knowledge-based and environmentally sustainable industries of the future here in Canada. This cannot happen without a well-funded economic development plan and a commitment to reduce our greenhouse gas emissions, both of which are strongly

rooted in the public sector.

Public infrastructure investment generates a rate of return of 17% to the private sector through lower operating and production costs. But there are even greater rates of return associated with the investments as they can also support new manufacturing jobs, if they contain "Buy Canadian" procurement requirements, as requested by both the CLC and the Canadian Manufacturers and Exporters as well as the Council of Canadians. When investments are tied to a percentage of Canadian content inputs, as in the case of steel or wind turbines manufacturing, we expand both jobs and economic growth here in Canada.

"Buy Canadian" procurement requirements are important in helping to fully maximize investment opportunities and job growth potential. International trade agreements include obligations that complicate procurement requirements such as NAFTA's chapter 10 and the WTO Agreement on Government Procurement, which forbid local content requirements and preferences. Currently, provincial and municipal procurement and even some federal procurement are excluded from international trade agreements, and this provides the flexibility to maximize local jobs and benefits while increasing renewable energy as well as energy efficiency. However, the Buy American negotiations and the Canada–European Union trade agreements talks taking place at the time of writing of this report, may pose risks to this flexibility.[22]

GREEN JOBS: ECONOMIC GROWTH POTENTIAL

At the simplest level, green energy produces green jobs. For instance, if the wind energy target of 20 per cent of Canada's electricity were to be realized, it would create more than 50,000 direct jobs.[23] It could be argued that investments in any type of infrastructure and any type of energy would also create jobs. However, "green" infrastructure investments, including the expansion of renewable energy, are a greater source of net job creation dollar for dollar than investments in traditional fossil fuel industries, tax cuts or investments to boost consumer spending. The average renewable energy investment creates four times as many jobs as the same investment in the fossil fuel economy.[24] Further development of other renewable energy sources would also create a large number of jobs.[25]

As many as 18,000 jobs are created for every $1 billion of investment in energy conservation and renewable energy systems.[26] Of these, energy efficiency is the most attractive sector for the intersection of job creation and GHG emission reduction, because the money saved on reducing energy consumption often covers the full costs of the investment. The federal government could and should provide an economic stimulus of at least $10 billion over each of the next two years. Such a program, mainly directed to energy efficiency and renewable energy projects including building retrofits and public transit, would create at least 200,000 jobs.[27]

Energy Source	Direct job creation per $1 million in output (# of jobs)	Indirect job creation per $1 million in output (# jobs)	Direct and indirect job creation per $1 million in output (# jobs)	Direct and indirect job creation relative to oil (% difference)
Fossil Fuels				
Oil and natural gas	0.8	2.9	3.7	-
Coal	1.9	3.0	4.9	+32.4%
Energy Efficiency				
Building retrofits	7.0	4.9	11.9	+221.6%
Public transit and freight rail (90% PT, 10% FR)	11.0	4.9	15.9	+329.7%
Smart Grid	4.3	4.6	8.9	+140.5%
Renewable Energy				
Wind	4.6	4.9	9.5	+156.8%
Solar	5.4	4.4	9.8	+164.9%
Biomass	7.4	5.0	12.4	+235.1%

Source: "The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost U.S. economic growth and employment," Robert Pollin, James Heintz and Heidi Garrett-Peltier.

THE POTENTIAL OF ENERGY EFFICIENCY MEASURES

Improvements in energy efficiency are some of the most effective methods dollar for dollar to reduce greenhouse gas emissions. In fact, energy efficiency is the cheapest source of energy available, as every dollar spent using less electricity saves US$2 in investment in increasing electricity supply.[28] The initial cost of investment in retrofitting (or construction of new high-performance buildings) is quickly recouped as savings on energy bills quickly surpass the cost of the initial investment.

It is for these reasons, among others, that public spending on improved energy efficiency can play a vital role in the creation of green jobs and economic recovery. This includes ensuring that homeowners, landlords and renters of all economic stripes are able to make their homes more efficient. Energy efficiency measures can include a variety of actions, such as housing retrofits (energy-efficient windows, increased or better insulation, high-efficiency furnace . . .), institutional retrofits at schools or hospitals, commercial and industrial retrofits.

One billion dollars in additional spending on basic infrastructure, including home retrofits and energy efficiency improvements, creates 11,500 jobs, half in construction and half in other sectors. Every $1 billion of investment in energy efficiency creates as many as 18,000 jobs.

Energy efficiency measures in the building sector lead to direct, indirect and induced jobs. Direct jobs in energy efficiency retrofitting look a lot like traditional construction jobs that are performed directly at the development site. Due to the fact that these new jobs are performed at the local level, energy efficiency programs can provide important economic growth for all communities, including underdeveloped regions, isolated communities and areas of high unemployment.[29] The job creation benefits will increase if the investments also contain requirements for Canadian content. Energy efficiency improvements in the building sector also create indirect jobs in the manufacturing sector – again, these would increase with Canadian content requirements. Induced jobs are also created, as money that would previously have been spent on energy is freed and re-spent in the community and the local economy.

Implementing a national Canadian municipal retrofitting program would result in 5600 to 7840 person-years of employment at the local level. This works out to 20 jobs for every $1 million invested, or 1 job for every $50,000. Further, a potential investment of $280 to $392 million dollars invested in energy efficiency improvements could reduce greenhouse gases by 800 kilotonnes per year. After the initial payback of five to seven years, this would save the government $56 million dollars per year.[30]

Retrofitting programs need to be tied to regional skills training and apprenticeship programs, as the construction and building trades face imminent shortages of skilled workers and certified contractors. Union apprenticeship, skills training and related programs, some of which are currently constructing workable pathways out of poverty, can be expanded to include retrofitting and other energy efficiency programs.

German Alliance for Work and the Environment Home Retrofit Example

Program Objectives:

- retrofit 300,000 homes per year
- create 200,000 jobs
- reduce GHG emissions by 2 million tonnes/year
- lower heating bills for homeowners, tenants and landlords
- become more independent of energy imports
- save the government US$4 billion through increased tax revenue and decreased unemployment costs
- increase independence from oil imports

The most ambitious building retrofitting project to date is the German Alliance for Work and the Environment's project to retrofit German homes. Since 2001, 11 billion euros of public investment stimulated 5 billion euros in investment and resulted in 200,000 apartment retrofits. There were additional tax revenues and savings of approximately 4 billion euros in unemployment benefits, and 2 per cent of annual emissions from German buildings were reduced.[31] The energy efficiency measures included improving heat insulation of roofs, windows and walls, introducing advanced heating technologies and controlled air ventilation systems, and using renewable energy such as photovoltaic or solar thermal systems. Under this program 342,000 apartments were renovated and 140,000 jobs were created or saved.[32]

The results, along with the additional revenue and savings, have prompted the German government not only to renew the project, but even to increase the money allotted for the program. In 2005, Germany increased the funding of its building retrofit program to 1.5 billion euros.

PART 2 - THE CANADIAN CONTEXT FOR EXPANDING RENEWABLE POWER GENERATION

RENEWABLE POWER POTENTIAL

There are tremendous opportunities to expand renewable power generation and create thousands of green jobs in Canada. The expansion of renewable power will play an important role in reducing emissions and generating green jobs in the manufacturing, construction and operation of renewable power facilities.

Renewable energy is energy that comes from renewable sources; thus it includes hydroelectric power, wind power, solar power, tidal power and geothermal power. However, because geothermal power is primarily used for green heat as opposed to green electricity, this paper will refer mainly to hydroelectric, wind and solar power, with additional reference to tidal power and biomass. In 2006, Canada's installed electricity generating capacity produced 610 billion kilowatt hours (kWh) of electric power and consumed 540 billion kWh. Hydroelectricity represents the largest share of Canada's electricity generation, followed by conventional thermal and nuclear; renewable energy excluding hydroelectricity represents the smallest share.[33] If we made a concerted effort, by 2050 the majority of Canada's electricity could be provided by renewable energy sources, excluding hydroelectric power[34](for a further breakdown of the current reliance, future source potential, greenhouse gas emissions, environmental impacts, and technological viability of individual renewable energy sources, see Appendices I to IV).

Renewable power generation, like all forms of power generation, must be subject to all relevant legislated environmental assessments and regulated in the public interest to minimize adverse environmental impacts (such as wind turbines affecting bird migration or the hydrological impacts of hydroelectric power) and social impacts (such as the impacts on communities near flooded areas for dams) as well as respect Aboriginal treaty and title rights. Nuclear power cannot be rapidly deployed and carries a significant up-front public investment, making it less able to address the urgent action required by the climate crisis. It is arguably green but not renewable, given its dependency on uranium, a plentiful but non-renewable resource. There are also significant risks associated with the storage of nuclear waste and water impacts. Nuclear power expansion, therefore, is not considered a renewable power source in this report.

There are tremendous opportunities to expand renewable power generation and create thousands of green jobs in Canada.

THE CANADIAN ELECTRICITY SECTOR

As we have seen, there is considerable potential for the public sector to play an important role in green job creation. In recognizing the needed expansion of renewable power, we must consider the current realities of the Canadian electricity sector and variations within it, and how the ownership of green power may unfold.

Safe, reliable and affordable electricity is a fundamental building block for all modern societies, providing the backbone for society's social and economic well-being. Electricity shortages and black-outs starkly demonstrate our complete dependence on safe, reliable and affordable supplies.

If energy is a right – a very strong argument can be made that this is the case as energy, including electricity, is essential for the realization of human rights such as rights to health and sustainable development – then the question of who decides how the associated resources and services are developed and managed, and who benefits from them, is significant. Democratic control through public power systems provides the capacity to ensure that the essential service of electricity is met.

It is through the long history of public power that Canadians and Canadian communities have viewed

a secure supply of electricity, with stable, fair and affordable power, as a right. A public power system is a system that is regulated in the public interest with public ownership of the transmission and distribution system as a whole, and predominantly public ownership of power generation. Currently 80 per cent of electricity produced is in the public sector in Canada, compared with only 12 per cent in the United States. Historically, the public power system was established for a number of reasons, which are still valid and compelling today. Electricity is an essential service and also a natural monopoly. By vertically integrating our electrical system through the public sector, we have been better able to provide affordable and reliable electricity as well as provide more investment capital and better governance.

Further, electricity has special qualities that make it different from other "commodities." These qualities include the fact that electricity is not easily stored, supply and demand must match at all times, and there are few, if any, substitutes. As a result, electricity is somewhat incompatible with a market-driven approach.

Power systems and electricity generation vary greatly from province to province in terms of the mix of power generation sources and the extent of public ownership and regulation. Sixty per cent of electricity generation in Canada is from hydroelectricity, approximately 16 per cent is from nuclear fuel, 22 per cent is from fossil fuels, and the remainder comes from renewable sources.[35] Nova Scotia, Saskatchewan, Alberta and, to a lessening extent, Ontario rely mainly on coal.[36] Fossil fuel generation, including coal, comprises a large portion of power generation in the Atlantic Provinces as well as the Territories.[37] British Columbia, Manitoba and Quebec primarily source hydroelectric power. Major hydroelectric projects include the James Bay Hydro in Quebec, Churchill Falls in Labrador, Niagara River in Ontario, Nelson River in Manitoba and Columbia River in B.C.[38] Ontario is dependent on nuclear power to meet half of its electricity needs, while New Brunswick uses nuclear energy to meet approximately 25 per cent of its needs.[39] While climate change–causing emissions associated with power generation are recognized as a result of the reliance on fossil fuels as an energy source, a lifecycle analysis will reveal emissions associated with all forms of power production.

Regulations in electricity sectors have developed primarily within provincial boundaries. Provincial and territorial governments have jurisdiction over generation, transmission and distribution of electricity, including electricity prices. The federal government has jurisdiction over nuclear safety, exports of electricity, and international and designated inter-provincial power lines. [40]

MARKET LIBERALIZATION IN THE ELECTRICITY SECTOR

There is a trend towards market liberalization in the Canadian electricity sector. Two important factors in this trend are internal pressure from the private sector to access Canadian markets and pressure from the U.S. export market for open access to the Canadian market. It is no coincidence that all electricity-exporting provinces in Canada have opened their transmission systems for wholesale access.[41]

Market liberalization in the electricity sector emphasizes competition in power generation as well as in, transmission and delivery. In order to facilitate the "free market" (uninhibited by government intervention), measures to deregulate the market (and re-regulate to market principles), privatize, and increase competition are given top priority. Here the free market model is understood as resulting in greater efficiencies than a natural monopoly regulated by the public sector, resulting in more supply options, greater reliability and lower prices. A first step is typically unbundling the generation, transmission and delivery functions of previously vertically integrated electric utilities with monopoly rights (often Crown corporations in Canada) into separate organizations eventually increasing competition in the supply and marketing of electricity. Market liberalization involves a shift in understanding electricity as a public good or "commons" that is provided as a public service, to electricity as a commodity that can be traded and sold for private commercial profit.[42] This shift is problematic for a number of reasons including decreased accountability, higher electricity prices and concerns with limited reliability.

Currently Alberta has a private open-market electricity system. Nova Scotia has a regulated private monopoly, PEI is served by Martime Electric which is a wholly-owned subsidiary of Fortis Inc. (imports most of electricity supplied from NB Power) and Ontario has a hybrid system. British Columbia, Saskatchewan, Manitoba, Quebec, the Northwest Territories, New Brunswick, and Newfoundland and Labrador all have Crown corporations but are, to varying degrees, incorporating more electricity generation by the private sector and unbundling previously vertically integrated electricity systems. Manitoba and Saskatchewan allow wholesale access while British Columbia, Quebec and New Brunswick have wholesale access and limited retail access.[43] Wholesale access can occur when transmission systems are opened up, allowing

local distribution companies or other large buyers of power to use the grid and purchase electricity from the most competitive generator, including commercial private generators. Retail access allows power marketers to access distribution systems in order to sell power to end-use consumers, creating more choice among suppliers for consumers.[44]

Most, but not all, provinces traditionally have allowed only a small role for private power generators. However, deregulation and privatization have increased this role. There is a need to recognize the role for some private production of power (e.g., cogeneration by large-scale industry and by small-scale producers of renewable energy for the grid). However, despite the fact that most provinces allow a small role for private generators, our regulations in the electricity sectors must serve the public interest. It is important to recognize that while there is a trend towards market liberalization in Canadian electricity sectors, this trend is at odds with entrenched Canadian standards and obligations requiring governments and regulators to put public interests ahead of investor interests. This baseline mandate, although being eroded by this trend, is largely still in place.

U.S. EXPERIENCES WITH ELECTRICITY MARKET LIBERALIZATION

> *We must recognize that the so-called invisible hand of Adam Smith was Enron and their fellow gougers picking the pockets of Californians to the tune of billions of dollars. Prices were skyrocketing in California in late 2000 and early 2001 as a direct result of Enron's influence and participation.*
>
> – David Freeman, Chairman of the California Power Authority in a statement before the U.S. Senate[45]

Influenced by the model in Great Britain begun with Margaret Thatcher, market liberalization began to sweep across the U.S. electricity sector in the 1990s. Instead of competition, it has brought about a rapid concentration within the U.S. electricity industry since deregulation. Between 1996 and 1998 an average of 12 mergers and acquisition announcements were given annually – in 2002 there were 9 per cent fewer investor-owned utilities than at the beginning of the 1990s.[46] Public Citizen, a national non-profit consumer organization, has compiled significant evidence, drawing from a number of U.S. examples that highlights the failure of deregulation to produce wholesale competition and instead create hardships for consumers faced with price increases and reduced reliability.

According to Public Citizen, in June 2008 the average price in the 12 deregulated states was 49 per cent higher than the average price in the 38 regulated states.[47] They also attribute a direct role to deregulation in the power black-out in northeastern U.S. and Ontario on August 14, 2003.[48] They observe that reliability planning requiring coordination between generation and transmission was complicated by the introduction of new entities in the electricity sector with more interest in profit than system reliability, as well as contracts for trading power longer distances.[49] This final point is an important one for the understanding of changes in the electricity sector involving market liberalization. Whereas power had been produced to meet a specific geographical area's need, deregulated markets give power traders incentives to sell to the highest bidder, including those outside the local market near power plants. This places stress on systems designed to serve specific geographical needs as well as complicating system reliability planning.[50] Market liberalization saw a spectacular rise in the role of power traders such as Enron and Duke Energy. In the case of market liberalization in California, but not limited to this state's experience, power traders became very skilled at "gaming" the market, undermining real competition and increasing corporate profits.[51]

ALBERTAN AND ONTARIAN EXPERIENCES WITH MARKET LIBERALIZATION

Under Premier Ralph Klein, the Alberta electricity sector was set on a path of market liberalization. Unlike most other provinces, Alberta did not have a provincial utility to privatize; instead, it resembled much of the U.S., with private generators selling to municipally owned distributors in a regulated system. While cheaper power was promised, Albertans have experienced higher prices. From June to October of 2000 the price of electricity rose from 5 cents to 25 cents per kWh – meaning that it jumped to the third most expensive jurisdiction in North America, following California and Hawaii.[52] Along with higher prices came an increase in brown-outs. Albertans have also been forced to compete with the California market (facilitated by B.C. Hydro's opening of transmission lines) for power generated in the province, and this means paying California prices and competing for power that is generated in the province to meet provincial needs. While Premier Klein was able to offset some of the initial social impacts of this rise in prices through revenue generated by the oil sector, electricity deregulation proved to be a challenge for Klein.[53]

In Ontario, the Harris Tory government set the province on the market liberalization path. In 1998, Ontario Hydro (Crown corporation) was broken up into Ontario Power

Generation (generating company), a retail and wires company (Hydro One) and the Independent Electricity Market Operator (IEMO). By May 2001, Ontario's power market was opened to competition, leading to an increase in prices and threats of power shortages.[54]

Large electricity-intensive industries in Ontario have a higher proportion of electricity making up their total expenditures compared with competitors in the United States. Average industrial electricity prices in Ontario rose sharply from May 2002, when the market was opened to competition. The price increases closed the gap between Ontario and U.S. prices, with Ontario surpassing the average U.S. price in 2004. Given the high electricity intensity of certain industries, specifically iron and steel, the petrochemical industry, and cement, Ontario has lost its industrial competitive advantage and this has made a huge impact on overall competitiveness and jobs.[55]

By April 2002, the plan to privatize Hydro One failed after the Canadian Energy and Paperworkers Union and Canadian Union of Public Employees successfully brought the Ontario government to court over their lack of legal authority to privatize the public utility. By November 2002, under intense pressure, including a strong anti-privatization movement, then Premier Ernie Eves was forced to introduce a four-year price cap and rebate scheme which brought the retail market experiment to an end. Ontario now operates as a hybrid system, with elements of regulation and competitive markets.

THE FUTURE OF RENEWABLE POWER: HEADING DOWN THE PATH OF MARKET LIBERALIZATION

Increasing renewable power generation is becoming a social and political priority; all provinces have some form of policy intended to increase "green" power and green jobs.[56] This is taking place in the context of a trend towards market liberalization in Canadian electricity sectors. Unbundling of electric utilities operations into separate organizations, increasing provincial wholesale and retail access, and establishing competitive markets in Alberta and Ontario are creating opportunities for the expansion of private power generation. Provincial policies, to varying degrees, are encouraging this pattern. B.C. Hydro (Crown corporation) has been directed by the provincial government to obtain contracts with "independent power producers" (private power producers) for renewable power generation.[57] In provinces across the country large scale, investor-owned wind farms are emerging.[58] In a number of provinces, such as B.C. and Quebec, there are policies to explicitly encourage privately owned renewable power generation while simultaneously preventing or discouraging Crown corporations from owning renewable power generation facilities.[59] Ontario's new Green Energy Act (GEA) uses feed-in tariffs to encourage green power projects. The GEA includes positive incentives for expanding community power and decentralized power (described below). While the rules had not been finalized at the time of writing this report, it appears that commercial renewable power generators such as investor-owned wind farms will also qualify for contracts with the Ontario Power Authority. This will lead to an increased role for private, for-profit power production in the province.[60]

Increasing renewable power generation is becoming a social and political priority; all provinces have some form of policy intended to increase "green" power and green jobs.

THE B.C. CASE: EXPERIENCES WITH MARKET LIBERALIZATION AND RENEWABLE POWER

In B.C., fostering a market for private renewable power producers has been part of a broader liberalization agenda. The Liberal government's energy policy saw the unbundling of B.C. Hydro's previously integrated services into separate generation, transmission, distribution and administrative and customer services companies.[61] The new B.C. Transmission Corporation (BCTC) allows wholesale access and supports efforts to coordinate greater grid connection with the Pacific Northwest.[62] Since B.C. Hydro has a competitive advantage in the efficiencies of an integrated system producing low-cost hydroelectricity and access to low-cost capital, B.C. Hydro's ability to invest in new generation is being limited in order to provide incentive and space for a private renewable power generation market to develop.[63] B.C. Hydro is effectively being transformed from a producer of electricity to a distributor of energy required to buy almost all of its future electricity needs from private investor–owned power producers (often referred to as independent power producers, IPPs). This is done through long-term Energy Purchase Agreements (EPAs), which place emphasis on increasing "green power."[64] Licences for water and wind resources are being sold at minimal costs, helping to create what some have referred to as a private power gold rush in B.C., particularly with "run-of-the-river" projects. Hundreds of water licences and project applications are under

review. EPAs are signed at a high cost to B.C. ratepayers and will result in an upward pressure on electricity prices. The average bid price of 2006 contracts was about $74 per MWh for large projects – the market price for energy in 2005 was close to $50-$55 per MWh.[65]

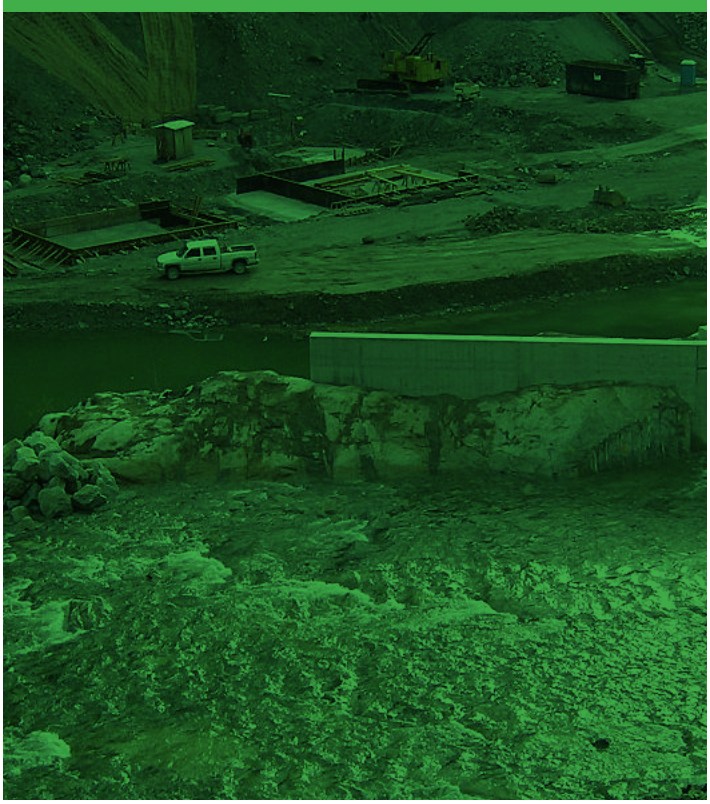
While the B.C. government claims that the private power gold rush is necessary to achieve electricity "self-sufficiency," the electricity appears to be destined for export. Run-of-the-river projects will produce power most reliably during the spring freshet when public hydroelectric generating stations are also producing their maximum, creating profit potential for private electricity exports to the U.S. When EPA contracts expire, private power producers will continue to profit from provincial renewable power resources and will have significant rights under NAFTA to export power to the highest bidder, including U.S. markets.[66] This raises concerns about the capacity of the B.C. government to ensure long-term energy security. The advantages of ongoing public ownership in providing the capacity to ensure energy security are discussed later in this report.

Run-of-the-river projects also show indications of the move towards a concentration of corporate ownership which undermines proposed benefits of greater competition accompanying further market liberalization. Investigative permits have been issued to a number of major wind farm corporations.[67] John Calvert, author of *Liquid Gold: Energy Privatization in British Columbia*, highlights the challenges of IPPs in B.C. in remaining independent. He argues that local owners do not typically have the economies of scale that large energy corporations have, nor the marketing skills and ability to capture the full benefits of their investments once contracts with B.C. Hydro expire. In this context, water licences, wind farm tenures and contracts with B.C. Hydro become valuable and saleable assets. There are already examples where run-of-the-river projects have "flipped" from local owners to major investors, including international energy companies, private equity funds and international banks.[68] Some of the largest corporate energy companies have already filed for multiple licences in B.C. – including Plutonic Power, Ledcor Power Inc. and Axor Power Inc.[69]

Private run-of-the-river projects are being actively opposed on several grounds by a coalition involving social justice, labour, indigenous groups and communities, environmental activists and municipalities. Concerns about the projects include the pace at which licences and approvals are moving forward, driven by the interests of private developers, without a framework that effectively engages communities and First Nations and considers the cumulative impacts of multiple projects on B.C.'s rivers and streams. There are significant concerns about the environmental impacts of the proposed projects, the privatization of renewable power, as well as concerns over electricity price increases and the potential for private exports to U.S. markets to undermine provincial energy security.[70]

The B.C. case and the other highlighted examples all contribute to creating a market for private renewable power generation which shifts away from predominantly public ownership. While the extent to which this is accompanied by other features of market liberalization differs based on provincial regulatory and policy context, it indicates a shift to the market liberalization path away from public power systems. While increasing renewable power is an undeniable priority, it does not have to be accompanied by further market liberalization in the electricity sector.

Private run-of-the-river projects are being actively opposed on several grounds by a coalition involving social justice, labour, indigenous groups and communities, environmental activists and municipalities.



PART 3 - PUBLIC AND COMMUNITY-OWNED POWER

PUBLIC AND COMMUNITY OWNERSHIP POTENTIAL FOR RENEWABLE POWER

Public and community power can be an alternative path to the market liberalization path, and may be the only way to inject public sector principles into systems that are heading down the path of market liberalization. Public and community power includes prominent roles for public utilities generating renewable power as well as roles for local ownership (community power). It includes both large renewable power projects (such as wind and solar farms, tidal power facilities) and smaller-scale projects (such as single wind turbines and biomass projects).[71] Decentralized energy (DE) applications (such as on-site renewable applications and cogeneration) offer roles for private generation by industry and small producers.

Public and community ownership models

Public power:

- Crown corporations and public utilities

Community power:

- local public ownership including municipalities, regional districts, First Nations and Aboriginal ownership
- Consumer or member-based co-operatives and worker co-operatives

Decentralized energy:

- a variety of power generators including industrial sites, institutions, businesses, farms and homes

PUBLIC UTILITIES AND GREEN POWER

As we have seen, through the long history of public power, Canadians and Canadian communities have viewed a secure supply of electricity, with stable, fair and affordable power through publicly funded utilities, as a right. Provincially owned utilities such as Crown corporations and municipally owned utilities can and should continue to play an important role in power generated from renewable sources. A number of Crown corporations are doing exactly this in generating hydroelectric power including: B.C. Hydro, Manitoba Hydro, Hydro-Québec, and Newfoundland and Labrador Hydro. While most public utilities' experiences are in producing power from non-renewable resources (outside of hydroelectricity), government policy can support investment in research and training to build knowledge and capacity for owning and operating renewable power generation facilities. This is particularly important for large-scale generating facilities. If the public sector does not ensure a prominent role for public utilities in large-scale renewable power projects, these large projects are likely to be owned and operated on a commercial basis, contributing to a shift away from predominant public generation to predominant private power generation. Further, large renewable power projects, such as wind and tidal, are extremely capital-intensive. As argued earlier, given the current economic crisis and the global credit collapse, the public sector has an advantage in having the financial capacity to support such capital-intensive projects. Crown corporations have played this role in Canada through investment in capital-intensive hydro power reservoirs.

Centennial Wind Power Projects, Sask Power
Crown corporation Sask Power runs a 150-megawatt Centennial wind power facility, currently Canada's second largest wind farm. Opened in March of 2006, Centennial has 83 turbines, each producing up to 1.8 MW of power, which collectively produce enough electricity to serve 69,000 Saskatchewan homes. Sask Power also owns the Cypress wind power facility.

COMMUNITY POWER

Much of the future for renewable energy development will be on a smaller scale and is amenable to local ownership and control. There are opportunities for renewable power ownership outside of commercial private ownership, in addition to roles for Crown corporations and public utilities. "Community power" (CP) often describes forms of local ownership and control of power generation and is typically associated with the shift to green power. While there is no single definition, there are certain features in the ownership of power generation that are commonly referred to as community power. The Canadian Renewable Energy Alliance defines community power as "locally owned, locally sited, and democratically controlled distributed renewable generation that minimizes environmental impacts."[72] The Ontario Sustainable Energy Association defines community power as "a class of sustainable energy projects that are owned, developed and controlled in full or in part (50 per cent or more) by residents of the community in which the project is located."[73] CP typically includes power producers such as public institutions, co-operatives, farmers and individual landowners.[74]

While it is difficult to provide a conclusive definition of community power (CP), three essential central characteristics of CP can be identified. Public power should be exemplified by these same three characteristics. These three characteristics are key reasons for why we established public power and are essential to achieving the advantages of public and community ownership discussed in this report.

Public and community power characteristics

- ownership structures that are democratically accountable
- not profit-driven
- focused on meeting local electricity needs or electricity for the provincial grid

Community power examples: Local public ownership

There are a considerable number of opportunities for democratic ownership and control at a local level. Municipalities, regional districts and First Nations are democratically accountable to local citizens. There already exist a number of municipalities and First Nations that own power generation facilities. These institutions can work with companies to build a renewable power facility which they then own and operate. Existing municipal electric utilities (local distribution companies) are well positioned to own renewable power generation, integrating this into their existing distribution networks.[75] There are also opportunities for alternative forms community control that can exhibit these characteristics with First Nations, Métis and Inuit communities. Public-public partnerships between local ownership examples and provincially owned utilities can blend local accountability with experience in the generation and delivery of electricity and the capacity to borrow needed capital. These forms of local public ownership can include owning and operating facilities such as wind and solar farms.

Public-public partnerships between local ownership examples and provincially owned utilities can blend local accountability with experience in the generation and delivery of electricity and the capacity to borrow needed capital.

There are also some unique opportunities for municipalities to produce low-emission power using their existing facilities. This includes owning plants that convert landfill methane emissions (methane, like carbon dioxide, contributes significantly to climate change) into electricity. For example, as of April 2005, a subsidiary of Guelph Hydro Inc., Ecotricity, produces around 2.5 MW of electricity annually from a landfill gas-to-electricity plant.[76] There are also opportunities for the use of cogeneration technology at municipal facilities such as water and waste treatment plants to reduce overall energy use and waste heat.

Columbia Basin Trust

The Columbia Basin Trust model in B.C. is an example of a public-public partnership. The Columbia Basin Trust (CBT) was created to promote the "social, economic and environmental well-being in the Canadian portion of the River Trust Basin."[77] CBT governance is democratic, designed for local accountability with a board of directors, management, stakeholders (residents of the basin) and the Province as a shareholder. In receiving an endowment from the provincial government as established by the Columbia Basin Treaty, the CBT investment program invests in three hydroelectric dams operated by the Columbia Power Corporation (a Crown corporation). The investment returns are then used by the CBT for its programs and initiatives. The initiatives focus on four core areas: improving the local environment, developing mechanisms to address social and economic priorities, increasing awareness and involvement in water issues and engaging youth in addressing social, economic and environmental issues.[78]

Community power examples: Co-operatives and green power

The co-operative model engages members as owners of the enterprise. In most cases, members (a.k.a. owners) also use the services or purchase the products the co-op produces, which can serve a range of sectors, including housing, food, worker, agriculture, service, financial, youth, Aboriginal and community. Co-operatives can be managed on both a for-profit and a not-for profit basis.[79] The economic revenue (i.e., profits), after operating costs are considered, flow to co-operative members. Co-operatives are meant to have multiple "bottom lines" outside of profit: being responsible to the needs of their members and the quality of life in their communities and guided by certain values and principles. All co-operatives are guided by seven principles, including voluntary and open membership, democratic member control and economic participation, autonomy and independence, an emphasis on education and training, and concern for community.[80]

Renewable power co-operatives

Renewable power projects can be consumer- or member-owned co-operatives where members pool capital to fund a particular project.[81] Members typically include local residents and potentially businesses in the community where the project is located, although membership can be broader. A co-operative can work with an institution or business capable of building the facility, which is then owned and operated by the co-operative. Renewable energy co-operatives differ from other co-operatives in that the electricity produced by the project is not typically used by members. Given the nature of provincial power systems, most renewable energy co-operatives will sell power to the provincial grid. While often associated with smaller-scale projects, co-operatives can also be involved in large-scale projects where, because of barriers in knowledge and technical expertise, they are likely to partner with other institutions (such as public utilities).

An example of a partnership between a co-operative and a public utility is the windshare project between the Toronto Renewable Energy Cooperative (TREC) and Toronto Hydro. This project is a co-operatively owned waterfront wind turbine at Toronto Exhibition Place.[82] TREC is the first large-scale energy co-operative in Canada and the windshare project is the first urban-based, commercial-scale wind turbine in North America.[83] While it has faced numerous challenges, including maintaining and repairing the turbine, it remains a key Canadian example of the potential for partnership between co-operatives and public utilities.[84]

There are examples of community power (CP) models including co-operatives demonstrating success in effective community engagement, enhancing their accountability to the broader public interest. Successful community engagement includes encouraging the participation of community members on a number of levels ranging from having a financial stake in the project through co-operative membership to public consultation processes and keeping jobs local. This kind of participation has helped to avoid the kind of local opposition that some large projects have faced (including legitimate concerns about noise issues, aesthetic impacts or possible harm to nearby wildlife). The successes of the co-operative model in expanding renewable power projects have been notable in Denmark and Germany.[85] In Denmark, co-operatives represent 24 per cent of the wind generating capacity.[86] In Germany, citizen-owned companies based on a co-operative model own nearly 40 per cent of the wind capacity.

Another possible model, besides consumer- or member-owned renewable power co-operatives, is the worker co-operative. This kind of co-operative is applicable to larger-scale renewable power facilities as well as installation of on-site renewable technologies. For example, the Vancouver Renewable Energy Co-operative designs, sells and installs grid-tied solar electricity systems for buildings for organizations, homeowners and other co-operatives.[87]

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Considerations in expanding community power

There are legitimate questions and concerns over whether co-operatives are democratically accountable. Whereas the local public ownership examples presented offer direct links to democratic accountability in that they are owned and controlled by institutions that are democratically elected and/or accountable to citizens, co-operatives are primarily accountable to their membership of private individuals. There is also the concern that co-operatives can be dominated by a particular shareholder, potentially a business, or eventually sell the generation assets to a private power corporation. Further, while reasonable rates of return are needed in order to support the ongoing viability of co-operatively owned projects, including

Middelgrunden Wind Farm, Denmark

COPENHAGEN Looking out to sea from this city's picturesque harbour, a wall of 70 meter windmills dominates the horizon with rotors silently spinning in the glinting sunshine as sailboats and fishing trawlers glide past... Here the windmills are seen as a graceful gateway to a historic harbour and a proud symbol for an environmentally conscious country...
– *International Herald Tribune*, September 2003[88]

The offshore Middelgrunden Wind Farm in Denmark is the largest wind farm in the world based on co-operative ownership. It is the product of the successful joint ownership between the Middelgrunden Vindmøllelaug co-operative and Copenhagen Energy owned by the municipality of Copenhagen. Established in 2000, it has 20 turbines (10 owned by each partner), each of which produces 2 MW, which means Middelgrunden can account for approximately 3 per cent of the electricity consumption of the municipality of Copenhagen.[89] Middelgrunden has become a key example for advocates of the potential for co-operatives. The wind farm is the product of an intensive information and participatory approach taken by both parties to engage local citizens and secure local acceptance. Between 1997 and 1999 an Environmental Impact Assessment Study, two visualizations and three public hearings (which influenced the final choice of the curved line that the turbines follow) took place.[90] The co-operative now has an 8000 plus membership. Shareholders are primarily individuals in greater Copenhagen; there are also some organizations, unions, foundations and companies – each partner has one voting right. The objectives of the co-operative are to produce electricity from the project and contribute to the sustainable energy supply in Denmark.[91] The co-operative has generated significant enthusiasm locally for the project and provided good contacts with the public and press. The utility provides credibility to the project in relation to the public and in securing local parliament commitment to the wind farm. The utility also provides the project with a significant knowledge base. In 2001, Copenhagen Energy merged with Energi E2.[92]

maintaining and operating facilities and membership, co-operatives with a for-profit orientation risk having their motives guided more by profit than by principles. This can also be the case with other forms of public and community power. Such risks can be minimized with rules such as the "one share one vote" principle for co-operative members, which prevents the concentration of influence and requirements associated with the sale of shares. Rules preventing the sale of the co-operative to a commercial, for-profit corporation as well as emphasis on community engagement (in line with co-operative principles) also help minimize the risks. Renewable power co-operatives with the three essential characteristics outlined above for public and community power will help to address these questions and concerns, as well as ensure they exhibit the advantages of public and community power discussed in this report.

In expanding CP, consideration must be given to the potential negative cumulative impacts of multiple small-scale projects for all ownership models. One of the central concerns raised with the rush of private run-of-the-river projects in B.C. is the lack of understanding of the cumulative impacts of multiple "small" projects.[93] Comprehensive assessments of the cumulative environmental impacts of smaller projects by regulators and an ongoing role for public institutions (such as Crown corporations) to manage provincial electricity supply and demand can address this.

DECENTRALIZED ENERGY: COGENERATION AND ON-SITE RENEWABLE POWER APPLICATIONS

Community power (CP) is also often associated with smaller distributed or decentralized energy (DE). Simply defined, DE is energy generated at or near the point of its use. It includes on-site renewable power production such as solar panels on buildings and solar thermal technology for water and space heating. Cogeneration is often associated with DE.

Cogeneration is the simultaneous production of electricity and heat, and is also referred to as combined heat and power.[94] Cogeneration applications make use of wasted heat to supply nearby heat needs and provide useful electricity. Cogeneration is associated with DE because if waste heat is to be used, it must be used nearby, given the inefficiencies in transporting waste heat over distances.[95] Cogeneration can be used both on a small scale, such as in homes or institutions like hospitals, hockey rinks or shopping malls, and in larger-scale applications for industry and power generation.[96] Cogeneration can meet electricity needs in a specific building, help meet nearby

electricity needs or surplus electricity can be sold to the grid and waste heat can be used for heating on-site and nearby spaces (requiring district heating). In the case of power generation, typically, generators waste heat, which is released in smokestacks. Due to their design, centralized energy grids waste more than two-thirds of their energy.[97] Efficiency can be vastly improved by making use of this heat, given off when fuel is burned, for useful thermal heat and electricity applications. A number of different fuels can be used, from conventional fossil fuels to methane from waste water plants or wood chips.[98] Natural gas cogeneration has been recognized as a promising source of power in the transition to a low carbon economy.[99]

DE includes public and community-based opportunities to reduce emissions and produce low-emission power. For example, utilities can own and operate a portfolio of decentralized smaller scale energy systems such as solar panels, small wind turbines and solar water heaters used at local homes and institutions such as schools, hospitals and arenas. Here, the local utility could pay the start up costs including installation. While the utility owns the systems, consumers would pay an energy bill based on use of these systems.[100] Also, governments can demonstrate leadership through action by "greening" public institutions (such as municipal buildings, hospitals, public arenas, and federal and provincial buildings) using on-site renewable technology and cogeneration applications alongside conservation and efficiency improvements. Public utilities can contribute to greater energy efficiency by using cogeneration at power plants, which will reduce waste heat and lower overall energy use. When public institutions use on-site renewable and cogeneration, it is ideal if the institution owns the generation. While a private firm may be contracted to build, install or maintain the technology, public ownership maximizes benefits to the institution.

Although this report argues for renewable electricity generation in public hands, DE raises a number of exceptions. DE includes a wide range of applications, such as small wind turbines and solar panels on individual homes, to much larger scale generating capacity by rural residents and farmers, to large-scale industry. In the case of smaller-scale decentralized private production, if the supplier requires more than the electricity they produce, they can buy it from the grid. If a surplus is produced, the meters reverse and they are billed for the amount they consume minus a rebate for what they put into the grid. DE can also supply nearby needs through local distribution network systems (sometimes referred to as microgrids), which can be connected at a single point to provincial grids. Although technically this includes private generation, this type of generation encourages renewable, distributed and diverse electricity generation in conjunction with public power systems. By having a large number and variety of smaller generators in industrial sites, businesses, farms or homes – each close to where the power is needed and delivered through the electricity grid – we are not only rapidly expanding renewable electricity generation but we are using our electricity much more efficiently, all the while keeping control in public hands.

DE is energy generated at or near the point of its use. It includes on-site renewable power production such as solar panels on buildings and solar thermal technology for water and space heating. Cogeneration is often associated with DE.

It is worth noting that fees charged for connection to the electricity grid can easily reach the 5-digit range and can be quite restrictive for individual homeowners, farmers and industries. Two policy mechanisms meant to reduce barriers to connecting "green power" to the grid are feed-in tariffs and Renewable Energy Portfolios (REPs).[101] Currently, a number of European countries offer support for small-scale renewable electricity generation using a variety of feed-in tariff policies. Here utilities are required to buy electricity generated from renewable sources at guaranteed, long-term prices which can differentiate tariffs based on technology, size and application and are based on the cost of generation plus a reasonable rate of return.[102] Feed-in tariff policies have been successful in both Denmark and Germany in increasing renewable energy capacity.

These tariffs are crucial to accomplish the rapid expansion of renewables in Canada. With feed-in tariffs, it is public funds being used to support renewable power projects. As such, it is logical and fair for the public to benefit from the eventual economic revenues (ie. profits) that the projects produce through public and community ownership. While feed-in tariff policy mechanisms may provide greater opportunities for public and community power as well as decentralized energy examples; if policy makers allow private commercial power generators to participate, the feed in tariffs can act as a subsidy for greater privatization in the electricity sector. This is a key concern: that further deregulation is a significant driving force behind opening up grids for more renewable power generation, including forms of public and community power as well as DE, and can lead to a shift away from public power systems to the market liberalization path under the guise of the need to rapidly expand renewables.

Connecting individually owned DE and CP projects to existing electricity grids can pose challenges. These include properly managing the intermittency of certain renewable energy sources (such as wind power) storing power where possible, and ensuring connections to the electricity grid. Advocates of CP and DE point to new technologies, including the smart grid, that can help address some of these concerns.[103] One of the most challenging obstacles to decentralized energy is the additional pressure on transmission lines. More specifically, when new electricity is generated, whether from decentralized or CP producers, the existing infrastructure capacity is not sufficient to handle all the new electricity inputs. Increased infrastructure and capacity required for DE places an added cost and burden on the public sector which remains responsible for transmission lines needed. As a result, we must ensure the public infrastructure is significantly funded so that limits of the current infrastructure and needed investment are not utilized as an excuse for privatization.

PART 4 - GREEN, DECENT AND PUBLIC: ADVANTAGES OF PUBLIC AND COMMUNITY-OWNED POWER

The need for renewable power expansion is a given in the current climate crisis. There are distinct advantages in having public and community ownership generate green jobs in renewable power generation: retention of economic rents, prioritizing conservation, ensuring energy security, and expanded social benefits.

ECONOMIC REVENUE FOR PUBLIC PURPOSES

When ownership is in public hands, if revenues are forthcoming they stay in public hands for the public good and can be redistributed. Traditional pricing dissipates these revenues by selling power to consumers at the average cost of producing it. Marginal-cost pricing would allow suppliers to retain the revenues. If the supplier is a public utility, revenues can be used for public purposes, including the further expansion of renewables and conservation as well as other social priorities.

Conversely, if power generation is owned commercially by corporations, these economic revenues go to CEOs and shareholders, with profits potentially leaving the country. Further, privatization reduces the capital and in turn the capacity to promote social priorities, conservation, small-scale renewable energy expansion, decent green job creation and other environmental initiatives. This is also applicable to the privatization of existing hydraulic and nuclear generators, which produce huge revenues because they supply power at a much lower cost than the gas plants that define the margin.

If the supplier is a public utility, revenues can be used for public purposes, including the further expansion of renewables and conservation as well as other social priorities.

While public ownership does not prevent electricity prices from being set according to market principles, it does ensure that the economic revenues created by these prices go to ordinary Canadians. Keeping the economic revenues in public hands also ensures that the existing infrastructure capacity and transmission lines are able to keep pace with any increased pressure on transmission lines by means of new inputs of decentralized renewable electricity generation.

Community power ownership models also provide opportunities for revenues to benefit the public. While commercial ownership will see corporate retention of profits, which typically leaves the area, community power ownership keeps economic revenue in the community and oftentimes provides more economic opportunities for local residents and businesses associated with the project.[104] A number of U.S.-based reports have compared communally owned renewable projects[105] with commercial projects.[106] One such study indicates that locally owned, small wind projects produce nearly ten times as much economic activity as out-of-state companies.[107] This activity includes

> *utilization of federal income tax benefits for wind generation by local residents and Iowa companies that can partner with the local owners; retention of profits by local residents; financing by local and regional banks; jobs for operation, maintenance, administrative and management of the wind generation.*[108]

Another study found that "community-owned distributed generation can add as many as 150 jobs and from $.7 to $4.3 million compared to the traditional ownership model utilized in centralized generation. Overall local economies see far greater benefits in the form of the revenues generated by CP projects that are retained and reinvested by members of the community."[109] Comparisons of commercial private ownership of renewable power projects to community power models in Canada are likely to show similar patterns.

SOCIAL BENEFITS OF PUBLIC AND COMMUNITY POWER

Public and community ownership also provides opportunities to ensure that the expansion of renewable power generation is accountable to the public interest and contributes to decent job creation and reduced inequality. Public agencies including Crown corporations and public utilities make it easier to regulate in the public interest – this includes environmental, labour and social protections.

Being publicly owned, Crown corporations and public utilities are accountable to elected politicians (who are in turn accountable to provincial residents), not CEOs and shareholders. With expanded private power generation and market liberalization, accountability is restricted by profit-driven interests and the need to answer to shareholders. Transparency in the operating of an essential service is fundamental for accountability. But in privatized systems, corporate secrecy is introduced in the delivery of an essential service to the public. This makes regulating industries in the public interest, including regulating reliability of services, health and safety, and the achievement of environmental and social goals, much more challenging. For example, a number of black-outs have occurred in deregulated electricity markets: Auckland, New Zealand (1998); New York; New Jersey; Pennsylvania; Illinois; Arkansas; Louisiana (1999); California (2001-2002); northeastern U.S. and Ontario (2003); and London, England (2003).[110] Disruptions in reliability are often associated with large-volume, long-distance trading of power as well as market manipulation.[111] Public and community power provide opportunities to retain economic revenues for public purposes, prioritize energy conservation and ensure provincial energy security, all of which are examples of accountability to the public interest.

Decent green job creation through expanded renewable power generation is an important social benefit – one that public and community power can generate. Renewable generation in the public sector is far more likely to be represented by a union, pay higher wages and offer better benefits, including pensions than renewable generation in the private sector. Internationally, research has not supported the claim that, on average, wages are higher in the public sector, rather *average* wages are higher in the private sector. However, the private sector has the greatest range between minimum and maximum pay levels within enterprises. it is in the private sector that the greatest difference appears between the minimum and maximum pay levels in some enterprises.[112] This is best illustrated by the example of deregulation in the water and electricity sector in the United Kingdom (although the same could be said for the U.K. telecommunications sector).[113]

Government action through public employment programs is far more likely than the market to provide job opportunities that help to reduce poverty and improve equity, building a fair and just green energy economy.

Privatization in the U.K. resulted in enormous increases in the salaries of the directors of the privatized electricity and water enterprises at a time of mass lay-offs for other workers. For example, the salary increases of the 13 members of the board of directors of British Telecom jumped from 489,000 pounds annually to a staggering 3,487,000 pounds annually,[114] equivalent to over 7 million Canadian dollars. These enormous increases were due to a number of factors. The sale of the public enterprises produced profits for the shareholders, the directors awarded themselves salary increases, and meanwhile profits and the share of managers' salaries linked to company performance also significantly increased. Similarly, upon privatization the salaries of the 12 members of the board of directors of British Gas jumped from 495,000 pounds to 3,413,000 pounds.[115] Meanwhile other workers in the same enterprises experienced lay-offs, increased casualization of work, and increased wage disparities within firms – meaning the lowest-paid workers were paid much less while the highest-paid were paid much more. Unionization is an important part of ensuring that public and community power green jobs are decent jobs.

Government action through public employment programs is far more likely than the market to provide job opportunities that help to reduce poverty and improve equity, building a fair and just green energy economy. Discussing the role of public employment programs in developing countries in fostering green jobs, a United Nations Environment Programme Poverty Reduction Discussion Paper highlights the following:

> *governments have an important role to play in direct employment creation for the poor, as most evidence to date suggests that the market will only create a limited amount of employment for this group and that those who do not manage to engage in employment are likely to remain poor and marginalised until they do so.*[116]

This also applies to targeting green job investments and reducing poverty in Canada. Expanded renewable energy in the public sector is more capable than privatized power to provide training for laid-off workers and provide access to "green jobs" being created through public investment programs in the electricity sector. This can include government spending for training programs (associated both with renewable power and improving energy efficiency) directed towards workers who have lost their jobs (including those displaced in the transition away from fossil fuel industries) as well as towards people and communities faced with poverty and systematic injustice. For example, Columbia Hydro Constructors, the construction arm of B.C. Hydro, implemented employment equity programs in the late 1990s that provided training and opportunities for traditionally marginalized groups in the province.

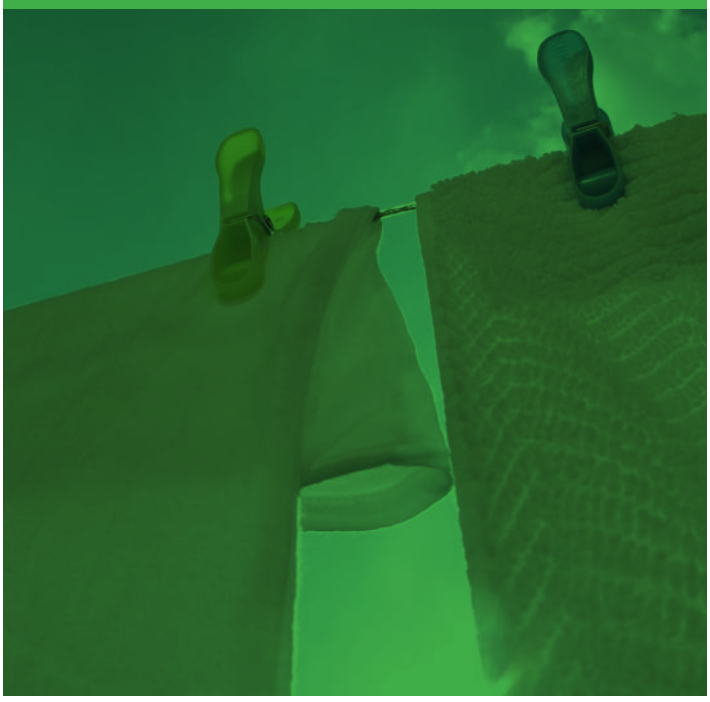
PRIORITIZING CONSERVATION

The cleanest energy is the energy we don't have to use. Lowering overall demand for electricity involves both energy efficiency measures and reducing consumption – simply using less. There are significant opportunities to reduce electricity waste in end-use applications such as lighting, appliances like refrigerators, washer and dryers, plug-in equipment, electric water heaters, furnace fans and air conditioning. Electricity end uses account for approximately 22 per cent of residential greenhouse gas emissions and 39 per cent of commercial sector emissions.[117] In addition to government action on efficiency standards and programs discussed previously,[118] power generators can play an important role through Demand Side Management (DSM) designed to encourage consumers to reduce their level of demand as well as modify their patterns of power use.[119] This can involve a range of actions, including public conservation awareness campaigns, incentives for measures that increase efficient power use and variable pricing to reduce demand at peak use periods. While it is clear that we need a rapid expansion of renewable power, it is equally clear that reducing electricity demand must play an important role in reducing carbon emissions.

In being held accountable and measuring success not only through profitability but also through achieving social, economic and political objectives, public and community-owned power provide the means to prioritize increased conservation. Public power generation in regulated systems where power prices are based on the long-term costs of producing power (as has been the case until relatively recently in Canadian public power systems), provides incentives for utilities to consider conservation on equal footing with building new power generation. Here the high costs of building new power generation facilities can be measured against "finding power" through DSM at a cheaper cost.[120] In the case of vertically integrated public power systems with Crown corporations being the single or predominant generator of power, Crown corporations can capture the benefit of savings through effective DSM programs.[121]

A number of provinces have developed regulatory systems requiring Integrated Resource Planning (IPR) regarding capacity expansion and tariff setting. This has been an important way to regulate the production and distribution of electricity in regulated markets. This type of planning uses a wide ranging set of demand and supply-side possibilities to meet planning objectives which also include environmental and equity objectives.[122] Here DSM is usually included in the mix of energy supply sources which are assessed on such considerations as mitigating environmental harm and controlling prices. With vertically integrated monopolies, provinces with Crown corporations have an advantage of being able to consider how power is delivered through transmission and delivery systems as well as other factors such as the price of delivery and effect on the environment and Aboriginal lands of power delivery and distribution.[123]

The cleanest energy is the energy we don't have to use.



A number of Canadian public utilities began DSM programs during the 1970s.[124] Manitoba Hydro describes itself as encouraging the efficient use of electricity to defer the construction of expensive new power plants and transmission lines. "[This] strategy lowers capital investment, reduces future debt loads, and lessen impacts on the environment. Customers benefit from lower electricity bills and more energy efficient electrical products and services."[125] In addition to improving the efficiency of power generation, Manitoba Hydro's DSM "Power Smart" programs aim to reduce electricity use by residential, commercial, industrial and agricultural customers.[126] Along with the Manitoba government, Manitoba Hydro was recognized with an award for setting the standard in energy efficiency (in the electricity sector and beyond) for the rest of the country by the Canadian Energy Efficiency Association.[127] It is important to recognize that while there are examples of public utilities exhibiting a conservation ethic, certainly not all have done so. Some Crown corporations have actively encouraged electricity consumption.[128] Nevertheless, there remain opportunities with public and community ownership to emphasize conservation measures.

While there are incentives for power generators to emphasize conservation in regulated public power systems, this dynamic changes with market liberalization in the electricity sector – the expansion of private power generation being a key feature of market liberalization. There is a tension between the objective of reducing demand for power through conservation and private power generators maximizing market opportunities to increase profits. In a market-based system, many generators are meant to compete against each other for customers. The driving factor in competition is to increase sales and market share – that is, profit.[129] Where competition between electricity suppliers emerges, it is the interests of private power generators to encourage consumption in order to sell more at the highest possible prices.[130] Reducing consumption can lead to profit loss. With greater market liberalization, if conservation is left to utilities DSM can suffer. If increased renewable power generation takes place with predominantly private sector participation (contributing to a shift to market liberalization), DSM and conservation may suffer. Further, in a market-based system, IRP is complicated by a multitude of actors (such as separate generators, power traders and distributors) making decisions in response to the market. During the 1990s, as unbundling was taking place in a number of Canadian electricity sectors, DSM programs did suffer. This was in part because of reduced incentives for utilities to invest in DSM, as well as lower-priced power supplies from competing resources available to large energy users.[131] Deregulation of California's electricity sector saw similar results.[132]

This disincentive for utilities to invest in DSM in a market based system is real. However, DSM and conservation can continue with market liberalization in the electricity sector. Some have argued that higher electricity costs (a likely outcome of greater market liberalization) can encourage greater energy conservation on the part of consumers. However, there is evidence that there is a weak correlation between electricity prices and electricity use.[133] Increases in electricity prices come at significant cost particularly to low income Canadians and to energy intensive and trade vulnerable industries. There are social costs as people bear the burden of balancing the costs of the essential service of electricity with the costs of meeting other important needs.

Governments and regulators can also provide additional incentives to meet DSM targets. This includes instituting DSM incentive mechanisms, using market-based incentives and utilizing finance and regulatory tools to encourage conservation in a market-oriented system (included in IRP).[134] In both the Canadian and California electricity sectors some success has been demonstrated in transforming markets, after initial deregulation, to value conservation.[135] Providing these incentives require public contributions – that is, comes at a cost to the public.

There is a further tension between instituting such regulations and the overarching objective of market liberalization in seeking less government intervention in markets. This can lead to resistance on the part of governments instituting a liberalization agenda, regulatory bodies and private market actors to such regulations. A further consideration in evaluating conservation potential with greater market liberalization is the potential of increased power trading to complicate the fundamental objective of lowering overall production. For example, B.C. Hydro's PowerSmart program had previously focused on encouraging both domestic and industrial power users to cut back on consumption rather than spend money on new power plants. The PowerSmart program, in a more market oriented B.C. electricity sector, is now focused on encouraging conservation in order to have more electricity that can be sold to the U.S. market.[136]

In the interests of reducing emissions, it is necessary to phase out fossil fuel–based electricity generation and rapidly increase renewable power generation. Alongside the rapid expansion of renewable power, conservation must play a prominent role in reducing emissions. There are incentives in regulated public power systems and with public and community ownership of power generation to ensure conservation is prioritized.

ENSURING ENERGY SECURITY

Energy security refers to secure supplies of affordable energy and includes considerations of supply, production, distribution and access. Energy security is necessary for the well-being of individuals and society. If renewable power rapidly expands, as proposed here, the capacity to ensure electricity supply security from these new sources of power will become increasingly pertinent to meeting Canadians' overall electricity security needs.

Directed by government, the primary mandates of government-owned utilities have been to provide reliable electricity within provincial boundaries at affordable prices and ensuring adequate supply is available.[137] Supply security has been firmly in the public sphere and governments have had the authority to direct utilities to prioritize supply for domestic needs. While electricity exports have been an important source of revenue for a number of provinces, they have been pursued as part of broader planning, where domestic needs are met first.[138] Supply security is often included in broader integrated resource planning for regulating the production and distribution of electricity. This includes considering both demand- and supply-side possibilities for achieving supply security (including DSM) as well as environmental and equity objectives.[139] By and large, Canadians enjoy reliable electricity at affordable prices.[140] Canadians are not typically faced with hardships associated with supply insecurity such as the curtailment of services, high prices or black-outs.[141]

The ability of governments to ensure supply security is curtailed by greater participation of the private sector in power generation and market liberalization. Private investors have significant rights under NAFTA. Whereas trade in oil and natural gas products are largely subject to NAFTA obligations, to this point, NAFTA obligations regarding the electricity sector has been somewhat theoretical. This is because most electricity exports have taken place in the context of the public sector. If the trend towards further market liberalization in the electricity sector continues, including the expansion of renewable power being dominated by investor-owned projects, NAFTA obligations gain relevance to electricity sector planning.

Canada's obligations under NAFTA are not contingent on questions such as whether exports could negatively affect supply in our country.[142] NAFTA imposes constraints on the capacity of governments to intervene in energy trade. It also accords foreign investors from member countries (U.S. and Mexico) rights with respect to their investments and their ability to export outside of provincial boundaries. NAFTA's chapter 6 prohibits the use of charges or taxes on energy exports and imposes constraints on energy import and export controls, effectively preventing a two-priced system with lower prices for domestic consumers. While chapter 6 is subject to certain safeguards in the form of exceptions related to temporarily relieving critical shortages and conserving limited natural resources,[143] it is questionable whether they can be relied on, given the narrow interpretations trade dispute bodies have accorded them.[144] These safeguards are not exempted from the proportionality clause, which requires Canada to maintain the proportion of exports to the U.S. of the total supply prevailing over the previous 3 years. This means that restrictions reducing the amount of electricity exported to the U.S. must also apply to domestic consumers, whose supply of electricity needs to be proportionally reduced.[145]

In addition to these rules, which can result in trade disputes between member countries, American and Mexican private power producers in Canadian markets also enjoy significant protection for their investments under NAFTA's chapter 11. Chapter 11 establishes obligations related to National Treatment, Performance Requirements and Expropriation,[146] and provides NAFTA member-country investors with a dispute mechanism to claim damages against member countries for infringements of investor rights under the Agreement. Investors have the right to sue Canada in World Trade Organization trade tribunals – as opposed to democratic state courts. As indicated in the case of Pope and Talbot,[147]a right to access export markets may be established under chapter 11 of NAFTA. Approximately half of chapter 11 cases have concerned government policies aimed at protecting the environment or managing natural resources.[148] As U.S. investors become more prominent in Canadian electricity markets, governments will find it increasingly difficult to interfere with their profit-making, regardless of what is in the public interest.

Canada has some of the lowest electricity prices in the world.[149] Electricity prices in the U.S. are consistently higher than many Canadian jurisdictions making private electricity exports attractive. This can contribute to increases in competition between Canadian and U.S. markets to access power produced in Canada. As well, in responding to the climate crisis, a number of U.S. jurisdictions have implemented targets for increasing the share of renewable power in their energy mix. This creates an attractive market for Canadian "green" electricity in the United States.[150] For example, the California Public Utilities Commission provided Pacific Gas and Electric (one of the largest private utilities in the world) was provided US$14

million to assess the feasibility of purchasing renewable power produced in B.C.[151] Other examples include references by public officials and private investors to the potential for "energy corridors" to help transform Canada into a "clean energy superpower" featuring increased exports of hydroelectricity, wind generation and nuclear power.[152]

An important consideration in evaluating the potential for private energy exports is the extent to which the private sector is able to access the transmission grid to facilitate exports. Desire to access U.S. markets has been a key factor in Canadian provinces taking steps to deregulate electricity sectors and allow U.S. producers both trade and investment rights to Canadian electricity markets. This has occurred in response to pressure from private sector actors wanting access to Canadian markets as well as the U.S. regulator FERC (Federal Energy Regulatory Commission) demanding further deregulation on behalf of Canadian jurisdictions in order to access lucrative U.S. export markets.[153]

While it is true that there are opportunities at the federal level to limit exports,[154] it is equally true that our government has largely, in practice, relinquished this capacity, which is undermined by further deregulation and market liberalization. How can provinces adequately plan for reliable domestic supply when private generators and traders are free to export power to the U.S.? This becomes a question of energy insecurity if the market fails to meet domestic supplies. Trade rules and investor rights curtail government policy options to address this insecurity in the public interest, since such government actions would interfere with the electricity market, resulting in a loss of revenue or profits of foreign investors. In other words, increased investor-owned generation and further market liberalization create a dynamic with greater risks to provinces seeking to ensure secure supplies of affordable electricity. Conversely, ensuring ongoing public ownership of power preserves the capacity to ensure energy security. Community power as defined in this report, not profit driven and focuseds on meeting local and provincial needs, would not present the same challenges, nor should it require consideration of NAFTA investor rights. Further, community power can be incorporated into provincial planning through contracts with provincial governments or public agencies.

Where electricity generation is privatized, procurement contracts with private generators by which a Crown corporation or public agency guarantees the purchase of electricity over a set period of time (typically 20 years) provide some protection against the constraints of trade rules.[155] While investor-state challenges are still a possibility, risks are reduced. During the length of the contract, governments can implement policy options that could otherwise be at risk from trade and investor challenges under NAFTA, such as ensuring that provincial electricity needs are met prior to exports or regulating electricity generation to meet certain environmental or social goals. As noted, procurement contracts are increasingly common for renewable power production. These contracts can also accompany a feed-in tariff regime, such as Ontario now has with the new Green Energy Act. The resulting mix of energy producers – be they individuals, public and community power, or large-scale private generators – is pertinent to evaluating the long-term impacts on the ability of provincial governments to ensure supply security. Public and community ownership and control of generation and transmission assets remain the best option for insulating public policy choices from NAFTA challenges. Once contracts end, generation assets remain in private hands and the risks and constraints highlighted here apply – ultimately the expansion of private sector generation contributes to further market liberalization.

Increased investor-owned generation and further market liberalization create a dynamic with greater risks to provinces seeking to ensure secure supplies of affordable electricity.

PART 5: CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

In the coming decades Canada's electricity mix and electricity consumption will evolve tremendously. Canada's electricity will increasingly be more distributed, smaller scale and more diverse. Steps should be taken to ensure that it is consistent with science-based greenhouse gas emission reduction targets, maximizes decent job creation, and remains in the public sector. Or, more simply, we should ensure that Canada's electricity is green, provides decent work and remains public. There is little room for debate regarding the urgent need to take action on both the economic and climate crises. One way this can be accomplished is by improving energy efficiency and expanding renewable energy production in a way that creates green jobs strong enough to lift people out of poverty. There are distinct opportunities and advantages for the public sector to play a prominent role in green job creation.

On a grassroots, movement level, there are growing efforts and examples of alliances calling for "green jobs" and a more equitable "green energy economy." Interestingly, in Canada this grassroots movement pushing for action on climate change and corresponding green job creation is over a decade old. The labour movement has long advocated that we can have jobs and a healthier environment. In 1999, the Canadian Labour Congress adopted a resolution to develop a strategy on "green jobs," and a special conference looked at what it would take to create truly sustainable communities and green jobs. In collaboration with environmental, social justice and development organizations, among others, the Canadian Labour Congress pushed for the ratification of the Kyoto Protocol until 2002, when Canada ratified this important global convention. Youth-based movements featuring labour and environmental NGO collaboration, like the Canadian Youth Climate Coalition and Power Shift,[156] have focused on the climate crisis and the need to build a green economy, including recognition of the importance of public, decent green job creation.

We should ensure that Canada's electricity is green, provides decent work and remains public.

Van Jones, *New York Times* bestselling author of *The Green Collar Economy: How One Solution Can Solve Our Two Biggest Problems,* and founder of Green for All has been a significant catalyst for the U.S. movement. Green for All, a national U.S. organization, has proven that through building awareness and action, a shift to a clean, green economy can address the disproportionate impacts on low-income people caused by the current "pollution-based economy," as well as provide "entrepreneurial, wealth-building" opportunities.[157] Coalitions such as the Blue Green Alliance and Apollo Alliance, which bring together labour unions, environmental organizations, communities and businesses united in the mission to expand the green economy and advance the rights of workers, are precedent-setting. More recently, the United Steelworkers and Environmental Defence launched Blue Green Canada.[158] The U.S.-based movement has emphasized the role of public power generation less, whereas in Canada this has figured more prominently in discussions. This difference is not altogether surprising, given the extent to which U.S. electricity systems have been privatized while power in Canada remains predominantly produced by public utilities.

Although there have been a myriad of definitions for what a green job is or is not, the key detail is that through targeted investments, we can create thousands of decent family-supporting jobs by investing in, but not limiting ourselves to, renewable energy and energy efficiency. Given the fact that the United States is currently out-spending Canada six to one per capita on "green" investments, Canada needs to quickly catch up or the economic opportunity will be lost, making Canada, at best, a branch-plant economy while greenhouse gas emissions

continue to grow unabated.

The favoured path forward is a power system that is regulated in the public interest combined with a public distribution system. There is both tremendous need and opportunity to expand the role of public and community power generation from wind and other renewable energy sources. However, there is also a role for some private power production, such as from cogeneration by large-scale industry and by small-scale distributed energy producers, for the grid. Public and community power is an alternative path to further market liberalization, for expanding renewable energy production, that has distinct advantages.

Given the economic crisis and the credit crunch, the public sector has the capacity to expand energy efficiency and renewable energy more rapidly; such a pace is desperately required by the urgency of the climate crisis. Other benefits from expanding renewable energy in the public sector include the retention of economic revenues, increased social benefits, prioritized conservation, and ensured energy security.

Steps can be taken, primarily at the federal and provincial levels, through skills training, jobs development and preferential hiring, to ensure that green jobs promote equality. We can do more than get Canadians back to work; we can ensure that workers of colour, Aboriginal workers, women and those in isolated or marginalized communities are not excluded from these economic opportunities. Both energy efficiency jobs and renewable energy jobs tend to be local jobs: this means that they are more accessible to all Canadians and are more likely to keep money in local communities than the fossil fuel sector or private sector renewable electricity production.

RECIPE FOR A SECURE, JUST AND PROSPEROUS ENERGY FUTURE

The analysis presented in this report lends itself to a number of policy recommendations for actions enabling the public sector to play a prominent role in improving energy efficiency and expanding renewable power generation.

Providing the framework for climate action and energy security

- A national plan for greenhouse gas emission reductions of *at least* 25 to 40 per cent from 1990 levels by 2020, moving to much deeper reductions of at least 50-85 per cent below 1990 levels by 2050.
- An end to all federal and provincial subsidies of fossil-fuel-based energy production.
- Federal action to repeal the energy provisions of NAFTA and chapter 11, and reject similar energy provisions in any future trade agreement.

RECOMMENDATIONS I

As recognized in this report, energy efficiency is the most attractive area for the intersection of job creation and GHG emission reduction and should be a key policy priority for all levels of government.

Public policy initiatives to promote much greater energy efficiency

- A national Canadian municipal retrofitting program, including targets and timelines. This would invest more significantly in increasing energy efficiency in existing residential, commercial and institutional buildings through retrofits using qualified, certified unionized workers. *While some progress is being made with the federal ecoENERGY efficiency initiative and retrofit grants and incentives, much more is needed.*
- Setting tough national and provincial standards for energy efficiency in furnaces, water heaters, air conditioners, household appliances, lighting, etc., to reduce energy use.
- Updating of building codes to accelerate energy efficiency in new housing and new buildings, and zoning requirements to create higher residential and commercial density in urban areas while preserving community settings with community buildings and public space.
- Government supports for lower-income households for housing retrofits and direct financing to acquire energy-efficient appliances and heating/cooling systems for low-income renters.
- Federal, provincial and municipal government policies that implement energy efficiency retrofits at public institutions, thereby leading by example.
- Government measures ensuring Demand Side Management (DSM) programs fostering greater energy conservation are prioritized.

RECOMMENDATIONS II

As recognized in this report, the rapid expansion of renewable power generation and decentralized energy will create green job opportunities and help reduce carbon emissions and should be directed towards public and community ownership.

Development of renewable energy sources and decentralized energy

- The federal government should work with the provinces and territories to achieve an ambitious national target for renewable sources of electrical energy, and to promote Canadian technological and production capacities.
- Financing support from federal and provincial governments for public and community renewable power projects. This includes access to low-interest or forgivable loans and grants.[159]
- Federal government working with provincial governments to facilitate interprovincial trade of existing public hydroelectric power, including improvement of provincial grid interties.
- Provincial feed-in tariffs and other innovative policy mechanisms that reduce barriers connecting renewable power to provincial grids. This policy mechanism should however be directed at supporting public and community power projects, as well as on-site renewables, small-scale renewable projects, and cogeneration on behalf of individual home or farm owners, businesses and industry.
- "Made in Canada" policies tied to expanded renewable power and improved energy efficiency has a huge role to play in maximizing employment generation.
- Federal, provincial and municipal government policies that maximize opportunities to implement on-site renewable power and where possible cogeneration technology at public institutions, thereby leading by example.
- Investment directed towards ensuring that provincial grids are upgraded, enabling connections to smaller-scale and decentralized energy producers.

Investment in Green Heat

- While not the focus of this report, the expansion of green heat (use of renewable power sources to heat or cool, including geothermal, solar water heaters and biomass heaters) should be included in green infrastructure investments in renewable power.

RECOMMENDATIONS III

As recognized in this report, to ensure that an adequate workforce exists for a new green energy economy, and to maximize opportunities to build an equitable energy economy, government action is required.

Skills training, jobs development and Just Transition

Establishment of a Just Transition fund jointly managed by unions, governments and employers, to assist workers and communities affected by the shift to a low carbon economy. This includes funding for skills training and jobs development for green jobs directed towards workers who have lost their jobs (including those displaced in the transition away from fossil fuel industries) and to meet future employment demands for these growth industries. It also includes government employment (such as green jobs associated with public utilities producing green power) and programs directed at communities affected by the transition to a low carbon economy and communities faced with poverty and systematic injustice.

RECOMMENDATIONS IV

Federal green infrastructure investments

- Commitment by the federal government to green infrastructure investments of at least $10 billion dollars over each of the next two years to five areas: energy conservation through building retrofits and renewable energy projects, mass transit, passenger rail and affordable housing.

This report has focused on opportunities for green job creation in the public sector, which can play a prominent role in improving energy efficiency and renewable power expansion, concentrating primarily on the electricity sector. It is clear that there are changes needed beyond those identified throughout this report to reduce carbon emissions and address the climate crisis. This recipe for a secure, just and prosperous energy future highlights key areas for government action.

Investment in Rail and Mass Transit Infrastructure

- Regulating and investing in new rail infrastructure to increase energy-efficient rail transportation of goods with fair wage programs.
- Major investments in mass rapid transit systems in urban areas.
- Limiting urban sprawl to allow for increased urban density and an opportunity for transit infrastructure to "catch up."
- Major investments in inter-city, high-speed rail, especially in the Windsor to Quebec City and Edmonton to Calgary corridors, to reduce emissions from trucks, autos and aviation.

Fair Fuel Efficiency Standards

- Creating mandatory rising fuel efficiency standards for autos and trucks by vehicle class, including standards focused on more energy-efficient short- and long-haul trucks. Efficiency standards must recognize the integrated North American auto market.
- A Green Vehicle Transition Fee charged to manufacturers based on each vehicle sold in Canada, with proceeds rebated to auto manufacturers located in Canada investing in new green technologies to assist with the further development of green technologies and re-tooling factories.
- Additional public investment in the re-tooling of factories, as Japan did with public funds during the 1990s. Additional re-tooling should be in line with vehicle production. For instance, to produce 2 million hybrid vehicles the re-tooling costs would exceed $3 billion.
- Implement measures to both retire and recycle older vehicles as production of more efficient vehicles increases public policy initiatives to promote much greater energy efficiency.

APPENDICES

APPENDIX I HYDROELECTRICITY

Hydroelectric power currently meets just over 60% of Canada's power demand.[160] With total hydroelectricity generation of 352 billion kilowatt hours (kWh) annually, Canada is one of the largest hydroelectric producers in the world, second only to China.[161] Hydroelectricity is a reliable source of energy capable of generating large amounts of power. Hydroelectric power can be easily dispatched, in comparison with other sources of power generation, particularly with short timeframes.

The future source potential for hydroelectricity varies greatly across the country. In Ontario, most hydroelectric power has been tapped. Natural Resources Canada estimates that as a nation we could increase our national hydroelectric production by 50% or more.[162] However, most of these developments are in remote locations and would involve substantial environmental impacts, and a greater share of the energy is lost in long-distance transmission, especially given our current electricity grid.

Although hydroelectric power is relatively cheap and environmentally benign, as an electricity source it is unlikely to supply a large share of future power needs. There is, however, potential to more efficiently use exported hydroelectric power in Canada, for instance, through closer integration of the Ontario system with those of hydro-abundant Manitoba and Quebec.

This includes an ongoing role in producing low-emission power from existing hydroelectric facilities which, as noted, is an important source of power in Canada meeting 60% of Canada's power demand. As a power source, hydroelectricity does not produce greenhouse gas emissions. One report, *Kyoto and Beyond, The Low Emission Path to Innovation and Efficiency*, which outlines a scenario where Canada reduces its greenhouse gas emissions to half of current levels over 28 years, foresees existing hydroelectric generation playing a vital role in a low-emission electricity sector.[163] In the scenario contained in this report, demand for electricity is offset significantly by conservation and energy efficiency measures, leaving existing hydroelectric capacity, in theory, able to meet most Canadian needs for electricity. The lack of east-west transmission capacity is a barrier to this. Future public developments of hydroelectricity must be evaluated on the basis of environmental impacts and effects to surrounding communities,[164] and involve a socially inclusive process that respects Aboriginal treaty and land rights.

APPENDIX II WIND

Wind power is likely the most talked-about form of renewable energy. Growth in wind power in recent years in the United States has been astronomical. In 2008, 42% of all new electricity generation was wind power, compared with 2% only four years earlier.[165] The five-year average annual growth rate in wind energy during this period (2004 through 2009) was 32%, with the largest annual increases being the most recent: 45% in 2007 and 50% in 2008. The previous U.S. five-year average growth rate from 1999 to 2004 was 29%.[166] This decade-long rapid expansion in wind energy in the U.S. has increased its total operational capacity to 25,000 MW, surpassing Germany, and making the United States the world leader in both wind power production and wind power.

Wind's talked-about status is also largely related to its environmental merits. Wind power can reduce the output required of peaking plants when the wind is available to meet peak demand.[167] With absolutely no emissions, and wind itself being both abundant and renewable, plus the fact that it takes only a few months for the energy generated by wind turbines to become greater than the level of energy used to make them, wind is appealing in comparison to many other energy sources. The existing technology has relatively high output and is affordable. It has no air pollutants, GHG emissions, water use impacts, extraction process or waste products. Also, turbines can be set up without disturbing ecosystems. It is a proven, commercially available technology. The only significant environmental consequence is possible bird and bat kills and, for some, negative impacts on the visual landscape and some wind farms generate concerns regarding noise and vibrations. Although studies are not conclusive, health effects have been documented in relation to noise and vibrations. Wind farm technology has advanced to the point that noise and vibration can be eliminated. This yields yet another advantage to wind generation owned in the public sector, ensuring public interest guides wind farm projects, not profit.

Canada's wind energy installation is behind that of the United States and most European countries. Canada's current installed wind power capacity is at 2,500 MW, and its total capacity will surpass 3,000 MW in 2009.[168] Current Canadian growth in wind power is a consistent 30% annually, a rate comparable to global wind power development. For many, including the Canadian Wind Energy Association, there is a goal of a 55,000 MW wind power capacity by 2025.[169] The 55,000 MW of wind power would fulfil 20% of Canada's energy needs, a percentage proportional to other wind leaders like Denmark**.** If 20% of Canada's electricity were generated from wind (55,000 MW), wind would be the second largest source of electricity, behind hydro and ahead of nuclear, natural gas and coal.

APPENDIX III SOLAR

Solar power is by far the world's most available and plentiful energy resource in that its theoretical potential is far greater than what the world would ever require. According to a number of studies – and supported by the International Energy Agency (IEA) and UNEP (in *Global Deserts Outlook*) – covering 4% of the world's desert area (approximately one-third of the global

landmass) with photovoltaics could supply all of the world's electricity.[170]

Solar energy refers to the use of photovoltaic cells which convert sunlight directly into electricity. When sunlight strikes a photovoltaic, or PV cell, electrons are dislodged creating an electrical current. Solar power has no air pollutants, GHG emissions, water use impacts, extraction process or waste products. It is a proven, commercially available technology, and has a low dependence on local resources. Solar energy depends on a daylight-hour base, and can provide both base and peak load, although it is a low-density energy by nature and is currently relatively expensive.

Current U.S. solar capacity is 8,775 MW, a 9% or 1,265 MW increase from the year before; however, it is worth noting that the largest segment of the solar sector in the U.S. by capacity is for swimming pool heaters. Homeowners in the developed world have been reluctant to pay for solar panels to be installed on their buildings while costs remain so high. According to a report by Greenpeace and the Chinese Renewable Energy Industry Association, China exports a staggering 90% of its PV cell solar output, for a number of reasons, but primarily because its citizens can't afford to use it.[171]

During the development process of PV technologies, crystalline silicon solar cells have been in the mainstream of commercial production. For instance, in the global market, over 98% of solar cells are made of high-purity polycrystalline silicon, making the manufacturing of high-purity polycrystalline the most important point in the whole PV industrial chain. With the increasing growth of the PV industry, however, a shortage of polycrystalline silicon is becoming a serious problem. Lack of supply means that the price of the feedstock has been increasing, which has further contributed to reluctance in the developed world to pay for solar panel installation.

APPENDIX IV MARINE SOURCES: TIDAL AND WAVE

Relative to hydroelectric river dams, tidal and wave power electricity projects are a very expensive investment given that large structures, none of which are yet mass produced, must be built in difficult salt water environments. However, it is worth noting that conventional hydroelectric dams are also extremely expensive investments, and yet most Canadian hydroelectric dams have long been paid for and the low-emissions electricity continues to be produced in abundance.

Canada has the third highest number of marine energy technology development projects internationally.[172]

Tidal

There are two main types of tidal electricity generation: through a tidal barrage and through tidal fences and turbines. A tidal barrage is similar to a dam; it is built across an estuary and captures the energy generated by the change in height between high and low tides as water flows through tunnels in the dam, which either turn water turbines or compress air through a pipe which then turns a turbine and generates electricity. Tidal fences and turbines operate similarly to wind turbines by generating electricity when the turbines are turned by tidal currents. It is worth noting that during operation, ocean currents generate more electricity than air currents due to the increased density of water, which puts a greater force on the turbines.

Tidal power is a long proven (since the 12th century), commercially available technology, but has high dependence on local resources; obviously not all regions are suitable for tidal power. Globally there are few locations where the difference between high and low tides is great enough to efficiently exploit this renewable energy source. Fortunately, many of the suitable locations are in Canada, including the Bay of Fundy, Ungava Bay in northern Quebec, and many coastal locations in British Columbia, including southern Vancouver Island, the estuaries along the British Columbia coast, Tofino and Ucluelet, as well as the islands north of the Campbell River among others. At suitable locations, tidal power electricity output is limited by the twice-daily ebb and flow of tides and the changes in the lunar cycle; however, unlike conventional hydroelectric dams and wind power, the daily, monthly and annual changes in tidal power's capacity is predictable and can easily be stored, integrated with other sources of generation and integrated with demand-side management.

In Canada future supplies suggest a potential total capacity of 8,500 MW and an annual production of 22,000 GWh.[173] Canada's current tidal capacity is quite small, with 20 MW (barrage) being produced at the Annapolis Tidal Power Station in the Bay of Fundy, a 1.5 MW (turbine) also in the Bay of Fundy and an additional 65 KW (turbine) in a demonstration project at Race Rocks, B.C.

Wave

Wave energy is produced from ocean surface waves; in other words, from water movement derived from wind. Energy can be produced using near-shore devices that are mounted on the sea bottom or shore, and offshore devices that incorporate one or more semi-buoyant or floating devices. One of the most effective methods is using the rise and fall of wave action to compress air in a chamber. The compression and release of air pressure is used to drive a turbine and a generator. Offshore locations are unobtrusive and the environmental and social impact should be low. Wave power is a proven technology, but is in early stages of commercial availability. It has a high dependency on local resources, but obviously not all locations are suitable.

Canada currently has no installed wave power, nor does the United States; however, research and development into wave power technology is being developed in Canada. Portugal houses the world's first commercial wave farm, the Aguaçadora Wave Park near Povoa Varzim, which was opened in September of 2008.

NOTES

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103. Smart grid uses digital technology to deliver electricity from suppliers to consumers. This includes such technology as smart meters and virtual power plants that "act as a hub that aggregates loads and generators, controlling dispatch and demand-side management in a decentralized fashion." Microgrids have small-scale generators are connected to each other, and this can include one main connection to the larger grid. "*Framework for a Model National Renewable Energy Strategy for Canada*," Canadian Renewable Energy Alliance (June 2006), http://www.canrea.ca/site/national-strategy/.
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105. Community-owned renewable projects here includes landowners (can be organized in a co-operative) or public institutions (such as a school) owning a wind turbine.
106. Commercial projects here include farmers leasing their land to private developers.
107. Teresa Welsh, "Small Packages, Big Benefits: Economic Advantages of Local Wind Projects," Policy Brief (April 2005), http://www.cpfund.ca/pdf/iowa-policy-project.pdf.
108. Ibid.
109. This study was conducted by Minnesota's Southwest Regional Development Commission. Ibid.
110. Canadian Union of Public Employees, "Deregulation, Privatization and the Ontario Power Failure," September 2003, http://cupe.ca/PrivatizationUtilities/ART3f719b0a8bd00 and Lester B. Lave, Jay Apt and Seth Blumsack, "Rethinking Electricity Deregulation," The Electricity Journal, Volume 17, Issue 8. (September 2004).
111. Ibid.
112. L. de Luca, ed., *Labour and social dimensions of privatization and restructuring (public utilities: water, gas, electricity*, ILO, Geneva (1998), 139.
113. *Structural and Regulatory Changes and Globalization in Postal and Telecommunications Services: The Human Resources Dimension*, International Labour Organization (Geneva, 1998), 78-80.
114. Table 3.7 in *Report for Discussion at the Tripartite Meeting on Managing the Privatization and Restructuring of Public Utilities: The Impact of Privatization and Restructuring on Remuneration and other Working Conditions*, International Labour Organization (Geneva, 1999).
115. Ibid.
116. "Green Jobs for the Poor: A Public Employment Approach," Discussion Paper, United Nations Development Programme (April 2009), http://www.undp.org.gy/documents/bk/PG-2009-002-discussion-paper-green-jobs.pdf, 5.
117. Ralph Torrie, Richard Parfett and Paul Steenhof, *Kyoto and Beyond: The Low-emission Path to Innovation and Efficiency*, David Suzuki Foundation and Climate Action Network Canada (October 2002), http://www.davidsuzuki.org/files/Kyoto_72.pdf, 27, 56.
118. While there is certainly more that can be done by governments to promote greater conservation of energy and improved energy efficiency, there are a number of examples of such policies and programs. A list of grants and incentives for improved conservation and energy efficiency (including and beyond electricity consumption) is available on Natural Resource Canada's Office of Energy Efficiency website at Natural Resources Canada, "Office of Energy Efficiency," http://oee.nrcan.gc.ca/corporate/incentives.cfm?attr=4.
119. "Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future," Canadian Renewable Energy Alliance (August 2006), http://www.canrea.ca/pdf/CanREAEEPaper.pdf.
120. Marjorie Griffin Cohen, "Electricity Restructuring's Dirty Secret," in *Nature's Revenge: Reclaiming Sustainability in the Age of Corporate Globalism* (Peterborough, ON: Broadview Press, 2006), 87-89.
121. John Calvert, ed., *Liquid Gold: Energy Privatization in British Columbia* (Halifax and Winnipeg: Fernwood Publishing, 2007), 214-216.
122. Marjorie Griffin Cohen, "Electricity Restructuring's Dirty Secret," in *Nature's Revenge: Reclaiming Sustainability in the Age of Corporate Globalism* (Peterborough, ON: Broadview Press, 2006), 87-89.
123. Ibid.
124. "Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future," Canadian Renewable Energy Alliance (August 2006), http://www.canrea.ca/pdf/CanREAEEPaper.pdf.
125. Manitoba Hydro, "Conserving Electricity," http://www.hydro.mb.ca/environment/projects/conserving/index.shtml.
126. Ibid.
127. The Manitoba government has a provincial target of saving 842 megawatts of electricity by 2017. Manitoba government, "Acting on Energy and Climate Change," http://www.gov.mb.ca/greenandgrowing/acting.html.
128. This is particularly true of the previous Ontario Hydro which had, at one point, actively encouraged electricity consumption. The case of Ontario Hydro is complex. For more information on the history of Ontario Hydro and push for market liberalization in Ontario's electricity system, including an analysis of Ontario Hydro's record on energy conservation, refer to Jamie Swift and Keith Stewart, *Hydro: The Decline and Fall of Ontario's Electric Empire* (Toronto: Between the Lines, 2004).
129. John Calvert, ed., *Liquid Gold: Energy Privatization in British Columbia* (Halifax and Winnipeg: Fernwood Publishing, 2007), 216.
130. Marjorie Griffin Cohen, "Electricity Restructuring's Dirty Secret," in *Nature's Revenge: Reclaiming Sustainability in the Age of Corporate Globalism* (Peterborough, ON: Broadview Press, 2006), 88.
131. "Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future," Canadian Renewable Energy Alliance (August 2006), http://www.canrea.ca/pdf/CanREAEEPaper.pdf.
132. Jamie Swift and Keith Stewart, *Hydro: The Decline and Fall of Ontario's Electric Empire* (Toronto: Between the Lines, 2004), 106-110.
133. "The Power to Choose: Demand Response in Liberalized Electricity Markets," Organisation for Economic Co-operation and Development (OECD), International Energy Agency (2003), 21.
134. These can include tax exemptions, loans targeted at measures that conserve energy, and better energy efficiency labelling and standards to encourage conservation.
135. "Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future," Canadian Renewable Energy Alliance (August 2006), http://www.canrea.ca/pdf/CanREAEEPaper.pdf.
136. Marjorie Griffin Cohen, "Electricity Restructuring's Dirty Secret," in *Nature's Revenge: Reclaiming Sustainability in the Age of Corporate Globalism* (Peterborough, ON: Broadview Press, 2006), 88.
137. This is also the case with regulated, vertically integrated private monopolies, such as Nova Scotia's power system.
138. Exports have typically been limited to the sale of surplus electricity through long-term contracts with guaranteed pricing. Marjorie Griffin Cohen, "From Public Good to Private Exploitation: Electricity Deregulation, Privatization and Continental Integration," Canadian Centre for Policy Alternatives – Nova Scotia (July 2002), 3.
139. This includes prioritizing less environmentally damaging, lower-emission power generation, addressing effects of power generation and distribution on communities, and equitable access to services. Marjorie Griffin Cohen, "Electricity Restructuring's Dirty Secret," in *Nature's Revenge: Reclaiming Sustainability in the Age of Corporate Globalism* (Peterborough, ON: Broadview Press, 2006), 89.
140. There have been problems with certain remote communities and First Nations not having access to provincial grids.
141. Marjorie Griffin Cohen, "From Public Good to Private Exploitation: Electricity Deregulation, Privatization and Continental Integration," Canadian Centre for Policy Alternatives – Nova Scotia (July 2002), 21-27.
142. As noted by the NAFTA Commission for Environmental Cooperation (CEC), energy rules under the trade agreement broadly seek to reduce the capacity of government regulators to intervene in cross-border energy sales both in removing restrictions to exports and in preventing the creation of new restrictions. "International Forces Driving Electricity Deregulation in the Semi-Periphery: The Case of Canada," in Marjorie

Griffin Cohen and Stephen Clarkson, eds., *Governing under Stress: Middle Powers and the Challenge of Globalization* (London: Zed Books, 2004).

143. These exceptions are "preventing or relieving critical shortages on a temporary basis . . . conserving exhaustible natural resources." It is questionable whether these "safeguards" could indeed provide security in the event of supply shortages. For more information, refer to the discussion of these exceptions, pages 9-22 of Scott Sinclair's overview of international trade law and the Ontario electricity system. Scott Sinclair, "International Trade Law and the Ontario Electricity Sector," in Council of Canadians Evidence for the Ontario Energy Board (August 2008), http://canadians.org/energy/documents/OEBEvidence-CoC.pdf, 9-22.
144. John Calvert and Marjorie Griffin Cohen, "The Impacts of International Trade Law and US Regulation on the Integrated Power System Plan," in The Council of Canadians Evidence for the Ontario Energy Board (August 2008), http://canadians.org/energy/documents/OEBEvidence-CoC.pdf
145. Ibid., 10-11.
146. Ibid., 13.
147. Pope and Talbot was an investor claim against Canada by a Canadian subsidiary of a U.S. lumber company. Pope and Talbot brought forward the complaint that an export quota under the Softwood Lumber Agreement offended several NAFTA investment provisions. As argued by Scott Sinclair, "it is important to note that in Pope and Talbot, access to US markets was not in fact limited in any material way. Rather the only question was whether the company's exports would be exempt from US tariffs under the Softwood Lumber Agreement. The important point is that the expansive definition accorded investor rights by the Tribunal effectively transformed a measure concerning trade in goods (in that case log exports), into also concerning investment (the right to access export markets)." Ibid., 17.
148. Scott Sinclair, "NAFTA Chapter 11 Investor-State Disputes (to January 1, 2008)," Canadian Centre for Policy Alternatives, http://www.policyalternatives.ca/documents/National_Office_Pubs/2008/NAFTA_Dispute_Table.pdf
149. National Energy Board, "Frequently Asked Questions," http://www.neb.gc.ca/clf-nsi/rnrgynfmtn/prcng/lctrct/frqntlskdqstn-eng.html.
150. John Calvert and Marjorie Griffin Cohen, "The Impacts of International Trade Law and US Regulation on the Integrated Power System Plan," in The Council of Canadians Evidence for the Ontario Energy Board (August 2008), http://canadians.org/energy/documents/OEBEvidence-CoC.pdf, 33.
151. The funding was/is to be allocated to investigating options for transmission lines linking the California grid to B.C. wind and water renewables. John Calvert, eds., *Liquid Gold: Energy Privatization in British Columbia* (Halifax and Winnipeg: Fernwood Publishing, 2007), 102-103.
152. Andrea Harden-Donahue, "Separating truth from Greenwashing in the West's Energy Export Boom," Rabble.ca, June 24, 2009, http://rabble.ca/news/2009/06/separating-truth-greenwashing-wests-energy-export-boom and Wayne Thibodeau, "Atlantic Green Energy Corridor Discussed by Region's Conservatives," *The Guardian*, August 17, 2008, http://www.theguardian.pe.ca/index.cfm?sid=162972&sc=98.
153. "International Forces Driving Electricity Deregulation in the Semi-Periphery: The Case of Canada," in Marjorie Griffin Cohen and Stephen Clarkson, eds., *Governing under Stress: Middle Powers and the Challenge of Globalization* (London: Zed Books, 2004).
154. Ibid.
155. John Calvert and Marjorie Griffin Cohen, "The Impacts of International Trade Law and US Regulation on the Integrated Power System Plan," in The Council of Canadians Evidence for the Ontario Energy Board (August 2008), http://canadians.org/energy/documents/OEBEvidence-CoC.pdf, 11-12, 38-39.
156. Powershift '09, http://www.powershift09.org/campaignhome.
157. Green for All, http://www.greenforall.org/acl_users/credentials_cookie_auth/require_login?came_from=http%3A//www.greenforall.org/about-us/our-mission/our-mission/document_view.
158. Blue Green Canada, "Good Green jobs and Healthy Communities," http://www.bluegreencanada.ca/.
159. "CanREA Recommends Federal Action on a New Green Economy," Canadian Renewable Energy Alliance (December 2008), http://www.canrea.ca/site/2008/12/canrea-recommends-federal-action-on-a-new-green-economy/.
160. *World Survey of Decentralized Energy 2006*, World Alliance for Decentralized Energy (May 2006), 15.
161. Energy Information Statistics: Official Energy Statistics from the U.S. Government, "Country Analysis Brief: Canada," (May 2009), 4.
162. *Energy in Canada*, National Resources Canada (2000), 99-100.
163. Ralph Torrie, Richard Parfett and Paul Steenhof, *Kyoto and beyond: The low-emission path to Innovation and Efficiency*, David Suzuki Foundation and Climate Action Network Canada (October 2002), http://www.davidsuzuki.org/files/Kyoto_72.pdf, 108-110.
164. The history of hydroelectric development in Canada includes a number of cases with significant social and environmental repercussions. This includes displacing communities and serious grievances by First Nations, flooding forest areas resulting in the release of methane and concerns over acidic water basins.
165. Mark Resnicoff, *Renewable Wind Energy in the United States: Growth Rate, Outlook and Manufacturing for Domestic Wind Power*, Energy Conservation (April 26, 2009), 1.
166. Ibid.
167. *Power Generation in Canada: A Guide*, Canadian Electricity Association (2006), http://www.canelect.ca/en/Pdfs/HandBook.pdf, 21.
168. *Canada's Current Installed Wind Capacity,* Canadian Wind Energy Association (2009), 1.
169. *Wind Vision 2025: Powering Canada's future*, Canadian Wind Energy Association (2008), http://www.canwea.ca/images/uploads/File/Windvision_summary_e.pdf, 3.
170. Ermer, Matthias, *Energy from the Desert: Practical Purposes for Very Large Photovoltaic Systems* (Chapter 1), Earthscan, 1. This is also referenced in data by the German Center of Aerospace (DLR) 2005), from a study from the DLR, page 12 and 26. Further information: http://www.dlr.de/en/desktopdefault.aspx
171. *China Solar PV Report*, Chinese Renewable Energy Association, European Photovoltaic Association, Greenpeace and World Wildlife Fund (2007), http://www.greenpeace.org/china/en/press/reports/china-pv-report, 21.
172. "Selon une étude réalisée pour l'Entente de mise en œuvre sur les systèmes d'énergie océanique, un élément de l'Agence internationale de l'énergie." Cited in Canmet Energy, Natural Resources Canada.
173. *Renewable Energy in Canada: Status Report*, Natural Resources Canada (March 2002), 9.

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