Electricity Restructuring's Dirty Secret

THE ENVIRONMENT[1]

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Fairly little public discussion has taken place about the effect on the environment of restructuring North American electricity markets. The reluctance to look carefully at this subject stems in part from the contradictory messages that llave been put forth by environmental groups. While some groups are skeptical of the claims that new "green" energy will readily meet new energy demands once prices reflect market demand, other environmental groups have actively supported the restructuring initiatives. But also significant has been governments' willingness to undertake restructuring programs on the assumption that people will support these initiatives if they can be convinced that new private and market-based electricity production will be environmentally sustainable.

In this paper 1 will argue that the restructuring of the North American electricity market, which involves the break-up and privatization of large public utilities, will not bring about significant environmental improvements that governments, industry, and some environmental groups are promising, and that it will destroy the collective benefits that public ownership of this resource provides. This does not imply, however, that the existing systems of electricity production do not need to be changed. All large-scale electricity generation has negative environmental consequences, and there is no doubt that some of the public electricity utilities in Canada have been a part of the problem. These are the large public monopolies that too often have taken environmental issues seriously only when massive and negative public reaction to their activities occurred. The extraordinary power of some public utilities, such as Ontario Hydro, is as legendary as their arrogante. The perspective of Adam Beck, the founder of Ontario Hydro famous for his braggadocio, "Nothing is too big for us. Nothing is too expensive to imagine," was not the isolated perspective of one inflated ego (Skene 1997).

The catalogue of terrible environmental damage that has been done in the name of utilities in the public domain cannot be ignored. Nonetheless, planning for clean energy in the future can and should be the main focus for all energy planning; but this is not likely to happen in a market-oriented electricity system. It is faulty logic to assume, because there are problems with the existing system (a public or highly regulated one), that its opposite (a private and deregulated one) will correct these problems. Protecting the environment is not as simple as creating a new market niche for green energy; it requires fierce and sustained public control over business and consumer practices.

In this chapter I explain the ways that electricity restructuring in North America compromises conservation efforts and programs designed to improve the environmental aspects of electrical generation and distribution. I explain why electricity should be treated as a common resource and will focus on how the logic of deregulation inherently undermines conservation efforts. I also examine the economics of private production and why the arguments of some environmentalists who favour deregulation to encourage green electricity generation are based on specific, but unlikely, assumptions about how international energy markets work. My ultimate point is that the current restructuring of electricity markets—to shift to a marketbased system—inherently encourages greater production and distribution of electricity and focuses primarily on the cheapest method of production. Market-based restructuring usually does not mean private exploration for "green" energy but rather a return to older and dirtier fuels in the production process. It also encourages the growth of international markets and power trading, developments that defeat the promise of small-scale, local production and curtailment of consumption. While traditional utilities in Canada have, in the past, been relatively unresponsive to demands for clean energy production, the shift to a market-based system will not bring forward a system that is more environmentally responsible.

ELECTRICITY AS THE COMMONS

From the time when electricity became a widespread energy source in industrialized countries during the first half of the twentieth century, it was transformed throughout North America from a small-scale private industry guided by market prices to a public responsibility provided by public utilities or highly regulated private monopolies. Electricity exhibits features of a resource that should be held in common, either directly by the public sector,

through co-operatives, or through highly regulated private utilities. This is because its nature as an essential part of modern life has been too significant to be left to the vagaries of the market. Security of supply at reasonable prices has been essential in order to make electricity available to the entire range of the population, including those with low incomes and those who live in rural areas. But probably most significant for publicly justifying the huge investment of government funds that went into developing the electrical infrastructure was having a secure and inexpensive electricity resource for private industry and economic development.

In Canada, the transformation from the private provision of electricity to almost total public control occurred mainly because the private sector was not able or willing to undertake the enormous investment necessary to develop the extensive infrastructure needed for the widespread use of electricity (Froschauer 1999). This public infrastructure was particularly important for the development of electricity in a country that is characterized by a huge land mass, a sparse population, and a relatively small capitalist class. The role of the state in electricity production is the story of the modern electrical industry. In most provinces of Canada, public utilities have dominated the market.' The electrical "commons" includes not only the public ownership of the resource, but also the public generation, transmission, and distribution of that energy.

Restructuring the electricity sector normally involves privatizing or re-regulating the market to encourage competition in the supply of electricity. It is a process that undermines the characterization of electricity as a product of "the commons." The term "the commons" is used in a variety of ways, but most commonly in recent years it has been used in connection with the over-exploitation of a resource that occurs when it is held in common, such as the over-extraction of fish from oceans.' Like other contributors in this book, I am using the term in a broader sense to indicate the collective sovereignty over a resource to ensure collective ends. The social nature of electricity as common property presents property as a collective right to a benefit stream, but it controls that right collectively to take into account competing social interests (Goldman 1997). That is, under collective control it is possible to take into account many of the external costs that could not be considered under strictly market conditions. Electricity is a "common resource because it is an essential resource, the cost of providing the resource has been sufficiently large that it would have excluded large numbers of people from access if it had been treated in the traditional manner of private property, and it involves a bisopheric intervention that requires action in the public interest (to reduce pollution, ensure sustain-

ability, to protect the environment, etc.). The essential resource nature of electricity is clear: access to electricity is crucial for participating in twenty-first-century society and for surviving in that society as it is presently constructed.[4] Related to this is the issue of equity in the use of a resource. Ecological economist Hernian E. Daly, unlike traditional economists, makes the important point that nature is scarce and its use needs to be priced accordingly. When nature is priced, the issue of who should receive the price paid is extremely significant, particularly for issues of equity. When payment for the resource is made to a private owner, the owner reaps the reward of controlling the resource. When it is made to a company owned by people collectively, the payment can be "the ideal source of funds with which to fight poverty and finance public goods" (Daly 2002).

Related to this is the nature of the cost of the "common" property itself. In an electricity market that treats electricity as a common good, long-terco planning regulates the use of resources for electricity generation, and vanous factors unrelated to profit making can be considered when building for an adequate supply. In a regulated system, the cost to the consumer is usually directly related to the cost of production, a feature that is significant if its distribution to all classes at reasonable prices is to occur. In a restructured system, such as is occurring in the creation of a North American electricity market, both the supply and price are to be determined entirely on the market. When market decisions determine supply, collective oversight to guarantee a sufficient supply is frequently set aside, and prices to consumers shift from being directly related to costs to reflecting what the market will bear. Electricity restructuring radically changes the character of the industry, shifting it from one that directly serves social and economic purposes of collective entities to one focused on profit making and serving the individual purposes of companies that provide and control the resource. It shifts from having the potencial to balance the competing needs of the population in making decisions about production and distribution, to focusing on making profit-driven decisions that are generally based on short-terco results.

THE ENVIRONMENTALISTS WHO ARGUE FOR DEREGULATION

In the public debate over the joys or sorrow of electricity restructuring, surprisingly little attention has been paid to the negative effects that deregulation and privatization will llave on the environment. Environmental considerations have been virtually absent because some very vocal environmental groups in North America actively championed the restructuring

process. This support by some environmentalists for a private, marketbased system for North American electricity complicated the politics of confronting the restructuring process. In particular, it constrained the efforts of those who sensed that there was a great deal to be lost by shifting electricity from a common good to a private, for-profit enterprise. Another rea-son for avoiding or not dealing with environmental issues associated with restructuring has been governments' focus on the private sector as a way to provide all future supply of electricity. This approach represents a neo-liberal ideological shift consistent with moving many government responsibilities to the private sector.

It should be noted that some environmentalists and the groups to which they belong in Canada, such as the Suzuki Foundation, the Canadian Environmental Law Association, Greenpeace, and the Sierra Legal Defence Fund, do not favour deregulated electricity markets. They have actively opposed the deregulation of electricity because it would harm the environment.[5] But other, corporate-sponsored environmental groups that have been most vocal in support of deregulation and llave had the backing of industry and governments that want to deregulate have had a considerable impact on the deregulation debate.

In 1996, before deregulation was implemented in any jurisdiction in Canada, the Ontario environmental organization Energy Probe was actively pursuing and arguing for a deregulated and privatized electricity market in Ontario.[6] Energy Probe's Executive Director Thomas Adams, in an article entitled "The Case for Breaking up and Privatizing Ontario Hydro," was clear: "Breaking up and privatizing Ontarío's electricity system—now bloated, polluting and propped up by secret rate discounts for big business-will make the system trim, green and fair. With competition, rates would fati as every user gains the right to shop for big power bargains." After citing examples of how rates have declined wherever markets have been deregulated and privatized, he argued that competition and privatization would help the environment. The environment would win because financial accountability would reverse Ontario Hydro's dependence on megaprojects, such as risky, uneconomic nuclear plants and dirty coal plants. Instead, cogeneration, which cuts both pollution and cost through energy efficiency, would flourish. While he conceded that competition and privatization would "not solve all our power system's environmental problems ... tightening pollution rifles would be easier when government is no longer in a conflict of interest as both regulator and polluter" (Adams 1996).

Energy Probe's argument favouring privatization seems to rest on three major theories: the belief that privatization will bring in lower prices; the

notion that removing government ownership will enable stricter regulations against pollution to be implemented because the government will be regulating private business rather than its own companies; and the theory that new energy generation will be cleaner than that under government control because, in response to consumer demand, cleaner sources of energy will become available. These arguments are repeated on Energy Probe's website (www.energyprobe.org), where their published articles consistently argue that lower prices will result from privatization. As Adams has said, "Everywhere else it's been tested, customer choice works; it's lowered costs for consumers." Even after the debacle of electricity deregulation in California and Alberta, Adams continued to argue that the benefits of deregulation would materialize if Ontario quit "waffling on privatization" and eliminated the uncertainty created by an "economic climate of indecision and reluctance similar to that which is partly responsible for supply problems in Alberta and California" (Holoway 2001). The solution, according to Energy Probe, is to avoid taking the cautious and slow approach to privatization, which it claims is the main culprit in deregulation and privatization and has resulted in price spiking and insufficient supply. However, since the deregulation exercises in California and Alberta, Energy Probe does seem to have shifted its position somewhat and now argues in favour of higher prices through the deregulation process. According to Thomas Adams, "consumers do conserve in response to price increases," so he is now advocating the use of higher prices as "an extra tool to protect supply."[8] Energy Probe has spread its message throughout Canada, and in its presentation to the BC Electricity Market Structure Review clearly indicated its position that BC Hydro should be privatized for environmental reasons.[9]

For most environmental groups that do not have as clear an ideological position against the public sector as Energy Probe, and that do not believe that market-based, private energy production is inherently superior to that in the public sector, the process of deregulation and privatization seems to have caught them offguard. Most were not actively involved in campaigns to derail the process, although some, such as the Natural Resources Defense Council in the US, actively supported the utility-backed deregulation plans (Blackwell 1997).

The reluctance of some environmental organizations to oppose the restructuring that involved either privatization or deregulation was related to the frustration they encountered whenever they approached monopoly power and the power of the state. Environmentalists tend to be suspicious of both the stare as a regulator, and any big power producer's environmen-

tal objectives. Both the state and the electricity companies consistently resisted dealing with bringing "green" electricity on line, usually with the argument that it was too expensive. Reliance on the market, the alternative to the planned approach, seemed to raise other avenues for action. In general, the environmentalists who did not actívely oppose electricity restructuring have taken an approach that is consistent with "market environmentalism." To arrive at solutions to environmental problems, market initiatives are used as a primary tactic (Stewart 2001: 209). It is a strategy that downplays the role of public accountability and public regulation and focuses instead on the power of consumer buying to influence business decisions. Marketbased solutions to environmental problems tend to be favoured by business elites as well. Corporations tend to favour self-regulation and responses to consumer demand, rather than government regulations to govern their behaviour.

The Environment Defense Fund (EDF), a US organization, talks about the opportunities being created through the choices consumers are being offered through deregulation. Their polis show that customers "strongly prefer energy efficiency and renewable energy sources, such as wind and solar power" (EDF 1996). This belief in the ability of the market to usher in green power encouraged the EDF to be heavily involved in a three-year negotiation on electricity deregulation in California. They pronounced the resulting law as "a victory for the environment," because it provided some money "to promote clean, renewable technologies in the new competition among electric power providers" (EDF 1996). While it may be true that the polis are correct and customers truly would prefer to use green energy, as Al Gore noted early in his terco as US vice-president, "[t]he minimum that ís scientifically necessary [to combat global warming] far exceeds the maximum that is politically feasible" (McKibben 2001). His point was that despite the rhetoric from environmentalists and polis showing that Americans are worried about global warming and are prepared to pay more for cleaner power, the politicians do not believe these sentiments will translate into the public being willing to pay more for green energy. As a result, they are not going to stick their political necks out either to curtail supply or to suppress cheap and dirty methods of delivering electricity.

Liberalization and restructuring are the terms these environmentalists favour when discussing deregulation and privatization of electricity. This terminology fits better than the terms "privatization" and "deregulation" with the notion that newly competítive markets will require significant government regulation in order to ensure that "green" energy is a player at all in the market. But deregulation has different connotations for energy

providers. Energy providers interpret deregulation to involve the removal of regulations that affect their ability to participate in the market, a re-regulation of the activities of publicly or privately regulated monopolies to ensure they do not have an advantage in a deregulated market, and, most significantly for environmentalists, a move toward self-regulation on environmental and labour issues. In many jurisdictions, energy providers have been successful in ensuring this forro of self-regulation has been implementad even before electricity deregulation has occurred (Swenarchuk and Muldoon 1996).

What is "green" energy?

"Green" energy is a relative concept. All energy use and all electricity production have negative effects on the environment. Electricity is the single largest source of air pollution in the world, and a wide variety of environmental problems arise from all stages of electricity production and distribution (Harvey 1997). These include damages resulting from greenhouse gases, thermal pollution, electromagnetic fields, sulphur and nitrogen oxides, noise pollution, degradation of wilderness with transmission lines, destruction of fish and other wildlife habitats, air toxins, ionizing radiation, heat and light pollution, and aesthetic degradation through creating ugly city and rural landscapes (Stevenson 1994: 404-05). The electricity sector is the single largest source of reported toxic emissions in the US and Canada (CEC 2001: 98). In the US, the electricity sector is responsible for 25 per cent of all NOx emissions, 35 per cent of CO_2 emissions, 25 per cent of all mercury emissions, and 70 per cent of SO2 emissions (CEC 2002: 5). In Canada, about 20 per cent of electricity generation is from high-carbon sources such as coal, oil, and gas. This generation accounts for about 17 per cent of Canada's greenhouse gas emissions.

Some forros of electricity production are much worse than others: coal is worse than oil, oil is worse than gas, and gas is worse than hydro; nuclear is probably worse than anything else (see Table 3:1). Coal- and oil-fired plants contribute most of the air pollutants, although gas-fired plants con-tribute to greenhouse gas through CO_2 emissions. Shifting from one forro of energy to another can reduce the environmental damage of electricity generation. For instante, when England shifted from electricity produced by coal to generation mainly by gas, the result was a mitigation of the air pollution and greenhouse effects of using coal. In California, the attempted shift from nuclear production to an increased use of gas was applauded initially because, while nuclear power does not contribute to air pollution, cli-

mate change, acid raro, or smog, it has even more troubling environmental problems: the spectre of a disaster like the one at Chernobyl, looms large, and only about one-third of the heat produced in nuclear reactors is con-verted into energy, so considerable waste occurs. But the most serious environmental problem is nuclear waste disposal. A minimum of 250,000 years of isolation from soil, water, and air is needed to decontaminate the radionuclides produced during nuclear power generation (Dwivedi et al. 2001: 41-42). This requires long-term planning of a spectacular nature that is hard to imagine the prívate sector undertaking. Nevertheless, the nuclear energy industry is promoting itself as "green" energy because it does not contribute to air pollution and greenhouse gas effects. Just as restructuring was beginning in the US, Don Hintz, chief nuclear officer for that country's Entergy Corporation, said, "global warming is the wild card in nuclear's future" (Fenn 1999). Playing this "green" card, the nuclear industry began a bold marketing campaign to "green" the public image of nuclear power,

starting with an ad in *Atlantic Monthly* by the Nuclear Energy Institute featuring a wise owl saying "thanks" to the nuclear industry for reducing global warming. The Institute claims that "nuclear power plants have accounted for 90 per cent of the U.S. electric utility greenhouse gas reductions since 1973" (cited in Fenn 1999).

In Canada, 60 per cent of electricity is produced from water, making Canada the largest producer of hydroelectric power in the world. There is much that is good about hydroelectric power, but whether this should be classified as "green" is hotly debated. Hydroelectricity is a renewable source of energy and is very clean compared to any other large-scale production method. Its generation does not contribute to air pollution, acid raro, smog, or climate change. However, the initial creation of large reservoirs and transmission systems (which is typical in Canada) resulted in incalculable damage to rivers and their watersheds. It also brought devastating hardship to Aboriginal peoples as it destroyed their socioeconomic way of life. It damaged the habitat of a wide range of wildlife, and it destroyed farmland and the livelihood of families with established communities in areas where dams were built. The operation of many dams continues to affect, often in a harmful way, fish habitats and river systems. But once a mega-hydro system is in place, it is much cleaner than other conventional forms of electricity generation and, if it is operated responsibly, can cause less environmental damage than many other forms of electricity generation.

Assessing the environmental impacts of existing hydroelectric generation needs to take into account a variety of different circumstances. While small-scale hydro plants (usually less than 30 megawatts) are normally defined as

renewable, and preferable to large-scale hydro, size alone cannot determine environmental impact levels. According to a US-based group that evaluates the environmental impacts of different sources of electricity, size is an especially poor indicator of the environmental impacts of a hydropower facility. For example, small facilities that de-water river reaches and block fish passage can be more environmentally destructive than larger facilities designed and operated to reduce environmental impacts (Swanson et al. 2000).

Unfortunately, the size criterion, with the notion that small is good and large is bad, has gained widespread political support. This means large dams are consistently opposed and small dams or run-of-the river projects are supported. In BC alone, by 2004 there were 358 private power projects proceeding, a great many of which were for small hydro-based projects, many of which would cause substantial damage to river systems (Pynn 2004: B1). While each small hydro facility receives an environmental assessment, the total and collective impact in a province is not assessed. The problems arise when each private project is treated as a discrete operation and its environmental impacts are measured solely on a local level.

The ratings shown in Table 3.1,[10] generated by the Pace University Center for Environmental Legal Studies, compares different types of electricity generation and assesses their impacts on the environment by levels of emission and damage to land and water use. Large hydro dams and "runof-the-river" hydro projects can be "low impact," and they usually are when they are public and highly regulated to take into consideration the fish habitat, water, and land impacts of their operations. Private hydro plants tend to be less environmentally friendly than these low-impact projects but are still better than gas-fired plants and considerably better than oil, coal, or nuclear systems. Hydro systems (usted as "Hydro Plant; default"), both large and small, that are poorly sited and managed without regard to fish and land management score worse than gas-fired generation, but are still preferable to oil, coal, and nuclear systems. For a hydro power facility to be granted a Low Impact Hydropower Certification by the Center for Environmental Legal Studies, it has to meet objective criteria in eight areas: its impact on river flows, water quality, fish passage and protection, watershed protection, threatened and endangered species protection, cultural resource protection, recreation, and whether or not the facility has been recommended for removal.

TABLE 3.1 1 **Power Scorecard** by **Type of Electricity Generation**

TECHNOLOGY									
Solar Distributed PV	0.0	0	0	0	0	0	0	0	0
Wind Turbine Plant: low land impact	0.1	0	0	0	0	0	0	1	0
Wind Turbine Plant: Poorly Sited	1.1	0	0	0	0	0	0	10	0
Geothermal: Binary Technology	1.4	0	0	0	0	1	6	3	1
Landfill Gas (IC Engine, high NOx rate)	1.6	0	1	7	1	1	0	3	1
Low Impact Hydro	1.8	0	0	0	0	4	4	4	4
Geothermal: Flash Technology	2.0	1	1	1	0	2	6	3	3
Biomass: Certified Sustainable Fuel, NOx Controls	2.1	0	1	5	1	1	6	2.5	2
Biomass: Certified Sustainable Fuel High NOx	2.2	0	1	6	1	1	6	2	2.5
Solar Central Station PV	2.6	0	0	0	0	1	6	14	0
Biomass: Some CC Benefit "clean supply", NOx Controls	3.0	2	1	5	1	1	6	5	4
Hydro Plant Private, Post-1986 Relicense	3.6	0	0	0	0	8	8	8	8
Biomass: High NOx, Some CC Benefit, mixed supply	3.7	2	1	6	6	1	6	5	4
Natural Gas Combined Cycle (w/NOx controls)	3.9	5	1	5	1	4	6	3	5
Natural Gas Combined Cycle	4.0	5	1	6	1	4	6	3	5
Biomass: Wood Fueled, High NOx. Biomass not replaced	4.1	4	1	6	6	1	6	5	4
Gas Fired Steam Electric (w1SCR and SWI)	4.3	6	1	5	1	5	6	4	5
Gas Fired Steam Electric	4.4	6	1	6	1	5	6	4	5
Natural Gas Combustion Turbine	5.2	9	1	8	1	1	6	6	5
Biomass: Wood Fuel, High NOx, No CC Benefit, has waste	5.4	10	1	6	6	1	6	5	4
Hydro Plant: default	5.6	0	0	0	0	10	10	15	15

TECHNOLOGY									
Oil-Fired Steam Electric (0.5% sulfur content)	5.9	8	3	7	4	6	6	4	7
Oil Fired Combustion Turbine	6.0	9	4	8	5	1	6	5	6
Oil-Fired Steam Electric (1.0% sulfur content)	6.1	8	4	7	4	6	6	4	7
Oil Fired Steam Electric	6.2	8	6	7	4	6	6	4	7
Coal With FGD (low mercury content)	8.1	10	4	10	6	9	6	5	13
Coa{ With FGD (high mercury content)	8.4	10	4	10	9	9	6	5	13
Coal Fired Steam Electric	8.8	10	10	10	10	9	6	5	9
Nuclear	11.8	0	0	0	0	10	6	55	34
Mass Burn Municipal Waste	Under review — to be added soon								

RATING

Excellent	1.5 or less
Very Good	>1.5 to 2.5
Good	>2.5 to 3.9
Fair	>3.9. to 5.5
Poor	> 5.5 to 7.0
Unacceptable	>7.0 — 10+

Source Swanson et al. (2000). The US group that prepared this scorecard specifically rated electrical generation facilities throughout the US to determine the environmental impacts of their production. Unfortunately, there is no similar *type* of rating system in Lanada. But in the absence of such a system, it would be a mistake to assume that small hydro projects are *necessarity* environmentally friendly while large ones are not.

PROBLEMS OF RESTRUCTURING FOR THE **ENVIRONMENT**

When environmentalists support a deregulated market, they hope to introduce new forms of "green" energy. The greenness of energy takes very different forms in different places. In some places, just switching to gas makes production greener; in most places, switching to water makes significant differences. But it is misguided to think that massive alternative forms of energy will rapidly come into use in a deregulated situation in Canada. Forros of energy that are greener than hydro are still relatively expensive to generate

on a large scale, or they llave technical problems that make widespread use unlikely. The more likely result of deregulation is an increase in demand that will reactivate ready markets for the cheapest—and that usually means the most polluting—forms of energy. This prediction is confirmed by the US Department of Energy, which sees demand growing steadily while renewable technologies grow slowly. The slow growth in renewable energy is primarily "because of the relatively low costs of fossil-fired generation and because competitive electricity markets favor less capital-intensive technologies in the competition for new capacity" (EIA 2004: 110).

Restructuring of the US electricity market began with the opening of wholesale electricity sales to competition in January 1997.[11] Table 3.2 shows the shifts that have occurred since then in the generation of renewable energy sources in the US. Overall, there has been approximately an 11-per-cent reduction in the use of renewable resources for electricity production since wholesale competition was initiated. The only substantial increase in "green" energy is the development of wind power, which tripled over this time. However, wind use, at 3 per cent of total sustainable electricity production, is still a very minor contributor to electricity generation. The biggest reduction in renewable energy generation was a result of substantial reductions in conventional hydroelectric sources because of dry years, and while this will undoubtedly change, the pattern indicates that renewable and "green" energy is not increasing significantly in restructured markets.

In both the US and Canada there is a great rush to rehabilitate the use of coal, and the US government in particular is supporting its use in order to meet energy demand in the future (see Cheney et al. 2001). The US has the largest share of the world's recoverable coal reserves and generates 49 per cent of its total electricity from this source. The US Energy Information Administration estimates that within the next twenty years, this will increase to 52 per cent of its total production of electricity (ETA 2004). The increased use of coal is also being supported by the government of British Columbia, through its new energy plan, and by the government of Alberta.[12] In any area where there is an abundant supply of coal that is not suitable as an export commodity (such as in the US, Alberta, and BC), coa] will be the preferred fuel choice for new production because it is cheaper than virtually any other fuel source (see Pape-Salmon 2001). In the US, coal-fired plants have increased electricity production since deregulation of the market began.[13] In Alberta, the Canadian province that relies most heavily on coa] for electricity production, coal accounts for more than 80 per cent of all electricity generation. Alberta also has the highest sulphur dioxide and nitrous oxide

TABLE 3.2 (OS Electricity Generation from Renewable Energy Utilities and Private Power Producers, 1998-2003

(Thousand Kilowatt-hours)

	1998	2000	**2003**	%
Total	*364,010,012*	*320,740,647*	322, 617,712	*-11%*
Biomass	37,841,304	29,223,160	28,916,775	-24%
Geothermal	14,773,918	14,093,158	13,357,034	-10%
Conventicnal Hydroelectric	317,866,620	271,337,693	269,288,508	-15%
Solar	506,473	493,375	534,781	+6%
Wind	3,025,696	5,593,261	10,506,112	+350%

Source: Energy Information Administration Renewable Energy Annual 2002, Table 4; Energy Information Administration, Renewable Energy Trends 2003, Table 4. Both documents are available at <www.eia.doe.gov>.

emis
sions in the country. While there is much discussion about the future of "clean coal," a discussion that the BC government, for example, relies heavily on in its support for coal-generated electricity, if this occurs at all it will be far in the future. Even the BC government's Task Force on Energy Policy, which is very optimistic about the development of "zero emissions coal," does not see any commercialization of clean coal for about twenty years (British Columbia 2002). In the US, the government has initiated several policy changes that give a clear signal that dirty coal will be tolerated in electricity production. The Clean Air Act exempts old coal plants from complying with current emission rules, and the rules that required any refurbishing of the old plants to comply with new regulations were set aside by the Bush administration in November 2003.[1'] While technically cleaner coal is certainly possible in the future, and strong governmental controis could ensure that the emissions that are responsible for air pollution and greenhouse gases are reduced, under the current political climate these mitigating actions are not likely to occur. The tremendous support given to the private sector throughout the privatization and deregulation process leads, logically, to governments softening their environmental regulations on electricity generation emissions to make coal attractive as a source for electricity.

When the US Federal Energy Regulatory Commission (FERC) modelled the effects of increased competition (before it actually occurred), it significantly underestimated the actual increases in air pollutants.[15] The most sig-

nificant factors accounting for the underestimation of environmental effects of electricity restructuring were the fair id incr 'ation facilities as the market reorganized and the low price of coal relativ_e_to-ga (Woolf et al. 20`02). The conclusion of the Commission for Envlronmental Cooperation of North America (CEC) is that "increased competition at this time is more likely to lead to increased air emissions" (Woolf et al. 2002: 6).

For deregulation of electricity to succeed in bringing to market "green" power, a great deal of activity on the side of consumers and governments would have to occur. It would require both an active demand for green energy and a willingness of the population to tolerate huge price increases. Such toleration of high price increases is highly unlikely from the population at large, but it is even less likely to occur from industrial consumers, the largest customer class. When cheap, dirty forros of electricity are available, industry's concern for reduced electricity costs will drive most industrial users toward cheap fuels. The utilities will be forced to compete on price in the short term, and this will squeeze out technologies that are not cost-effective. The only solution to this problem would be strictly mandated regulation within a deregulated market or massive subsidies of green energy by governments. While some government subsidies of "green" energy have occurred and are likely to continue, the total impact so far in the deregulation process has been marginal.

The logic of deregulation

There exists a powerful logic of conservation which is lost in a deregulated system. A regulated utility that is required to provide electricity to its customers faces enormous start-up costs for any new generation of power brought on line. Whether this involves new gas turbines, new "green" energy, or more turbines on dams, it is a very expensive business. Once a system is in place, it is in the interests of a regulated utility to encourage its customers to conserve energy, and it will go to considerable lengths to see that this happens through "demand-side management" (DSM). DSM attempts to "find" energy by encouraging all classes of customers to reduce their demand for energy. Sometimes, this is achieved through variable pricing to lessen peak-period energy demand, aggressive advertising to encourage the public to conserve, and specific monetary incentives to retrofit inefficient businesses or to encourage the use of energy-efficient appliances.

Most public utilities in Canada began programs of demand-side management during the 1980s. For example, before the spectre of deregulation changed its policy, BC Hydro encouraged both domestic and industrial

customers, through its PowerSmart program, to cut back on consumption, offering time-sensitive pricing and outright rebates for retrofitting and installing power-efficient appliances. Even though these initiatives were expensive, paying for this new "found" energy was considerably cheaper than investing in new power plants.

The logic of power conservation completely changes in a deregulated market, where the goal is to encourage a large number of producers to compete against each other for customers. The whole point of production in a private market-based system is not to curtail demand but to foster it and to sell as much as possible. In this case, if competition among suppliers actually emerges, it will be in their interests to entice customers to consume as much as possible—in that way, everyone will be able to sell more at the highest possible prices. While some analysts optimistically envision a new "third wave" of demand-side management through electricity deregulation and privatization, the vision tends to be more fanciful than convincing.[16]

Demand-side management may survive in a market-based system, but with a decidedly different objective than curtailing overall production. Companies such as BC Hydro may continue to encourage PowerSmart programs, but these programs begin to take a decidedly different approach to conservation. Through PowerSmart, BC Hydro undertook a variety of different activities, such as buying back energy it had promised to large industrial producers because it could sell it at a much higher price in the US." That is, BC Hydro has encouraged conservation in Canada so that it can sell more in the US. This is not overall conservation that will reduce the need for more energy, as in the original PowerSmart design. Instead, it merely encourages low use in low-price areas so supplies can increase for high-priced markets. The use of electricity in economic production in BC decreases through initiatives of this sort, but energy consumption does not—it is merely shifted out of the country. "Conservation" of this sort may prop up the image of the company as "green," but it will be good for neither the economy nor the environment. The public may be satisfied because programs such as PowerSmart will survive, but their function will not be to reduce overall energy use. The ultimate objective of the private sector is to sell more everywhere, and demand-side management as a conservation measure is hard to reconcile with a deregulated market.

Integrated resource planning

Integrated Resource Planning (IRP) is a concept that fairly recently became significant for regulating the production and distribution of electricity in

regulated markets. This is a type of planning that uses a broad set of demand-side and supply-side possibilities for meeting a complex set of planning objectives, including environmental and equity objectives. It usually includes DSM in its mix of alternate sources of energy supply and carefully assesses the sources of energy supply to mitigate environmental harm and to control prices (Stevenson 1994: 406-07). One of the most significant features of IRP is that it involves the participation of a wide range of people with competing interests who are eager to assert their positions. Since IRP is frequently done under considerable public scrutiny when electricity is provided through public monopolies, debates can emerge about the dangers of pursuing only a low-cost strategy, particularly when it has a high environmental impact. IRP is most effective when the electricity monopoly is vertically integrated because it takes into account not only the various choices that can be made in the energy source to be used for electricity, but it also considers how that energy will be delivered through the transmission and distribution systems to take into account various things such as equitable access, the price of delivery, and the effect on the environment and Aboriginal lands.

In a market-based system, integrated resource planning usually does not take place because planning occurs through individual, separate electricity producers, power traders, and distributors responding to the economic stimulus of the market (Bakken and Lucas 1996). Normally, the deregulated environment demands that transmission, distribution, and generation systems be "unbundled" so that no firm has exclusive access or control over any particular aspect of the system. This means that planning to take advantage of efficiencies that can be gained through an integrated system is much harder to do. It also means that decisions to expand certain parts of the system, such as the transmission grids, will be made in response to demands from the generators for more access to the grid for trading purposes and for export. Normally, these kinds of decisions are taken with considerable attention paid to environmental problems that arise from extending transmission lines. But with private electricity producers ratcheting up production for export, the separate transmission operator will be responding only to demand for its services.

Energy trading

The logic of the use of a common resource also changes with the expansion of the boundaries of a market. When a utility's primary function is to pro-vide electricity within a specific geographical area, such as within a

province, decisions about planning for future supply relate to a variety of objectives, including decisions about equal access to the resource (such as having a common pricing system throughout the province), environmental considerations, and the costs to the publica[s]

While exports to other provinces and to the US have often been significant revenue sources for Canadian electrical utilities, their main market and the focos for planning was the domestic and local market. Generally, between five and ten per cent of Canada's total electricity generated is exported, something that is highly dependent on weather conditions and how much water is stored in dams. Between 1988 and 1996, an average of only six per cent of the total production was exported to the US. However, deregulation, as it is occurring in response to changes in the US market and in response to the requirements of the US regulator FERC (Federal Energy Regulatory Agency) for access to the US market, changes the rationale for electricity production. Rather than making decisions that make sense within a specific geographical boundary, and with all the balancing that needs to be done to deal with the negative effects of energy generation, decisions will be made by private producers and will be primarily focused on revenues and costs.

In a deregulated continental market, as is emerging in North America, a great many conditions arise to encourage both greater production and greater consumption of energy. Energy producers in Canada, for example, will be encouraged to increase production in order to be able to sell into high-priced US markets. The ability to make huge profits from this is attracting major international players. The power-trading market is in the process of dramatic expansion, partly because of the actions of major players such as Enron, the now-discredited US energy-trading giant. Enron spearheaded a coalition of energy traders to push for the deregulation of the electricity market throughout the world, mainly so that it could expand its energy-trading operations. Although Enron's unscrupulous actions have been discredited, the results of its initiatives in shaping the system to accommodate electricity traders are proceeding as though Enron's collapse was unrelated to the nature of the new market.

Electricity traders need access to transmission systems that are closed to them when vertically integrated utilities are held in the public sector. Since these traders do not usually generate electricity themselves, they need to encourage as much energy production as possible in the private sector and establish conditions so that it can be sold thousands of miles away. Profit-driven energy trading thus contradicts conservation. The creation of three massive Regional Transmission Organizations (RTOs) that are

TABLE 3.3 Comparative Electricity Prices in North America

(Canadian cents per kWh) Average Prices on May 1, 2003

CITIES	RESIDENTIAL	MEDIUM POWER	POWER
POWER		1,000 kW	50,000 kW
CONSUMPTION	1,000 kWh	400,000 kWh	30,600,000 kWh
CANADIAN			
Winnipeg	5.89	4.44	2.96
Montreal	6.03	6.10	3.83
Vancouver	6.12	4.56	3.36
Ottawa	8.80	7.33	6.79
Edmonton	12.00	9.50	7.15
Toronto	9.65	9.96	8.81
St. John's	8.50	6.29	3.79
Regina	8.20	6.79	4.33
Moncton	9.42	8.35	5.07
Halifax	9.40	8.44	5.72
Charlottetown	12.24	10.86	6.59
US			
Seattle	10.30	8.25	8.24
Portland	9.42	6.41	5.39
Nashville	9.51	8.59	6.14
Miami	11.46	9.23	7.14
Houston	12.75	9.78	5.81
Chicago	11.11	10.49	6.76
Detroit	13.31	12.46	6.76
Boston	18.26	16.47	13.59
New York	28.15	24.50	20.72
San Francisco	23.57	26.69	21.48
AVERAGE	11.69	10.28	7.66

Source: Hydro Québec, Comparison of Electricity Prices in Major North American Cities: Rates in Effect, May 1, 2003, p. 27. Available at: ewww.hydroquebec.comlpublicationslencomparison_prices12003>.

designed to integrate the entire North American electricity system is rapidly on the way to becoming a reality.[19] When Canada's increasingly privatized and deregulated energy market is completely integrated with the US market, Canadians will be competing with US electricity consumers for electricity generated in Canada.

Will higher prices reduce energy consumption?

Most early attempts to sell the benefits of electricity deregulation to the public focused on the ways that prices could drop. This was always a tricky argument to use in Canada because electricity prices were already considerably lower than in the US.

The price spiking that is associated with deregulation in Alberta, California, and elsewhere has meant that arguments made by some environmentalists, i.e., that higher prices are needed to curtail production, have come in handy. In theory, there is considerable merit to this approach. But there is a catch, and that catch concerns the relative distinctions that can be made among markets. Normally, one would expect higher electricity prices to prompt people to conserve. But it is entirely possible to have much higher prices and still have production increase, as would be the case with expanding international markets. This is the likely scenario when prices in Canada begin to rise in response to the ability of private producers to export energy at higher prices to the US. It could bring about the worst of all possible worlds: increased production and all of the attendant environmental problems this entails, and much higher prices for Canadian electricity consumers.

Regulating for green

There are a variety of ways in which green energy could emerge in a deregulated market, but none is likely to succeed on a large scale unless heavily subsidized by government. Most effective would be considerable government re-regulation of the industry, including regulations that might compel the electricity industry to introduce green energy. One of the solutions most favoured by industry and environmental groups is for the state to provide specific incentives for electricity producers to invest in renewable energy technologies. This would involve direct payments to electricity generators that use wind, solar thermal, tidal, wave, or photovoltaic generation (Zucchet 1995). Since this is a direct cost to the state, it depends on the willingness of politicians and the public to support renewable energy development. The

most significant issue here is whether these new energy sources will be public or private. It would make cense for the public to benefit from public ownership of the resource if public funds are used in the investment process.

Another possibility is for the state to regulate specifically against increases in emissions through tighter regulatory controls such as a cap on carbon dioxide emissions from power plants. But this wóuld be difficult to implement in a deregulated market, especially considering the difficulties that environmentalists faced even when markets were clearly under government control. Electricity producers staunchly resist even minimal attempts at regulating for what legitimately can be considered green energy. Even something minimal such as the federal government's proposal to impose strict guidelines for the use of an "EcoLogo" stamp of environmental approval, in an effort to keep environmentally conscious customers from being deceived by electricity companies, was met with howls of protest (Jaimet 2001).

Those proposing emission caps see caps emerging in a variety of ways. One method would be to establish a maximum emission level for a defined jurisdiction and allow generators to trade permits among themselves within the total allowable emission levels. It is claimed that the institution of a tradeable permit system could achieve a specified reduction target at a lower cost while giving generators maximum flexibility (Pollution Probe 1999). Another variation on this is emission caps through voluntary agreements among energy producers to achieve the desired reductions. According to Pollution Probe, this measure has two main advantages over a mandatory cap. It avoids the problems of allocating initial permits and it eliminates the need to establish and oversee the trading process (Pollution Probe 1999).

Despite the rhetoric of market environmentalists, however, almost no one believes that relying entirely on market prices will bring about the changes needed to ensure energy conservation and an increased use of renewable sources of energy. In virtually all proposals, even by the most ardent pro-market environmental groups, some type of government re-regulation to ensure green energy is considered essential. In a political climate of deregulation and privatization, and given the power of the private sector to influence the political process, the massive regulatory regimes that environmentalists feel would be necessary are simply not likely to get onto the policy agenda. They are simply too intrusive to be tolerated by business. One telling indicator was the outline of electricity restructuring published by the National Energy Board of Canada in 2001. The report failed to even mention environmental issues as something of concern in the deregulation process (Canada 2001). The general tone of the report was that electricity

deregulation was inevitable. The board's role concern was the uncertainty and volatility of a deregulated market and the likelihood of higher prices.

Regulation of all industries is essential in order to reduce environmental damage, and this will be necessary whether the industry is in the private or the public sector. My main point is that in a deregulated and privatized system, environmental protection would require substantial regulation, and this is unlikely to be tolerated by business. If business has been strong enough to bring about a deregulated electricity market, it will be strong enough to oppose new regulatory measures. The proposals of environmentalists who support deregulation are, in many cases, good proposals, but they are used politically more as selling points for deregulation by politicians who have no intention of re-regulating for "green." Environmental goals can be more effectively secured in a regulated market through the public generation, transmission, and distribution of electricity. Rather than advancing environmental sustainability, a deregulated market by its very logic undermines any attempts at limiting consumption and eliminating cheap but dirty energy.

CONCLUSIONS

Throughout this chapter, I have argued that deregulating the electricity market will intensify environmental degradation. Deregulation undermines demand-side management programs that attempt to reduce the consumption of electricity; it will prevent integrated planning to address environmental concerns, and it will encourage the emergence of large international markets for electricity that will discourage local production for local use. Most significantly, private, market-based electricity production will rapidly expand electricity production from the cheapest and dirtiest types of fuels.

My argument is that we should not give up on the public sector as a way of achieving a healthier environment. People should pay more for electricity in order to bring forward intensely environmentally responsible electricity. The research and technology necessary to bring this to fruition could, and should, be financed through mandated requirements on public utilities.

Notes

1. The author is grateful for critiques on earlier drafts of this article from anonymous reviewers, the editors of this book, and the following: Manfred Bienefeld, Mae Burrows, John Calvert, Randy Christensen, Tim Howard, Seth Klein, Dale Marshall, Alex Netherton, Bob Paehlke, and Ian H. Rowlands. They, of course, bear no responsibility for the final version.

2. The exceptions are PEI, which imports its power through a private company, and Alberta and New Brunswick, provinces that llave privatized their systems within the past ten years, Ontario's and British Columbia's electricity is still largely in the public sector, although steps have been taken in both provinces to privatize sections of the system.
3. The "tragedy of the commons" usually implies that ready access by all to a resource, such as grazing land or the otean, leads to the overuse of the resource as each individual using the commons recognizes that there are limas to its use but maximizes his/her own use to extract as much value as quickly as possible.
4. As is often noted, the "conunons" takes different forms in different societies and different systems, John Vandermeer, for example, refers to the right to free health care in many parts of the world, the right to border crossings betwecn sub-units within a nation state, and the right to use land by indigenous peoples (Vandermeer 1996).
5. For an excellent example of their arguments see Sierra Legal Defence Fund Report: *Power* Grab: *The* Impares *of Power Market Deregulation* on *BC's Environment* and *Consumers* (Vancouver: BC Citizens for Public Power, July 2002).
6. Energy Probe is pan of the Energy Probe Foundation that consists of Pollution Probe, Environment Probe, Consumer Policy Institute, the Margaret Laurence Fund, and Energy Probe (see Dwivedi et al. 2001).
7. Thomas Adams, quoted in "Lower Rates Promised on Ontario gets Competition," *The Canadian News* Digest, 7 June 1996.
8. Unpublished letter to the Toronto *Starby* Thomas Adams, 3 April 2001, Available on Energy Probe website, <http://www.energyprobe.org>.
9. British Columbia Utilities Commission Repon on Electricity Market Structure Review, September 1995.
10. The Power Scorecard grades the relative environmental impacts of the fuel and technology used to generate electricity. It measures the performance of the product on eight environmental eniteria: global climate change, smog, acid rain, air toxics, water consumption, water pollution, land impacto, and fuel cycle/solid waste, An overall environmental impact score for each electricity product is calculated as the weighted average of the eight measured indices. For further details on the methodology employed see Swanson et al. (2000).
11. This occurred through FERC Order 888 that allows producers, marketers, and local distribution utilities to exchange electricity at market prices.
12. Currently, BC does not use coal in electricity generation.
13. Between August 2002 and August 2003, electricity generation increased by two per cent, but coal-fired production increased by four per cent (United States Department of Energy 2003). 14. See "Environmental Enemy No. 1," Economist 6—12 July 2002: 11; Richard A. Oppel, Jr., and Christopher Dres, "States Planning their Own Suits on Power Plants," *New York* Times, 9 November 2003: 1, 24.
15. FERC is the US federal agency that has jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. It oversees the nation's utility industry by regulating the conditions of power sold in interstate commerce and regulates the conditions of all transmission services.
16. Fereidoon Sioshani argues, "DS:Vt is not going to wither away; it will be pruned and reinvigorated like an overgrown rose bush. It will bloom with fragrant flowers that both the customers and utilities will cherish" (Sioshani 1995: 111; cited by Ernst 1997: 21).
17. This occun-ed during the very high price period in California (see British Columbia Hydro and Power Authority, Application *for Power* Smart Industrial Rafe, Jttne 2001).
18. Of course, in jurisdictions such as Quebec and BC, the building of large dams clearly had the dual purpose of providing for future supply while in the interim using the power deemed a "sur-plus" for expon sales. In BC, for example, ahnost the entire generation from the Revelstoke Dam was exported when its power first came online, although, over time, more and more was needed for provincial use, so exports from the dam only occurred during heavy rainfall years.
19. For a discussion of RTO West, see Cohen (2003).