Tilting at windmills? The changing ownership of renewable power generation in Canada

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Abstract

This paper examines the implications of private ownership of new renewable electricity generation in Canada. In a time of rising energy prices, intensifying climate change and federal attacks on environmental oversight, it is more important than ever to ensure that the mode of provincial power 'greening' actually serves to meet public needs rather than further undermine them. Provincial power sectors have undergone significant change over the past two decades (Gattinger and Hale 2010; Gattinger 2010). Since power restructuring began in the 1990s, private interests have captured the lion's share of new renewable electricity development. This trend is particularly pronounced in the case of windpower generation; in 7 provinces in 2010, for example, the private sector accounts for between 83 and 100 per cent of installed capacity (MacArthur 2012). As new wind, solar and small hydro generation come online the distribution of asset ownership is changing from one dominated by public hydropower to one with a larger role for private industrial and utility actors. For some advocates, new private renewable generation injects much-needed capital into projects that aid in a transition from coal and nuclear to 'clean' power, in some cases even allowing for community and first nations project ownership. For skeptics, however, the shift to private renewables in the context of NAFTA—and perhaps now FIPA—are part of a larger erosion of democratic resource control in this country (Cohen 2006; Cohen and Calvert 2011). This shifting ownership structure may, in fact, be accompanied by efficiency, equity and environmental challenges (Beder 2002, 2003).

Introduction

Economic growth and resource extractive industries still occupy pride of place at the centre of the Canadian policy agenda at both federal and provincial levels. A heavy emphasis on resource development exists despite increasingly dire warnings from scientists that human activities are forcing planetary-scale transitions "with the potential to transform Earth rapidly and irreversibly into a state unknown in human experience."(Barnosky et al. 2012) In May 2013 the average concentration of carbon dioxide in the atmosphere passed 400 parts per million above Hawaii (Sweet 2013). This new milestone serves as a reminder that greenhouse gas concentrations driving global climate change continue to increase. Climate change has been on the policy radar internationally for more than two decades, but effective action at national and international levels is still lacking. While the scope and scale of climate change requires a wide range of policy initiatives, the energy sector plays a core role in both the problem and the solution; this is particularly the case in resource-rich and energy intensive countries like Canada.

Canadian policy action on environmental issues like climate change is most accurately characterized as 'abysmal'(Jaccard and Simpson 2007; McLeod-Kilmurray and Smith 2010). The emissions from the combustion of fossil fuels for transportation, heating, manufacturing and electricity generation have risen 22 per cent since 1990 from 591 megatonnes (MT) of carbon dioxide equivalent to 702 MT (Environment Canada 2013b: 1). The power sector will play a key role going forward as relatively 'clean' electricity generated from renewable sources can form the basis for greener systems of production and exchange. The generation of electricity accounted for 13 per cent of Canada's total emissions in 2011, after the transportation and oil and gas sectors (which sit at 24 per cent and 23 per cent respectively) (Environment Canada 2013a). Canadians are thus facing a conjunction of rising energy prices, intensifying climate change and federal attacks on environmental oversight. This paper examines the significance of a move towards private ownership of renewable electricity generation in Canada in light of these issues.

The idiom 'tilting at windmills' emerged from Cervantes' novel Don Quixote and refers to the title character's tendency to attack imaginary enemies. Indeed, Cervantes' character embarks on a noble crusade with the best of intentions but is tragically unable to view the world accurately. He is deceived by those around him, and ultimately fails in his quest as a result. This literary lesson is one that bears repeating and serves as a cautionary tale: grand plans to improve society need be accompanied by careful scrutiny of the problem, especially if they are not working. Such is the case with the fight against global climate change: two decades of stalled progress, despite the urgent warnings of scientists, suggests that there may be something missing from our diagnoses. The imaginary problem in this context is not—as climate deniers suggest—a conspiracy by scientists to increase their research funding, but an inability to understand the root causes of environmental

degradation. Our policies focus on the profit-making capacity of power generation rather than the real problem: an elite-driven economy centered on every-expanding growth and material throughput.

In the following pages I examine where and how new renewable electricity generation is developing in Canada, with a view to understanding the roadblocks towards more radical action on greenhouse gas emission reduction. I draw from Statistics Canada data on generation sources, levels and ownership forms at national and provincial levels as well as provincial policy documents and academic literatures on renewable energy and power sector restructuring. While electricity generation is part of the broader energy sector, and that is but one part of a much larger socio-economic system, I focus my attention here primarily because this is one part of an environmentally intensive sector where significant ownership changes are taking place. Furthermore, these changes are often justified by the need to 'green' energy, and in doing so make green power synonymous with private ownership in a way that has us 'tilting at windmills'. As I build this argument I address three questions: first, how is renewable electricity being developed across Canadian provinces? Secondly, what explains variations in ownership? And thirdly, what are the implications of these choices for sustainability?

Sustainability, Electricity and Green Political Economy

The growing importance of the environment as a policy issue in the past forty years has led to important research connections between political economists, environmental scholars and experts in new power sector technologies. What has emerged from these interactions is that the crucial issues for developing 'sustainable' electricity are not just technological, they are largely socio-political. In this paper, sustainability refers to a process of restructuring socio-economic systems in order to enhance rather than erode the quality of life on earth. This formulation challenges ecological modernization's focus on neoclassical economic growth, and the 'decoupling' of the economy from both social justice and environmental degradation (Barry 2012; Connelly et al. 2011; Johnston et al. 2006).

Researchers investigating the electricity sector generally fall into two groups. In the first sit those from more technological backgrounds, studying and developing new mechanisms for generating and transferring electric power between actors while minimizing the environmental impact per unit (Bell and Weis 2009; Canadian Renewable Energy Alliance 2006; Sathaye et al. 2011). This work has built on a well-established scientific consensus that climate change is real and fossil fuel burning plays a significant role (IPCC 2007, 2011). In the other, are those focusing on the social and economic systems mediating the uptake and diffusion of green technologies(Cohen 2006; Glover 2006; Heiman and Solomon 2008; Hoffman and High-Pippert 2009). The relative environmental impact of electricity differs by political jurisdiction and is the result of resource endowments as well as public policy choices. These policy choices have been heavily informed by a heavy emphasis on market-based mechanisms. Strong debates exist over the appropriate

institutional forms—technological, social, and economic—needed to move to a more sustainable system.

A central issue with significant implications for state policy centers on the role of markets and private ownership in the development of new renewable energy. Some researchers advocate—following the trend of neoliberal policy promotion over the past four decades—a central role for private ownership of electricity generation and a circumscribed role for governments. State actors are argued to manage best when setting incentives, establishing trade connections and defending private property rights. The connection between a liberal economic order and renewable electricity is established via: references to the innovative role of profit (to spur new technologies), the opening for new (and perhaps smaller) actors, the role of competition in price levels. The argument then follows that a renewable energy system should be owned and operated by private industries.

These familiar arguments about the virtues of private ownership and competition have been applied across many sectors, banking, housing, education and healthcare, both in Canada and around the world and often fall short as they privatize economic gains and socialize risks and losses. However, there are some key differences with the electricity sector that make it a particularly complicated and problematic case for advocates of private markets. In most countries, its centrality to the economy makes it an essential service that always requires a significant amount of government 'intervention', lest another Enron-type debacle erupt. Technological constraints require that administrators precisely match levels of generation entering the transmission system to avoid brown-outs and black-outs also require a level of systemic co-ordination and management that doesn't lend well to a hands-off government. And, as with many other sectors (professional sport, transportation) significant public subsidies and guarantees are required in order to justify project investments.

The other side of the debate over private renewables development is occupied by researchers highlighting the importance of equitable distribution of costs and benefits. They cite the important role that governments have historically played in Canada (and, prior to significant restructuring, most countries) in building and managing the power sector. Indeed, the vast majority of electricity systems are publically owned and hydro-'powered'. Public actors have a long history of developing renewable generation sources via long-term public investments. Moreover, these projects can be used for economic policy purposes (skilled job creation, manufacturing) in a way that does not rely on the trickle down benefits from private investment. Public agencies in Canada have access to financing at relatively low interest rates compared to most private companies, so the objections to public ownership are not so much about capacity, as ideology. Once the sectors open up to private ownership, policies are constrained by the ever-expanding rules of international trade agreements that preclude preferential treatment for private local firms.

Environmental scholars sometimes align with the neoliberal policy prescriptions for green energy: public funding for private control. Most often this arises out of a commitment to small-scale wherein the government becomes synonymous with 'big' and 'centralized' and whereas private control can include the 'community' based systems popular in much ecological thought. While true to some extent, this formulation ignores both small state (i.e. municipal systems), 'big' private multinationals (often bigger than many states) and the core role that profit plays in ever-increasing growth and over-consumption. Thus, while important environmental critiques exist of the power of large crown corporations and the impacts of flooding vast tracts of land, new renewable generation can just as easily serve to transfer 'green' public assets to private actors rather than improve the overall level of power consumption or fuel mix of a given jurisdiction. Private actors are also more likely to build smaller projects (when subsidized) because infrastructure on the scale of a large hydroelectric project is too expensive and discount rate on long-term investments too high. The result of these intersecting discussions is a range of new research on renewable electricity development, each focusing on the importance of factors such as: competition(Nelson 1997), scale (Bouffard and Kirschen 2008; Paish 2002), democracy (Hoffman and High-Pippert 2009), generation source (Jacobsson and Lauber 2004) and system co-ordination (Gil et al. 2006)[1]. What is increasing clear is that issues of system ownership and fair distribution are crucial in making sure that a shift to renewables is effective, efficient and just. So how are these systems structured in Canada and what impact has neoliberal policy had on them?

Renewable electricity generation in Canada: source, ownership, policy

Canada's electricity sector is relatively unique in the world. Generation facilities are still majority owned by public utilities, the majority of generation is renewable (hydropower) and each province has a very distinct ownership and generation mix. This section presents data from Statistics Canada on the overall status of generation in Canada by jurisdiction and source, as well as how these have changed over the ten year period of increasing renewable electricity policies.

Source

Renewable electricity includes facilities that use water, wind, plant-based products and the sun to provide power. They generally provide low-emission power into a transmission and distribution grid for end-users. Each fuel source, from

[1] A more thorough discussion of these developments is contained in Julie L. MacArthur (forthcoming), *Chapter 23: Sustainability and the Social Economy in Canada: From Resource Reliance to Resilience*, International Handbook of Environment and Social Policy, edited by Tony Fitzpatrick, London: Edward Elgar.

hydro, wind and solar to uranium, coal and natural gas comes with a unique cost, reliability and environmental footprint. Generators can be small (500 kilowatt to 50 megawatt), medium (50 to 200 megawatt) and large (above 200 megawatts of installed capacity). By comparison, the Three Gorges Dam, the world's largest power station has a 22,500 MW capacity and Canada's largest is the Bruce Nuclear station in Ontario at 7,276 MW. The vast majority of power generated in Canada comes from large, centralized power plants (between 100 and 5,000 MW)[2].

According to Statistics Canada data, Canada has the fourth largest national share of hydroelectric generation in the world[3] at 60 per cent of installed capacity in 2011 and the third highest total generation at 377 gigawatt hours (GWh) in 2011 (after China and Brazil). Hydroelectricity as a generation source is renewable and significantly greener in terms of life-cycle air emissions than coal, natural gas and diesel and is, over the long term, cost effective (Hydro Québec 2003). Steam plants fired mostly by coal make up 16 per cent of the mix, and nuclear comes in third with 14 per cent of the share in generation (see table 1). New renewables like wind and tidal power play a small, albeit growing, role in Canada's generation mix. Between 2000 and 2010, wind, tidal, solar and hydropower grew from 54 per cent to 61 per cent of total installed capacity (Statistics Canada 2002, 2013b)

Table 1 Canada Electricity Generation by Source 2011

	GWh	% Share
Total	618,550	
Hydro	372,076	60
Tidal	26	0
Wind	10,086	1.6
Conventional Steam (Coal)	99,411	16
Nuclear	88,291	14
Combustion	44,245	7.2

Source: CANSIM Table 127-0007

[2] Large-scale hydro also has negative environmental impacts, as every generation source does, which include: flooding of often prime agricultural land, displacement of human and animal populations from large areas of land, and disruption of fish populations (Froschauer, 1999). The benefits of hydro as a firm power source and the economic efficiencies that arise from a large-scale project may, in some cases, trump the alternatives in a life-cycle analysis, but a diversity of renewable sources suited to different human and natural geographic conditions is critically important.

[3] After Norway, Brazil and Venezuela.

The changing generation sources of power matter, both economically and environmentally. The International Energy Agency's 1998 comparison of GHG emissions, nitrous (NOx) and sulphuric (SOx) oxide emissions from large-scale hydro plants performed relatively well. The technologies used to generate power from these sources vary (seasonally and daily) in their ability to provide predictable fuel on demand (base-load power). Hydro, nuclear and coal are highly reliable, whereas wind and solar are variable. Finally, the lead-time and capital investment needed to develop new generation varies significantly between power sources. Nuclear plants take the longest to develop and are prone to significant cost overruns (Sovacool 2010).

Many valid and well-documented critiques of the environmental and democratic record of these institutions exist from, for example, environmentalists and First Nations groups (Brooks 2006; Cohen 2004; Netherton 2007). What is important today, however, is that the vast differences that exist between different provinces and market structures mean that in many cases, environmental sustainability is best advanced through conservation and efficiency measures rather than creating private power markets for new renewable generation. Within this context the potential role for co-operatives in either legitimating these new markets or challenging them becomes important for their potential for empowered participatory governance.

Table 2 Life Cycle Assessment of GHG emissions (g CO2eq./kWh)

	Minimum	Maximum	CCS min/max
Coal	675	1689	98/396
Oil	510	1170	
Natural Gas	290	930	65/245
Nuclear	1	220	
Wind	2	81	
Ocean	2	23	
Hydropower	0	43	
Geothermal	6	79	
Solar PV	5	217	
Solar CSP	7	89	
Biopower	-633	75	-1368/-594

Source: IPCC 2011, p.982

The federal picture of electricity generation in Canada obscures important differences between the provinces. The provincial structure of the electricity sector means that power sector reforms are taking place to different degrees across each of the 13 provinces and territories. Provincial generation source diversity creates uneven environmental impacts of generation across the country, and with this comes the need for provincial co-ordination (for example, for reliability) and targeted policy. For example, Quebec and Ontario generated the majority of electricity in the country in 2011, 33 per cent and 23.7 per cent respectively. However, 97 per cent of Quebec's came from hydropower while 61.8 per cent of Ontario's came from nuclear power, with the balance from Hydro, Coal and Natural Gas. On the other end of the spectrum Saskatchewan generates 3.9 per cent of Canada's electricity and 70 per cent of this comes from coal-fired steam generation. The province of Alberta has a similar source profile to Saskatchewan, but accounts for more than 11 per cent of the total power generated in Canada(Statistics Canada 2013a).

Table 3 Majority Ownership and Fuel Source by Province

	Renewable fuel	**Fossil**
Public	BC, YT, MB, QC, ON, NL	SK, NB, NU
Private	PE*	AB, NT, NS

* PEI imports the vast majority of its electricity from New Brunswick. So, while the renewable installed capacity on the island is a significant percentage (56 per cent), residents consume their power from New Brunswick.

Ownership

The second factor at play in Canada is a changing ownership pattern, particularly for new renewable generation. The share of public utility ownership for all types of electricity decreased from 81 per cent in 2000 to 72 per cent in 2010. This drop coincided with a shift to private utilities from 11 per cent in 2000 to 21 per cent of Canada's total in 2010. The balance of generation is owned by industry, which stayed constant at 7 per cent. During this decade total electricity generation increased from 111 Terawatt hours (TWh) to 130 TWh (Statistics Canada 2013b). When the data for renewable generation is pulled out from the above, the trend is even more pronounced. In 2000, the public sector accounted for 99.5 per cent of renewable generation (hydro, wind, solar and other). By 2010, this number had decreased to 85 per cent of Canada's total 130 TWh. The share of private utilities in this period grew from 0.45 per cent to 9.44 per cent. The industry share of renewable generation also grew from 0.13 per cent in 2000 to 6.6 per cent in 2010.

Table 4 Installed Capacity Ownership 2000-2010 (GWh)

Canada		2000	2010
Total Generation		111,300	130,543
	Public	90,681 (81.47%)	93,827 (71.87%)
	Private	12,777 (11.48%)	27,720 (21.23%)
	Industry	7,842 (7.05%)	8,995 (6.89%)
Renewable (hydro/non conventional)	Total	60,126 (54.02%)	79,070 (60.57%)
	Public	59,802 (99.46%)	66,479 (84.08%)
	Private	244 (0.41%)	7,465 (9.44%)
	Industry	79 (0.13%)	5,233 (6.62%)

Source: Statistics Canada CANSIM Table 127-0009 and STC 2001a

Drilling down even further to wind generation alone, a stark difference emerges between this new renewable source and the overall picture of power generation in the country. For all power generated in 2010, public utilities accounted for nearly 82 per cent of the total. For windpower generation, however, *private* utilities accounted for this share (82 per cent).

Table 5- Windpower Generation vs All Generation 2010

	2010 Wind Generation[4]	All Generation 2010
Total Generation (GWh)	3,974	111,740
Public	647 (16%)	90,681 (81.5%)
Private	3,263 (82%)	12,777 (11.5%)
Industry	64.5 (1.6%)	7842 (7%)

Source: CANSIM Table 127-0007

[4] NB: this data here is for the actual generation, rather than installed capacity.

One final note on electricity generation data: until 2007 the data on generation source by ownership was readily available in the Statistics Canada Annual Publication, Electric Power Generation, Transmission and Distribution (Catalogue 57-202-XIB), which was discontinued in 2007. The data for this research came primarily from one CANSIM table, 127-0009 as the balance of other datasets do not show the ownership by public and private sector, but rather focus on grouping 'utilities' and 'industries' more broadly. The data presented also likely understates the shift of ownership, as the solarpower generation in 2010 in Ontario is classed under 'public utility' but is, in fact, largely owned generated by private companies (Enbridge, for example owns the 247MW Sarnia Solar PV Plant). This is likely because the private generators in the province sell to Ontario Power Generation, which then is then classed as the utility generator. This does not run as an probable bias in the opposite direction since publicly owned generators (usually crown corporations) are still the central actor in most systems, though it might be a factor where private utilities (in Nova Scotia or Alberta, for example) play a far larger role as intermediaries in the power system. Clearly, more investigation is needed into parsing out the status of actual generation of power in Canada.

Policy

The changes in generation sources and ownership illustrated above are driven by Canadian public policies as well as pressure from international actors. Thus it is politics and policy rather than technological inevitability driving new developments. Strong regulatory and financial support for private actors from provincial governments from B.C. to Nova Scotia has been a prime mover (Datamonitor 2010; NS Department of Energy 2010; OSEA 2009). These initiatives began in the late 1990s following a wave of ideologically motivated power sector restructuring internationally in the previous decade in Britain, Chile, the United States and New Zealand.

In Canada this started with the unbundling of integrated utilities (as in B.C. and Ontario) and the establishment of independent system operators, the creation of power pools (as in Alberta). Provinces during this period opened access to retail, transmission and generation of power. For example, the signing of Open Access Transmission Tariffs (OATTs) set rates and rules for actors to move power over provincial power grids and facilitated wholesale (and in some cases retail) power trading. As a result, markets to buy, sell and trade power either openly, or with the public utility, have created incentives for profit and for private actors in the electricity sectors. See the table in the appendix for a provincial breakdown of restructuring policies. This period was also when the data on climate change internationally started to solidify and pressure to move to move away from fossil fuel generation increased.

At the provincial level important policy choices include: mandating development of renewables by independent power producers (IPPS), setting up targets for increasing the share of renewables in the overall generation mix, funding

and guarantees (through subsidies, long-term contracts and feed-in tariffs), as well as reducing support for or shutting down fossil fuel generation (most notably in Ontario). Pressure to increase the role of private actors and markets has also come from developments in the United States, via the rulings of the *U.S Federal Electricity Regulatory Commission* (FERC) via its role as an arbiter of export licenses to the United States. FERC rulings have, in the name of competitive efficiencies and market fairness, pushed public utilities in Canada wanting to export power to sign OATTs (Blue 2009; Chick 2007; Cohen 2001, 2007).

In addition to the break-up of utility functions, mandates in provinces like B.C., Ontario, Québec and Nova Scotia for public utilities to leave the development of wind, solar, bio-mass and micro-hydro projects to the private sector (IPPs) played an important role in the changes we see today. British Columbia's experience illustrates this type of partial market restructuring via IPP development. While the public crown corporation still retains its generation assets, the utility was functionally separated, with separate transmission and oversight bodies created. These moves have since been rescinded. The 2001 shift to a Liberal government led to a policy mandate for BC Hydro to purchase new renewable power from private IPP sources. In 2002, IPPs selling power to BC Hydro were exempted from regulation as a public utility. Starting in 2003, a number of calls for power initiated a series of bids from private developers to construct, for the most part, run-of-river power plants. In the 2003 call, 16 20-year contracts were awarded. As of April 1, 2011, BC Hydro has signed 68 Power Purchase Agreements (PPAs) worth 3,183 megawatts of installed capacity and 12,524 GWh of supply annually to the provincial utility (BC Hydro 2011). According to a 2011 review of BC Hydro undertaken by the Province of B.C., "in fiscal 2010, IPPs produced 16% of total domestic energy requirements; however IPP electricity costs represented 49% of the overall domestic energy cost" (Province of British Columbia 2011: 107).

In Ontario, public policies—first the Renewable Energy Standard Offer Program and most recently the *Green Energy and Economy Act*'s (2009) Feed-in-tariff—also contract out new renewable generation to IPPs. In 2009, in order to spur new renewables development, Ontario introduced a feed-in tariff (FIT) (the first of its kind in North America) for wind, solar, small hydro and biomass. FITs are statutory arrangements that set prices for renewable sources. The price set for FITs is political, and is generally described as the price of generation plus a reasonable return. If a project meets the criteria specified by the power authority, it is granted a contract. FITs are increasingly being applied around the world. They were the key policy choice in place in California, Ontario and Michigan, as well as in Germany, Denmark, Spain and 18 other EU countries (Barclay 2009; Gipe 2010; Lipp 2008). The relative successes in the development of wind power in these jurisdictions has led others to look to the FIT model as a best practice for new renewables, particularly community renewables (see chapters 6 and 7). FITs are also seen as more effective at actually getting new projects built, and are, based on experiences in Germany and Denmark, more favourable than other market-based procurement mechanisms to small (co-operative and community) IPPs (Gipe, April 7, 2010). The

Ontario FIT also includes a 1 cent per kilowatt hour adder (extra payment) for community-based power, and 1.5 cents for aboriginal and First Nations power.

While IPP supporters justify these moves on the basis that private investments help shelter governments and ratepayers from financial risk, they neglect to point out that system co-ordination, infrastructural upgrading and profit-based rates (not to mention long-term, 20–30 year contracts to offset project risk) are all costs borne by the public (Calvert 2007). The Ontario FIT in particular has been criticized for being excessively expensive and having a negative impact on social welfare in the province (Pirnia et al. 2011). IPP agreements with integrated utilities are guaranteed purchase contracts at high prices (10–80 cents per kWh) paid by households, many times the cost of conventional (older) power generation. Opening up markets while providing subsidies and long-term contracts is a useful way to increase profits for generation and industry and a small minority of communities; however, this has little to do with deeper sustainability as overall generation and material throughput (as the deep greens call it) continues to increase.

Policies aren't only driving a shift to private ownership of new generation; they are also shaping the types of conditions that can accompany new project development and the distribution of costs and benefits of electricity development across Canada. At the federal level, international trade and investment protection policies guarantee market access to foreign energy companies to build projects and supply materials once the private sector plays a role. One of the arguments made by advocates of the Green Energy Act is that it will stimulate a green energy economy in Ontario (2010; Ontario Power Authority 2009, 2010). In particular, the act includes local (Ontario) content requirements for wind and solar project components—60 per cent content for of FIT projects needs to come from Ontario—in order to qualify for the FIT. In 2010 and 2011, in response to this requirement, however, Japan launched a complaint against Canada at the World Trade Organization, alleging that "…under these measures, technologically advanced and highly competitive and sophisticated solar panels or other renewable energy generation equipment produced in Japan are discriminated against in the market of the Canadian province of Ontario simply because of their origin"(World Trade Organization 2010). It was joined by the United States and the European Union. In May 2013 the WTO found that the local content requirements contravene international trade rules on non-discrimination (World Trade Organization 2013). This case will serve as a cautionary lesson to other jurisdictions on policies aimed to stimulate local green job creation (Howlett et al. 2012; Lord 2011; Wilke 2011).

The free trade and investment agreements Canada has and continues to sign—NAFTA, GATT/WTO, FIPAs—also serve to ensure that rents from new developments go largely to industry leaders rather than new entrants. Market leaders in renewable energy technologies (EU countries, and Germany in particular) have already developed strong manufacturing sectors for solar and wind generation equipment. So while in some sectors Canadian companies benefit from these investment protection rules in new renewables the case is somewhat different. Indeed, in assessing the benefits of new FIPAs for Canada more generally, Lawrence

Herman at the C.D. Howe institute argued recently that there are serious costs to Canada in allowing private arbitration tribunals to rule on matters of social and environmental importance (Herman 2013). With the signing of an increasing number of arbitration-based investment agreements (FIPAs) these challenges are set to only increase.

Challenges for sustainability

For some advocates, new private renewable generation injects much-needed capital into projects that aids in a transition from coal and nuclear to 'clean' power, in some cases even allowing for community and first nations project ownership. For skeptics, however, the shift to private renewables in the context of NAFTA—and perhaps now FIPAs—is part of a larger erosion of democratic resource control in this country (Cohen 2007, Cohen and Calvert 2011). This shifting ownership structure is, in fact, accompanied by efficiency, equity and environmental challenges that threaten sustainability (Beder 2003).

The scale of restructuring needed to shift the Canadian economy off an environmentally and socially self-destructive path *requires* systemic and radical change, requires taking on powerful actors and industries, reshaping prices and consumption preferences (Daly 1989; Faber 2008; Robinson 2007). Market-based environmentalism is simply not up to the task. Real sustainability requires strong co-ordinated intervention across industrial sectors by the federal and provincial governments, as well as significant infrastructural spending on grids and generation (Jacobson and Delucchi 2011; Kaswan 2009; National Energy Board 2011). Without this co-ordinated investment and intervention, policy targets are far more likely to lead to *greenwashing*—wherein companies and governments spin policies as environmentally friendly to appease public opinion while continuing to degrade the environment.

A confluence of pressures is thus leading to rate increases across Canada: a shift to power for profit and exchange rather than local consumption, to upgrade and shift generation to greener sources, and to upgrade and build new transmission for system reliability and export. Each of these issues raises problems of democratic control and scale. The expanding continental market undeniably generates revenue for some communities, provinces and corporations. What is sacrificed is local and public control over how and where this energy is produced, not to mention how much it will cost. In this vein, Marjorie Griffin Cohen (2004: 6) argues that:

> …powerful trade agreements that support an export-centered energy strategy can compel markets to open in ways that will jeopardize the stability of both supply and pricing that Canadians take for granted…The major risk for Canadians in a deregulated market is that the new private producers, who will have access to the transmission grid, will focus on exporting to the more lucrative market in the US. Since public utilities would no longer plan for future supply, but rely on the private sector's investments, and since prices would no longer

be regulated to reflect the cost of production, Canadians would be forced to compete with customers in the US for access to their own domestically generated electricity.

In the case of electricity, claims about the virtues and consumer benefits of privatization and deregulation are overstated. The real work of infrastructural upgrading, of providing incentives for new renewables and public education, is borne by the state and consumers. For high GHG intensity provinces, improving the environmental record of the power system means taking on the issue of source of generation, certainly. For the provinces with higher hydro capacity, the challenge is to work much harder on demand management, and where necessary diversify to include new renewable technologies. Canada, as an electricity system dominated by relatively low GHG hydroelectric power, is in some provinces, doing quite well in comparison to other states around the world. In the United States, for example, almost half (44 per cent) of all power generation in 2009 came from coal. This is not to say that diversification through the introduction of wind, solar and biomass is not useful or important, merely that for provinces with very low GHG intensity, the benefits of demand management and reducing power consumption are a bigger part of the puzzle than shifting electric power away from existing hydro facilities to other (new) sources of generation.

As it stands today, generation from new renewables like tidal, solar and wind account for a very small share of total generation (less than 2 per cent in 2011). Almost all new growth in this sector is private generation. The pairing of green power with private power raises serious concerns for sustainability as rate rises are passed on to consumers and increasing generation, rather than decreasing demand, becomes the focus. If the goal of the utility is not low stable rates but profit, the utility has little incentive to reduce consumer demand, or to invest over the long term. Indeed, electricity rates across the country have been rising steadily over the past 10 years. Some of these costs are necessary. For example, upgrading aging infrastructure. However, some are intimately tied to the push for private accumulation and expanded continental grids. This has led to double-digit electricity rate increases in Nova Scotia and New Brunswick, as provincial actors provide incentives for new generation sources and to tackle aging infrastructure (National Energy Board 2010a, 2010b).

In Ontario, the liberal government admitted that rates are set to rise 46 per cent over the next five years (CBC News 2010; Ontario 2011) in part to address the costs of nuclear and transmission systems as well as the phase out of coal by 2014. However, new higher rates are not just going toward upgrading, improving and bringing greener generation sources into the system, but also toward enriching investors at home and abroad. This undermines social support for green transitions. These increased costs in different provinces need to be weighed against not only the benefits of a shift in generation source, but also against the alternative modes of development (in this case public renewables) oriented more strongly around public needs rather than profit.

Table six (below) shows the changes in average residential utility rates between 2006 and 2010. In British Columbia, rates are set to rise 32 per cent over three years and up to 50 per cent over the next five years (Province of British Columbia 2011: 4)This is due to the increasing costs of IPP generation together with infrastructural upgrades like smart meters and subsidizing transmission lines to support mine development (in the case of the Northwest Transmission Line project). These price increases in B.C. are wildly out of step with fluctuations in the economy more broadly and are problematic given the centrality of the power sector to the economy (Statistics Canada 2010a: 20; 2010b). Fuel poverty for low-income Canadians is a very real risk in coming years.

Table 6 Residential Electricity Rates in Canadian Cities (c/kWh)

City	2006	2010	% change
Charlottetown	12.15	16.15	25
Regina	10.43	13.15	21
Halifax	11.21	12.89	13
Toronto	11.14	11.82	6
Moncton	10.14	11.66	13
Ottawa	10.09	11.00	8
St. John's	9.88	10.73	8
Edmonton	10.22	9.27	-10
Vancouver	6.41	7.79	18
Winnipeg	6.3	7.08	11
Montreal	6.6	6.88	4

Source: Hydro Québec , 2010, 2006

Conclusions

The way in which the shift to new renewables is taking place across Canada ultimately undermines our power (in both senses of the word). On the one hand, access to electric power for the average Canadian, and on the other, the power to properly manage the transition to a greener future in a meaningfully democratic way. Energy is not just a commodity for sale. Access to electricity and control over

its sources (e.g., for environmental reasons) is a matter of citizenship (Doern and Gattinger, 2003; Hampton, 2003). Neoliberal power sector reforms are eliminating a critical tool for states and provinces to protect the environment, create new technologies, help manage demand, and provide jobs and low-cost access to power for poor families (Byrne et al., 2006; Hampton, 2003). In other words, these reforms are undermining the security *and* sustainability of the power sector in Canada. While still a small part of the larger electricity—and energy— system in the country the mechanisms of 'greening' affect their social acceptability, their distributive impacts and their environmental effectiveness.

Let us not be quixotic. The project to reform our socio-economic systems to ensure we live within the carrying capacity of the earth is a vast and daunting one. It does not need to be a tragedy or a farce, however. It is vital that the most important drivers of the problem are correctly identified and that the policies implemented do not serve to distract from the root causes of unsustainability. Other routes to develop renewable electricity in Canada are certainly technologically possible. Financially, any serious shift in the energy sector is bound to incur significant costs, the question is: who will pay and will it be effective? It is unwise to develop renewables in a way that causes energy insecurity through double-digit price increases in a time of stagnant wages. It also is irresponsible to continue developing renewables in a way that undermines the policy options of public agencies to create new jobs and industries. Finally, it is harmful to fall into the trap of increasing our share of renewables generation without tackling consumption, something unlikely when profits increase as consumption increases. These policies will continue, however, as long policy-makers see private markets and conventionally-measured economic growth as a solution to environmental degradation.

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Appendix- Initial Provincial Electricity Restructuring Policies

Province	Policy	Details
Alberta	1996 Electric Utilities Act (EUA)	-Created power pool. -Opened transmission (OATT)
Ontario	1998 Energy Competition Act	-Unbundling of transmission, distribution and generation (integrated utilities). -Break up of Ontario Hydro. -Creation of wholesale and retail electricity markets (opened May 2002).
	2004 Electricity Restructuring Act	-Tasked public agencies with incentivizing the development of new generation. -Started making large IPP power calls for new renewable generation.
	2009 Green Energy Act	-Brought in North America's first Feed-in Tariff (FIT) (guaranteed price contract) for renewable generation.
Québec	1997 filed Open Access Transmission Tariff (OATT)	-Opened transmission grid to private generation.
	2006 Energy Policy	-Ended moratorium on private hydropower below 50 MW. -Started making large IPP power calls for new renewable generation (wind, in particular).
British Columbia	1997 filed Open Access Transmission Tariff (OATT)	-Opened transmission grid to private generation.
	2002 Energy Policy	-Limited role of BC Hydro in building new generation. -Functional separation of BC Hydro, privatization of admin functions to Accenture. -Creation of B.C Transmission Corporation (reintegrated in 2010).

		-Started making large IPP power calls for new renewable generation.
	2007 B.C. Energy Plan	-required BC Hydro to buy private power for self-sufficiency by 2016
Nova Scotia	2004 Electricity Act	-Mandated (private) that Nova Scotia Power allow other private generators of power (IPPs) access to the grid via an open access transmission tariff (OATT).
Saskatchewan	2001 filed OATT	-Opened transmission grid to private generation.
Manitoba	1997 filed Open Access Transmission Tariff (OATT)	-Opened transmission grid to private generation.
New Brunswick	2003 filed OATT	-Opened transmission grid to private generation.
	2004 Electricity Act	-Expanded IPP opportunities for generation.
		-Created independent system operator.
		-Changed into NB Power into a holding company with subsidiary structures
		-Created competitive market for wholesale, industrial and municipal utility customers.
Newfoundland and Labrador	2007 Energy Plan	-Created NL Energy (parent company for NL Hydro).
Prince Edward Island	Electric Power Act 2005	-Enacted cost-of-service model of price regulation.
	2007 filed OATT	-Maritime Electric (Fortis) OATT approved in 2009.

Source: Adapted from Blake 's Lawyers 2008; Datamonitor 2010; Canadian Electricity Association, 2010.