

UNIVERSITY OF TORONTO

# The Coal Industry and Electricity Policy

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CPSA Submission

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## 1.0 Introduction

The transition to a low-carbon economy, now occurring, albeit fitfully, throughout the industrialized world will inevitably produce winners and losers. In the former category we will find the natural environment and future generations of humans, particularly those living in high-density urban areas served by public transit and benefiting from the growth of renewable energy industries. Those paying a price for the transition will include rural residents dependent upon gasoline-powered motor vehicles, those living next to wind turbines, and fossil-fuel energy industries. Depending upon their relative political powers, conflicts amongst such winners and losers has the potential to stall the transition. In particular, based upon their activity to date, we can expect the oil, natural gas and coal industrial sectors to do all they can in both the market and the political sphere to maintain or expand their share of the total energy market. Given the economic size and political power of these sectors, that activity will be a significant factor determining the speed of the transition. This paper examines such activity by one of those sectors, the coal industry, as it has worked to influence electricity policy in two Canadian provinces.

Coal is the fuel that brought Western civilization through the industrial revolution. It has been cheap and abundant and a staple in the electricity supply mix. The oil crises of the 1970s further increased coal's appeal as an energy source. For many countries in the developed and developing world coal is the primary source for electricity generation. However, our continued dependence on this dirty fuel is a cause of concern for environmentalists and health care workers who have pushed it onto public policy agendas. The pollution created by burning coal was singled out as one of the main causes of acid rain. Since then, governments and the electricity industry have worked to make coal burn "cleaner" and they have found ways to reduce the sulfur emitted (that in turn caused acid rain); however acid rain is not the apex of the environmental challenge of coal. Climate change, or global warming, caused by carbon emissions is. Burning coal releases huge amounts of carbon dioxide into the atmosphere and has been identified as the single greatest source of emissions globally (Swart and Weaver 2012).

IPCC scientist and head of NASA's Goddard Institute, James Hansen, has been publically calling for a moratorium on coal since 2007, and recently Andrew Weaver, a University of Victoria Climate modeler (and lead author of two UNIPCC reports) published in *Nature Climate Change*, a prestigious and peer reviewed journal his findings on the effect of burning world fossil fuel stocks. He and his team found that mining and consuming all oil would only raise temperatures by less than one degree, whereas burning all natural gas reserves (including shale and undersea methane hydrates) would increase temperatures more than three degrees, while this is greater than the international consensus that two degrees warming is the upper threshold of acceptability, the changes wrought by burning the globe's vast coal deposits is shocking: more than 15 degrees Celsius (Swart and Weaver 2012). Dr Weaver's study did not model coal burnt in facilities using carbon capture and sequestration. Therefore, one can expect the results to be far less severe with CCS technology in place. However a quick survey of the state of CCS globally doesn't leave much optimism that this technology will

become commercially viable in advanced industrialized countries this decade (much less developing countries which are heavily coal dependent for electricity).<sup>1</sup>

The International Energy Agency began a world coal market report only in 2009, as Carlos Fernandez Alvarez explains: "Indeed with climate change a priority on the political agenda, both the public and policy makers need to see that coal use is not declining and is not foreseen to decline in coming years....The purpose of the IEAs report is to help both audiences understand coal's critical role in energy supply and security as well as the magnitude of the environmental challenge." (Alvarez 2012, 26).

This paper seeks to investigate the "critical" role played by coal in Canada's use of energy to generate electricity. More specifically, we seek to determine the factors which influence provincial governments and their electricity agencies as they make policy decisions concerning the contribution of coal to the total mix of fuels they use to generate electricity. To do this, we provide case-study examination of such decision making in two provinces, Ontario and Alberta. Although Ontario was based initially on hydro-electricity from Niagara Falls, during the latter half of the twentieth century limits on the quantity of electricity which could be produced from hydraulic sources required the addition of nuclear and fossil fuel energies: for the past fifty years, and more, coal has provided approximately between 12-28% of total fuels used to generate Ontario's electricity (Ontario Ministry of Environment, 2001). Since 2002, however, successive Ontario governments have pursued a policy of eliminating coal as an electricity source. Although the target date has been changed several times, Ontario is on task to achieve a complete phase out by the end of 2014. On the other hand, during that same time period Alberta has continued to rely on coal as the largest source (45% coal, 39% natural gas and 16% others) of its electricity supply needs and has made several policy decisions intended to maintain coal-fired electricity supply (Government of Alberta, 2011). Why have the two provinces moved in such completely different directions?

## 1.1 Case Selection

Ontario and Alberta have been selected for comparative policy analysis for a number of reasons. First, all authors on this paper contribute to a research project for Carbon Management Canada (CMC) which has given us an opportunity to examine the transition to a low-carbon economy within Canada. Given the central role of the provinces in many aspects related to climate change and energy policy, focusing on that level of government appears to be necessary to understand the dynamic of the low-carbon transition (or the lack of thereof). . Secondly, one of the main utilizations of coal in Canada is for electricity generation which seems to be a first important field of investigation to investigate the influence of the coal industry in the policy-making process. Although, other provinces have been know also to use coal as an important part of their electricity generation, this first explanatory study focuses on two well-documented cases.

The Ontario coal phase-out is unique in North America and perhaps beyond as it is the first and thus far only jurisdiction to move beyond a moratorium on new build and issue a full phase-out (Sourcewatch, 2011). Since such a policy decision is very

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<sup>1</sup> See *Nature Climate Change*, Vol 1, October 2011, "Policy Watch: CCS industry fights its corner" by Sonja van Ressen for an overview of the beleaguered state of CCS development across Europe, which runs the world largest CCS demonstration program. Furthermore, Canada, US and Australia all have CCS programs with the same symptoms of the EU program: behind schedule, over budget, lack of industry financial support, and decline government financial support.

significant for the transition to a low-carbon economy, it is essential to understand why the decision was made. Comparative analysis will help that understanding and Alberta is an interesting choice for a first comparison given both its similarity and difference with Ontario. Both electricity systems went through a process of liberalization starting in the 1990s, although with different results. The two jurisdictions also relied on coal for a significant amount of baseload supply. While Alberta has been more dependent than Ontario on coal-fired electricity, the quantity generated in each province in 2006 was the same at 6,300 MW (NEB, 2008, 14). In terms of differences, Alberta has continued using coal and is the only province to have recently approved and built coal-generating stations.

## 1.1.2 Coal and Electricity in Canada

**Table 2: Coal Generation Capacity – Year 2010 (NEB)**

Region	Number of Coal Plants	Number of Coal Units	Coal-Generating Capacity (MW**)	Share of Total Coal-Generating Capacity for Canada
Ontario	4	15	6 459	39%
Alberta	7	18	6 397	38%
Saskatchewan	3	9	1 822	11%
Nova Scotia	4	8	1 308	8%
New Brunswick*	2	2	537	3%
Manitoba	1	1	98	1%
<b>Total</b>	<b>21</b>	<b>53</b>	<b>16 621</b>	<b>100%</b>

\*One of the two coal units in New Brunswick in 2010 is now closed. Excludes petroleum coke (one unit).

\*\*MW = megawatt.

The use of coal fired electricity in Canada is largely confined to provinces that do not have large scale hydroelectric capabilities. British Columbia, Manitoba and Quebec use hydroelectricity for the vast majority of their electricity supply and, subsequently, have a (comparatively) low emission electricity sector that has not felt the pressure of climate change legislation. Alberta, Saskatchewan and Ontario have historically relied on coal for a large part of their electricity. However, research on emissions and particulate matter pollution from this energy source has forced these provinces to reevaluate their dependence on coal and the results have been mixed. Saskatchewan is a comparatively small province, with a government owned and vertically integrated power supply system. The government has chosen to move toward natural gas and invest in carbon capture and storage technology to address the issue of greenhouse gases (GHG). Overall though, Saskatchewan's actions to clean up their energy sector and address climate change have been dismal. The recent Suzuki Foundation publication assessing provincial efforts to address climate change ranks Alberta and Saskatchewan as the worst (Holmes 2012). However, Saskatchewan is not part of our pair comparison here. Alberta and Ontario have been chosen because they are both deregulated electricity markets and both had roughly 6,300MW of coal fired electricity generation in 2006 (National Energy Board 2008, 14). Since then, these two provinces have taken divergent paths on coal fired generation. Alberta has continued to rely on coal for a majority of its electricity needs (different estimations available indicate that it represents 74-82% of its current electricity production).. Alberta has continued to approve new build, for example the 450MW Keephills 3 generating station came online in 2011 (Wingrove

2011). Ontario, conversely, committed to a total phase out of coal by 2014 and has stayed the course on this promise, filling the generating capacity lost with conservation and low emissions sources, such as wind supported through the Green Energy Act. The Ontario coal phase out is the single largest source of greenhouse gas emissions reduction in North America, and as this research will show the advocacy coalition framework provide some interesting insights to explain the policy differences between the two provinces. One of those insights is the important of actors involved in the policy-making process, their objectives, resources, and strategies. The work of different coalitions of actors, with different policy objective and resources, in each province offer a first explanation of the different policy trajectories taken in the two different jurisdictions.. The coalition against coal in Ontario was effective and ultimately largely responsible for the 2004 decision by the McGuinty Liberals which occurred with remarkably little controversy or protest.

## 1.2 Theoretical Framework: Advocacy Coalition Framework

In order to facilitate our understanding of the policy-making process that led to the decision concerning coal electricity generation in Ontario and Alberta, we intend to investigate the actors involved and the characteristics of the electricity policy subsystem in each jurisdiction. A policy subsystem can be understood as a “space where relevant actors discuss policy issues and persuade and bargain in pursuit of their interests.” (Howlett and Ramesh, 2003: 53). The first set of questions to be answer in order to understand the difference in policies towards coal-fired electricity is: who are the actors and groups involved in the subsystem where issues related to electricity generation policy have been discussed in Alberta and Ontario?

A first set of hypotheses could focus on the difference in the composition of the policy subsystem in both jurisdictions as a source of the policy differences. If some actor is present and involved in one jurisdiction, and not present or not involved in another jurisdiction, it might provide a first explanation of the differences in policy outcome. However, the advocacy coalition framework (ACF) suggested by Sabatier and Jenkins-Smith (1993; see also Weible and al., 2011) contends that the nature of the actor’s participation in the policy process should also be considered as a possible source of explanation for policy change or the absence of thereof. Actors in the policy subsystem have various level of resources. They might also form or attempt to form coalition with other actors, based on similar core values and shared understanding. They can select different strategies (Sabatier and Jenkins-Smith, 1993). Therefore, even if the same actors are present in both provinces, it is expected that their strategies, resources, and the extent to which they are able to successfully form coalitions might also explain the observed policy outcome, forming a second set of hypotheses.

Often mentioned is the interaction between policy subsystem and the institutional and ideational contexts (Howlett, 2002). The emergence of new ideas, sustainable development and renewable energy are obvious examples, can create novel partnership opportunities between groups and even new groups altogether. For instance, the recent expansion of non-hydro renewable energy in Ontario as certainly contributed to the emergence of citizen groups opposed to further wind power development and new coalitions between some rural residents, developers, and ecologists. New fracture and conflicts also emerged between long-time allied as some environmental organizations might feel closer of the preoccupations of rural communities opposed to the projects and

other ecological associations more focused on global environmental problems and for which wind electricity remains an important and underdeveloped electricity generation source. In a similar fashion, the evolution of institutions, including regulatory framework, can also create new actors, as previously publicly owned energy companies are restructured and in some instances privatized. Both sets of factors are also included.

The change in Ontario regarding coal-fired electricity, and the absence of change in Alberta is puzzling given that both jurisdictions face similar challenges at an environmental level but also concerning the affordability and security of the electricity supply. Furthermore, they face the same concerns over possible federal regulations to address climate change that would affect the power sector, in particular coal-fired generation.

It is the case that Ontario could rely on more diversified possibilities and venues for new electricity generation projects, relying on hydroelectric resources and its expertise in nuclear energy. However, in recent years both types of electricity generation have experienced difficulties as the cost of new hydroelectric projects increased and resistance of the public toward the nuclear sector, given concerns on public safety and cost overruns. Although both jurisdictions have been investing in non-hydro renewable energy, using very different policies to promote it, the sector remains marginal in terms of the overall electricity production, despite rapid expansion, especially in Ontario. Therefore, how can we explain Ontario's decision to move away from coal-fired electricity generation and Alberta's to continue to develop coal-fired plants?

Observing the policy subsystem of both jurisdictions, two important differences in actors' involvement in the policy subsystem can be observed. In the case of Ontario, the Ontario Clean Air Alliance (OCAA) has been early on loudly opposed to coal-fired electricity, it was supported by the Ontario Medical Association (OMA), claiming that coal-fired electricity, and related atmospheric emissions, have an important impact on atmospheric pollution and drastic costs in terms of health impact, notably pulmonary disease (DSS Management Consultants 2000). OMA study findings were repetitively used by policy-makers to justify the policy. Despite an important mobilization, only in the 2000s was the coalition of environmental and health advocates able to successfully promote the phasing-out of coal by government. That was done despite the resistance of the members of the business community, and in particular the Major Power Consumers Association and some municipal utilities companies (Winfield 2012, 135-138).

No such health and environment coalition can be observed in Alberta, instead the presence of a coalition of coal mining industry, power generation firms and utilities companies, often vertically integrated conglomerates, dominate the policy subsystem. Environmental groups, alone, do not effectively contest the role played by coal-fired electricity generation. Our research found no evidence that the Alberta Medical Association supports a coal moratorium or phase-out. They have conducted no studies on human health costs of coal pollution and have not lobbied government on the issue. In investigating that question, we intend to contribute to the study of coalition formation and of the determinants of actor mobilization and coalition formation, and issue that has been examined by ACF literature over the past 25 years (Matti and Sandström, 2011).

This investigative and explanatory study looks into what factors might have contributed to mobilize the OCAA and the OMA and engage in a successful coalition? Also given the presence of the coal extraction industry, and importance source of economic opportunities for Alberta, it raises the question of the difference in the



distributional costs of a policy aimed at reducing coal-fired electricity. The presence of distributional costs might very well be a factor that pushed some actors to mobilize more in some instances and have an impact on policy change. The question of distributional costs and its impact on coalition formation is generally overlooked by the ACF literature.

### 1.2.1 Methodology

This paper gathers primary and secondary literature from government, civil society actors, news media and scholarly publications to investigate the divergence in policy in these two jurisdictions. We look at the structure of the electricity sector in each, the effects of changes in the power sector in recent decades, the role of the coal mining industry, as well as the role of civil society actors to exert public pressure on government. It is our hypothesis that the different advocacy coalitions in the two jurisdictions pressured government which led to divergent policy on coal-fired electricity.

In the Alberta market, the private sector firms which own and operate coal-fired plants are powerful and have an incentive to block or stall policy which may reduce their market share. Furthermore, they are supported by a local (provincial) coal mining industry and transportation industry. Often firms are involved in more than one aspect of the market, for example involved in mining both coal and oil resources, or owning both whole sale electricity generating facilities as well as retail energy supply companies. These firms share a mutual interest in maintaining their market supply share and pool resources, forming coalitions to lobby government.

In Ontario the story, where there has been major policy movement rather than no movement is clearer to explain. When the government opened up the electricity sector to competition in the late 1990's it retained ownership and control over all coal-fired generation plants. They stayed crown corporations, previously belonging to the now defunct Ontario Hydro, and turned over to the newly created Ontario Power Generation, an arm's length corporation but still accountable to the government and the ministry of energy. There is evidence the Harris PC government wanted to sell the OPG coal assets, but ran into immediate and united opposition from a newly formed coalition of environmental and labour groups (less the Power Workers Union), the Ontario Electricity Coalition. (Winfield 2012, 135). A phase-out of coal was not on the policy radar yet, and the continued ownership by the government of coal stations seems to be an important difference between the cases. Another difference is that coal for these Ontario plants is not mined in Ontario, or even Canada. It is imported from the United States, thus there was minimal political or public backlash from the fuel supply side. These two differences culminate in the lack of effective coalition formation to keep coal from the coal and coal-fired generation firms that we see in the Alberta case. Furthermore, in 2000 the OMA added damning evidence to the anti-coal crusade (begun by the OCAA) when it published a report (it had commissioned) on the costs of air pollution, the report estimated there had been 1,900 premature deaths, 9,800 hospital admissions and 13,000 emergency room visits due to air pollution largely attributable to coal resulting in \$10 billion in economic damages (DSS Management Consultants 2000, iii). Following this, in 2002, the government was presented with a report from the Ontario Public Health Association that stressed the harm of particulate pollution and the environmental impact on human health of coal-fired generation and urged a phase out. An advocacy coalition for phase-out of coal was formed; first advocated by the OCAA it had gained the support



of the medical community, was gaining public support, and fit with the newly elected Liberal government's electoral campaign of increasing environmental control and supporting health care.

## 2.1 Alberta's Electricity Sector

The Alberta electricity system can be described as a liberalized, privatized market driven system. The reform of the sector began with the *Electric Utilities Act* in 1995, which had the goal of attracting private sector investment in new generation to meet growing demand and inducing efficiency through competition. (Alberta, Facts on Electricity Deregulation 2004). Prior to reform three vertically integrated actors with assigned service areas controlled the market, accounting for 90% of the provinces generation capacity (Trebilcock 2006, 443). The move by both Alberta and Ontario was largely motivated by ideas and experience, as Donald Dewees points out, economists had been pressing the virtues of a competitive system for efficiency and a literature of experiences with regulatory bodies being captured by inefficient regulated firms and monopolies was growing (Dewees 2005, 131). These two factors along with technological developments like combine-cycle gas turbines, which allowed for smaller generating stations to be build, led policy makers to view open market competition more favorably.<sup>2</sup> Open markets require private investment to keep up with demand and replacement of aging infrastructure and thus require regulatory certainty from governments in order to assure private firms that investments will return profits and not become stranded assets if government puts in place new regulation, for example on carbon emissions or particulate pollution. In Alberta, the government has not given industry clear direction on what emission standards a likely in the future, instead choosing to focus on the development of CCS to avoid new emissions standards. Furthermore, there is concern about federal regulation be put in place on coal as part of a federal climate change strategy, therefore provincial government has also been lobbying the federal government to maintain control over emissions reductions and regulation.

### 2.1.2 Institutions, Open Market Sustainability and Planning

The move to open up the Alberta market to become a wholesale and retail electricity market has had ramifications for supply planning. Wholesaler electricity suppliers have government contracts called Power Purchase Agreements (PPA's) provide offers of power to the power pool at specific prices that vary throughout the day. Simultaneously purchasers (retail distribution companies) put in bids on quantities and purchase price. These bids and offers form the supply and demand forecast for how much power will be needed at a specific time and what generating units will fill that load requirement. The province has PPAs with eleven coal-fired plants that all expire December 31, 2020 (Henton, Rising costs, coal plant closings leave grid's future uncertain 2012). The large number of PPAs expire at the same time is due to them all being enacted at the same time in 2000 and coming into effect January 1 2001. These PPAs were all negotiated with pre-existing plants in order to assure cost recovery for owners and access to power for consumers, PPAs represented the new regulatory

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<sup>2</sup> Traditionally, large generating stations were needed to have positive returns on investment. Coal stations were favoured and coal was the most abundant, least expensive fuel source.

compact between the industry and the Alberta Utilities Commission (AUC). The end of the PPAs for these power plants would mean that if proposed federal legislation on coal plants passed it would be fully implemented and these plants would be subject to such legislation. Under the draft legislation, if the utilities continued to run past this date they would be fully on the hook for plant decommissioning and environmental recovery costs. The federal regulations did not leave room for purchasing offsets or other equivalency measures, like Alberta's *Specified Gas Emitters Regulation*. The extra cost the proposed federal regulations would impose on the industry potentially left many coal plants as 'stranded assets'. The financial cost of ceding to the federal draft legislation is likely not something the firms would want to carry so the other option would be to shut down in 2020 and let the taxpayers carry this burden. Clearly this would leave a large gap in the supply grid and provincial legislation only requires they give one year notice to the government on whether they are choosing early shutdown or will negotiate a new PPA. If they choose to shut down, this does not give the government near enough time to plan and replace that capacity on the grid. A Brattle Group study commissioned by the Alberta Electric System Operator stated the province will have to double the current amount of new generation planned annually over the next decade to offset the supply that could be shut down from the 11 coal fired plans whose PPAs supply over 4,300 MW (or more than 40%) of the provinces power (Henton, 2012). The Canadian Electricity Association has lobbied the federal government to extend the grace period for existing plants 40 years from the start of regulations, and Alberta's ATCO Power lobbied for 45-50 years, even though the amortized lifespan of plants is 40 years and most plants will have reached the end of their life-cycle by 2030 (Souza 2012). The Alberta government and power industry has been lobbying the federal government aggressively to relax the draft legislation to allow for provincial legislation to guide the emissions regulations as long as it achieves equivalent reduction targets, meaning overall emissions targets would be set by the province rather than strict targets for each individual power facility as the federal draft legislation set out (McCarthy 2012). Nova Scotia recently announced that the province will be the first to have an agreement with the Feds to be doing exactly this (CBC 2012).

### 2.1.3 Alberta's Actors and Institutions

The coal mining industry is relatively minor in the overall fossil fuel industry in the province. However, it is still the largest coal industry in the country, with around 70 percent of proven reserves (Coal Association of Canada 2011). The coal mining industry in Alberta is of central importance to the coal-fired power generation sector there. The Coal Association of Canada reported that Alberta produced 31.8 Mt of coal in 2008 and burned 27.4 Mt in coal-fired electricity generation illustrating the importance of the electricity sector to the mining industry (Coal Association of Canada 2011). Thus regulatory controls over coal-fired electricity generation go beyond the coal plants and these two related sectors have been able to pool resources to their shared benefit to prevent regulatory action that would hamper their activities. The provincial government has an economic and electoral incentive not to disrupt those relationships. Even so, the power sector and the fossil fuel sector seek regulatory certainty from government (both federal and provincial) so they can long-term plan effectively and confidently to prevent 'stranded assets'.

Ownership of coal-fired generation facilities in Alberta is entirely in the hands of the private sector; Capital Power, TransAlta, Maxim Power, and ATCO Power own coal

generation stations. Coal mining facilities in Alberta supply these plants. Therefore, any move by governments to impose new regulations on coal-fired electricity plants experiences blowback from firms in both the mining industry and the electric power industry. Both these industries have strong footholds in both the Alberta and Canada Conservative governments as is exemplified by their joint initiatives in promoting carbon capture and sequestration as a way to green coal. In 2009 Alberta announced \$779 million in funding for TransAlta's CCS development site at Keephills 3, which began functioning in 2011 (CBC 2009). The CCS facility is not scheduled to come online until 2015 (TransAlta 2012). However, it may never come to fruition, as TransAlta (along with several other major players including Capital Power Corp and Enbridge Inc) dealt a blow to CCS development by canceling the \$1.4 billion CCS project on April 26, 2012. They have opted instead to pay the lax \$15 tonne penalty for their overages in emissions<sup>3</sup> (Tait 2012).

Alberta (and Saskatchewan's) decision to invest in CCS rather than promoting and subsidizing renewables speaks to the ideas and actors involved in the electricity sector. While in places like Nova Scotia, electricity generating firms are looking to diversify their portfolio in light of looming regulations<sup>4</sup>, the fossil fuel firms (tar sands as well as coal) in Alberta joined with government to put their lot into CCS technology. The technology is not yet proven and far from commercially cost effective. Granted that it does become both it is estimated to cost anywhere from \$85-150/MWh, significantly more than wind or cogeneration (both \$75/MWh) or hydro (\$60/MWh) (Pembina Institute 2012). Again the actors in the sector seem to be key here, fossil fuels will continue to supply the majority of Alberta's grid supply, and the firms that currently supply the grid have not expressed support for diversifying their portfolios to include renewables, nor have they been given incentive by the government to do so. Since there is a significant amount of power coming off the grid over the next decade, these firms have a significant amount of power to press their interests on the government and they need regulatory certainty before they will invest in new capacity. There seems to be a preference for keeping coal, naturally abundant in Alberta, as dominant in the mix, therefore CCS is the sole focus of attempts to significantly reduce GHG from Alberta's electricity sector and its success development and implementation will green not only dirt coal, but also the heart of Alberta's economy, the oil sands.

The lack of clear direction and meaningful regulation on carbon emission in Alberta is troubling, but not unsurprising given the weak opposition. There is opposition to coal, however these actors have been far less effective and have far less resources. The environmental battle against coal has been an uphill one in Alberta, recently Ecojustice filed an unsuccessful challenge, on behalf of the Pembina Institute, over the AUC approval of a controversial coal-fired plant expansion for Maxim Power Corp.'s Miner plant in Grand Cache, Alberta (Robinson 2011). The plant was hastily green lit, with the AUC foregoing public hearings to speed up the process in order to avoid incoming federal regulations by getting it in service by July, 1 2015, (as draft legislation applied to plants in put into service after this date). The approval, now final, cannot be appealed further.

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<sup>3</sup> See *Specified Gas Emitters Regulations 2007* discussed in the last paragraph of this page.

<sup>4</sup> Nova Scotia Power, which owns coal-fired generation, announced recently plans to develop the lower Churchill in a large hydroelectric project to help green the provinces power supply.

The reliance on CCS fits with Alberta's *Specified Gas Emitters Regulations*, which came into effect in 2007 and applies to all facilities emitting over 100,000 tonnes of carbon dioxide equivalent in any year since 2003. It forces these facilities to reduce their CO<sub>2</sub> emissions by 12% below 2003-2005 baseline emissions intensity. Facilities have a number of options to achieve reductions either through facility improvements or offsets such as:

1. Climate Change and Emissions Management Fund (the fund): Pay \$15 per tonne of CO<sub>2</sub>e, (Fund Credits) into the Fund to meet reduction requirements.
2. Alberta based offsets: Purchase Emission Offsets generated from projects by facilities not subject to the Regulation. The offsets must be from Alberta-based projects which occurred after January 1, 2002.
3. Emissions Performance Credits: The facility may purchase Emission Performance Credits from a different Alberta facility.

which can also be utilized by the other fossil fuel in the supply mix, natural gas. (Alberta, SPECIFIED GAS EMITTERS REGULATION 2007)

In the Ontario story, as we will examine, the role of civil society actors and advocacy coalitions was instrumental in the decision to phase-out coal. In the Alberta case these actor are largely absent or without resources. The Alberta Medical Association has no advocacy against the use of coal or the health hazards of smog. There is no epistemic community in existence in the province opposing coal, aside from a few researchers and scientist whom have not coalesced into an advocacy coalition. Furthermore, even the Alberta Clean Air Strategic Alliance has no publications advocating against coal use or even for a moratorium on new build until CCS is proven. They seem to have very little political power and are not mentioned in any government reports, media articles or scholarly reports found in the duration of this research. They themselves seem rather inactive, as they have not released any reports on their website since 2008. Finding opposition to coal-fired power plants only comes from the Pembina Institute, which has a significant research and policy think-tank in the province and has published extensively on the electricity sector and ways to green it, however, their role in the policy network is unclear but seems fairly marginalized by the Progressive Conservative government.

## 2.2 Ontario's Electricity Sector

The Ontario electricity sector went through liberalization and moved to an open market system in the late 1990s under the Harris Conservative government. The future of Ontario Hydro, the province owned monopoly player was very much at a crossroads in the nineties. The utility was in a great deal of financial trouble mostly stemming from over budget nuclear projects and government prohibition of rate increase, this left Ontario Hydro \$35 billion in debt (accounting for 30% of total provincial public debt), however Ontario Hydro's indebtedness levels were hardly a new advent for the corporation; as early as 1923 debts incurred on behalf of Ontario Hydro amounted to one-half the entire provincial debt (Daniels and Trebilcock 1996, 2, 4). Ontario Hydro had also overestimated demand growth in the province which was becoming more service-sector based and less heavy manufacturing based, in addition conservation measures, falling gas prices, a recession, and an anachronistic regulatory structure with occasional bouts of government micromanagement were all contributing factors to the

undesirable state of Ontario Hydro in the 1990s (Daniels and Trebilcock 1996, 4). In short, the breakup of Ontario Hydro and the opening up of the electricity market to competition was favored for many reasons; chief among them was arguable to provide a more efficient power system. Like in Alberta (in fact across the industrialized world), the technological developments of combine cycle gas turbines for new generation capacity held the prospect of being attractive to the private sector, the built times and capital costs were substantially quicker and lower than thermal coal plants and a fraction of nuclear. Thus, “a competitive generating sector characterized by significant levels of risk assumed by private investors is immediately feasible, rather than a natural monopoly sector that has required either external regulation, or public ownership or both” (Daniels and Trebilcock 1996, 7). In 1998, the Harris government introduced the *Energy Competition Act* and the following year Ontario Hydro was broken up into five separate components.

### 2.2.1 Ontario’s Actors and Institutions

Before Ontario Hydro was dismantled though, environmental regulations for stationary combustion turbines and regulations on nitrogen oxide and sulfur dioxide emission had already come into place, the former applying to all new generators installed after November 1994 and the later applying to corporate sources of emissions in manufacturing and energy, including Ontario Hydro from 1994 onward (Deweese, 1996, 175). Thus a regulatory framework that was discouraging conventional thermal coal was already taking shape as the decade came to a close.

The sector was opened up to the market in the late 1998 through the *Energy Competition Act* and new firms established a foothold as Ontario Hydro was reorganized, all coal fired plants owned by Ontario Hydro remained with the new crown corporation, Ontario Power Generation. No new coal facilities were built by private firms. The government’s continued ownership monopoly over coal plants undoubtedly made the decision to phase-out coal easier as there were no long-term PPAs to renegotiate with private firms, as in the Alberta context. As well, all Ontario coal fired plants were at their half-life or past.<sup>5</sup> Furthermore, there is no coal mining industry in the province either, the vast majority of coal burned in Ontario plants was/is shipped from the United States, thus the Canadian Coal Association, or provincial natural resource and mining ministers did not have any significant investment to protect in coal-fired generation in Ontario, again easing opposition to the phase-out.

The first formidable calls for a coal phase out came from the Ontario Clean Air Alliance (OCAA) begun in 1997. The Ontario Clean Air Alliance, which represents 90 groups constituting over six million Ontarians in health care, unions, environmental, faith groups and municipalities had been applying pressure to government to get rid of coal-powered electricity since formation in 1997. The OCAA came together because there was fear the opening of the market and the break-up of Ontario Hydro had potential to result in new (privately owned) coal-fired generation (Rowlands 2007). It achieved small victories in 2001 when the phase-out of the Lakeview Generating Station in Mississauga (by 2005) was announced and in 2002 when then-Premier PC Ernie Eves adopted the goal of phasing out coal power by 2015 (Ontario Clean AirAlliance 2012). This was a

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<sup>5</sup> Most plants were built in the 1960s and 1970s and the life expectance of coal-fired generating stations is roughly 40 years.

politically difficult move for the Progressive Conservative government, as a key constituent group (the business community and in particular the Association of Major Power Consumers of Ontario) announced they would not support such a move for fear of the consequences that it would have on electricity prices (Rowlands 2007, 195). However, legislative movement on the coal-phase out didn't occur until McGuinty and the Liberals took power.

Coal accounted for 21% of installed generation capacity in 2005, and the decision to eliminate coal was buttressed by three other Ontario government policies already in place: creation of a conservation culture; preference for renewable sources of energy; and replacement of coal-fired generation for environmental and health reasons (Ontario Power Authority 2005). Providing support to the environmental and health costs of coal, the Ontario Public Health Association released a report to government in 2002, *Beyond Coal: Power, Public Health and the Environment*. The report is cited by both civil society and government as a catalyst for the decision to phase out coal in Ontario<sup>6</sup>. Conservation and renewable energy was identified early on as falling short of replacing capacity for coal as the phase out would be faster than renewable capacity could be added to the grid. Conservation in the long term was pegged at 1,800 MW (5% of requirements), this figure is considered reasonable and prudent by the *Long-Term Energy Plan* (Ontario Power Authority, 2005). Natural gas generation, which has roughly half the emission of thermal coal plants, was also part of the plans for the future supply mix because it can be built quickly, located to reduce transmission bottlenecks and can supplement wind generation in meeting demand, particularly during energy intensive summer months, however its drawback of price volatility and environmental impact have made it undesirable for base load generation. Nuclear continues to be the bedrock of base load generation for Ontario, however, the nuclear fleet is aging and there are environmental, financial and regulatory challenges to nuclear. Ontario has moved from a net importer of electricity to a net exporter, it has halted coal-fired generation and now has capacity 28% greater than peak demand (OPA, 2005).

The legislative decision to phase-out coal fired generation was announced in 2007, and it has put Ontario on track to not only meet, but better the Round 1 Kyoto target, Ontario is 7% below 1990 GHG emission levels<sup>7</sup>, (Holmes 2012, 12) and is currently on track with its total phase out by 2015 with only six coal-fired generators (at two different plants) being kept online but only used if absolutely necessary to keep the lights on (Government of Ontario 2011). To maintain grid stability and minimize economic impact to communities affected by the coal-phase out Atikoken Generating facility is being converted to biomass (completion expected 2013), Thunderbay is being retrofitted for natural gas. Nanticoke and Lambton, the remaining online stations are being evaluated for possible conversion to natural gas or co-fired biomass and natural gas (Government of Ontario 2011, 12). Regulation by government on coal in Ontario only affected workers in that sector. To minimize the economic impact to workers and to maintain grid requirements the government plans to retrofit some coal stations with natural gas, biomass or COGEN. This fits with larger green energy plans to reduce

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<sup>6</sup> Interviews conducted with the Ontario Sustainable Energy Association, the NDP energy critic and SENES consultants all mention the impact of the report in moving the conversation on coal forward. The government itself cites multiple healthcare stakeholders here in its update on the coal phase out from December 1, 2011 <http://news.ontario.ca/mei/en/2011/12/support-for-mcguinty-governments-progress-in-phasing-out-dirty-coal.html>

<sup>7</sup> Alberta is 37% above their 1990 levels mostly owing to increase oil sands production.



greenhouse gases and encourage sustainable development. Also has the support of forestry industry (biomass) and natural gas firms whom are able to increase their market share.

Furthermore Ontario has increased its renewable capacity and created new jobs in the province as it has phase out coal, which is on schedule to be complete end of 2014. Wind capacity in the provinces has grown to 5,721 MW (OPA, 2012). In 2003 there were only 10 wind turbines in the province, now there are over 700 (Government of Ontario 2011, 28). While wind has not made up for all of the capacity lost in the coal phase-out, it is very significant.

## 2.3 Looking Forward: Developments in both Jurisdictions

Green energy was not a significant election issue this year in Alberta, conversely, it was a very significant issue in Ontario in 2011 where several Liberal MPs lost their seats to PC candidates in ridings where wind turbines and the feed-in-tariff are contentious. However, this does not seem to have shaken the Liberal governments resolve, and even facing a \$15 billion fiscal year deficit, the government remains committed to renewable energy and the FIT program. For both provinces updating the grid requires large capital investment. However, there is some debate in Alberta as to the cost-effectiveness and necessity of some of the grid improvements. For example a \$3billion plan has been put forward to build two high-voltage direct current power lines between Edmonton and Calgary, lines that TransAlta, which owns coal-fired plants near Edmonton, say are necessary to support new investment in coal-fired power generation (Henton, Groups want to pull plug on power lines proposal 2012). This may have played a role in the defeat of PC 'stalwart' Ted Morton, the former Energy Minister, in the 2012 spring election. As written in the Calgary Herald, "Political observers predicted the writing was on the wall for Morton as anger in the riding mounted over controversial government land bills and high voltage transmission lines." (Tetley 2012). Both Ontario and Alberta, like much of North America, face the problem of an aging electricity grid and growing population density requiring greater load requirements in urban areas. An open market system was supposed to bring efficiency but a 2004 study of the Alberta electricity system pointed to transmission inefficiencies particularly in the north/south line around the Calgary area, where growth has been the largest (Miller 2004). The same study also investigated the efficiency of different types of electricity generation and concluded (as is known) that COGEN facility are considerably more efficient than thermal stations but even though opportunity exists as many are coming to the end of their lifespan and PPA, there is little incentive for the operators to increase their efficiency as no regulations proposed aside from the *Specified Gas Emitters Regulations*, which came into effect in 2007 and offer flexible mechanisms to meet requirements and a cheap price on carbon, as discussed earlier.

Alberta is looking to keep coal in their energy mix and to expand the minable coal in the province. They are also investing in syngas technologies. There is a partnership between the provincial government and private industry in developing syngas technology. Swan Hills Synfuels ([www.swanhills-synfuels.com](http://www.swanhills-synfuels.com)) has been busy in 2011 with their In-Situ Coal Gasification (ISCG) pilot project in the Swan Hills area. The total estimated cost of the project is \$1.5 billion. This includes development of the ISCG process, carbon capture and storage system and power generation station. The Government of Alberta announced a \$285 million contribution to the pilot project in July 2011. ISCG is the creation of synthetic gas (syngas) from deep underground coal seams



(>1km). Swan Hills is currently targeting coal at a depth of approximately 1400m. To produce the syngas “an injection well delivers oxidants (oxygen, O<sub>2</sub>, and steam) into the coal seam, which fuels combustion (700 to 900°C) of the coal. The raw syngas, consisting mainly of carbon dioxide (CO<sub>2</sub>), hydrogen (H) carbon monoxide (CO) and methane (CH<sub>4</sub>), is collected by a separate extraction well and processed at surface to remove the CO<sub>2</sub> and produce clean syngas. The syngas can then be burned in a generation plant to produce electricity.” (Alberta, Coal and Mineral Development in Alberta:2011 Year in Review 2012, 17). Because ISCG can target deep currently unrecoverable coal, a proven gasification technology would drastically increase Alberta’s usable and economically profitable coal reserves. The government states, “Conversion of these coals to syngas has the potential of becoming an important resource for Alberta and a major source of fuel, for a future alternative to coal power generation. The hydrogen produced during gasification of coal will act as an important local feedstock to the oil sands industry, which relies on large amounts of hydrogen during upgrading”. (Alberta, Coal and Mineral Development in Alberta:2011 Year in Review 2012, 18). The economic investment in ISCG further evidences that the province is unlikely to move away from coal-fired electricity and may in fact look to expand its share of the energy supply mix if the technology affords it. ISCG uses CCS as it is currently being developed but can also operate without CCS.

### 3.0 Conclusion

The differences in institutions, ideas, and advocacy coalition actors can provide a first explanation of the different policy trajectories. . In one case there is a clear advocacy coalition of civil society actors, including an epistemic community of ecologists and health care professionals advocating a phase out of coal-fired electricity on a variety of grounds, economic, environmental and medical. Beyond that Ontario has a ruling party ideology in favor of green energy which perceive the removal of coal from the energy supply mix as an opportunity to open the grid capacity for renewable forms of energy. This push toward developing new forms of energy do create the emergence of new industries who are now supporting to continuing implementation of the *Green Energy and Economy Act* and also mobilize civil society actors which have formed coalition with the emerging industry through groups like the Ontario Sustainable Energy Association and the Green Energy Alliance.

Conversely, the dominant advocacy coalition in Alberta is made up of the fossil fuel industries working together to promote carbon capture and storage technology investment as a solution to GHG. This approach is favored by the government and businesses which has a vested economic interest in the fossil fuel industry. CCS technology is a focal point for partnerships between firms in the fossil fuel industries and the federal and provincial government. There is a noticeable lack of opposition to coal from groups within the province with the exception of Pembina.

Liberalization took two different forms in Alberta and Ontario, for Alberta coal generation firms are now frequently also retail distribution firms and as such have a vested interest in both the wholesale market as sellers and the retail market as distributors. The government agencies that regulate them have an interest to ensure that supply and demand are in balance. Electricity is a unique sector, as supply and demand must be in harmony for the system to function since effective methods of storing electricity have not been developed. Furthermore, open market investment in new

generation requires private firms to take on the cost and they will only do so if there is regulatory certainty that their assets will not become stranded as GHGs are regulated. Thus, the private sector has a coalition of actors within the policy network that government must bargain with when creating regulatory requirement in order to keep the lights on and the oil sands producing. Additionally, Alberta has a local coal mining industry that supplies coal fired electricity, this is another group able to pool resources to fight to maintain market share that must be considered by the provincial government when attempting to put regulations on the industry.

The coal supplying industry to Ontario was external and therefore not important to provincial government in terms of votes. In Ontario, OPG is a crown corporation and the sole operator of all coal fired plants which made the decision easier. Furthermore, it opened up grid capacity for other firms/fuel sources (specifically renewable sources like wind), which fit with the interests of the government, as exemplified by the *Green Energy, Green Economy Act*. Additionally in Ontario there was a large advocacy coalition with civil society actors (OCAA, OSEA, GEA) pressuring coal phase out supported by an epistemic community (medical and public health associations). Much more support for green energy and climate change legislation in Ontario than Alberta. No such civil society groups are visible in the Alberta case; there has not been a galvanization around health or environmental effects of coal in that province by CSOs, medical groups or voters on a meaningful scale. Climate change still not scientifically confirmed in the view of many Albertans, including politicians. Fossil fuel industry the lifeblood of Alberta, coal mining is a significant part of that.

It must be noted that liberalization is not a barrier to effective legislation and emissions regulation for utilities. Effective legislation largely depends on the political will of government to do so while ensuring private sector investments continue to bring supply certainty. For example, Texas, one of the first jurisdictions in North America to experiment with electricity liberalization also became one of the sub-national governments to introduce mandatory energy saving goals for utilities in 1999. The utilities companies have successfully met 10% of annual growth in demand through energy efficiency instead of new build. (Pembina Institute, 2012). It has also put a moratorium on new coal plants and introduced regulations for plant efficiency. Texas has a long and close relationship with fossil fuels, but unlike Alberta, their electricity sector is not putting their lot in with oil and gas firms on CCS. Instead, progress toward environmental sustainability is being achieved through improving plant efficiency, investing in renewable energy, like wind and solar, or conservation measures. Alberta has not diversified its energy portfolio to move away from coal, and there is no indication it will, unless CCS technology proves to be economically or environmentally unrealistic and pressure to reduce GHG in the near term intensifies. Currently, neither the actors involved in the policy network, nor the institutions and rules governing the energy sector are predicated upon diversifying the energy sector away from GHG intensive sources. The ideas that rule these actors and institutions have placed their faith in technology to deal with the problem and a business as usual strategy when it comes to day-to-day operations.

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