Lessons from Alberta on the De-regulation of the Electricity Industry

The British Columbia Advantage

A study for The Parkland Institute, University of Alberta by Rick Wallace
About the Author

Rick Wallace

Rick Wallace has been involved in research work during and since obtaining his Master of Arts degree in Sociology in 1987. He has worked for the Alberta Government in the Child Welfare Department, Program Policy Development and for Strathcona County in Corporate Planning as their Strategic Information Analyst. His company Wallace Research Associates (established in 1989) engages in market research, government policy analysis, social trend analysis, program evaluation, and general research consulting.

What is the Parkland Institute?

Parkland Institute is an Alberta research network that examines public policy issues. We are based in the Faculty of Arts at the University of Alberta and our research network includes members from most of Alberta’s academic institutions as well as other organizations involved in public policy research. Parkland Institute was founded in 1996 and its mandate is to:

• conduct research on economic, social, cultural and political issues facing Albertans and Canadians.
• publish research and provide informed comment on current policy issues to the media and the public.
• sponsor conferences and public forums on issues facing Albertans.
• bring together academic and non-academic communities.
In 1995 the Alberta government followed the example of Margaret Thatcher in Britain, and began to deregulate Alberta’s electricity industry. Defying critics, the government promised Albertans lowered electricity prices and more stable supplies once electricity was subjected to the competitive pressures of the marketplace.

Six years later, this study seeks to evaluate these claims, and draw out lessons for British Columbia, another province moving down the deregulatory path. Have Albertans benefited from deregulation? What would be the likely results if British Columbia follows in its neighbour’s footsteps? Although the distinctive features of the electricity industry in each province must be taken into account, the Alberta case makes some powerful suggestions about the potential outcome of electricity deregulation in British Columbia. Millions of dollars are at stake, either in the form of potential savings (or additional costs) for consumers, and potential profits for the corporate producers of electricity.

The first lesson taken from this research is that Albertans have not experienced lower prices, or a more stable supply of electricity under a deregulated electricity regime. In contrast, Albertans are paying a premium price for their deregulated electricity. Between June and October of 2000, the price of electricity rose from 5 cents to 25 cents per kWh (kilo watt hour). Without the $2.3 billion rebate program for households and businesses, Albertans would have seen their residential electric bills go up by 500% in this same period. Price hikes are especially harmful for small-business, residential, and low-income customers. Large industrial interests are more likely to be aggressively solicited by power producers and secure deals on the rising cost of electricity.

To counter vocal criticism of rising electricity prices, the Alberta government claimed that rising electricity prices simply reflected the higher price of natural gas and the correspondingly higher cost of producing electricity. To evaluate these claims we calculated the cost of producing power in Alberta, compared it to the selling price, and found that higher production costs cannot explain skyrocketing electricity prices. Taking into account increases in natural gas prices, the average cost of generating electricity should not have gone over 6.38 cents per kWh in December 2000, yet the average pool price was 18.99 cents – almost three times the estimated cost. Contrary to the government’s optimistic claims about ‘competition’ and market efficiency, deregulation has introduced a complex system of buying and selling that can allow collusion between sellers, and enables producers to sell electricity at prices well above the cost of production.
Besides higher prices, this study also documented a **substantial and foreseeable shortage** in electricity. Analysts estimate that the province needs four more plants to meet current demand, yet it will take at least three years before the three major scheduled plants come on line. Since the Public Utilities Board and the Energy Resources Conservation Board were amalgamated into the Alberta Energy and Utilities Board, there has been no provincial requirement that sufficient electricity reserves be available to Albertans. While British Columbia continues to export significant amounts of power (7797 GWh), Alberta relies on imports (1119 GWh).

What would happen if British Columbia had followed the same route as Alberta? Although we cannot re-write history, we can cull some important lessons from the Alberta experience. If British Columbians had paid the same price as Albertans for electricity, their electric bills would have been substantially higher – almost four billion higher. In 2000 BC Hydro produced 46,442 GWh (giga-watts per hour), which they sold for $2.3 billion. If this power had been sold at the average pool price in Alberta, the total revenue would have been $6.1 billion. This would have meant an additional cost to power consumers of approximately **$3.8 billion**. This figure would rise to **$4.1 billion** if non-BC Hydro power (the other 7.74% not produced by BC Hydro) was factored into the calculation.

Even with the price caps on residential electricity rates, Albertans are paying **1.9 times** as much as their counterparts in B.C. If these subsidies were removed and the power pool price was used, Albertans would pay 2.3 times as much as British Columbians.

If the March 2001 Alberta power pool price were in effect in Vancouver today, a home that was using 750 kWh of electricity would see their electric bill jump from $46.73 per month to $106.08 per month or **from $560 per year to $1273 per year**.

In addition, this study cautions that a deregulated electricity industry is open to challenges under the North American Free Trade Agreement (NAFTA). If Canadian electric companies were to try and supply local customers at preferential rates, they would be open to a challenge under NAFTA.

Enforcing the public good for a critical resource like electricity was relatively straightforward when the industry was a regulated monopoly. Under a deregulated system, it is far more challenging to ensure that the needs of electricity consumers for low prices and stable supplies are met.
This study is an attempt to outline the British Columbia and Alberta electrical power systems and compare electricity rates for the two provinces. While some people in British Columbia want to deregulate their electrical industry, many Albertans are seriously questioning the wisdom of government deregulation in their own province.

Although there are many dimensions to this highly complex industry, our research is organised around three key questions.

1. What has been the effect of deregulation of the electricity industry in Alberta? Has it lead to lower prices and a more stable supply of electricity? Did deregulation create competition in the electric industry?

2. What does it cost to produce electricity in Alberta? How do production costs relate to market prices under deregulation? Is the increased price of electricity in Alberta caused by the increased price of natural gas?

3. How do the electric industries compare between Alberta and B.C.? Based on the experiences of Alberta, should British Columbia follow a similar path towards deregulation?
PART 1. The Electricity Industry in Alberta: Then & Now

1.1 A Thumb-Nail Sketch of the AB Industry

Before discussing the changes that have taken place, we need to give some sense of Alberta's electricity industry before the deregulation processes got underway.

Alberta’s consumption of electricity grew by an average of 3.9% between 1990 and 1997, and increased by 2.9% in 1996-97. In 1997, Alberta:

- Generated 53,946 GWh, consumed 55,065 GWh, and imported 1,119 GWh of electricity.
- Exported 930 GWh to other provinces and 122 GWh to the U.S.
- Imported 2,118 GWh from other provinces and 53 GWh from the U.S.
- Had a per capita consumption of energy of 19,396 kWh per person.
- Generated 81.42% of electricity by coal, 8.39% by natural gas, 3.5% by hydro, and 6.67% by other sources.

In 1997 three major suppliers - EPCOR, TransAlta, and ATCO - produced 95% of Alberta’s electrical energy requirements. Although there were a handful of smaller players, these three major players provided the majority of Alberta’s electricity in the following manner:

1. EPCOR: Publicly owned by citizens of Edmonton. Generated 20% of Alberta's electric capacity in gas-fired plants (Cloverbar and Rossdale) and a coal-fired plant (Genesee). Market was primarily Edmonton, and distribution systems were regionally concentrated in the capital region. Customer base included 270,000 households.

2. TransAlta: Investor-owned, largest power company in Alberta. Generated 60% of Alberta's electricity through a range of coal-fired, and hydroelectric plants. Had most regionally dispersed distribution and transmission system. Customer base

Yet another error seems to be in the way that the Power Pool price is set. The method appears to allow for price fixing and collusion among retailers and wholesalers. At the same time, there is no information readily available on costs to produce electricity. Without this information, how are Albertans to know what is a fair rate of return for these producers?

Another serious problem is the problem of supply. There are no serious controls on how much (or little?) electricity is produced other than the "invisible hand" of the market. There is also no requirement ensuring that a set amount of reserves are available in the case of unforeseen breakdowns/shutdowns. There are also no available reserves for export to higher priced markets (in the event that we don’t end up permanently tied to those higher priced markets through "free" trade).

There are other problems with deregulation besides those documented in this study. Deregulated electricity markets are fraught with problems that most governments are not equipped to foresee. California is the ‘not so shining' example of how many things can, and do go wrong. Alberta is not far behind.

At the time of this writing, research was released in the U.S. showing that some 3.5 million U.S. homes were about to be disconnected from electrical power for non-payment due to the high costs of electric power. Especially once the rebate cheques stop flowing out of the provincial coffers, we can only guess how high these figures will be in Alberta.

Given the devastating experience of Alberta and other places like California with electricity deregulation, the question remains for the people of British Columbia (and other provinces who are looking down this road) will you allow your policy makers to be blind sided by those who stand to gain by deregulation? Or will the next BC government stop to carefully examine the evidence at hand, evidence that strongly suggests that deregulation be treated with the greatest of scepticism, and to maintain "the BC advantage" of a regulated and low price electricity system.
CONCLUSION: Learning from the Alberta ‘Disadvantage’

The first conclusion of this study is that any government considering deregulation should not listen only to the voices of those who stand to gain financially from the arrangement - the power companies, wholesalers/retailers, transmission companies and brokerage firms that would profit from the transition. When contemplating deregulation, it is absolutely critical that governments consider the public good. How will citizens and businesses be affected by deregulation?

Our study found that deregulation of electricity has brought little benefit to Albertans and small businesses in Alberta. Despite government assurances that Albertans would be protected from higher energy prices, we have seen that price hikes are inevitable. These price increases could take several forms: direct payments to the electrical industry, lost tax dollars, higher taxes than would otherwise be necessary, or lost enhancements to health, education and social welfare. Albertans are paying a premium to satisfy the ideological imperative of ‘competition’ in the electrical industry.

The Alberta government has made glaring errors in the lead up to deregulation. For one, they might have avoided removing departments that could have kept an eye on what was happening in the electrical industry for their citizens. One has to wonder whether this might not have been by design.

Another error was being blindsided by an ideological commitment to the free market, even when the commodity being “privatized” is not a true commodity that could respond to the “invisible hand” of the free market. The Alberta government also made glaring errors in the auction process. They effectively sold off the assets of Albertans (the generating capacity that they had paid for when the system was regulated) without ensuring that there were sufficient bidders that could afford to buy the amounts of electrical generating capacity available. This led to a loss of revenue to Albertans who deserved a fair return on their investments. Again, one has to wonder whether this might not also have been by design.

This tripartite, mostly private structure makes Alberta different from other provinces, where one large crown corporation, like B.C. Hydro, Ontario Hydro, and Saskatchewan Power, dominates the electric industry.

1.2 Precedent Setting: Deregulating Electricity under Thatcher

The model of deregulation was not Klein’s personal brainchild, but came from one of the world’s most famous champions of deregulation - Margaret Thatcher. Deregulation of the electrical industry was first conceived and designed in Margaret Thatcher’s England and launched there in 1990. Prior to this time, the electrical industry in England, as elsewhere, operated as a “natural monopoly” and was regulated as such. It was assumed that granting a monopoly to one company to produce electricity for a specific region could provide electricity most efficiently. A public regulatory agency worked to ensure that sufficient electricity was produced, and consumers’ needs for a stable, reasonably priced electricity source were met. This agency also determined a reasonable rate of return on investment for electricity producers and distributors. Ensuring that the electricity provider acted in the public interest was relatively straightforward under a regulated monopoly system.

In an effort to introduce competition into what had been working reasonably well as a natural monopoly, the Thatcher government changed all this. As the first step towards deregulation, electricity businesses were split into generators and distributors. Generators own the power plants, whereas distributors own the wires that transmit and distribute power. A trading
exchange called a power pool was also established. Every day, generators offer to supply electricity at a certain price at a certain hour of the next day. Purchasers then place bids on the amount of power they want at specific times and prices.

The fundamental problem is that the electricity market will never function like a free market. As Gregory Palast wrote in the Washington Post:

“free markets in electricity go berserk because they aren’t really markets, aren’t free and can’t be. Electricity isn’t like a dozen bagels; it can’t be frozen, stored or trucked where needed. And while you can skip your daily bagel, homes and industry will not do without their daily electricity.”

The Thatcher model for deregulation has since been followed in a number of countries, and many U.S. States. In Canada, Alberta is the one province that has fully embraced the new model. Meanwhile many other governments have chosen to wait and analyse the evidence about the advantages of introducing ‘competition’ into a natural monopoly.

1.3 Obfuscation, Legislation, and the Deregulation Route in Alberta

In most jurisdictions that have followed the British model, the public has experienced higher prices, declines in service levels and resulting blackouts. But not everybody has been equally effected by deregulation. Large industrial interests are more likely to be aggressively solicited by power producers and can end up securing lower prices on electricity. For small businesses, residences, and low-income customers, on the other hand, price hikes tend to be especially burdensome. Under deregulation, it becomes more difficult to provide for the public good, since a competitive market on its own does not ensure that utility companies comply with fundamentally fair procedures and principles. The promise of free, open competition for electricity becomes suspect. As large players in England learned how to work the game of the daily power pool, a small handful of powerful buyers and sellers turned “the daily auction into a fixed casino.”

Using this information, we can calculate what it would have cost the economy of British Columbia had the electricity industry in B.C. been deregulated with the same “success” as in Alberta. Focusing on the production of BC Hydro, which produced 92.26% of the province’s electricity in 1997 and using the average cost per GWh in the Alberta Power Pool system, we could expect an added cost of $49,481 per giga-watt hour of electricity under a market system.

BC Hydro sold 46,442 GWh of electricity in 2000. At the current rate for electricity in B.C., total domestic revenue was $2.3 billion. If this power had been sold at the average Alberta Power Pool price ($131,230 per GWh), the total revenue would have been $6.1 billion. This would have meant an additional cost to power consumers of $3.8 billion. This figure would rise to $4.1 billion if non-BC Hydro power (the other 7.74% not produced by BC Hydro) was factored into the calculation.
The following chart shows the difference between prices in BC and Alberta.

![BC Residential Electric Rate Compared to Alberta Power Pool Price](chart.png)

The above graph clearly demonstrates the premium that Albertans are paying for their government’s move to deregulation. Albertans, even with price caps on residential electricity rates, are paying 1.9 times as much as their counterparts in BC. If the January 2001 Power Pool price were the effective price, Albertans would be paying 2.27 times as much as British Columbians. These conclusions are summarised in the following table.

<table>
<thead>
<tr>
<th>Residential Rates for March 2001 (cents per kilowatt hour)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta (capped rate)</td>
<td>11.0</td>
</tr>
<tr>
<td>Power Pool Rate January 2001</td>
<td>13.123</td>
</tr>
<tr>
<td>BC Hydro</td>
<td>5.77</td>
</tr>
<tr>
<td>West Kootenay Power</td>
<td>6.11</td>
</tr>
<tr>
<td>Medicine Hat</td>
<td>6.77</td>
</tr>
</tbody>
</table>

The Alberta government has long believed in the role of the free market and since Ralph Klein became Premier in 1992 has aggressively set out to privatize and deregulate many government services. We might also presume that there was pressure exerted from the interest groups standing to make massive windfall profits.

The road towards deregulation began when the Alberta provincial government amalgamated its Public Utilities Board and the Energy Resources Conservation Board to form the Alberta Energy and Utilities Board (AEUB) in 1994. This amalgamation worked to conceal what was, and is actually happening in the electrical industry.

The Public Utilities Board provided information on the cost to produce electricity in their annual report. This information is no longer available, as the AEUB appears to be only interested in regulating transmission lines, not power producers. This makes it far more difficult to determine whether the “discovery, development, and delivery of Alberta’s resources take place in a manner that is fair, responsible, and in the public interest,” as per the mission of the AEUB. The Electric Utility Planning Council had a mandate to ensure that there were sufficient reserves of electrical power available to Albertans. With the amalgamation of this body into the AEUB, the government rid itself of any provincial requirements that sufficient reserves be available. With the creation of the AEUB, the government effectively removed itself from the business of regulating key aspects of the industry.

Once the groundwork for bureaucratic obfuscation had been laid, the deregulation movement officially started with the introduction of the Electric Utilities Act in 1995. This act set up the Power Pool of Alberta, an exchange to trade electricity that was initiated in 1996. As a result of the new Electric Utilities Act, the balance between the total provincial generating capacity and the province’s energy needs was not evaluated or planned on a province-wide basis. Instead, each electric distribution company took its own initiatives, resulting in a situation of the pool had become standard business practice.”

The AEUB also did not concern itself with providing information on costs of production, or the prices at which retailers sell their power to major industrial consumers. This information is generally not available as it is now (after deregulation) considered to be commercially sensitive and it would not be in the best interests of companies to provide this kind of information to its competitors.


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became responsible for ensuring that sufficient contractual arrangements were in place to supply the load of its customers and its own desired level of reliability of supply. When Alberta began to face supply shortages, this abdication of provincial responsibility raised serious questions - what was driving the government’s lack of forethought on electricity supplies and unwillingness to provide for the public good? (see section 1.9).

The Electric Utilities Act also left a number of questions unanswered for producers and consumers of electricity. The Act never really made it clear how power would be deregulated. Reluctant investors were wary of investing in new electrical production facilities. This again, contributed to problems of inadequate supply. In 1998 Bill 27, the Electric Utilities Amendment Act, was passed. The government hoped that this act would clarify the outstanding questions that had kept new generating capacity from being constructed in Alberta.

1.4 Attempting to Create Competition: The Alberta Power Pool

In order to create competition in the electric power industry, the Alberta government deregulated power generation, but kept power distribution systems regulated. They initiated Power Purchase Arrangements (PPA) and created a Power Pool as a means to generate competition where none had existed before at the retail level.

Power purchase arrangements give independent marketers the right to trade power in the Power Pool. According to the provincial government, the Power Pool is an open-access, competitive market for electric energy. The Electric Utilities Act stipulates that all electricity traded in the province is bought and sold through the Pool. The Pool accepts offers from all generators, retailers and importers who are Pool members. The Pool also accepts bids for energy from distributors for price-sensitive load (electrical power). This refers to load that would prefer to be cut off rather than pay more than a given price for power.

It is apparent from the above table that BC Hydro provided cheaper rates than Alberta even prior to deregulation for both residential and business/industrial users. If the BC government decides to privatise or deregulate British Columbia’s electrical power generating facilities, there is little doubt that British Columbians will likely see dramatic increases in their electric power bills. If the March 2001 Alberta Power Pool price were in effect in Vancouver today, a home that was using 750 kWh of electricity would see their electric bill jump from $46.73 per month to $106.08 per month or from $560 per year to $1273 per year.

What does the picture look like after deregulation? The picture is complicated somewhat by subsidies. Even though electricity rates are subsidised in Alberta, citizens must still pay the power generators and retailers the costs that are incurred through the Power Pool. Currently the provincial government is diverting public funds to pay the high Pool prices. So even though rebates may feel like free gifts to Albertans, they are indeed subsidies to the power producers, who are the final beneficiaries of these rebate cheques. In B.C. electricity rates have been frozen for 8.5 years.
The B.C. government under the New Democratic Party has specified that B.C. Hydro assets will remain in provincial government ownership. The government also seems to have eliminated the possibility of breaking up generation into several competing producers. It is not yet clear what shape deregulation will take in British Columbia’s future, or whether the provincial government will take careful, non-partisan steps to evaluate all the evidence for and against this agenda.

2.4. Comparing Prices in B.C. and Alberta

The rates charged by major power producers on May 5, 2000 for cities in Alberta and BC, prior to Alberta deregulation, were collected by Manitoba Hydro. The table below shows the average monthly bill for city residents, rural residents, and businesses in various cities, using the prices that were in effect just prior to the large price spikes that started in June 2000 in Alberta.

<table>
<thead>
<tr>
<th>RESIDENTIAL, CITIES</th>
<th>375 kWh</th>
<th>750 kWh</th>
<th>2000 kWh</th>
<th>Population</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver</td>
<td>$25.10</td>
<td>$46.73</td>
<td>$118.86</td>
<td>514,008</td>
<td>BC Hydro</td>
</tr>
<tr>
<td>Medicine Hat</td>
<td>$29.93</td>
<td>$53.45</td>
<td>$131.82</td>
<td>46,783</td>
<td>Medicine Hat Electric</td>
</tr>
<tr>
<td>Calgary</td>
<td>$31.80</td>
<td>$54.80</td>
<td>$131.42</td>
<td>768,082</td>
<td>ENMAX</td>
</tr>
<tr>
<td>Edmonton</td>
<td>$33.37</td>
<td>$56.42</td>
<td>$141.92</td>
<td>616,306</td>
<td>EPCOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESIDENTIAL, RURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
</tr>
<tr>
<td>ATCO</td>
</tr>
<tr>
<td>TransAlta</td>
</tr>
<tr>
<td>BC Hydro</td>
</tr>
</tbody>
</table>

The Pool acts as an hourly spot market for energy. A single price is declared for each hour based on a weighted average of the prices of the most expensive units (the highest price paid in each minute of the hour) dispatched to meet load in that hour. All energy is traded at the declared Pool price for the hour. Once Power Pool members purchase power at the auction, they are free to resell it to industry, business and residences at whatever price they can get. This aspect of the ‘transparent’ system is not entirely transparent, since this information is considered commercially sensitive and not readily available to the public. As we will see in Section 1.8 the amount that it costs to produce electricity and what it is ultimately sold for can be vastly divergent.

Distributors and exporters place hourly bids to indicate how much power they are willing to buy at different prices. Bids are then ranked according to willingness to pay, from highest to lowest. The owners of generating units that are not covered by the PPAs, the retailers who purchased generating capacity and importers offer blocks of power into the Pool at the prices they are willing to accept. Offers are ranked by price from lowest to highest. The bids and offers form the basis for a forecast of what load will be served and which units will be dispatched in the hour. As demand for electricity shifts throughout the day, the System Controller keeps supply and demand in balance by dispatching the next offers or bids in the merit order (ranked price order). In other words, as demand increases during the hour, the system controller moves up the merit order, bringing on more expensive supply and cutting back supply to power purchasers as the market price of electricity rises above what they are willing to pay.” If no one wants to purchase power at a set price, production is cut back. This ensures that at a certain price level, there will not be a supply of electricity available. This is one area in which price fixing and collusion can occur.

Every minute, the last energy block dispatched (the unit on the margin) sets the System Marginal Price (SMP). At the end of the hour, the time-weighted average of the 60 one-minute SMP’s is calculated and posted as the official Pool Price. All energy traded during the hour is cleared at the Pool Price.

**System Marginal Price (SMP)**

The system marginal price (SMP) measures the price paid for the last energy block sold in the Alberta Pool at the end of every minute. The SMP system is one of the major contributors to the large increases in electrical power rates in Alberta since deregulation.

**Official Pool Price**

At the end of the hour, the time-weighted average of the hour’s SMP’s is calculated, and posted as the official Pool Price.

Distributors and exporters place hourly bids to indicate how much power they are willing to buy at different prices. Bids are then ranked according to willingness to pay, from highest to lowest. The owners of generating units that are not covered by the PPAs, the retailers who purchased generating capacity and importers offer blocks of power into the Pool at the prices they are willing to accept. Offers are ranked by price from lowest to highest. The bids and offers form the basis for a forecast of what load will be served and which units will be dispatched in the hour. As demand for electricity shifts throughout the day, the System Controller keeps supply and demand in balance by dispatching the next offers or bids in the merit order (ranked price order). In other words, as demand increases during the hour, the system controller moves up the merit order, bringing on more expensive supply and cutting back supply to power purchasers as the market price of electricity rises above what they are willing to pay.” If no one wants to purchase power at a set price, production is cut back. This ensures that at a certain price level, there will not be a supply of electricity available. This is one area in which price fixing and collusion can occur.

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1.5 Power Pool Auctions: Success of the Free Market?

Power Purchase Arrangements (PPA) were set up to allow new entrants and existing players to purchase generating capacity from power generators. This was an attempt to create competition at the retail level.

PPAs are similar to contracts. Each PPA is an arrangement between the owner of the generating facility and the PPA buyer. Buyers of PPAs have exclusive rights to the generation output of the facility, and can sell this energy to customers or to other marketers. The PPA buyer is obligated to pay the generator-owner the fixed and variable costs of producing the electricity specified in the PPA (like maintenance, administrative costs and feed stock). As one journalist wrote, “generators would still own the car, but retailers would tell them where and when to drive it.”

PPAs only affect plants built before 1996 and “extend a maximum of 20 years, or to the end of the estimated operating life of the particular power plant, whichever is less.” There are 42 power plant units operating that have surpassed their estimated operating lives. Two months prior to the Power Pool auction actually taking place, prices on the Power Pool began to rise dramatically. According to Optimum Energy Management Inc: “[t]he biggest paradigm shift for power buyers is the change from a stable, cost-regulated environment to a highly volatile commodity market.” From May to June 2000 the Power Pool average monthly price per MWh jumped over 100% from $50.66 to $106.73, the

2.3 Deregulation in B.C.?

While the political decision to deregulate has not been made in the British Columbian legislature, certain economic actors are clearly interested in pursuing this agenda. Although deregulation requires definitive political actions and legislation, there is an unfortunate, and perhaps a deliberate tendency to depict deregulation as inevitable.

On March 26, 1997 the Minister of Employment and Investment established the British Columbia Task Force on Electricity Market Reform to develop a package of electricity market reforms. The Task Force (which was unable to reach consensus among the stakeholders participating) reported that “competition in generation is widely recognized as offering several benefits from both a consumer and societal perspective. In BC Hydro’s Integrated Electricity Plan they assert that the “electricity market is deregulating and subject to competition at the wholesale level.” The B.C. Task Force on Electricity Market Reform recommends the following:

electricity market reforms [should be instituted] that allow industrial customers and electricity suppliers to contract directly with each other for electricity supply,...with the grid-related assets of B.C. Hydro and West Kootenay Power controlled and operated in a structure that ensures fair and efficient transmission services, including system operation, transmission planning and transmission tariffs.

Major electricity producers also tend to portray deregulation as inevitable. BC Hydro has restructured into three separate subsidiaries that would allow for an easier transition to deregulation. This inevitability is written into West Kootenay Power’s 1999 Annual Report: “as is happening in other jurisdictions, British Columbia is gradually moving toward electricity market reform” BC Hydro and West Kootenay Power are setting up a Regional Transmission Organisation that will “ensure non-discriminatory access to the transmission system for customers and independent power producers.”
2. Source of Electricity: Alberta relies primarily on coal (81.42% in 1997) and natural gas fired electrical generation (8.39% in 1997) to produce electricity. British Columbia relies almost exclusively on hydroelectric power generation (92.39% in 1997) and uses only a small amount of natural gas (4.29% in 1997). Alberta’s power networks are, to some extent dependent on the price of coal and natural gas, while BC’s are mainly dependent on the amount of precipitation and run off that occurs during the year and collects behind the dams that generate electric power.

3. Cost Structure: In British Columbia, hydropower costs are primarily incurred “up front.” Major costs involve the construction of dams. After that, gravity, some maintenance, administrative costs and upgrading do the rest. Alberta’s gas and coal fired plants are about half as expensive to construct, for the same amount of generating power. However, these plants must be fed coal and natural gas constantly at current market prices over their life spans. Coal plants are about twice as expensive to construct as gas plants but their costs for feed stock is generally lower in price.

4. Customer Base: In Alberta about 75% of electricity generated is used by non-residential consumers. BC Hydro sells only 41% of its electricity to non-residential customers, while another 33% is exported to western provinces and the western U.S., mainly California.

5. Rebates & Subsidies: The Alberta government has initiated a complex series of rebates to commercial and industrial consumers and a price freeze for smaller consumers. The rebates are worth $2.3 billion to electricity consumers. They have been initiated to keep costs down, at least until after the provincial election in 2001. The BC government announced a freeze of basic tariffs, for all classes of customers until September 30, 2001, resulting in an 8.5 year rate freeze that has been in effect since April, 1993. With an upcoming election, the BC government has also initiated a $200 energy rebate to households that will be deducted from Hydro bills and paid for from Hydro’s profits. This is worth roughly 30 per cent of the average residential customer’s annual bill and will amount to a total of $305 million.

6. Political Cushioning: The Alberta government has a $7 billion surplus available to help quiet opposition to its deregulation plans. BC has access to the $1 billion in profits that BC Hydro has collected from power exports to California and western Canada.

7. Exports: Thirty percent of the power generated by BC Hydro is exported to western Canada and the western U.S. Powerex, BC Hydro’s wholly owned power-marketing subsidiary reported sales outside the province of $1.1 billion Cdn for almost 24,000 gigawatt-hours (BC Hydro “Triple Bottom Line Report 2000”: pp 41-42). Alberta, in contrast, exports relatively little electricity, and instead relies on imports.

8. Transmission Capacity: Alberta has 21,000 km of transmission lines. These do not include about 170,000 km of smaller distribution lines (used to transmit power 60 kV and under). BC Hydro has a network of more than 74,000 kilometres of transmission and distribution lines. West Kootenay Power currently has 1583.5 km of transmission lines and 4788.5 km of distribution lines in their system.

highest it had ever been to that date. The rate increased again in July to $124.11 and then almost doubled again from the June rate to $202.09 in August 2000.  

The PPAs went up on the auction block in August 2000. According to Jim Wachowich of the Consumers Coalition of Alberta, (who sat on the committee that helped set up the de-regulation process) it was at this point that both government and industry started to notice that there was something wrong. This auction was expected to bring in big revenue for Albertans. Theoretically, by selling off their assets, ratepayers would recoup their investments in the regulated system of electricity production. A successful outcome required that the auction raise “at least $3 billion, as well as introduce seven to ten new competitors in the marketplace.” The results were disappointing. Of the forty ‘interested’ corporations, only seven submitted bids, and only five actually bought generating capacity. Only two-thirds of power capacity was sold, and it went for a mere $1.1 billion.

The process almost seemed to be designed not to work. About 60% of the capacity was sold to five of the large established interests for $1.1 billion. This power was sold in batches much too large for smaller potential bidders to contemplate.

Large players dominated the field. Two thirds of the generating capacity that was sold to EPCOR, owned by the city of Edmonton, and ENMAX, owned by the city of Calgary. The following table lists the 8 PPAs that were successfully auctioned off in August 2000, the committed capacity that was purchased, and the price per kWh excluding fixed and variable operating costs.

<table>
<thead>
<tr>
<th>PPA</th>
<th>Seller</th>
<th>Buyer</th>
<th>Capacity (MW)</th>
<th>Cost (Cdn)</th>
<th>Price (Cdn/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ATCO Electric Ltd.</td>
<td>EPCOR</td>
<td>247.9 m</td>
<td>247.9 m</td>
<td>0.0139</td>
</tr>
<tr>
<td>2.</td>
<td>ATCO Electric Ltd.</td>
<td>EPCOR</td>
<td>247.9 m</td>
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<td>6.</td>
<td>ATCO Electric Ltd.</td>
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<tr>
<td>7.</td>
<td>ATCO Electric Ltd.</td>
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<tr>
<td>8.</td>
<td>ATCO Electric Ltd.</td>
<td>EPCOR</td>
<td>247.9 m</td>
<td>247.9 m</td>
<td>0.0139</td>
</tr>
</tbody>
</table>

22 After the auction, power pool prices came down somewhat, possibly due to allegations of price fixing by the Alberta Market Surveillance Administrators.  
25 ENMAX purchased the 786 MW generating output of Keephills for $240.7 million over 20 years (1.57 cents per kWh) and the 548 MW output of Wabamun for $75.1 million over five years (2.74 cents per kWh). EPCOR purchased one PPA that granted them the right to sell electricity for its net share, 963 MW of the committed capacity from five units of two Alberta generating stations for terms ranging from 13 to 20 years. In return for an investment of $247.9 million and the obligation to pay the plant owners their costs, EPCOR will be entitled to the power produced from the coal-fired Battle River Units 3, 4 and 5 owned by ATCO Electric Ltd. and Sundance Units 5 and 6 owned by TransAlta. EPCOR Utilities Inc. Third Quarter Report, September 30, 2000. pp 1-2. ENMAX Press Release August 24, 2000. http://www.enmax.com/page.asp?ISPFID=1222.  
Results of Alberta’s August Power Purchase Arrangement Auction

<table>
<thead>
<tr>
<th>PPA</th>
<th># OF UNITS</th>
<th>WINNING BIDDER</th>
<th>CAPACITY (MW)</th>
<th>YEARS IN EFFECT</th>
<th>AMOUNT BID ($ Million)</th>
<th>$ per kWh</th>
<th>FUEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keehills</td>
<td>2</td>
<td>Enmax</td>
<td>766</td>
<td>20</td>
<td>$240.7</td>
<td>$0.0157</td>
<td>Coal</td>
</tr>
<tr>
<td>Sundance C</td>
<td>2</td>
<td>Enmax</td>
<td>710</td>
<td>20</td>
<td>$268.5</td>
<td>$0.0189</td>
<td>Coal</td>
</tr>
<tr>
<td>Sundance B</td>
<td>2</td>
<td>Enron</td>
<td>706</td>
<td>20</td>
<td>$294.8</td>
<td>$0.0209</td>
<td>Coal</td>
</tr>
<tr>
<td>Sundance D</td>
<td>2</td>
<td>Enron</td>
<td>663</td>
<td>13 &amp; 20</td>
<td>$64.9</td>
<td>7</td>
<td>Coal</td>
</tr>
<tr>
<td>Battle River</td>
<td>3</td>
<td>EPCOR</td>
<td>666</td>
<td>13 &amp; 20</td>
<td>$64.9</td>
<td>7</td>
<td>Coal</td>
</tr>
<tr>
<td>Wabamum</td>
<td>4</td>
<td>Enmax</td>
<td>548</td>
<td>3</td>
<td>$75.1</td>
<td>$0.0457</td>
<td>Coal</td>
</tr>
<tr>
<td>Rosedale</td>
<td>3</td>
<td>Engage</td>
<td>203</td>
<td>3</td>
<td>$0.0</td>
<td>$0.0000</td>
<td>Gas</td>
</tr>
<tr>
<td>Rainbow</td>
<td>3</td>
<td>Engage</td>
<td>93</td>
<td>5</td>
<td>-$21.0</td>
<td>-$0.0452</td>
<td>Gas</td>
</tr>
</tbody>
</table>

Exactly how low were the purchase prices for this electricity in relation to the costs of production? The document Power Purchase Arrangements Determinations Regulation (AR 175/2000; Schedule C), includes useful information on the fixed and variable costs associated with each generating unit covered in the PPAs. These numbers show a disturbing story.

### Useful Information on Electricity Measurement

There are two ways of discussing electrical measurement.

1. Measuring overall capacity that a Generating Unit can produce in one hour. This is measured in mega-watts per hour (MW). For example, a generating unit may be able to produce 450 MW.

2. Measuring the actual amount that is produced or consumed in an hour. When discussing the amount of power produced by a generator in a given hour, or the amount of power consumed by a larger industrial site, the measurement is usually given in mega-watts per hour (MWh). When discussing even larger amounts of power produced by a generating plant, or consumed over the course of a year, we refer to giga-watts per year (GW/yr).

To find the amount of power that a generating unit is capable of producing in a year, its rated capacity per hour is multiplied by 24 hours in a day, and then multiplied again by 365 days in a year. If there were no scheduled maintenance or breakdowns, we can estimate the total potential power produced. For example, a generating unit rated at 450 MWh, would theoretically be able to produce 3,942,000 MWh/yr or 3,942 GWh/yr.

When discussing the amount of electricity used in a residential home, the measurement usually used is the kilowatt-hours (kWh) - the standard found on electricity bills. One kWh means that 1,000 watts are used in an hour - think of ten 100-watt light bulbs. The average Alberta home uses about 650 kWh per month.

The BCUC usually sets BC Hydro’s industrial, commercial and residential electricity rates. On April 1st, 1993, the legislature decided to halt rising prices, and froze the rate for all classes of customers of electricity and have kept them frozen for the past eight years. After adjusting for inflation real electricity rates have actually declined by approximately 13% in the last decade.

Unlike Alberta’s free-for-all system of profit making in the electricity industry, in B.C. the BCUC sets rates of return for BC Hydro. These rates are set assuming “normal” or average water years (given BC Hydro’s use of hydroelectric power). This is why BC Hydro sometimes earns less than the “allowed rate of return” and sometimes considerably more. The BCUC then allows rates to be adjusted so that the utility will be able to achieve the targeted rate of return. This rate of return is not guaranteed. In the past six years, in regard to its allowed rate of return, BC Hydro “under-earned” four years and “over-earned” two years.

### Summary of Provincial Differences

There are major differences between Alberta and British Columbia’s electrical generating industries that must be kept at the forefront of this analysis. Foreseeing the criticism that an Alberta-B.C. comparison is akin to comparing apples and oranges, we wish to make these differences explicit, rather than imply that these cases are identical. These differences make comparisons of the two provinces’ electric industries difficult, but ultimately electricity is electricity - a commodity that commands a similar price, and has similar production constraints throughout the continent. Alberta’s experiences cannot provide a photographic representation of outcomes in B.C., but it can be a suggestive case forewarning of some of the pitfalls of deregulation.

The differences between the two provinces can be summarised as follows:

1. Ownership: Alberta’s power-generating facilities are privately owned, except in the case of EPCOR which is owned by the City of Edmonton, and Medicine Hat Electric which is owned by the City of Medicine Hat.

BC Hydro is a provincial Crown corporation that reports to the Minister of Energy and Mines and is regulated by the Utilities Commission. It is “one of the largest electric utilities in Canada serving more than 1.5 million customers in an area containing over 94% of British Columbia’s population.”

2.2 Power Planning in B.C.

The British Columbia Utilities Commission (BCUC) is an independent regulatory agency of the provincial government operating under and administering the Utilities Commission Act. The Commission’s primary responsibility is the regulation of the energy utilities. Its job is to ensure that the rates charged for energy are fair, just and reasonable, and that utility operations provide safe, adequate and secure service to their customers. It also approves the construction of new facilities.

A key job of a regulatory body is to ensure adequate supply of electricity. In April 1999, West Kootenay Power (WKP) submitted a comprehensive 20-Year Transmission and Distribution Plan to the BCUC. This Plan provides the detailed analysis and justification for upgrading its transmission and distribution system in order to maintain system reliability and to meet an expected 40% increase in power demand over the next 20 years. The first five years of the Plan proposes $150 million in system upgrades, representing the most ambitious network improvement and modernization program in their history.

BC Hydro is also planning ahead “to ensure that adequate energy is available to meet customer needs even during low streamflow conditions...[they apply] an energy reserve criterion that allows for up to 2,500 GWh/yr of resources...in the scheduling of new energy resource requirements.”

Since 1995 BC Hydro’s hydroelectric system has increased by 360 MW. BC Hydro’s Integrated Electricity Plan forecasts that by 2007/08, annual energy requirements will have increased by 13,500 GWh/yr, and capacity requirements will exceed 1997/98 demand by 2,370 MW. By 2003/04 BC Hydro expects to have 11,668 MW of capacity. The energy reserve criterion reduces the risk of unserved load, and reduces exposure to high costs during periods of high market prices. Based on a probable load forecast, the next major addition to generating capacity will be needed in 2007. Under a high load growth scenario, BC Hydro would need new resources by 2005.

The Keephills Units 1 & 2 provide an illustrative example. For the year 2001, fixed and variable costs totalled $52,501,660. On the production side, these two units are capable of producing 766 MW of committed capacity per hour. If Enmax, who purchased the PPA, wished to run at the full rate and there were no shut downs, they would produce 18,384 MWh per day. If they ran the units 365 days per year they could produce 6,710,160 MWh of electricity for the units’ costs of $52,501,660 (or $7.824 per MWh), and their PPA average cost per year of $10.235 million.

While Enmax’s average cost per MWh weighs in at $9.35 per MWh, the price of this electricity in the January 2001 average power pool was $131.23 per MWh. For each MWh sold into the pool Enmax would have made about $121.88 per MWh on the Keephills plant alone.

Of course each plant covered in the PPAs has different costs and profits involved. However, one has to wonder why the initial PPAs were offered in such large blocks, so large that smaller companies could not afford to participate. Was this to allow the larger established interests to do some “cherry picking” before allowing smaller interests to participate? Electricity consumers in Alberta should be asking their government what happened. Why was electricity that cost $9.35 to produce, selling for $131.23?

1.6 Delinking production costs and corporate profits

Prior to deregulation, there was a relatively stable relationship between cost of production, and the prices charged for power. These prices were not only stable, but were “on average, the lowest on the continent.”

Under the deregulated system, there is no longer a fixed rate of return to investors, nor is there any direct link to the cost of production. If coal generated electricity that

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23 BC Hydro, 2000: pp. 11-12.
24 BC Hydro, 2000: p. 34.
26 BC Hydro, 2000: pp. 11-12.
27 BC Hydro, 2000: p. 34.
costs $50/MWh to generate is sold in an hour when the System Marginal Price is $800/MWh, the generator or retailer rakes in a $750 profit for each mega-watt sold during that hour. The SMP appears to be one of the major contributors to the very large increases in wholesale electrical power rates that Albertans have witnessed since June 2000. The deregulation experience in California is instructive. A study by the managers of the state’s power grid reported that “electricity wholesalers over charged California $5.5 billion US over the past 10 months.” The five companies involved offered electricity at prices that were double the cost of production. The Edmonton Journal reported that the “California Independent System Operators planned to file the study with federal regulators...and are demanding that the money be paid back.” It is entirely possible that consumer groups or industrial associations may take similar actions in Alberta. In another story from California, there is evidence of collusion between electricity producers. Power producers selling electricity to California’s fledgling deregulated market shared confidential data that allowed them to watch each other’s every move. This gave them leverage to drive up prices, and helped launch the state into its energy crisis last spring.

1.7 Up, Up, Up: The Effect of Deregulation on Electricity Prices

Great promises were made for deregulation. Competition was supposed to lead to greater efficiencies in the production of electricity and lower prices. A government news release from October 18th, 1994 was titled, “Proposed changes to electricity industry will help keep consumer costs down.” In this release, they cited Energy Minister Patricia Black: “The government’s objective is to retain and build upon the most positive features of our existing system, including reliability and low consumer costs, while positioning the

PART 2. Lessons for British Columbia

2.1 A Thumb-Nail Sketch of the B.C. Industry

To draw lessons from the Alberta case, it is first necessary to gain an understanding of the B.C. electricity industry.

British Columbia has one crown-owned electric utility, BC Hydro, which was established in 1962. There are also seven investor-owned electric utilities (West Kootenay Power is the largest) and six municipally owned electric utilities. BC Hydro, through its subsidiary Powerex, was able to export 33% of its generated power to both the U.S. and other provinces in 2000.

B.C.’s electricity consumption grew by an average of 0.8% between 1990 and 1997 but, primarily due to the Asian crisis, declined by 6.9% in 1996-97. In 1997:

- B.C. generated 66,852 GWh, consumed 59,055 GWh and exported a net 7,797 GWh of electricity.
- B.C. exported 1,939 GWh to other provinces, mainly Alberta. They also exported 10,175 GWh to the U.S. while they imported 814 GWh from other provinces and 3,503 from the U.S.
- Ninety-two percent of B.C.’s power was generated using hydro, 4.29% using natural gas and 3.32% by other sources.
- Per capita consumption of electricity in B.C. was 15,491 kWh/person.

Maureen E. Howe of RBC Dominion Securities also reaches this conclusion. She writes: “There are a number of variables that enter the equation regarding the dramatic increase in power prices in markets that deregulate. However, in our view, the most relevant factor is the change from pricing the commodity (electricity) at the average cost of the total projected demand to a single price equal to the marginal cost of the last kilowatt-hour of electricity required. The price impact from pricing at the marginal cost rather than the average cost is particularly dramatic in a jurisdiction such as Alberta that starts the deregulation process with a low average cost of existing generation.” RBC Dominion Securities, January 11, 2001. p. 4.


The Orange County Register, Mar. 28, 2001.


One estimate suggests that B.C. Hydro earned $800 million selling power to Alberta over a three month period. Report on Business, March 2001:p112.

Imports from the U.S. are the result of the Columbia River Treaty, which is a flood control program. This program limits the amount of water that can be released, thereby cutting down electrical generation by B.C. and stopping flooding in the U.S. for which the U.S. supplies B.C. with electricity as payment in kind.

A program announced January 18, 2001 to help small businesses will provide a “Market Transition Credit” of up to 4 cents per kilowatt-hour, depending on the Power Pool rate. This program will cost approximately $336 million depending on the Power Pool rate. This credit is to be paid out of general revenue.

On February 1, 2001 Klein promised to shield Albertans from rising electric and natural gas prices with subsidies. If this policy promise is enacted, these subsidies would transfer $4 to $5 billion of public monies to power companies every year for four years.

1.12 Deregulation and Trade Challenges

Besides problems with high prices and short supply, deregulation also opens the door to potential trade challenges under NAFTA. If Canadian electric companies attempted to supply local customers first at “subsidised” rates, U.S. corporations could object on the basis of NAFTA’s Chapter 11 regulating ‘investor’s rights’. President George Bush has made it clear that he is aggressively seeking a “continental” energy program, complete with an open-door policy towards Canada’s energy resources. The U.S. has also lobbied the World Trade Organisation (WTO) to enforce greater competition and market access in energy trade.

Furthermore, under NAFTA, there is no way to stop companies from exporting electricity to the U.S., even if there is a shortage of supply in Alberta or B.C. Under the proportional sharing arrangement in NAFTA the more we export to the U.S. the more we are obligated to supply. This will mean that even though new generating capacity will be developed in Alberta over the next decade, that energy may not be destined to bring down Alberta’s price. If the generators can get a higher price by exporting it or if they are required to export it under the proportional sharing arrangement, Alberta’s prices will remain as high as those in American states.

industry to become more competitive as we move into the next century.”

Despite these alluring promises, prices for electricity had consistently risen from the inception of the deregulation process until October 2000.

Since its inception, the Power Pool recorded steadily increasing prices until the first two months of 2001. During the last three months of 2000, the Power Pool Price averaged 22.3 cents, whereas in 2001, the Power Pool price averaged 12.7 cents per kWh. While prices dropped somewhat, power was still seven cents higher per kWh than it was in B.C. at the same time.

If deregulation had started in 2000 and the Alberta government had decided not to implement their $2.3 billion rebate program for households and businesses, Albertans would have seen their residential electric bills go up by 500% between June and October; the price per KWh increased from just five cents to 25 cents per kWh. If this policy promise is enacted, these subsidies would transfer $4 to $5 billion of public monies to power companies every year for four years.

http://www.resdev.gov.ab.ca/room/updates/press/101894.htm; emphasis ours.

Edmonton Journal, February 27th, 2001,

Report on Business, March 2001 p. 113


http://www.resdev.gov.ab.ca/room/updates/press/101894.htm; emphasis ours.

In September 2000 John Davies of Lethbridge Ironworks requested quotes on power prices for 2001. Of the 10 registered retailers, only three replied. Their offers were as high as 19 cents per kWh - more than three times the price paid by similar customers in Manitoba or British Columbia.

Now that a provincial election has taken place, it is widely predicted that rebates will end, and homeowners can look forward to large increases in their power bills. Businesses will also face increased power bills, which in turn could trigger higher consumer prices, layoffs, bankruptcies, and relocations to other provinces to remain competitive. There are currently numerous cases of small businesses closing due to increased electric costs. This could well become the “Alberta disadvantage.” Jayson Myers, chief economist at the CME, predicted that the Alberta disadvantage could eliminate 30,000 manufacturing jobs in the next year alone.” Jim Wachowich of the Consumers Coalition of Alberta notes that Albertans get hit on multiple levels: through higher home heating bills, higher electric costs, and rising prices from businesses that are trying to absorb the shock of their own high bills.

In sum, prices are higher than they would have been had Alberta continued with a regulated system. Optimum Energy Management Inc. reports that “the benefits of competition expected when deregulation was initiated in 1995 may not produce prices that are lower than could have been expected under continued regulation.” In a RBC Dominion Securities paper, Maureen E. Howe makes the same point: “while other Canadian provinces will find some relief from the North American energy crisis through relatively low-cost electricity, the trend for power prices in Alberta is expected to increase.”

The consumers of Alberta are going to have to pay a premium in order to achieve competition in electric energy markets. . . It is no longer clear that the prices consumers will pay are going to be lower as a result of competition."

1.11 Buying-off the Opposition

The Alberta government has spent $2.3 billion of ratepayer, customer and public money on rebates to residences and businesses to help ward off concerns about the deregulation process. These rebates appear as ‘gifts’ from the government to consumers. In reality, these rebates actually represent a transfer of wealth from Alberta citizens to the power companies and power retailers who ultimately pocket these cheques.

The monies collected in the Power Pool auctions were supposed to be returned to Albertan ratepayers to compensate them for their previous investments in production systems. All of the money earned in the power auctions was spent in the first year to defray costs of de-regulation. That is, all of the money was returned to the power companies instead of going back to Albertans.

Rebates, or what we can more accurately refer to as production subsidies, took the following forms:

• In December 2000 the Klein government introduced an eight cent per kilowatt hour price cap for homeowners. The utility companies subsequently complained about the low rate, and the price cap was raised to 11 cents.

• The $20 homeowner rebate was raised to $40 and the 1.8-cent industrial subsidy was also doubled to 3.6 cents per kWh.

• Non-residential rebates will total over $1.5 billion and will run through to December 31, 2001. Residential rebates will be $40 per household and will total $500 million for the 1.1 million households in Alberta. Both of these rebates come from power sales obtained in the PPA auction and the second auction where the remaining one-third of generating capacity was sold off (referred to as the MAP auction or “Sale of Balancing Pool Electricity Contracts”).
So-called market forces have not created sufficient market incentives to encourage power plant generation. Analysts estimate that the province needs four more plants to meet current demand, yet it will take at least three years before the three major scheduled plants come on line. At the same time the Alberta government was unable to provide clear signals and details to the electrical industry, TransAlta was planning construction of a $400 million, 650 MW power project in Sarnia, Ontario - Canada’s largest co-generation project.

To help reassure the public and private sectors the Alberta Energy and Utilities Board announced on January 19th, 2001, that it would review electricity deregulation “to determine whether the market is functioning to produce reliable electricity supply at competitive prices.” On February 6, 2001, in a Government of Alberta News Release Premier Klein announced plans to create an external committee that will advise government on longer-term issues surrounding electrical deregulation.

But there is no quick fix to the two-sided problem of short-supply and high prices. It usually takes at least three years to get new plants up and operational. Major new generating capacity will not come on line until early 2005 when TransAlta expands its coal-fired Keephills plant and adds two 450-MW generating units. Industry officials, such as Enmax Corp. President Bob Nicolay, warn that the next few years will bring continued volatility in the Power Pool, and high prices on consumers’ electric bills.

Even if supply is expanded, it is not clear that the deregulated system will bring lower costs for consumers, given the unclear link between costs of production, and electricity prices (see section 1.6). Vice-President of Optimum Energy Management Incorporated (OEIMI), Dale Hildebrand reports:

1.8 What is the cost to produce electrical energy?

What are we to make of the provincial government’s claim that higher natural gas prices were the main causal factor behind higher electricity prices? The Alberta government tells us that: “it is important to remember that whether our electricity system is regulated or deregulated, we would still be facing high natural gas prices and, therefore, high electricity prices.”

To evaluate the governments’ claims, we calculated the cost of producing electrical energy, in an attempt to determine to what extent rising natural gas prices were pushing costs upwards.

As noted above, Alberta relies mainly on coal and natural gas to produce electricity. What are the relative costs between natural gas and coal? For illustrative purposes, pre-deregulation coal and natural gas prices had similar cost structures: approximately $50 per megawatt hour. The price of coal has not increased, while as is well known, natural gas prices have risen substantially. In March 2001 gas powered generators produced electricity at about $65 to $70 per megawatt hour. Ten giga-joules of gas are needed to produce one megawatt hour of electricity (including plant cost). In general, one ton of coal is needed to produce one megawatt hour of electric power. The amount of feed stock required depends on the plant, heat rates and other costs. Electricity producers in Alberta pay about $10 for a ton of coal.

While natural gas prices have increased, there has also been an amazing growth in the use of natural gas to produce electricity in Alberta. According to the publication Electric Power in Canada 1997, natural gas only accounted for 8.39% of electrical energy production in 1997. In January 2001 natural gas accounted for 30% of electrical production and in February the provincial government announced that it was at 34.5% on its Action on Energy website.

Even if supply is expanded, it is not clear that the deregulated system will bring lower costs for consumers, given the unclear link between costs of production, and electricity prices (see section 1.6). Vice-President of Optimum Energy Management Incorporated (OEIMI), Dale Hildebrand reports:

The correlation between average monthly natural gas prices and average monthly Power Pool prices is fairly high at .745. However, looking at the dollar change in natural gas prices on a month by month basis it is obvious that the increase in natural gas price per Giga joule does not justify the large increases in electric prices. For instance, in August when electricity prices rose $77.98 to reach $202.09 per MWh, natural gas prices actually dropped forty-nine cents per giga-joule. In December when electricity dropped $38.76 per MWh, natural gas went up by $2.49 per giga-joule.

If all production were gas based, what would have been the effect on electricity prices? Based on an increase of $5 per MWh of electricity for each 50 cent increase in natural gas, we would have expected to see electricity rates rise from $4.90 per MWh in April to $24.9 per MWh in December. We would expect a total increase averaged over the year of $5.25 per MWh per month.

The following table charts the price increases we would expect if natural gas price increases were the only price driver. This is compared with the actual pool price, which is consistently more on a month by month evaluation.

<table>
<thead>
<tr>
<th>Month</th>
<th>$MWh Pool Price</th>
<th>$MWh @ Cost</th>
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</thead>
<tbody>
<tr>
<td>Jan</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Feb</td>
<td>$50.00</td>
<td>$50.00</td>
</tr>
<tr>
<td>Mar</td>
<td>$100.00</td>
<td>$100.00</td>
</tr>
<tr>
<td>Apr</td>
<td>$150.00</td>
<td>$150.00</td>
</tr>
<tr>
<td>May</td>
<td>$200.00</td>
<td>$200.00</td>
</tr>
<tr>
<td>Jun</td>
<td>$250.00</td>
<td>$250.00</td>
</tr>
<tr>
<td>Jul</td>
<td>$300.00</td>
<td>$300.00</td>
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<tr>
<td>Aug</td>
<td>$350.00</td>
<td>$350.00</td>
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<tr>
<td>Sep</td>
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<td>$400.00</td>
</tr>
<tr>
<td>Oct</td>
<td>$450.00</td>
<td>$450.00</td>
</tr>
<tr>
<td>Nov</td>
<td>$500.00</td>
<td>$500.00</td>
</tr>
<tr>
<td>Dec</td>
<td>$550.00</td>
<td>$550.00</td>
</tr>
</tbody>
</table>

These numbers might sound high, but estimates suggest that in the next fifteen years 4,100 to 6,700 MW of new generating capacity are needed to meet rising demand and replace old units. Since deregulation started in 1996, only 2,100 MW of new capacity has been built or announced.47

We need to seriously consider when the Klein government knew that a power shortage was emerging. With the economy growing at 4% per year and the population growing by 10% over the past 5 years and no significant new generating capacity being built, how could they not have foreseen major shortages? If the Alberta government did not notice that there would be serious shortages, why not? Were they in fact asleep at the switch?

Premier Klein himself admitted that his government is partially to blame.48 Even the government’s appointed overseer expressed severe doubts about the likelihood that the system would work properly to protect consumers’ interests. On October 17, 2000, the Market Surveillance Administrator, Howard Ward, released a report, Pool Prices Summer 2000, which stated that deregulation created an opportunity for market manipulation and an oppressive supply crisis. That is, when no one wants to purchase electricity at a high price, generating capacity is shut down; this ensures that there is no excess supply that would help bring prices down. So-called “market forces” (supply, demand and Pool Price) determine how much electricity is produced. But the cost to Albertans has proven to be very dear indeed.

Under the old regulated system the regulators would have guaranteed a “reliable” assured steady supply of energy at competitive rates by ensuring that adequate reserve capacity was in place. Under regulation there were built in incentives to keep power companies efficient, ensuring that new plants were built as needed and consumers were assured they got what they needed. These requirements, enforced by the Energy Resources Conservation Board and the Electrical Planning Council, ensured that when demand grew by 10% a year in the 1970s (almost 3 times the rate of growth in the 1990s), a crisis of supply did not ensue, nor did prices substantially inflate.49

49 Taft & Cooper, 2000 p. 10.
electric prices in Alberta and created a situation where the “power pool price in Alberta has essentially mirrored that of California.”

So, it was not the “invisible hand” of the market so much, as it was a matter of linking to an international electricity market without considering the implications on prices in Alberta. But more importantly, Alberta had a government that should have been able to clearly see that there was going to be a shortage of electrical generating capacity given high population and industrial growth and little new generating capacity coming on line. The government had decided that “market forces” would take care of the problem in due time. That is, prices would rise and investment would flood in to take advantage of those higher prices. Albertan’s appear to have been set up to pay higher prices for electricity by their government.

1.10 Asleep at the switch, or guaranteeing shortages?

Today the major problem is a very tight supply in the face of population growth and industrial expansion, which result in growing demand. Over the past five years Alberta’s economy has been growing at 4% per year, and its population has grown by 10%. Demand for electricity is expected to grow between 0.9% and 4.4% for 2001 to 2010, with an average growth rate of 3.0%.

The Alberta government reports that in 2001 there will be 590.4 MW of new capacity installed; in 2002 they expect another 465 MW installed, and in 2003 another 975 MW of capacity.” Despite the obvious problems of high prices and short supply, their official material maintains an optimistic tone: since Alberta passed the Electric Utilities Amendment Act in 1998 - which got deregulation underway - investors have shown confidence in the Alberta electricity industry and electricity generation in Alberta has grown by 15 per cent....This increased supply will help reduce costs.

We can go a step further and build in the cost of electrical production sources in Alberta. Assuming that 30% of the electricity generated comes from natural gas and the other 70% from coal, we can determine the cost to produce electricity. This is done by holding the base price steady at the January 2000 price of $46.46 per MWh for the roughly 70% produced using coal, and adding the 30% of production accounted for using natural gas. This scenario ignores wind, solar and bio-mass sources. The price increase in the price to produce electricity from natural gas is the same price that was used to calculate prices in the table above. The picture becomes even more disturbing as the monthly average cost of generation never rises above $63.80, yet the actual pool price rises from $46.46 in January to $189.91 in December.

### Electric Company’s Price per kWh If Natural Gas Price Increases Were The Only Price Driver

(Starting at the January 2000 Power Pool Price)

<table>
<thead>
<tr>
<th>Month</th>
<th>$kWh Pool Price</th>
<th>Price Based on Cost of Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(if all electrical production used only Natural Gas)</td>
</tr>
<tr>
<td>Jan</td>
<td>46.46</td>
<td>46.46</td>
</tr>
<tr>
<td>Feb</td>
<td>47.07</td>
<td>47.66</td>
</tr>
<tr>
<td>Mar</td>
<td>77.19</td>
<td>48.66</td>
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<tr>
<td>Apr</td>
<td>93.68</td>
<td>52.46</td>
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<tr>
<td>May</td>
<td>51.66</td>
<td>54.96</td>
</tr>
<tr>
<td>Jun</td>
<td>106.73</td>
<td>64.76</td>
</tr>
<tr>
<td>Jul</td>
<td>124.11</td>
<td>65.66</td>
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<tr>
<td>Aug</td>
<td>202.09</td>
<td>60.76</td>
</tr>
<tr>
<td>Sep</td>
<td>176.28</td>
<td>68.06</td>
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<tr>
<td>Oct</td>
<td>253.28</td>
<td>76.76</td>
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<tr>
<td>Nov</td>
<td>227.73</td>
<td>79.36</td>
</tr>
<tr>
<td>Dec</td>
<td>189.91</td>
<td>104.26</td>
</tr>
</tbody>
</table>

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43 RBC Dominion Securities, January 11, 2001: p. 3
44 RBC Dominion Securities, January 11th, 2001 p. 9
### Electric Company’s Price per MWh (Assuming 70% Coal & 30% Natural Gas)

(Starting at the January 2000 Power Pool Price)

<table>
<thead>
<tr>
<th>Month</th>
<th>$MWh Pool Price</th>
<th>$MWh @ Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>$46.46</td>
<td>$46.46</td>
</tr>
<tr>
<td>Feb</td>
<td>$47.07</td>
<td>$46.82</td>
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<td>$47.12</td>
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<td>Apr</td>
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<tr>
<td>May</td>
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<td>$49.01</td>
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<td>Jun</td>
<td>$106.73</td>
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<td>$55.55</td>
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<tr>
<td>Nov</td>
<td>$227.73</td>
<td>$56.33</td>
</tr>
<tr>
<td>Dec</td>
<td>$189.91</td>
<td>$63.80</td>
</tr>
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</table>

1. **Reasons behind soaring prices**

What is behind these large increases in electrical power costs? The answer is both political and market driven. There is certainly evidence to suggest that one of the factors is a problem of strong demand, and weakened supply. According to Optimum Energy Management Inc.’s *Alberta Electricity Update*, there is not one factor, but several factors explaining the rising price of electricity.

1. Demand has out-stripped supply since 1996, with supply additions barely keeping up with incremental load growth.
2. Reserve margins have therefore worsened. Where reserve margins were once 10% to 15% in 1996, they are now closer to 5% to 8% in 2000.
3. Average natural gas prices have gone up over 40% since 1999 and are almost 3 times as high as 1996 prices.
4. Electricity from the American Pacific Northwest has experienced similar price increases due to California’s tight fundamentals. This has resulted in lower, more expensive imports into Canada. Higher US prices have created higher demand for Canadian electricity, and hence, increased exports. These supply and demand changes all contribute to upward pressure on Canadian electricity prices.
5. Planned and unplanned outages cause volatility. [When a generating unit is shut down for scheduled maintenance, like replacing worn out parts, it cuts out that unit’s generating capacity. If another unit suddenly fails, there is an even larger loss of capacity to the integrated electrical system, which drives up prices since the same amount of demand chases less generating capacity.]

There are also political reasons behind the increases. The Klein government’s lack of details about deregulation seems to have scared away new investment in generating capacity, even though demand for electricity was growing.

1. Competition from U.S. markets also helps to drive up electricity prices. Alberta must now compete for imported electricity from B.C. with sales to California and the pacific northwest where electricity prices have skyrocketed. This has caused upward pressure on

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*Optimum Energy Management Inc., Alberta Electricity Update, Volume 1, Issue 1.*