

Attracting New Business to Calgary In a Restructured Energy Environment

A Background Analysis

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Given the current media attention paid to the provincial deregulation process in Alberta, it is apparent that the processes of determining appropriate policies and appropriate responses to policies have not been easy tasks for any of the players involved. With the restructuring of the industry, electricity prices have risen significantly, at least over the short-term. Predictions about long-term prices vary wildly. The result is an expensive and uncertain operating environment for many businesses in the city of Calgary. Calgary Inc., a municipal body formed to ensure the city's competitiveness, is not surprisingly concerned that these conditions will deter businesses from locating in Calgary.

The objective of this paper is to provide a broad, contextual background and process of the restructuring of the electricity industry, with the intention of identifying possible avenues for investigation into possible Calgary Inc. policies to mitigate the problem.

MAJOR PLAYERS IN PROCESS TO DATE

Given the importance of the supply of electricity to virtually all components of society and the complexity of the supply chain structure, there have been many players in the process to date. However, three players or groups have dominated the process leading towards the deregulation of the electrical industry in Alberta: (1) the provincial government of Alberta; (2) the three major utility companies in Alberta; and (3) consumer groups.

Provincial Government

The authority of the provincial government to legislate in respect of the provision of electrical services is found in s. 91(10) of the *Constitution Act*,¹ which gives the province

¹ *Constitution Act*, 1867. 30&31 Victoria, c.3. (U.K.).

jurisdiction over “local works and undertakings.” Within the provincial government, the Ministry of Resource Development (previously the Ministry of Energy) has guided the restructuring process. The Ministry of Resource Development includes both the governmental Department of Resource Development and the independent quasi-judicial Energy & Utilities Board (previously the Energy & Resources Conservation Board). Because of the cabinet-level political nature of the forces driving the deregulation process, as discussed below, this paper refers to the various players within the provincial government collectively, and assumes a common interest among them, unless specified otherwise.

Utility Companies

Unlike most other provinces, Alberta does not have a single, publicly owned electric utility. Instead, the Alberta industry includes a mix of investor-owned and municipally owned utility companies. Before deregulation, three utility companies generated over 90% of the electricity in Alberta: TransAlta Utilities Corporation (investor-owned), ATCO Electric (investor-owned) and Edmonton Power (municipally-owned).

Consumer Groups / Media

Although consumer groups have had very limited direct involvement in the restructuring of the industry, they clearly have a direct stake in the outcome. In the case of electricity, all Albertans and Albertan businesses are consumers. The member companies of the Industrial Power Consumers and Co-generators Association of Alberta (“IPCCA”), for example, consume 50% of the province’s power.² As a result, their public support of or opposition to the process should be relevant to government policy-makers. As the restructuring process has continued, media coverage has become increasingly intensive and critical, and has likely exerted influence on the policy process.

² Nikiforuk, A. 2001. “Power Trip.” *Report on Business Magazine*, March 2000 (vol. 17, no. 9) p. 40 at 44.

THE REGULATED ENVIRONMENT BEFORE RE-STRUCTURING

Before 1996, the electric industry in Alberta was heavily regulated by the provincial government. The three biggest utility companies supplied more than 90% of Alberta's electricity,³ and functioned as regulated monopolies to provide power to the province. Each of these companies were involved in each of the three stages of the electricity industry:

- (1) Generation – the production of power;
- (2) Transmission – the bulk movement of power around the province; and
- (3) Distribution – the local delivery of power to consumers.

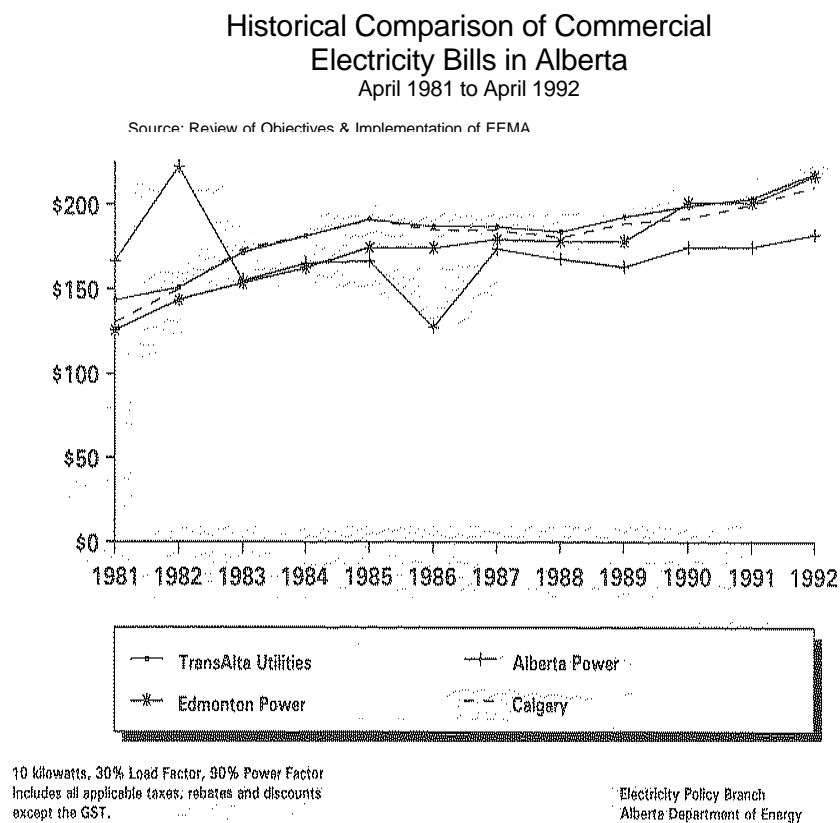
Each utility company was responsible by legislation for providing power to a particular area of the province. These service areas developed primarily because towns and villages (many of which already had generation and distribution facilities) wished to be connected to the transmission system. This prompted the utility company with the closest transmission facilities to provide service.⁴ Because of the legislation of service areas, customers were required to deal with the utility company responsible for their particular area to buy their power. Many cities and towns in Alberta own their own distribution systems; they bought power for their systems from the utility company that supplied power to their area. TransAlta supplied Calgary's power.

TransAlta built and owned its own power generation plants, but was required to apply to the provincial regulator, the Energy Resources Conservation Board ("ERCB"), for each approval to build its facilities. The ERCB was responsible for evaluating applications for new generating facilities, recommending when plants were needed and deciding which plants should be built if the utility companies filed competing applications. After generating the electricity, TransAlta then transmitted it to the City of Calgary's local transmission grid, and sold it to the City. The City of Calgary provided retail electricity services to consumers from its local transmission grid. Because there was no competition

³ Alberta Resource Development. 1999. "power of competition: A guide to Alberta's new competitive electric industry structure." Edmonton: Queen's Printer at 2.

⁴ Electric Energy Marketing Act Review Panel. 1992. "Review of Objectives and Implementation of the Electric Energy Marketing Act." Edmonton: Queens Printer at 6.

in the system, electricity rates were regulated. The Public Utilities Board (“PUB”) was responsible for the setting consumer rates of investor-owned utilities (TransAlta & Atco). Municipalities purchased electricity from these utilities at regulated wholesale rates (or produced their own, in the case of Edmonton Power) and were free to set retail rates for their own customers, on a non-profit, service provision basis. The system was designed to ensure that the utility companies were compensated for their costs and were able to earn a reasonable profit. It also kept a cap on the consumer price of electricity.⁵



Consumer power rates in the years before 1996 had increased steadily (see chart below). However, a 1992 report by the Alberta Electric Energy Marketing Act Review Panel predicted: “It is likely that Alberta rates will continue to compare favourably to rates

⁵ *Supra* note 3 at 2.

outside the province. TransAlta and Alberta Power forecasts indicate that rates in Alberta will, on average, decrease by 0.8% per year in real terms to the year 2000.”⁶

DRIVING FORCES OF DEREGULATION

The Alberta government considered that the traditional structure “worked reasonably well,” but it also had concerns about what it saw as shortcomings in the system:⁷

- High regulatory costs. Because utility companies could neither expand their generating capacity nor increase prices without regulatory approval, they tended to devote significant time and money towards regulatory hearings over these issues.
- Constrained adaptability. Because utility companies required regulatory approval to make significant changes, they were unable to respond to changes in market demand efficiently.
- Inhibition of new technology. The same regulatory restraints inhibited the introduction of newer or cleaner generation technology in Alberta. The utility companies had protected profits, and little incentive to make these changes.

These provincial government concerns were augmented by external factors. Beginning in the early 1990’s a number of nations began the restructuring of their electric industries based on the principles of market competition.⁸ Also, a number of American states were considering the enactment of restructuring legislation.⁹ The Alberta government was concerned that the province “risked falling behind. Alberta risked the erosion of its low-cost power advantage compared to other markets. Albertans faced a potential reduction in their ability to compete effectively for investment and jobs.”¹⁰ These concerns were held both at the bureaucratic and cabinet levels within the government. Although some have disagreed as to the validity or urgency of these concerns, the concerns all appear to

⁶ *Supra* note 4 at 9.

⁷ *Supra* note 3 at 2.

⁸ International Energy Agency. 1999. “Electricity Market Reform. An IEA Handbook.” Paris: OECD at 24.

⁹ Lackey, C. J. 1999. “Restructuring the Electric Industry.” Lexington: Council of State Governments at 5.

¹⁰ *Supra* note 3 at 2.

have some basis in a careful analysis of the shortcomings of the regulated system. However, it was only in concert with the ideological belief of the new Progressive Conservative Klein government in the early 1990's in the use of market mechanisms to provide services wherever possible in Alberta society, that these concerns led to the decision to restructure the electric industry. Because the primary driving force behind industry restructuring was political, rather than technical, subsequent technical attempts at restructuring were regularly interfered with politically. The result, as discussed below, has been policy instability and uncertainty.

However, the government was not alone in its support of restructuring. The utilities companies also supported restructuring, as it presented them with the opportunity to control their output and pricing more directly. Given their dominant positions in the market, the major utility companies were generally confident that industry restructuring would provide them with more growth opportunities than risks. Initially, many consumer groups in the province were also generally in favour of deregulation, and optimistic about the promise of lower power prices.¹¹

THE MECHANICS OF RESTRUCTURING

The Alberta government, with support from the utility companies, made an ideological commitment to deregulation in the early 1990's, but significant steps were not taken until 1995. Although the process of restructuring has been, and continues to be, complex, the provincial government has attempted to restructure effectively both the generation and distribution segments of the industry.

All observers agree that the transmission segment of the industry should remain regulated. Competition in transmission would require competing systems of capital intensive high-voltage electrical transmission lines across the province. As a result, transmission operates most efficiently as a natural monopoly, and therefore requires regulation.

¹¹ CBC Calgary. 2001. "The Road to Deregulation" <www.calgary.cbc.ca/deregulation/.story1.html>.

THE PROCESS OF DEREGULATION

	Pre-1995	Electric Utilities Act 1996	Electric Utilities Amendment Act 1998
GENERATION Power Production	Regulated	Deregulated	_____
TRANSMISSION Bulk Movement of Power around Province	Regulated	_____	_____
DISTRIBUTION Local Delivery of Power to Consumers	Regulated	Regulated	Deregulated

Energy Utilities Act, 1995

The first formal step in the restructuring process was the enactment of the *Electric Utilities Act*¹² in 1995, which came into force on January 1, 1996 and formalized government restructuring policy, primarily with respect to the generation segment of the market. The four key purposes of the Act, found at s. 6, were:

- To establish an efficient market for generation based on fair and open competition.
- To ensure that the benefits and costs associated with existing regulated plants continued to be shared equitably by existing and future customers.
- To ensure that investment in new generation was guided by market forces.
- Where regulation was still necessary, to minimize its cost and provide incentives for efficiency.

The EUA provided for the establishment of the Alberta Power Pool through which electric energy is traded in the province. As the first legislative step in the process, it

¹² S.A. 1995, c. E-5.5.

introduced the formal structure for the industry and market. However, it left many implementation details outstanding.

Alberta Power Pool

The Power Pool is the actual trading market in which power suppliers sell electricity to purchasers. In its basic function, it is similar in many ways to other commodity markets. The laws of supply and demand drive changes in the price of electricity just as they do in other commodity markets. One task of the pool is to manage the "bid-offer" process, through which electricity purchasers and electricity suppliers participate in the market, in a way that ensures equally-priced supply for all consumers buying from the pool.

Power suppliers each offer certain amounts of power to the Pool at certain prices, for each hour of the following day. Buyers enter bids to buy a certain amount of power at a certain price for the times they wish to purchase it on the following day. From this information, the Power Pool administrator determines the amount of power that will be needed for the next day, on an hourly basis, and sets hourly market prices for the following day. The demand is filled first using the cheapest electricity offered by the generators, with more expensive supplies to be used only as demand rises. The actual price may vary hundreds of times an hour, but the Power Pool administrator declares a single average price for each hour which takes into account the most expensive electricity that was needed to completely meet demand in that hour. Every buyer requesting electricity from the Power Pool pays that price and all suppliers whose product was used to meet load demands in that hour receive it.¹³

Very large industrial consumers may be able to take advantage of varying prices by buying directly from the pool rather than from retailers if they can use more electricity when prices are low and limit their consumption when prices are high. Small consumers may eventually be able to opt for this real-time pricing, but for them, the effort and inconvenience would likely far outweigh the potential cost savings.¹⁴

¹³ *Supra* note 3 at 15.

¹⁴ Leslie-Spinks, A. (Enmax Corporation). 2001. "Questions and Answers on The Power Pool of Alberta," <<http://www.elecleague.ab.ca/aelmain.htm>> February 22, 2001.

Electric Utilities Amendment Act, 1998

The 1998 amendments to the 1995 Act took several more steps towards restructuring. First, the amendments helped to set out a number of the details surrounding the implementation of deregulation. This included the formal recognition of Power Purchase Agreements (discussed below) to work towards the actual restructuring of the industry. Also, the amendments provided for the deregulation of the distribution segment of the industry, introducing the policy of consumer choice of supplier.¹⁵

Power Purchase Arrangements

Although the Power Pool provided a mechanism for competition in the industry, further steps were necessary to restructure the industry. With only three utility companies accounting for over 90% of all generation in the province, no true competition could be possible despite the formal legislative changes made to the system. The market power of the existing utility companies would effectively control the market. In this situation, there would be a risk that the market price would be controlled by the wishes of the three utility companies rather than by open competition.

In other jurisdictions, such as The U.K. and Australia, governments had introduced competition into their systems by breaking up state owned utilities. With advice from deregulation consultants, the Alberta government chose a different approach, and presented it as a “made-in Alberta plan.”¹⁶

To attempt to mitigate the potential market power of the existing generators, the provincial government introduced plans to transfer to third-party electricity “marketers” the rights to offer output into the Power Pool from existing generating facilities and to receive the revenues from the Power Pool for doing so. The transfers occurred by way of long-term “Power Purchase Arrangements” (“PPA’s”) between the marketers and the owners of the regulated generating facilities. Under the terms of the PPA’s, energy

¹⁵ Alberta Resource Development. 1998. “Backgrounder on the Electric Utilities Amendment Act.” Edmonton: Queen’s Printer.

¹⁶ *Supra* note 2 at 44.

marketers have guaranteed access for 20 years to certain portions of output from generating plants, which they then offer into the Power Pool at the times and rates they choose. The marketer of a particular portion of output from a facility is required to pay the owner of the generating facility (one of the existing utility companies) its costs (fixed and variable), including a reasonable return on assets. The three utility companies continue to own and operate the generating facilities themselves.¹⁷ In other words, “generators ... still own the car, but [marketers] ... tell them when and where to drive it.”

The PPA’s were distributed to marketers through an auction process administered by the Alberta government in August & December 2000, and formally set out in the *Power Purchase Arrangement Auction Regulation*.¹⁸ Under the auction process, marketers were to bid on PPA’s, with accepted auction bids flowing to a financial account called the Balancing Pool. Any surplus in the Balancing Pool was to be transferred to consumers through a rate reduction or levy.¹⁹ To ensure that unacceptably low bids would not be successful, s.3(1) of the Regulation authorized the Alberta Minister of Energy to set reserve prices to determine the lowest price at which each PPA could be sold at the auction. The Regulation, at s.10, also allowed the Minister to deem any bid tendered unacceptable, without explanation.

Despite such procedural safeguards, “the government set no goal for how much it hoped to fetch.”²⁰ However, consumer groups estimated that to be successful, the auctions would need to raise at least \$3 billion, and introduce 7-10 new competitors.²¹ The two PPA auctions resulted in only \$2.1 billion dollars flowing into the Balancing Pool.²² Although 40 companies expressed interest in the process, the August 2000 auction resulted in only five buyers. Two of the buyers, Enmax & Epcor, purchased the majority

¹⁷ Alberta Energy & Utilities Board. 1999. “Board Review of the Independent Assessment Team’s Report on Power Purchase Arrangements and Other Determinations.” Decision U99073, File 5608-1, Proceeding No. 990277 at 2.

¹⁸ Alberta Regulation No. 85/2000.

¹⁹ *Supra* note 17.

²⁰ *Supra* note 2 at 46.

²¹ *Ibid.*

²² Alberta Resource Development. News Releases, August 24, 2000 & December 6, 2000. <www.resdev.gov.ab.ca/room/updates/nrelease/20000824.htm> & <[20001206.htm](http://www.resdev.gov.ab.ca/room/updates/nrelease/20001206.htm)>.

of capacity auctioned.²³ In the December auction, a number of bidders were successful, although many of the purchasers were very large corporations buying electricity directly rather than risking the prospect of purchasing from marketers in the restructured environment.²⁴ Because the auction process raised lower than expected funds, and failed to introduce a large number of competitors into the market, it has widely been considered unsuccessful. “Every major industrial and consumer group in the province declared the PPA [process] a failure.”²⁵ The government has responded to these claims by stating that if the bids had been higher, “consumers would have had to pay more in electricity rates to allow the bidders to recover their investments.”²⁶

Consumer Choice

The 1998 amendments to the EUA also provided for customer choice by restructuring the distribution segment of the industry. Section 31.992(1) of the Act allows licensed electricity retailers to bid for energy from the Power Pool and offer services to customers. The move to full consumer choice is being introduced over time, starting in 1999 with major electrical consumers. Industrial and commercial consumers with an annual electricity consumption of less than 250,000-kilowatt hours (kWh) have been subject to the retail market from January 2001.

For a three-year period until the end of 2003, these ‘small’ industrial and commercial consumers will have the option of:

- Continuing with their current service provider and receiving a regulated stable rate; or
- Making new arrangements with another electricity retailer.²⁷

²³ *Supra* note 2 at 46.

²⁴ *Supra* note 2 at 112.

²⁵ *Supra* note 2 at 46.

²⁶ *Supra* note 23.

²⁷ *Supra* note 15.

The regulated stable rate for 2001 is set at 11 cents per kilowatt-hour, up from approximately 5 cents before restructuring.²⁸ Major industrial and commercial consumers do not have the option of choosing the regulated stable rate, and must either:

- choose an electricity retailer;
- purchase power directly from the Power Pool at spot market prices; or
- contract directly with a non-utility power generator.²⁹

“Only Hawaii and California now have higher industrial electricity rates than Alberta.”³⁰

Municipal Retailers

Pursuant to the scheme set out under the Act, municipalities are free to participate in the market as retail electrical service providers. However, in the case of municipalities that also own local electrical distribution systems, their retail operations must be established as arms-length affiliates.³¹ Also, because municipalities are exempt from taxation, their retail operations are required to pay an equivalent amount in lieu of taxation into a fund to be distributed amongst consumers in the province. Although the Act addresses some of the legal details involved in the necessary arms-length relationship, more operational details of municipal retailers are uncertain. Further investigation in this area may be relevant.

TODAY’S REALITY

Increasing Costs & Policy Uncertainty

With provincial government legislation formalizing provincial policy in force, the fundamentals of the restructuring of the industry are already largely in place. However, since the establishment of the Power Pool in 1996, and particularly since early 2000, the cost of power at the power pool has risen significantly, from among the lowest of any

²⁸ Alberta Resource Development. 2001. <www.customerchoice.gov.ab.ca/elect/rroqa.html#whattrate>.

²⁹ *Supra* note 3 at 16.

³⁰ *Supra* note 2 at 43.

³¹ *Supra* note 3 at 13.

North American jurisdiction to the third highest, lower than costs in California and Hawaii only.³²

The cost of power has risen in part as a result of the market dynamics put into play: demand for electricity has risen as Alberta has grown, but supply has not increased. Although the large utility companies were in support of the restructuring process initially, they have grown increasingly concerned with the provincial government's management of the process. In the face of what they see as policy uncertainty, they have refrained from investing in new generation facilities.³³ "When the government appears to be developing policy on the fly, investors hang onto their dollars."³⁴ In other words, the current problem with the restructured industry is a supply-side problem. With more supply and more suppliers, many say the structure would be more viable.

Electrical Industry and Government Responses

The industry has announced new generating capacity totalling approximately 1055 megawatts, to come on line before the end of 2002. This compares with a total power supply for the province in 2000 of approximately 11,000 megawatts.³⁵ The official government position is that increases in supply in the next several years, and over the long term, will both bring down and stabilize consumer prices. However, many observers disagree. According to some critics, only a fraction of the new generating capacity announced will ever be built. "To a certain extent, those announcements were made to deliberately bail the government out of an uncomfortable situation," by existing power generators enjoying the current high prices.³⁶ Also, even given all announced new capacity coming online, critics argue that because of the failure of the PPA process, there is insufficient competition in the generating & supply segment of the industry to provide incentives for producers and suppliers to offer significantly lower prices into the Power Pool.

³² *Supra* note 2 at 46.

³³ *Ibid.* at 44.

³⁴ *Ibid.*

³⁵ Alberta Resource Development. 2001. <www.resdev.gov.ab.ca/keyfigures.htm>.

³⁶ *Supra* note 12.

Although the provincial government continues to insist that the deregulation process will end in success, it has introduced a number of consumer rebates and consumer protection devices to shield consumers from the current price volatility. Ironically, the result is not a truly deregulated system, but a differently regulated system with higher prices for consumers.

VISION FOR THE FUTURE

With these difficulties, the concern of Calgary Inc. that businesses considering locating in Calgary may be scared away because of the deregulation issue becomes obvious. Ideally, Calgary Inc. (and consumers across the province) would like to see an environment in which:

- electrical prices are competitive with those in neighbouring jurisdictions in Canada and the United States;
- electrical prices are relatively stable and predictable, both in the short-term and the longer-term;
- relevant provincial policies are prepared in consultation with stakeholders, announced in advance and implemented carefully; and
- the public and media perception of the electricity industry is more positive and confident.

POSSIBILITIES FOR CALGARY INC.

Because of the provincial jurisdiction over the electrical industry, Calgary Inc.'s ability to directly affect the restructuring process is extremely limited. Also, given Calgary Inc.'s municipal nature, as a creation of the City of Calgary, it is likely under significant financial limitations.

However, given Calgary Inc.'s:

- recognition of the challenges it faces over the issue,

- “Community Strategy for Sustainable Prosperity”;³⁷ and
- The objectives of its strategy, including the objective “to attract investment, financial capital and multinational corporations,”³⁸

it is relatively well-placed in terms of municipal-level agencies to address the issues surrounding the restructuring of the electricity industry.

The scope of this paper does not extend to the proposal or specific analysis of specific policies to address the problems outlined. However, this paper’s analysis of the development of restructuring policy has presented a number of possible areas to be investigated in search of policy opportunities. A few of these include:

- Municipal energy retailing;
- Management of public perception; and
- Policies adopted in other jurisdictions that have undergone electricity industry restructuring.

The following paper will investigate these areas, and any other relevant possibilities, and develop and assess relevant policy options for Calgary Inc.

³⁷ Calgary Inc. 2000. “Community Strategy for Sustainable Prosperity.”

³⁸ *Ibid.* at 17.

ELECTRICITY INDUSTRY RESTRUCTURING & ITS IMPLICATIONS FOR CALGARY'S COMPETITIVENESS

EVIDENCE FROM CALIFORNIA

The restructuring of the electricity industry in Alberta has led to higher electricity prices and uncertainty for Alberta electricity consumers. The preceding paper described the history and progression of provincial restructuring policy and process. In short, the restructuring process to date has brought electricity price increases for consumers due to a lack of electricity supply to meet growing Alberta energy demands. Further, there exists significant uncertainty and disagreement regarding the future direction of electricity prices in the province. Although significant new generating capacity has been formally announced to reduce the supply crunch, some observers remain concerned that prices will stay high because of a lack of significant market competition. This situation contributes to an operating environment that is clearly less than ideal for industry. Higher electricity costs impact the financial bottom-line, and uncertainty regarding future costs makes effective business planning difficult. The situation directly influences Calgary Inc.'s goal to "position Calgary to compete in the new economy" and to "attract investment, financial capital and multinational corporations." (Calgary Inc. 2000, p.17).

The basic objective of this paper, discussed more fully below, is to sketch out the potential consequences of increased electricity prices and price volatility to industry in Calgary and to Calgary's ability to attract and retain new businesses and industry. Calgary Inc. has adopted a strategy of promoting specific industry clusters (Calgary Inc., p. 20). The Information and Communications Technologies (ICT) and Logistics cluster is identified as a cluster whose further development will be supported by Calgary Inc. (Calgary Inc., p. 21). To provide a more specific context for the potential impacts of restructuring in Alberta, this paper will briefly discuss the potential impacts of the restructuring process on this industry cluster.

However, given the complexity involved with the restructuring of the Alberta electricity industry, attempting to predict the outcome and its impact on Calgary's competitiveness

in attracting and retaining new business and industry is little more than speculation. Only those ‘experts’ with a clear political agenda tend to hold decisive opinions about the success or looming failure of the process. More impartial observers tend to argue that the process has been flawed, but that the outcome is still uncertain. Because of these limitations, further useful prognostication regarding the situation faced by Alberta industries is difficult, and research into potential solutions for industry is premature. This paper assumes that prices will remain volatile and generally high, at least for the next several years. If this assumption proves incorrect, and the provincial government’s stated belief that prices will come down quickly is correct, then Calgary’s competitiveness will not suffer beyond the short term.

Assuming that volatile and generally high prices will continue, a potential source of insight into Alberta’s electricity future may be the state of the restructuring process in another jurisdiction that is further into the process. A look at another jurisdiction that has undergone restructuring may provide a real example of some of the potential issues faced by Alberta commercial consumers in the future, and some indication of how industry will react to uncertainty and price volatility.

ALBERTA & CALIFORNIA

Although various jurisdictions have restructured electricity industries, this paper will briefly examine the restructuring process in California. Through the examination, this paper will:

1. Assess the value of comparisons between the Alberta and California processes, through an examination of differences and similarities between the two processes; and
2. Provide a brief examination of some of the impacts of the California restructuring process to industry, and the high-tech industry in particular.

Alberta has been at the front of the deregulation process amongst Canadian provinces, but California is further along in the process of electricity industry restructuring than Alberta. Although the state's restructuring process formally began in 1996, around the same time the Alberta process was started, it has moved more rapidly, and is at a more advanced state. The situation in California is not identical to the Alberta situation, but it has been chosen by this paper due to a number of broad similarities between the structures of the two processes (more fully described in the following section):

- Before restructuring, California's electricity industry had a broadly similar structure, with several large, investor-owned utilities involved in generating, transmitting and distributing power.
- The restructuring process involved the creation of an electricity market, the divestment of control over generation from the utilities to new generating companies and the divestment of transmission from the utilities to an independent, regulated transmission grid operator.
- Due to rapid economic expansion, demand for electricity in California grew steadily throughout the restructuring process. At the same time, because of uncertainty and potential risk, new electricity supply was not sufficient to meet demand.

Roots of the California Restructuring Process

Before restructuring, the California electricity industry was broadly similar to the Alberta industry. Several major, investor-owned utilities controlled the generation, transmission & distribution of electricity within most of the state (several cities, including Los Angeles, own their power systems and have been excluded from the industry restructuring). These utilities each supplied electricity to a specific geographic area within the state. A state utilities commission regulated electricity rates. Investment in further generating capacity by utilities required approval by the state utilities commission (Vogel 2000).

The roots of the restructuring debate in California date from 1994. The state economy was emerging from a difficult period of economic recession. At the same time, its average electricity rates in the regulated environment were amongst the highest in the United States (Vogel 2000). These high electricity rates were the result of two basic factors. First, enormous capital cost overruns in the construction of several major nuclear generating plants by utility companies were passed on to consumers by state regulators. Second, utilities were required by federal legislation from the 1970's to purchase a portion of their energy from these alternative energy source generators. Because state regulators set extremely high prices for the purchase of electricity by utilities from alternative source generators (such as wind & solar power producers), due to a miscalculation of future petroleum market prices, by 1994 the utilities were locked into long-term purchase contracts for 'green' energy at prices far above the cost of conventional energy generation. Again, these high costs were passed on to consumers by regulators (Vogel 2000).

Major industrial power consumers in the states were threatening to relocate away from California. Given the economic difficulties the state had recently felt, these threats created significant pressure on the state government. After further lobbying by the state's major industrial power users, an agreement was reached between the state government, major industrial power consumers, independent power producers and Southern California Edison (a major California utility) to support an independent power market. According to the then-deputy chief of staff of the state governor, "It was not ideology that persuaded us to go to deregulation. It was an assessment of what was going on." (Vogel 2000)

The agreement led to a formal decision in December 1995 by the state utilities board to attempt to make the electricity industry competitive. On September 23, 1996, the state legislature enacted the *Electric Utility Industry Restructuring Act* to modify the board's restructuring model and to ensure that the process would not be reversed (Lackey 1999).

The California Deregulation Process

Although the deregulation process in California has been different from the Alberta process in several important ways, the major steps in the process have been comparable and the envisioned result is essentially the same. The 1996 California law established the Power Exchange, a power price setting mechanism broadly analogous to Alberta's Power Pool. The law also opened up the electricity-generating market, encouraging commercial utilities to sell non-nuclear power plants in California to other companies. Instead of owning power plants, utilities would buy power from producers presumably vying to be their suppliers (Monmaney 2001). To initiate this process, starting in March 1998, generating facilities were auctioned off under a process comparable to Alberta's Power Purchase Arrangements auction.

With these structural changes made, the law allowed consumers to choose whether the utility responsible for their area would provide them with electricity, or whether a new electricity retailer would, beginning on March 31, 2001. It also allowed new retailers to purchase power from generators, either through the Power Exchange or directly from generators through long-term contracts, and sell to consumers. "The notion was that these new companies would absorb the risk of volatile electricity prices, giving customers stable rates. And they would keep prices low by competing among themselves." (Vogel 2000) The law also included a 10% rate reduction and a rate freeze until March 31, 2002 or until the utilities paid off their stranded costs (whichever came first). Ultimately, the drafters of the legislation envisioned a system in which the large investor-owned utilities, that once controlled electricity from its generation through to its supply to individual customers, would be reduced to operating the regulated transmission segment of the industry. However, competition at the retail level has not developed to the extent the California policy-makers envisioned. Although many potential retailers showed interest in the system, as of December 2000 only 10 retailers were offering customers electricity (Vogel 2000). These retailers constituted a small segment of the retail market: only 2% of homeowners in California had changed from their original utility electricity supplier to a retailer; 13% of large industrial electricity users switched to a retailer (Vogel 2000).

Competition at the retail level may not be successful, but competition in the industry definitely occurs. Instead of electricity generators competing to supply the utilities and utilities competing with retailers to supply customers (as was envisioned), utilities have been forced to compete for increasingly scarce power. “Spot wholesale electricity prices at peak summer demand rose from \$49.56 a megawatt-hour in 1999 to \$522.55 in 2000. The average wholesale electricity price has risen tenfold.” (Monmaney 2001) This scarcity has meant that no utilities or retailers have been successful in providing power at lower costs to consumers. Instead, California electricity consumers are faced with much higher retail costs. The rates freeze and 10% rate reduction has insulated many consumers from these rising costs. This rate freeze is in effect until March 31, 2002 unless utilities can pay off the “stranded costs” they incurred in building their (mostly nuclear) power generating facilities earlier. Stranded costs are infrastructure investments made by utilities, including major power generation stations, in order to meet the state regulator’s requirement that they provide sufficient electricity to meet California's demand. “These investments were financed by the utilities, based on the assurance that repayment of the debt could be made through future electricity sales. In the restructured market, some of these power plant assets may become stranded; that is, they won't be able to operate competitively in the new market place.” (California Energy Commission 1998, p. 13)

San Diego Gas & Electric retired its stranded costs debts early and became the nation's first utility to offer customers in its geographic area free market rates in 1999. At first, the rates were low. During the summer of 2000, however, rates tripled and consumers were furious. The California governor intervened to temporarily limit the utility's rates to 6.5 cents per kilowatt-hour, down from 21.4 cents. The other two major investor-owned utilities, Pacific Gas & Electric and Southern California Edison, have not yet paid off their stranded costs. As a result, they are not yet eligible to raise rates, and have had to absorb the extremely high market prices of electricity. Those two utilities, which serve 24 million people, state that since May, they have spent \$11 billion more buying electricity than they have been allowed to charge customers (Monmaney 2001). These utilities warn that this debt will inevitably be passed on to consumers, who will then face similar issues to those faced in San Diego. Because of their financial deficits, utilities have not been

paying alternative electricity generators, citing their inability to do so. As a result, some of these generators have shut down, or refused to sell to the California utilities – causing a further tightening of supply (S.D. Union-Tribune 2001).

In mid January 2001, the California Power Exchange itself filed for protection against its creditors and halted operations, as a result of the failure of utilities to pay in full for power purchased through the exchange. Since then, the state's Department of Water Resources has taken over the job of buying electricity on behalf of PG&E Corp.'s Pacific Gas and Electric unit and Edison International's Southern California Edison. The state has been spending about \$1.5 billion a month (S.D. Union-Tribune 2001). In late March 2001 the California Public Utilities Board approved a rate increase in an attempt to prevent the utilities from declaring bankruptcy (S.D. Union-Tribune 2001).

The process in California has been universally recognized as a failure (The Economist, p.12). As in Alberta, growing demand has not been met with an increase in supply. However, the supply shortage has been aggravated by the utilities' failure to pay for power supplied by alternative energy generators and power importers, resulting in a number of electricity sources becoming unavailable. This situation, significantly more critical than that in Alberta, has resulted not only in price increases and price volatility, but also in recurring blackouts to portions of the state. These blackouts are necessary to maintain the integrity of the transmission grid, but have been extremely disruptive to California industries, including the high-tech and ICT industries.

Industry Reactions to Restructuring in California

To measure the level of disruption caused by high prices and blackout, the National Federation of Independent Business, an advocacy group for small business, conducted a survey of 523 businesses from around California in February 2001 (Mason-Dixon 2001). The survey was one of the first to attempt to gauge the toll on business from the electricity crisis (Brooks 2001). The survey found that approximately 43% of respondents agreed that the electricity crisis had changed their view of California as a place to do business, and nearly 71% said it had shaken their confidence in the state's political and business leadership. Regarding prices, about 31% of respondents had plans

to postpone or reduce further investment in their businesses, while 43% expected lower business earnings because of the increased earnings. Regarding electricity blackouts, about one-third of respondents said they lost sales, nearly 21% said materials were damaged or destroyed, and nearly 40% had to absorb wage costs for work not done because of the blackouts (Mason-Dixon 2001).

The survey clearly shows that the California restructuring process has been confusing, expensive and disruptive for independent businesses, and a small but significant number of them are seriously considering relocation outside of the state. About 18% of the respondents stated that they have taken steps to explore the possibility of moving their companies to another state. According to the NFIB, this number is not higher because many of the businesses surveyed “don't have the option of moving to Texas or Colorado” in search of cheaper or more reliable power. “A lot of them are family owned and minority owned . . . and they want to do business in California.” (Brooks 2001) At the same time, the NFIB says the survey “showed [business owners are] very uncertain about the impact on their business once the dust settles.” (Chan 2001)

This survey provides a useful start in determining reaction in the California small and independent business community to restructuring. However, a more specific look at some of the impacts the process has had on the ICT and high-tech industries in California may also be useful.

The California ICT and High-Tech Sector

High electricity costs and blackouts have affected different segments of the California ICT sector in different ways and to different degrees. Although estimates vary as to the exact amount of electricity consumed by the California high-tech industry, it is clear that electricity blackouts are a major problem for the industry. “Without safe, dependable power, Silicon Valley – and the entire high-tech economy – would collapse. A power outage spells dot-com Armageddon.” (McKenna 2001) The manufacturing sector of the high-tech industry is particularly power sensitive, although most California high-tech companies have manufacturing operations spread throughout numerous jurisdictions. As

a result, the restructuring process has not been especially difficult for manufacturers with headquarters in California and operations elsewhere, even though the manufacturing operations themselves are highly sensitive to electricity price and stability (Reuters 2001).

Another sector of the industry that is power sensitive, and also power intensive, is the 'server farm' (McKenna 2001). These server farms support the Internet – the data and voice traffic that is created by the vast network of personal electronic equipment, from cell-phones to PC's, and they are very electricity intensive. A typical server farm requires about 10 to 60 megawatts of power. The largest server farms require up to 100 megawatts, about "equal to what a city of 100,000 people needs" (McKenna 2001). Although these server farms are found in a growing number of cities throughout the world, they are easily relocated. A simple server farm can be built in about 2 months (McKenna 2001). In California, large numbers have been built. As a result, "energy demand in Silicon Valley grew by as much as 12 per cent last year, compared with less than 3 per cent for all of California." (McKenna 2001). With the uncertainty caused by restructuring, some high-tech companies have looked into the possibility of moving server-farms and operations to jurisdictions with more abundant and cheaper electricity. (McKenna 2001).

Aside from manufacturing and server-farms, high-tech companies in Silicon Valley mostly use electricity "for the same purposes as lower-tech ones: lighting, heating and air-conditioning and running computers. To be sure, some high-tech firms do use a bit more juice than other companies, because of the large number of powerful computer servers they have to run their networks, store data and the like." (Reuters 2001).

CALIFORNIA & ALBERTA: SIMILARITIES AND DIFFERENCES

As discussed above, the basic structures of the restructuring processes in Alberta and California have been similar. Some observers have stated that the similarities are

sufficient to use California as a model for Alberta's future (CBC 2001). However, there are some significant differences between the two processes also.

First, although both jurisdictions suffer from a supply crunch, evidence indicates that Alberta will be able to ease the shortage more quickly and easily than California. In Alberta, major new generating plants, providing approximately 1000 megawatts of power, are expected to come on-line within the next 2 years (Alberta Resource Development 2001). In California, new supply is much more difficult to come by. California residents have blocked several plans to build new generating plants, and some now say that California has gone "BANANAS (build absolutely nothing anywhere near anybody)." (Economist 2001, p.12). Also, California utilities have faced enormous financial deficits from buying electricity at high market prices and being legislatively forced to sell the same electricity at much lower, capped rates. These deficits have created debts that could distort the California electricity market for some time to come. In Alberta, the provincial government has temporarily capped rates for residential and small business consumers also. Upon first announcing the caps in December 2000, the CEO of Epcor stated that the move "would cost power companies nearly a billion dollars, given production costs." (Nikiforuk 2001, p. 112). As a result, the provincial government raised the level of capped rates. Utilities in Alberta are not facing bankruptcy, and power suppliers are being paid in full. Because of these critical differences between California and Alberta, this paper concludes that power blackouts on the scale of those faced by California are less likely to occur in Alberta. However, many commentators continue to believe that the situation in Alberta will "get worse before [it gets] better." (Nikiforuk 2001, p. 113).

POLICY IMPLICATIONS

Because of the uncertainty that exists in Alberta regarding the future implications of electricity industry restructuring, selecting and evaluating specific policy instruments is problematic. Calgary Inc. has already defined its broad goal to position Calgary to compete in the new economy. However, determining specific objectives to pursue this

goal with respect to the electricity industry restructuring process would involve speculation in the face of significant uncertainty. Calgary Inc. cannot yet know the exact nature of the problem it may face (although this paper has attempted to begin to map out some of the potential problems). Potential objectives for Calgary Inc. to ensure its goal of competitiveness in the context of restructuring might include:

- To ensure that existing and prospective Calgary businesses understand and are able to plan for the electricity retail market;
- To ensure that existing and prospective Calgary businesses are aware of all of the city's competitive advantages, beyond the restructuring issue;
- To seek to attract businesses that are not energy intensive or energy sensitive; and
- To seek to minimize, or eliminate, electricity costs of Calgary businesses above the costs in competing jurisdictions or regions.

These objectives are necessarily reactive rather than proactive due to the jurisdictional constraints discussed in the previous paper. Although this paper has provided an initial list of potential objectives, the current uncertainty and volatility makes the implementation of some of the objectives through specific policy initiatives premature. However, regardless of the future of restructuring, the first two objectives can be pursued confidently; they will be relevant in any future scenario unless the provincial government abandons the restructuring process – a highly unlikely prospect.

Appropriate policies to address the first objective should involve Calgary Inc. as a source of information regarding the retail electricity market or as an agency to connect retail market information consumers (Calgary businesses) with retail market information experts. Policy tools involving more direct or substantial involvement by Calgary Inc. would be inappropriate and impossible given the limited jurisdiction of Calgary Inc. An appropriate policy to address the second objective would likely involve Calgary Inc. directly, given the objective's alignment with Calgary Inc.'s goals and other objectives.

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