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# Canadian Electricity Deregulation

**No Need To Fear California-Style Disaster**

## Pipelines & Utilities

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*All figures in Canadian dollars, unless otherwise stated.*

## Investment Conclusion

- We believe the deregulation disaster that has occurred in California is highly unlikely to occur in Canadian jurisdictions. Similar conditions to California are not present in Alberta or Ontario. In contrast to California, electricity market conditions in Ontario suggest that deregulation will deliver benefits to consumers, companies in the Canadian energy business, and the economy as a whole.

- Skyrocketing power prices, the specter of rolling blackouts, and the potential bankruptcy of two large and supposedly low-risk utility companies are ample evidence of an electricity market gone dismally wrong. Some see California's problems as an indictment of deregulation. As a result, some politicians and customers in other regions are becoming nervous about pursuing deregulation in their jurisdictions. We would argue that California's experience is the result of a combination of unique factors, including strong demand growth, rising natural gas prices, the failure to develop adequate in-region supply, and a flawed approach to deregulation.

- There are some parallels to California, which will cause prices in Alberta to remain elevated for a period of time, but these prices should abate as existing plants come back into service and new plants under development come on line for the first time. No new generation was built in Alberta during the early 1990s, partly due to the initial uncertainty regarding the design of the province's deregulation. An important reason for the confidence that emerged among generation investors in Alberta is the province's practice of protecting residential and small commercial customers, without distorting prices and inhibiting the development of an efficient market. A related reason is that the province and regulators have signalled their intention to allow companies to pass their costs of power through to customers.

- Ontario's situation is different from California's in several key respects. Demand growth, while steady, is expected to be moderate over the next decade. Ontario also has a large supply of domestic electricity, which is easily sufficient to meet growing demand, without relying on neighbouring jurisdictions. Ontario's power prices are not susceptible to rising natural gas prices like California's. Finally, Ontario's deregulation model is favourable to new power investment, and does not create the type of wedge between wholesale power costs and retail prices that have jeopardized California's distribution utilities.

- On this basis, we believe that the approach to deregulation being pursued in both Ontario and Alberta will ultimately lead to the intended benefits of customer choice, as well as a more responsive and efficient electricity industry. A lengthy delay in market opening could be a threat to the success of deregulation in Ontario. Delay could create uncertainty and impede new investment. Even with modest demand growth, new generation will ultimately be required to contain prices.

- Power deregulation has worked in other jurisdictions, such as the Eastern U.S. (Pennsylvania, New Jersey), the U.K., Australia and Scandinavia. We are of the view that conditions are right for successful deregulation in Ontario and Alberta, as well.

## What Went Wrong In California

### Demand Growth

Power demand growth in California has contributed to the electricity crisis. Annual power demand growth rates in California were relatively modest in the 1990s, but have nonetheless been problematic in the context of the near total absence of new power generation over the same period. In addition, extremely warm weather in the summer of 2000 led to peak loads that were far higher than peak loads experienced in 1999.

In line with economic growth trends, power demand in California grew at an average annual rate of 3.2% in the 1980s, and only 0.9% in the 1990s.[1] While recent growth seems modest, the compound effect of this growth has resulted in a large cumulative increase in electricity demand. Statewide demand has grown by over 50% since 1980, and little or no new power generation has been added in the last 15 years.

Even more concerning than the growth in aggregate demand is the growth in peak demand. Increases in peak power demand have been much more extreme than annual average increases. Due to warm weather, peak loads in May 2000 were 21% higher than they were in 1999.[2] In June, average loads were 13% higher in 2000 than they were in 1999.[3] In the absence of growth in supply, a region with a high proportion of weather-sensitive load becomes increasingly vulnerable to price variability as its base load builds.

### Supply Squeeze

Despite the compound growth in demand, almost no new generation has been added in California in the last 15 years. In addition to stringent environmental regulations and the "nimby" (not in my back yard) syndrome, the process of deregulation itself (see later in the report) discouraged the construction of new plants. This lack of new capacity has been exacerbated by low water levels, which have reduced hydro-electric production, and emission caps, which have limited the output from fossil-fired plants.

1 Figures are slightly understated, as data excludes 1999 and 2000, a period in which demand was projected to grow by about 2.2% per annum. Demand growth has been in line with population growth of about 1.5% annually over the past decade. Data on California power demand derived from Staff Report of the California Energy Commission: *California Energy Demand 2000 – 2010"*, June, 2000.

2 California Independent System Operator: *"Report on California Energy Market Issues and Performance: May-June, 2000"*, August 10, 2000.

3 Data are for the California ISO region, which includes about 85% of electricity demand in California.

The continued growth in power demand and supply squeeze have combined to produce the current California power shortage. The shortage has been evidenced in recent weeks by rolling blackouts ordered by the California Independent System Operator. In the region controlled by the Independent System Operator (encompassing about 85% of total state power demand), there is about a 20% chance (depending on weather) that total in-state power and imports combined will be insufficient to meet peak demand.[4] In short, there is currently no supply cushion in California.

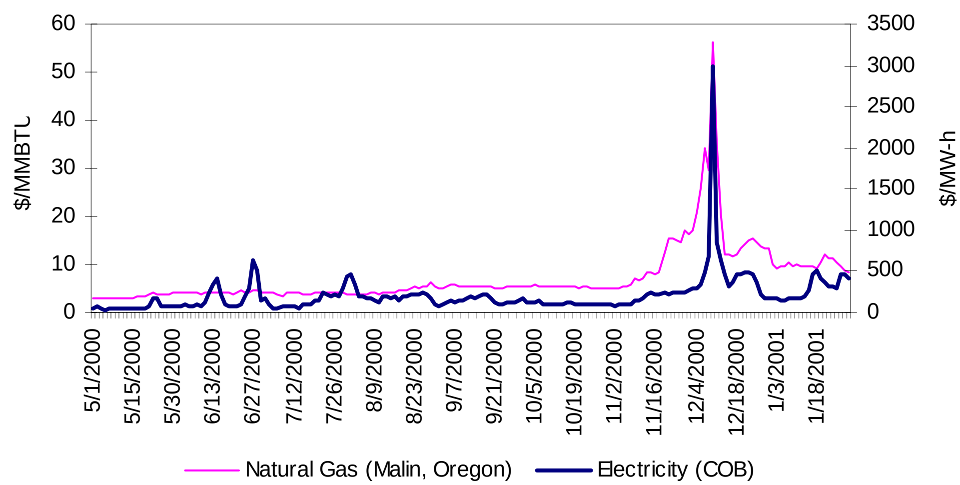
Failure to build more generating plants, along with reduced supply from existing plants due to outages, has made the state increasingly reliant on imported electricity.[5] This reliance is especially true of peak demand periods, when about 25% of the state's requirements must be imported. Indeed, California's increasing reliance on imported electricity is underlined by the fact that the state is currently importing power at this time of year. While the winter in California has been cooler than normal, peak demand occurs in the summer months when air conditioning demand is at its highest.

At the same time as California has become more reliant on imports, out-of-state power prices have been increasing. The western states, from which California imports power, are generally the fastest-growing regions of the U.S. As a result, their power reserves have also fallen and their electricity prices have increased.

An additional supply and price-related factor is the high percentage of gas-fired generation in the state. Continental natural gas prices have risen, reflecting a much tighter supply-demand balance than in previous years. With natural gas pipelines into California running at near capacity, strong electricity demand, and a cooler winter, natural gas prices in California have risen dramatically. They jumped from about US$2.50/MMBTU in the summer of 1999 to spikes above US$50/MMBTU last summer, and have settled recently in the relatively high range of US$8/MMBTU to US$11/MMBTU.

The higher input price for gas-fired electric generation has a direct impact on the price of electricity when supplies are tight and gas-fired generation is required. This relationship is illustrated in Figure 1.

**Figure 1. Electricity And Natural Gas Prices In Northern California**




Source: Bloomberg Financial and CIBC World Markets.

[4] California Energy Commission: *"Electricity Supply/Reliability 2000 to 2002"*, August 10, 2000.
[5] During periods in the summer of 2000, the California Independent System Operator estimates that about 22% of the state's capacity previously held by the investor-owned utilities was unavailable due to scheduled maintenance and forced outages.

### Flawed Approach To Deregulation

Deregulating at a time of growing demand and constrained supply was a recipe for rising electricity prices, but California's approach to deregulation exacerbated the situation. California introduced electricity deregulation with the passage of Bill AB 1890, in September 1996. In order to mitigate the market power that could be exerted by the state's utilities in a competitive market, the utilities were forced to sell significant portions of their fossil-generating capacity, without simultaneously hedging their power supply through long-term contracts.

As growing demand collided with constrained supply, the utilities were destined to pay more for power. However, the situation was severely aggravated by requiring the utilities to buy on the spot market all the power they could not generate themselves. During the period while they were recovering stranded costs, they were not permitted to enter into long-term power supply contracts. The utilities were forced to buy many of their requirements from competitive generators — either within or beyond the state's borders — based on the price of power in a competitive market established by the high-marginal-operating-cost fossil units.

At the same time as the utilities were being forced to buy much of their power requirements in a rising and volatile spot market, the rates they could charge their retail customers remained frozen at a 10% discount to 1996 levels. It is this combination of a deregulated wholesale market and fixed-price retail market that has pushed the state's two largest utilities to the edge of bankruptcy, as they have been unable to fully recover their power costs.

With retail rates for many of the state's customers frozen at below market levels (having recovered its stranded costs, San Diego Gas and Electric's rate freeze was lifted), customers have not been receiving the price signals that in a properly functioning competitive market would have a dampening effect on demand.

While wholesale power markets in California have been competitive, they have not been immune to government interference. Wholesale price caps, as well as changes or threatened changes in those caps, send signals to generators that may discourage the construction of new capacity in the state. Threats of legal action against power generation companies, by different levels of government, have exacerbated the climate of investment uncertainty.

The requirement that the state's utilities sell much of their generating capacity was designed to prevent the exercise of market power in a deregulated environment. Nonetheless, in a capacity-constrained market, it is possible to influence prices with even a relatively small market share. There is some evidence that out-of-state generators are able to exert market power in peak demand periods when demand approaches the California supply constraint.[6]

## Outlook For Alberta Is Better

Like California, electricity prices in Alberta have been rising because deregulation followed a period of sustained growth in demand during which little new generation was added. However, by allowing the market to work, we anticipate that power prices in Alberta will begin to moderate as new capacity is brought on line.

[6] California Independent System Operator, August, 2000.

### Demand Growth

Buoyed by a strong economy, demand for electricity has grown at a robust pace since the Electric Utilities Act was implemented in early 1996. Over the last four years, peak demand on the Alberta Interconnected Electric System (AIES) has grown at an average annual rate of 3% or about 225 MW.[7] In fact, this figure understates the growth in demand, as the AIES demand statistics only include the net demand of large industrial projects such as petrochemical plants or oil sands projects that have installed dedicated generation.

### New Supply Coming On

Following the completion of the last regulated plants in the late 1980s, Alberta had a significant surplus of supply. Indeed, the 375-MW, coal-fired Sheerness II plant — the last regulated plant in the province to be commissioned — did not go into rate base and start earning a return for shareholders for several years after it was built because it was deemed surplus to Alberta's needs.

With this surplus, no new generation was built through the early 1990s. By the mid-1990s, the government had signaled its plans to deregulate the generation business and introduce competition. However, all the rules of the new market place were not clear until much later. Complicating the picture was a unique aspect of the Alberta market: the cost of new gas-fired generation was higher than the embedded cost of the older coal-fired units. Furthermore, in Alberta's regulated environment, the cost of generation was averaged across the province. There was much debate about how to introduce competition without giving windfall profits to the owners of the lowest-cost generating units or causing rate shock to the customers served by the owners of higher cost units. This period of uncertainty did not encourage investors to risk capital in the construction of new generating facilities — even though the need for new capacity was becoming more evident.

It was not until 1998 that new capacity came on line from independent power producers, and even then, the initial increment was relatively minor (85 MW). As a result, like California, Alberta was becoming increasingly dependent on imported power. The province has a 150 MW DC intertie with Saskatchewan and an 800 MW AC intertie with B.C. (upgraded from its 1996 capacity of 400 MW). In the last few years, the province's reserve margin above its winter peak has been between 500 MW and 600 MW — less than the combined import capacity of 950 MW. The tightness of supply has made pricing very sensitive to any unplanned (forced) outages.

As long as Alberta is dependent on imported power from B.C. to meet its peak requirements, it will be unable to fully insulate itself from high prices in California or the U.S. Pacific Northwest. In a competitive market, Alberta must compete with customers in those jurisdictions for BC Hydro's surplus power. Indeed, we understand that there have been instances in which BC Hydro was buying power in Alberta (and thereby raising the Alberta Pool price) in order to sell to California at even higher prices.[8]

Alberta's power prices will depend to an extent on natural gas prices. With about 18% of the province's generation capacity fueled by natural gas, high gas prices will tend to support relatively high electricity prices. Natural gas prices in Alberta (AECO-C) hit a high of $16.95/MMBTU before falling back to their (still historically high) level of about $7.50/MMBTU.

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7 Population growth in Alberta has been about 1.9% per year over the past four years, which is slower than the 3% growth rate in electricity demand over the same period.

8 In an effort to reduce the impact of California and Pacific Northwest pricing on its market, Alberta recently changed the calculation of the hourly pool price — the price that all in-province suppliers receive — to exclude the impact of imports and exports. The new method does not change the price that B.C. receives for power, but prevents all in-province suppliers from receiving the high price paid for imported power at times of constrained supply.

A tight supply-demand balance is likely to keep prices in Alberta higher than historical levels and production costs for a couple of years. However, with a properly functioning market (see below), new generation will be built and prices will fall in time. Two significant plants are currently in the final stages of commissioning in Alberta. About 69% of the 416 MW Joffre Plant, owned by ATCO, NOVA and Epcor, will be available for sale into the Power Pool. At least 85MW of the 360 MW Suncor Plant, owned by TransAlta, will also be available for sale into the power pool.

Several other plants are under development in Alberta. ATCO Power has announced the construction of two cogeneration plants that have a combined capacity of 320 MW and which will come into service in 2002. Much of this capacity will be dedicated to their steam hosts, but some may be available to sell into the AIES. In addition, EPCOR has proposed to add 400 MW to its coal-fired Genesee plant by 2005. Calpine has proposed 250 MW of gas-fired capacity (in service 2003) while AES has proposed 525 MW of gas-fired capacity (also in service 2003). TransAlta has talked about the ability to add 800 MW at its Keephills plant, and is expected to bring the 286 MW Wabamun 4 Plant back into service by May 31, 2001.

### Regulation On The Right Track

In early 1996, Alberta established a power pool into which all generators (either within or outside the province) bid their power on an hourly basis. While the pool price fluctuated with demand and supply, there were legislated hedges in place to set the price that in-province generators received and distributors paid for most of their output or requirements. As in California, there was a sharp increase in power prices in Alberta in the second half of 2000. With growth in demand, not all of distributors' power purchases were covered by legislated hedges. As a result, regulated retail rates were not sufficient to fully recover all of the distributors' power costs. However, unlike California, the shortfall will be recovered over a three-year period beginning in 2002.

Effective January 1, 2001, the market was opened up to true competition. Large industrial customers are responsible for securing their own supply of power. In so doing, they are free to enter into long-term contracts. For up to three years, small industrial and commercial customers have the option to continue buying their power at a regulated rate from their distribution company. Residential and farm customers have this option for five years.

Like California, Alberta had to deal with the potential market power that could be exerted in a deregulated market by the incumbent utilities. Three of them own virtually all of the generation in the province. Unlike California, Alberta did not require the sale of generation. Instead, the government created long-term (20 years or the life of the plant, whichever is shorter) power purchase arrangements (PPAs) that specify the required output that each generating unit is obligated to produce and the price the owners will receive. These PPAs were then auctioned to marketers, who can make bilateral deals with customers for the power to which they are entitled or bid that power into the power pool.

The distribution companies will be compensated for the cost of the power that they buy on behalf of regulated rate option customers — even if initially there is some deferral of full recovery. Given the sharp increase in the power pool price in late 2000, and on the heels of escalating natural gas prices, the Alberta government elected to give regulated rate option customers some protection. Retail rates have been frozen at $0.11 per Kwhr for 2001. As well, retail customers will receive a provincial government subsidy of $40/month that will reduce the average effective rate (after rebate) to about $0.05 per Kwhr, or about the same price that was paid in 2000. Non-residential users will receive $0.036 per Kwhr in provincial subsidy.

While a retail rate freeze sounds ominously similar to the actions in California that have contributed to the near bankruptcy of some of the utilities there, there are critical differences between the actions of California and Alberta. First, the retail rate freeze is at a level much closer to the market price. For the year to date, the weighted-average Alberta Pool price has been $0.132 per Kwhr, compared to the frozen level of $0.11 per Kwhr.

Second, the action taken to reduce a customer's net price to about $0.05 per Kwhr is being done through a subsidy. This means that while customers are no worse off economically than they were in the previous environment, they nonetheless see and have to pay a price close to market rates. This means that the impact of price on demand will not be blunted, as it is in California.

A third important difference is that the distribution companies will have the opportunity to recover costs for power above the rate cap of $0.11 per Kwhr. Thus, any shortfall is only temporary and will be recovered, with interest, at a later date.

In summary, the delay in formulating clear market rules for the new competitive environment forestalled the development of new generation, which led to a shortage of in-province generation and an increase in power prices. However, with a functioning market now in place, price signals will attract the required new generation to bring power prices down in time. In the interim, short-term measures to protect the retail customers should not distort market price signals or the financial integrity of electricity distributors.

## Conditions Are Right For A Successful Deregulation In Ontario

Ontario has neither the demand/supply problems nor the regulatory design flaws that are present in California. For these reasons, conditions are favourable to a successful de-regulation of power in Ontario.

### Moderate Demand Growth

Electricity demand in Ontario has grown at a rate of about 1.4% annually over the period from 1986-1999.[9] This modest growth rate is evidenced in part by the fact that Ontario has not met its 24,000-MW, all-time-high peak demand since 1994. Going forward, the Independent Electricity Market Operator is forecasting only about 0.9% growth in average electricity use over the period 2001-2010. Even peak demand is forecast to grow at an annual rate of only 0.8% for the winter peak and 1.1% for the summer peak.

Ontario's electricity demand can be significantly volatile due to weather fluctuations. This year, the median winter peak demand is forecast to be 22,633 MW under normal weather conditions, but almost 8.8% higher at 24,617 MW under extreme weather conditions. However, as outlined below, Ontario has sufficient cushion in its generation capacity to absorb such volatility without experiencing power shortages.

[9] Demand and Supply statistics derived from The Independent Electricity Market Operator *"10 Year Outlook: An Assessment of the Adequacy of Generation and Transmission Facilities to Meet Future Electricity Needs in Ontario"*, August 25, 2000.

### Abundant Supply

Ontario has the necessary supply of power generation within the province to accommodate demand and to reserve a significant amount of capacity in excess of peak demand. Even with eight nuclear reactors laid up, the province currently has about 26,700 MW of generation capacity, which is well is excess of this year's winter peak demand level of 22,600 MW. It would also be well in excess of the extreme weather, winter peak demand forecast of about 24,600 MW.

The 26,700 MW of available power generation includes minimal imports and should increase substantially over the next few years. Imported power constitutes only 200 MW of the total available, despite the fact that Ontario's total inter-tie capacity is approaching 5,000 MW. Ontario Power Generation is planning to begin reintroducing the four Pickering A units into service at the start of 2002. By the end of 2003, these units should add another 2,060 MW of capacity in Ontario. In addition, several other power projects have been identified, constituting several thousand potential megawatts of incremental power, and the Ontario Energy Board has recently approved a 1,250-MW interconnection with Hydro Quebec due in service by 2003.

Unlike California, Ontario has a cushion of excess power to guard against shortages in the event of extreme weather conditions. The Ontario Independent Market Operator establishes a required power capacity margin above peak demand of about 18%-20%. It forecasts an excess of power above the capacity margin in the range of 1,000 MW-2,000 MW over the period 2001-2007. Also unlike California, Ontario would not have to rely on net imports to maintain this cushion.

Ontario's power prices should not be highly correlated with natural gas prices. In contrast to California and Alberta, very little of Ontario's power is generated using natural gas as a fuel. Only about 3% of Ontario's power is generated using dedicated natural gas technology.[10] The vast majority of power produced in Ontario is derived from nuclear, coal and hydro.

These favourable supply conditions are likely to be bolstered even further by the construction of new power generation in Ontario. With substantial inter-tie capacity, private investors are likely to find Ontario an attractive location in which to construct new power facilities for export purposes. As a potential example, TransAlta is currently constructing the 440-MW Sarnia cogeneration plant. The company will have over 200 MW for sale as merchant capacity within Ontario or for export.

### Ontario De-regulation Approach Not Flawed Like California

Ontario's de-regulation model is designed to facilitate a well-functioning competitive market, not to interfere with market prices in a way that could cause a California-style crisis. Wholesale and retail price interference is minimized in the Ontario model, and buyers, including the utilities, will be able to purchase power on the forward market.

Minimal price interference in Ontario should ensure that investors are comfortable building new power capacity in Ontario, as the need arises. Ontario has not threatened to implement wholesale price caps on power generation, the way California has. For a transition period and in order to mitigate the potential use of market power, Ontario Power Generation will provide rebates to customers if its average revenue from the bulk of its generation exceeds a \$38/MW-h threshold.[11] However, this proposed measure does not alter the price at which

[10] Figure excludes the 2,140 MW duel-fuel oil/gas Lennox facility.
[11] Ontario Power Generation must provide rebates to residential customers if its average annual rate exceeds \$38/MW-h for the first four years after open access in Ontario.

wholesale power is actually sold nor does it apply to competitive generation companies that may consider entering the Ontario market. For these reasons, investor-owned power generation companies should not perceive any undue risk in investing in Ontario.

Consumer demand should also be appropriately responsive to price signals in Ontario. The province has not frozen retail rates, as did the State of California. As a result, Ontarians will adjust their consumption levels based on prices. These demand responses can be as important to containing prices, as are supply responses. They are also not incompatible with protecting consumers. If Ontario supply were ever to tighten, as it has in Alberta, the province could provide direct subsidies to customers without implementing rate caps or a rate freeze.

Ontario also plans to implement energy forward markets in Ontario, coincident with the market opening. The Independent Market Operator will administer forward markets to allow for hedging opportunities and reduce spot-market volatility. Private operators will be encouraged to establish competitive forward power markets. Unlike the California situation, Ontario electricity distribution utilities are not prevented from purchasing power forward for their customers nor are they prohibited from entering into forward bilateral contracts. The ability to buy forward should protect consumers and improve market efficiency.

## Conclusions

Evidence suggests the conditions are right for successful deregulation in Ontario and, ultimately, in Alberta. Demand and supply conditions, as well as regulatory frameworks, are vastly different in Alberta and Ontario than they are in California. The ability to utilize forward bilateral contracts in Alberta and Ontario was not present in California. In summary, the poor conditions for deregulation and market design mistakes made in California are not present in Canadian jurisdictions.

We don’t consider deregulation itself to be a flawed concept. The positive benefits of deregulation have been borne out in the U.S. Northeast, in European nations, and in Australia. In this context, California should be taken as an outlier and as an example of how deregulation can fail with poor timing and a flawed regulatory framework.

Deregulation will not be without its implementation challenges, but our view is that a firm commitment to the principle of a deregulated, competitive electricity market will provide economic and consumer benefits in Ontario and Alberta.

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