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Sticker Shock

The Impending Cost of BC Hydro's Shift to Private Power Developers

By John Calvert



Summary

The BC government's energy policy is rapidly transforming the province's electricity system from one owned and controlled by the people of the province, to one that is operated in the interests of private energy developers and multinational energy corporations. Rejecting all the evidence that public ownership of electricity has kept prices down and provided energy security for the province, the government has arbitrarily banned new investment by BC Hydro in electricity generating facilities. This policy forces the Crown Corporation to purchase more and more energy from private interests through long-term contracts at prices almost double those of other options.

Yet for all the money the public is now required to pay to private energy developers, it acquires no assets, no long-term energy security, and no price protection once these expensive contracts expire. The government's energy policy is rapidly bringing to an end the era of affordable hydroelectric energy in BC. Despite the magnitude of the changes it is implementing, there has been virtually no public debate about the strategic direction of the policy or its enormous implications for ratepayers and the public. This debate is long overdue.

Among this paper's key findings:

- The provincial government's 2002 BC Energy Plan transformed BC Hydro from a generator of publicly-owned electricity to a purchaser of energy from private power developers.

As a result, BC Hydro customers can expect their electricity bills to escalate dramatically in the coming years, as more and more of their energy comes from high-cost private sources.

- When BC Hydro's 2006 tender call for new electricity projects was first being developed in early 2005, the market price of electricity was in the \$50 to \$55 per megawatt hour (MWh) range. Earlier tender calls had resulted in bid prices in the \$56 to \$61 range. However, the bids submitted in 2006 to BC Hydro were far, far, higher. According to BC Hydro, the average price over the terms of the 38 contracts – at today's prices – is \$87.50 per MWh. In actual dollars, prices will rise during the term of the longest contracts to \$124 by 2051.
- In total, the outcome of BC Hydro's 2006 tender call is a commitment to purchase a staggering \$9.5 billion from private power developers over the next 25 years, and \$15.6 billion by 2051. (If the two coal-fired proposals originally accepted do not proceed, given the province's new commitment to reduce greenhouse gas emissions, these figures would need to be adjusted downward; however, absent any change in government policy, BC Hydro would likely need to replace this energy with equally expensive private power in subsequent tender calls.)
- The US Energy Information Administration predicts that electricity prices will be about \$50 per MWh at the BC border until 2018. Throughout this period the indexed price to be paid under the BC Hydro contracts will average nearly \$100 per MWh, or approximately double the predicted market price. It is difficult to understand how locking BC into long-term contracts with private energy developers at such high prices can be construed as sensible public policy.
- Although BC Hydro and various government ministries have spent tens of millions on research into opportunities to develop renewable sources of energy, the BC Energy Plan requires that small hydro and wind projects be developed exclusively by private interests.
As a result, there has been a frenetic scramble by private investors to acquire the most promising sites for hydro and wind projects. At last count, over 495 private water-for-power licenses (or applications for licenses) have been registered by the provincial government. These include all the most accessible – and potentially most profitable – sites in BC. Two fifths of these licenses/applications are held by only 10 companies. The government does not restrict foreign ownership.
- Most of the best wind farm sites in the province have been allocated to a handful of developers, several of whom are foreign controlled or backed by foreign investment funds.
- In 2002, the BC government amended the Environmental Assessment Act to make it easier for private power developers to have their projects approved quickly.
- In 2006, the provincial government passed Bill 30, which took away the right of local governments to reject private power development applications. This effectively denies communities and First Nations affected by these projects any voice in whether they are approved.
- Under the province's policy framework, private investors will be free to export their energy (once these initial contracts expire) if they can get a better deal in the US, thus undermining BC's energy security.



This paper also proposes numerous alternatives to relying on private developers to meet BC's future energy needs, including:

- BC could have the large block of Columbia River Treaty 'downstream benefits' energy returned to the province rather than sold in the US. This would eliminate the need for almost all the private energy that BC Hydro purchased in its 2006 tender.
- The province could make greater use of the energy potential that could be developed by Columbia Power Corporation, a regional public utility based in the Kootenays.
- The BC government could reverse its policy of opening the grid to private energy exports by companies such as Alcan and Cominco so that this energy could be used to satisfy the needs of BC customers.
- The government could re-consider the policy of providing extremely low-cost electricity to major industrial users. Perversely, because the price BC Hydro charges its industrial customers is so low, it must subsidize them further, through Power Smart, to put energy conservation initiatives in place, when higher prices would encourage them to do so on their own.
- Power Smart energy conservation could be expanded. One key element should be to retrofit all public facilities with the most energy efficient equipment and systems. Reducing electricity consumption in schools, hospitals, municipal buildings and other public facilities would have the added benefit of returning the resulting savings to the province in the form of lower energy costs.
- Finally, the province could allow BC Hydro to construct small hydro, wind farm and other renewable energy generating facilities. As BC Hydro enjoys a gold standard credit rating, it can borrow money for capital projects much more cheaply than private energy developers. It could also benefit from significant economies of scale, avoiding enormous amounts of duplication in the private sector as each firm learns how to construct and operate power plants. Public ownership would also avoid the problem of foreign control of our water and wind farm resources, guaranteeing that energy produced in BC would be available to meet the needs of future generations of BC customers. Saskatchewan, for example, has taken a very different approach: the two largest wind farms are owned by the public through SaskPower.

In sum, the government and BC Hydro have many other – and better – options than the one adopted in the 2006 tender call and required under the BC Energy Plan.

Sticker Shock

The Impending Cost of BC Hydro's Shift to Private Power Developers

On July 27, 2006, BC Hydro announced the outcome of its 2006 tender call for new electricity from private energy developers. In doing so, BC Hydro committed the ratepayers of the province to purchase an enormous amount of new energy, at prices close to double the current market price, for at least the next two decades, locked in by extremely generous contractual commitments to private energy investors.

The amount of money involved in this one tender purchase is staggering. By BC Hydro's own figures, it could amount to \$9.5 billion, or more, over the next 25 years and \$15.6 billion by 2051. (If the two coal-fired proposals originally accepted do not proceed, given the province's new commitment to reduce greenhouse gas emissions, these figures would need to be adjusted downward; however, BC Hydro would then have to replace this energy with equally expensive proposals in subsequent tender calls.) In fact, it could be even more: these calculations are based on BC Hydro's assumption that only 70 per cent of the contracted energy will actually be delivered.

Private power interests were undoubtedly celebrating BC Hydro's decision to purchase three times more of their energy than it originally requested in its 2006 tender call at prices that were far higher than expected when the tenders went out. (BC Hydro sweetened the deal even further by partially indexing the prices to inflation). Yet for all this money, BC ratepayers will earn no assets, no long-term energy security and no protection from future price increases.

This bonanza for private energy interests represents an enormous future financial liability for ordinary ratepayers. It will add between \$400 and \$500 million to BC ratepayer costs every year from 2012 to 2039. BC Hydro estimates that the impact on hydro rates of this one tender call will be 8.1 per cent. The new BC Energy Plan ensures there will be more such calls in the coming years, as energy demand grows in the province (the 2007 call has already been announced. In addition, the government has recently directed BC Hydro to establish a standing order to purchase new energy from private power plants of less than 10 MW capacity. So developers do not even need to wait for the next tender call to submit their bids). These tenders will ensure an ongoing stream of profitable opportunities for private power investors in the future.



The cost of BC Hydro's 2006 energy purchase should trigger alarm bells across the province. It provides the most clear – and dramatic – evidence of the disastrous financial implications of BC's current energy policies. The government's decision to prevent BC Hydro from acquiring new generation assets in favour of electricity purchases from private energy interests means that BC Hydro will have to purchase even more private energy in the future, adding to the already large commitments made in the 2006 and earlier tender calls. As a result, customers can expect their electricity bills to escalate, dramatically, in the coming years as more and more of their energy comes from high-cost private sources.

Abandoning BC's Competitive Advantage in Energy

To understand why BC will lose its ability to provide secure, affordable energy to BC residents, it is necessary to analyze the profound policy changes the government has implemented since its election in 2001. Despite its frequently-voiced assertion that it is not privatizing BC Hydro, it has moved, step by step, to deregulate and privatize BC's electricity system, while integrating it with the US-dominated energy market in the Pacific Northwest through fundamental changes in the structure and operating rules of BC's transmission system.

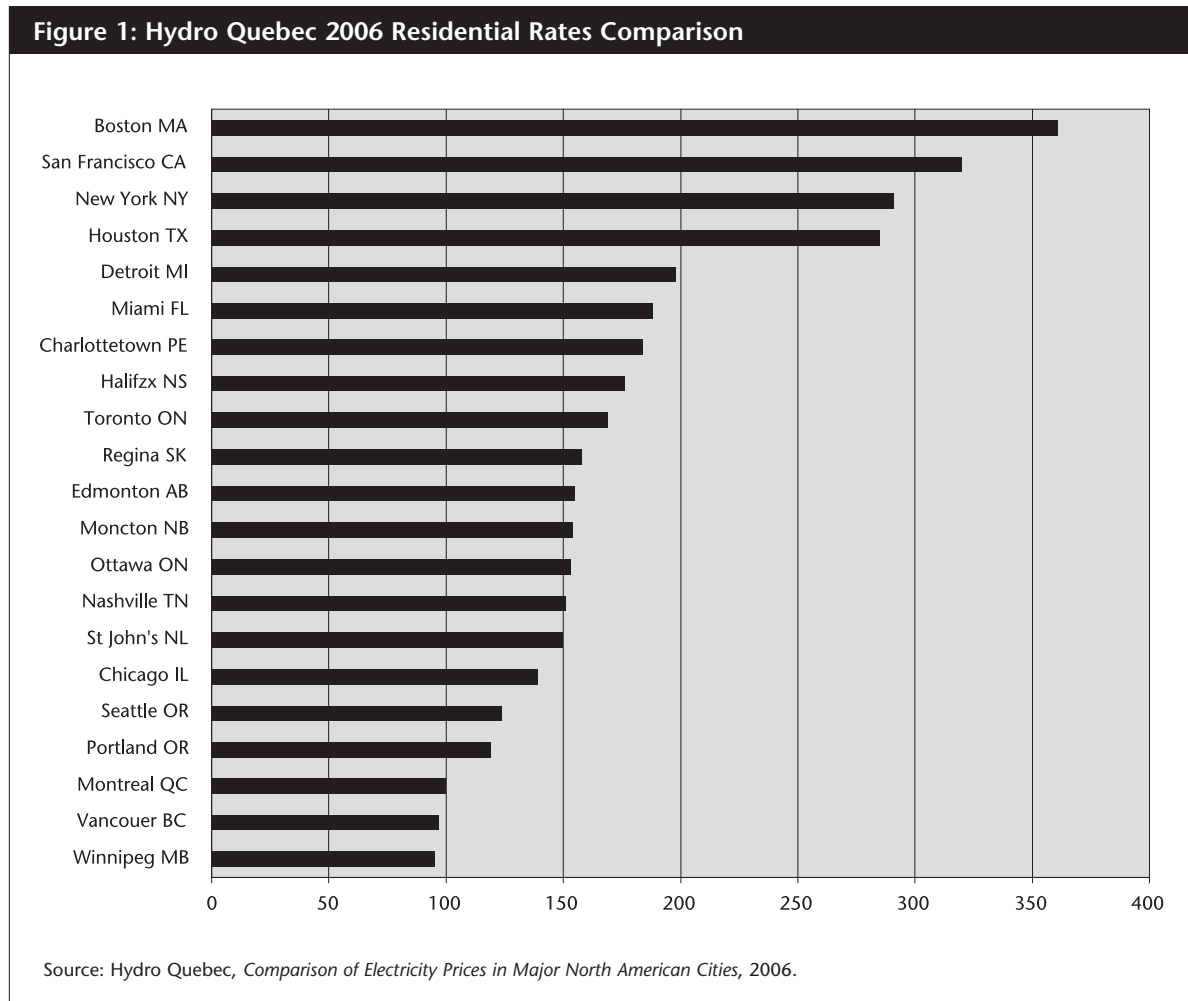
The new policy framework was clearly laid out in the 2002 BC Energy Plan and reinforced in the new 2007 BC Energy Plan. It transforms BC Hydro from a generator of publicly-owned electricity to a purchaser of energy from private power developers. The significance of this change is hard to over-emphasize. The energy plans signal a fundamental shift from the earlier – and highly successful – policy of relying on the Crown Corporation to build and deliver BC's electrical energy at prices based on the cost of production and controlled through public ownership of BC's generation assets.

This earlier policy resulted in BC's prices being among the lowest in North America and enabled customers to enjoy a lengthy period of stable prices. During the same period BC Hydro delivered approximately three quarters of a billion dollars, annually, in dividends, water rentals and taxes-in-lieu to the provincial government – money that contributed to funding needed for public services such as health and education. Even today, the legacy of cheap public power provides enormous benefits to BC customers.

To get a sense of how successful public ownership of energy resources has been for all categories of customers in BC, it is helpful to compare BC's electricity prices with those in other jurisdictions. Every year, Hydro Quebec conducts a detailed comparison of prices across Canada and the US, published in its annual *Comparison of Electricity Prices in Major North American Cities*. The report includes a breakdown among various categories of customers, including residential, small power, medium power and large power customers. In every category, BC has among the lowest prices in North America. Significantly, the other two low-price utilities, Manitoba Hydro and Hydro Quebec, are also publicly-owned. Figure 1 compares residential rates using Montreal as the benchmark (i.e. assigning it a value of 100 and ranking the others higher or lower depending on their relative price).

Figure 1 shows that BC has the second lowest prices in the survey, only marginally above Manitoba.

When we turn to commercial and industrial customers the pattern is broadly similar. BC customers pay the lowest rates among all medium size customers – lower than Quebec or Manitoba.¹ Even with large industrial users, BC Hydro is in a virtual tie with the other two public utilities and offers rates far, far cheaper than those charged by major US utilities. This is possible because BC built and owns its electricity generation through BC Hydro. The rates BC Hydro charges customers are based on the actual cost of producing the electricity, not on the uncertainties of a volatile energy market.



However, the BC government has chosen to turn its back on this successful history of public hydro.² It now requires BC Hydro to acquire virtually all of its future electrical energy from private power developers.³ This is done through issuing tender calls for new energy to private bidders. BC Hydro then enters into Energy Purchase Agreements (EPAs) with the successful bidders. EPAs are legally binding contracts to supply energy for periods between 15 and 40 years. They lock in long-term financial commitments by BC Hydro and, ultimately, the ratepayers of BC.

In signing these agreements, BC Hydro commits provincial ratepayers to purchasing a fixed amount of private energy, every year, during the term of each contract. The price of the energy is indexed, rising each year during the term. While this guarantees escalating revenues to energy investors, it does so at the expense of BC ratepayers who will be required to pay incrementally higher prices every year.

The 2006 energy call originally requested bids from private power developers for the acquisition of 2,700 gigawatt hours (GWh) of electricity, equivalent to a bit less than an additional 5 per cent of the total energy used in the province each year.⁴ There were two broad categories of bidders: those with large projects, defined as over 10 MW, and those with smaller projects. The call was an “open” one allowing a range of technologies, including: hydro, waste heat, wind, biomass and coal. The only energy source excluded was nuclear. All private projects had to be located within the province.

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More Unpleasant Surprises in the New Energy Purchase Agreements

When BC Hydro announced the results of the 2006 call in July, the amount of energy it had committed to purchase had risen dramatically, from the 2,700 GWh originally tendered, to 7,125 GWh.⁵ This represented over three times the amount BC Hydro had previously indicated it would acquire. It signalled a dramatic expansion of the role of privately-sourced energy in BC’s electricity system.⁶

BC Hydro’s explanation for its decision to buy so much more energy was curious. It argued that projected future energy requirements (load forecast) for the province had increased significantly since the previous projections had been made in December, 2004. The new information, it claimed, indicated there could be a significant shortfall unless BC Hydro acquired more energy in the 2006 tender. The decision also represented a dramatic increase from the amount that was widely assumed by participants in its major stakeholder consultative process, the Provincial Integrated Electricity Planning Committee (of which this author was a member) only a few months earlier.

Aside from the much larger amount of energy being purchased, there are also concerns about the type of energy BC Hydro is purchasing. In determining the province’s energy requirements, two basic variables need to be considered: the amount of energy needed and the capacity, or power output available from the province’s generating facilities. The amount of energy is normally measured in megawatt hours (MWh) or gigawatt hours (GWh). A gigawatt is a million kilowatts. But capacity is measured in megawatts (MW). Energy is like the fuel

in your gas tank. Capacity is like the horsepower of your engine. What is important is getting the right balance between the amount of energy and the capacity of the system. Capacity is particularly important during periods of peak demand, when everyone has the lights on. If energy demand exceeds the capacity of the system to generate this electricity, the system can experience power outages.

However, much of the energy BC Hydro is purchasing at premium prices has little capacity. In the language of the energy industry it is not “firm” energy. Consequently, it is normally sold at a considerable discount when it is offered on the energy market at off peak hours. Conversely, firm energy – energy backed by capacity – commands a premium price, particularly if it is near a load centre. Run-of-the-river and wind energy normally have little capacity because their energy output is not reliable, whether on a seasonal (run-of-the-river) or hourly (wind) basis. Yet almost half of the energy BC Hydro is purchasing is from these two sources. Thus, not only is BC Hydro purchasing much more energy than, arguably, it requires: it is also purchasing too much of the wrong type of energy.⁷

BC Hydro’s decision to purchase new energy from two proposed coal fired generation facilities was another nasty surprise. It reflected, in part, the heavy lobbying by the mining industry to sanction the use of this

fuel. The industry’s influence was already reflected in the 2002 BC Energy Plan’s policy action 20, which opened the door to purchasing energy from this controversial energy source. The government’s adoption of a “clean” environmental standard legitimized its use because it set the threshold for clean sources at only 50 per cent.⁸ This target was voluntary, not mandated. And, the definition of “clean” included electricity generated by biomass (wood waste) and co-generation if it was less polluting than previous co-generation systems.

More significantly, the “clean” threshold of 50 per cent meant that the other half could come from sources such as coal (although the government did not publicize the possibility of purchasing large volumes of coal-based energy at the time). The decision to purchase electricity generated from conventional coal also reflected the concerns of the large industrial customers, some of whose members were worried about the potentially high cost of energy generated from run-of-the-river and wind farm projects,

while others contemplated new opportunities in selling coal-based energy to BC Hydro. Ironically, the price of the two coal generated electricity contracts was not significantly lower than the other “greener” sources.

The two coal contracts quickly became a major source of criticism of the government’s energy policies. In the context of growing public awareness of the impact of greenhouse gas emissions on global warming, the advisability of utilizing this fuel in BC rightly came under fire from environmentalists across the province. In late February 2007, the government did an about-face and said it would allow coal fired electricity generation only if the emissions were sequestered using the latest technology. But, apparently, this condition had not been included in the tender call. While one of these contracts may be able to proceed using biomass or wood waste, it remains unclear what will happen to the other contract and, perhaps more significantly, what recourse the company may pursue in light of the government’s change of heart.

When BC Hydro announced the results of the 2006 call, the amount of energy it had committed to purchase had risen dramatically, from the 2,700 GWh originally tendered, to 7,125 GWh. This signalled a dramatic expansion of the role of privately-sourced energy in BC’s electricity system.

A Windfall for Private Energy Interests

The much larger volume of energy purchased in the 2006 tender is not the end of the story. While BC Hydro was purchasing much more energy, it was not getting a bulk discount on the price. Instead, the price was far higher than earlier projected. When the tender was first being developed in early 2005, the market price of energy was in the \$50 to \$55 per MWh range. Earlier tender calls had resulted in bid prices in the \$56 to \$61 range – still quite expensive in comparison to BC Hydro’s own energy. However, the bids submitted in 2006 to BC Hydro were far, far, higher. And the Crown utility purchased virtually all the energy offered by private power developers, which meant moving to the top of the price curve for the final increments acquired.

In its August 31 submission to the BC Utilities Commission, BC Hydro notes that its “adjusted” bid price averages about \$74 per MWh for the large projects that constitute roughly 90 per cent of its total 2006 purchase. But this \$74 figure is based on the price at the power plant gate, which can be hundreds of miles from the main load centre. Consequently, it is not what BC Hydro will end up paying when delivered to Lower Mainland customers, for example. BC Hydro must make adjustments for transmission losses, attrition and outages, greenhouse gas emissions, firm energy requirements and inflation between now and the time it starts paying for the energy.

The actual cost to BC Hydro – and the ratepayers of BC – will, as a result, be considerably higher. According to BC Hydro, the average price over the term of the contracts – at today’s prices – is \$87.50 per MWh. In actual dollars, prices will rise during the term of the contract to \$124.00 by 2051. (See Appendix A for annual costs of this new energy and its volume during the term of the tenders.)

To put this price in context, in its 2006 annual report, BC Hydro included a table showing the costs of its various energy sources. The figures indicated that the cost of energy from its own hydro dams was \$5.81 MWh, or just over half a cent per kilowatt hour. While this cost reflects investments made in the 1960s and 1970s and would, obviously, be considerably higher today if BC Hydro were to make similar investments, it underscores the cost advantage of publicly-owned electricity over the long term when the public owns the generating assets. BC Hydro’s table (reproduced here in Table 1) also shows how expensive it has been to purchase energy from private power developers.

BC Hydro’s own cost of production from its hydro facilities is this low because BC Hydro built (and owns) the generating assets and continues to charge customers rates based on the cost of production.⁹ During BC

	Gigawatt hours	\$ millions	\$ per MWh
Hydro generation	\$46,219	\$272	\$5.81
Private power developers	\$6,741	\$449	\$66.61
Other domestic purchases	\$5,853	\$343	\$58.60
Gas for thermal generation	\$375	\$53	\$141.33
Transmission charges	\$71	\$79	n/a
Totals/averages	\$59,259	\$1,196	\$20.18

Source: BC Hydro *Annual Report 2006*, p. 69.



Hydro's Integrated Electricity Planning (IEP) process, the Crown utility indicated that the estimated cost of energy from Site C (were it to be built by BC Hydro) could be as low as \$47 MWh (\$42 MWh if we exclude the \$5 MWh water rental that the government collects from BC Hydro). Given increases in construction costs over the past several years, this figure would likely be somewhat higher today. But it is still considerably below what BC Hydro is now paying to private energy developers. This is in large part because BC Hydro can borrow

capital at interest rates far below its private sector counterparts, which is critically important on capital intensive projects where a difference of one or two per cent in the interest rate can add up to many millions, annually, in extra financing costs. The other advantage of Site C is that it would be owned by the public, meaning in the long term, that costs would remain stable. Site C would also produce almost as much energy as BC Hydro acquired in the current tender.

While the low cost of energy from its own hydro dams reflects investments made in the 1960s and 1970s and would, obviously, be considerably higher today if BC Hydro were to make similar investments, it underscores the cost advantage of publicly-owned electricity over the long term.

The IEP's estimated price of coal-generated electricity was in the \$45 to \$50 MWh range (but admittedly subject to a big question mark about greenhouse gas offset charges). However, the actual price of coal in the 2006 call is much higher. The contract price BC Hydro agreed to pay for the 2,032 GWh of energy – roughly 28 per cent of the tender amount – it proposed to acquire from the two coal firms is confidential, as are many other elements of

these energy purchase agreements. But piecing together information from company press releases, it appears to be broadly similar to the average paid to the other private power developers.

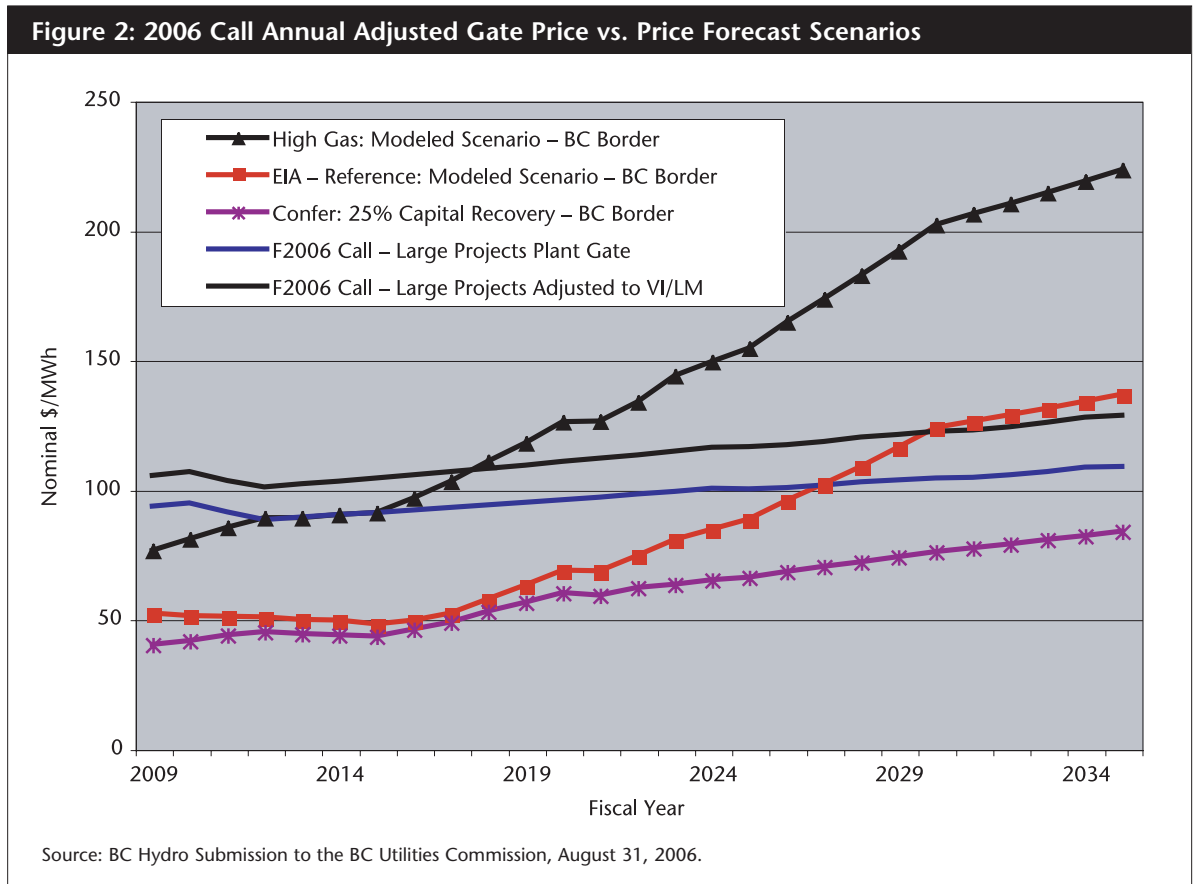
A rough calculation indicates that over the term of the contracts BC Hydro was prepared to pay over \$4 billion for coal-based energy. And this is for a power source that has major environmental drawbacks due to the greenhouse gas emissions and other pollution it produces. While there are proponents of developing "clean" coal technology, including methods for sequestering carbon emissions, these technologies remain at a very early stage of development and it is not clear how effective they will be. Until these methods of reducing emissions are well proven, there is every reason for BC to avoid the risks of this fuel source.

Given February’s Throne Speech commitment that any new coal-based electricity production must employ sequestering technology, the future of these two projects is at best uncertain. They may not proceed, or if they do, their costs could be considerably higher.

The high cost of the energy BC Hydro is now committed to purchasing is further underscored when we examine predictions of future energy prices by well-respected forecasting agencies. BC Hydro included these forecasts in its submission to the BC Utilities Commission (BCUC) on August 31 (see Figure 2). The US Energy Information Administration (EIA), part of the US Department of Energy, predicts that prices will be about \$50 per MWh at the BC border until 2018. Throughout this period the indexed price to be paid under the BC Hydro contracts will average nearly \$100 per MWh, or approximately double the predicted market price. Moreover, even if we go further into the future – where predictions become more and more problematic – the estimates show that BC Hydro will still be paying far more than the projected market price – for at least another decade – by which time many other factors could significantly change price estimates.

Confer, another well-respected source of energy forecasts, provides estimates of future electricity prices that are even lower than the EIA estimates. Figure 2, taken from BC Hydro’s submission to the BC Utilities Commission, shows these forecasts, along with the anticipated price BC customers will pay.

If these forecasts prove accurate, BC ratepayers will be paying roughly double the market price for the next two decades. At the BCUC hearings, BC Hydro executives acknowledged that the Pacific Northwest is currently awash in energy and that prices will remain stable for the next five years at least. Given that estimated market



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Run-of-the-River, Small Hydro and Wind Farm Projects

In recent years there has been growing interest, especially among environmentalists, in the development of renewable energy resources. BC is fortunate to have a large number of rivers and streams that can be used to generate energy. It also has some of the most promising locations for wind farms. Although BC Hydro and various government ministries have spent tens of millions on research into opportunities to develop such renewable sources of energy, the BC Energy Plan requires that small hydro and wind projects be developed exclusively by private interests.

As a result, there has been a frenetic scramble by private investors to acquire the most promising sites for hydro and wind projects. At last count, over 495 private water-for-power licenses (or applications for licenses) have been registered by the provincial government. These include all the most accessible – and potentially most profitable – sites in BC. Far from being widely distributed, 196, or two fifths, of these licenses/applications are held by only 10 companies. The government does not restrict foreign ownership of water-for-power licenses, nor does it prevent BC owners from selling their projects to out-of-province, or foreign, interests.

In 2002, the government amended the Environmental Assessment Act to make it easier for private power developers to have their projects approved quickly.

While there are many good sites for properly planned small hydro plants, there are many other locations where these projects adversely affect the environment, tourism, recreation and community access to rivers and streams. As BC energy researcher Arthur Caldicott points out, the term run-of-river is misleading as virtually all these small hydro projects require some form of dam (euphemistically called a weir or inflatable barrier) to allow the silt to settle out of the water before it is drawn into the power house. One project actually has a 76 metre high dam. Many involve diversions of several kilometres or more, leaving stream beds almost empty of water for long stretches and eliminating recreational uses.¹³

They also require the construction of lengthy transmission lines that can cut an ugly swath – as much as 60 meters wide – through pristine forests. Some of the proposed new lines are well over 100 kilometres long. These lines must be regularly trimmed to keep trees from overrunning them. And many need access roads to facilitate repairs resulting from storms and other damage.

But instead of establishing a sound planning framework with full community, First Nations and environmental involvement, the process favoured by the BC government is driven by the interests of private power developers who are anxious to get the projects – and their revenue streams – up and running as quickly as possible. Moreover, the watered down environmental assessment process looks only at the impact of individual projects, and ignores the cumulative impact when dozens of projects in a single watershed or river system are approved.

In light of the staffing cuts to the Ministry of the Environment in recent years, it is not clear how the government intends to monitor these projects in the future. Given that water is money, there is a clear incentive for private power developers to maximize their use of this resource. But this may result in reducing stream flows, allowing stream temperatures to rise unacceptably and disrupt spawning of environmentally sensitive species of fish such as salmon. This problem is exacerbated by the fact that most projects are in remote locations where it is difficult – and costly – for the government to monitor them closely, even if it wanted to do so.

In addition to environmental concerns, communities have also questioned the benefits of these projects for local residents and First Nations. Private power projects are capital intensive. They create very few full time jobs once the short period of construction is completed. A project costing \$100 million to build may create only three or four full time jobs in the local community, while generating tens of millions in revenue annually for its lucky investors, few of whom are likely to live in the community and many of whom will not even live in BC. In light of this situation, it is hardly surprising that there has been so much community opposition to private power projects in areas such as Squamish-Lillooet and Christina Lake, to cite just two examples.

Faced with opposition from a number of local governments who did not see how these projects could benefit their communities, the government passed Bill 30 to override local government zoning and planning regulations that were holding up project approvals. While many observers saw Bill 30 as directed at the dispute between Ledcor and the Squamish-Lillooet Regional District over a project on the Ashlu River, the legislation clearly has much broader implications for local governments. Power projects can now be authorized by the BCUC, whose mandate is not to address the broader question of whether these projects are in the interests of communities or First Nations, but only whether they are economically viable. Not surprisingly, at last October's annual Union of BC Municipalities Convention, delegates voted overwhelmingly for a resolution demanding the government repeal Bill 30. Minister Penner quickly made it clear he had no intention of allowing the UBCM's resolution to influence his commitment to Bill 30.

Similarly, from a provincial standpoint, these projects provide very little financial benefit to BC residents. Water licenses, water rental fees and capacity charges amount to roughly three or four percent of the value of the energy produced.¹⁴ Under the government's policy framework, private investors will be free to export their energy if they can get a better deal in the US, thus undermining BC's energy security.

The situation with respect to wind development is broadly similar. While much of the research on wind farm potential has been done by BC Hydro, only private interests are allowed to develop new wind farms. Investigative permits have been given out to a number of major wind farm corporations, giving them rights over literally hundreds of thousands of hectares of land. Most of the best sites in the province have been allocated to a handful of developers, several of whom are foreign controlled or backed by foreign investment funds. Permitting fees are minimal and provincial revenues from these sites have effectively been waived for 10 years. Even after that, the fee structure will give the province only between 1 and 3 per cent of the value of the energy produced, depending on the capacity utilization of the wind farm.

Saskatchewan has taken a very different approach. While the first – and smallest – of its wind farms was a joint venture between SaskPower, the provincially owned utility, and two private firms, the two largest are owned by the public through SaskPower. This was an option available to BC, which would have ensured that future generations would continue to own and control the most promising sites.

What is most notable with respect both to small hydro and wind farms is how the interest of private developers have taken precedence over the long-term interests of the public. With increasing concern about global warming, the value of renewable resources will likely increase significantly in the coming years. By turning over ownership of these promising sources of energy, the government is prejudicing the interests of future generations of BC residents who will, belatedly, discover that the benefits of this renewable energy will flow almost entirely to private energy developers and foreign investors.

prices at the US border will be roughly half what ratepayers in BC will be paying, it is difficult to understand how locking BC into long-term contracts with private energy developers at such high prices can be construed as sensible public policy.

Small hydro and run-of-the-river projects will account for 40 per cent of the total purchase. But most of this energy comes during the spring run-off – the same time period as the tributaries of the Peace and Columbia rivers are filling BC Hydro’s reservoirs. In committing to acquire this energy, regardless of the amount of water in its own reservoirs – which can vary dramatically from year to year – BC Hydro may end up with more than it can use, forcing it to spill its own water or sell the excess energy when market prices in the Pacific Northwest are low due to a glut of energy from the spring run-off. Given that the contracts are locked in, the risk falls entirely on BC Hydro.

The cost of the current energy call is not the end of the story. BC Hydro was already committed to \$1.8 billion in EPAs signed up until the end of 2003.¹⁰ And it was on the hook for an unspecified – but significant – additional amount of purchase commitments for the two tender calls immediately preceding the 2006

call. Moreover, the current BC Energy Plan requires that BC Hydro continue to purchase even more of this expensive private energy. As noted, BC Hydro has indicated that there will be a 2007 tender call as well as a new standing order for projects of less than 10 MW. BC ratepayers are only at the beginning of this process. This is a point which many ratepayers may not fully appreciate due to the very low price increases experienced over the past decade and the fact that the rate increases from this tender will not begin to hit their pocketbooks in a major way until 2012. But the period of rates cushioned by cheap public power is now about to end. The government’s energy purchase strategy will ensure price increases significantly above the rate of inflation year after year over the coming decades.

BC ratepayers are only at the beginning of this process. This is a point which many ratepayers may not fully appreciate due to the very low price increases experienced over the past decade and the fact that the rate increases from this tender will not begin to hit their pocketbooks in a major way until 2012.

Government documents confirm the very large amounts BC Hydro is now committed to spending. In its October 2, 2006 response to a freedom of information request, the government acknowledged that by September 2006 BC Hydro had a total of \$13.4 billion in

committed contracts to private energy developers. While this number differs slightly from the totals we have calculated, possibly due to different assumptions about the amount of energy that private developers may end up delivering over the life of the contracts, and whether some contracts have been finalized, it is surprisingly consistent with our estimates and confirms the magnitude of the obligations now being undertaken by BC Hydro.

But the numbers from the 2006 call announcement – alarming as they are – do not convey the entire picture. In reality, BC ratepayers are effectively paying the costs of financing and constructing the new private power plants. BC Hydro’s Energy Purchase Agreements give private energy developers a guaranteed revenue stream they can use to obtain the capital they need to finance their new power projects. Once they have a commitment from BC Hydro that it will enter into a long-term purchase agreement at a defined price, developers can go to the bank – using this guarantee of public financing as collateral – to borrow the money to construct their new power plants. In other words, the public, through the EPA process, is guaranteeing their financing. Yet the public earns no assets, no price protection once the contracts have expired and no guarantee that the energy will not be exported in the future.



As noted earlier, the impact of this one tender call on our electricity rates is estimated by BC Hydro in its submission to the BC Utilities Commission to be about 8.1 per cent, once most projects are on stream in about six or seven years' time. While this may not seem excessive at first glance, it must be remembered that the very high prices of this one purchase are being diluted by the much larger amount of BC Hydro's own very low cost energy. If all our energy were being purchased from private power developers our electricity rates would be more than double what we are now paying.

Another Nasty Surprise for Ratepayers: The Alcan Give-Away

Several months after BC Hydro released the outcome of its 2006 call, it made another startling announcement. It had entered into a new long term energy purchase agreement with Alcan, the aluminium giant that operates the smelter at Kitimat. In 1950, the provincial government agreed to allow Alcan to dam the Nechako River, drill a 17 km tunnel and use the diverted water to generate energy for a new smelter. However, in recent years, Alcan has been shifting its focus from aluminium production to selling electricity, arguably because the latter activity is much more profitable.

Alcan's generation facilities were built in the 1950s and, consequently, its cost of production is even lower than that of BC Hydro's own dams. Including the \$5 MWh water rental fee paid to the BC government, Alcan's cost of energy is almost certainly less than \$10 MWh. The deal BC Hydro signed with Alcan was based on a price of \$71.30 per MWh, indicating, according to the District of Kitimat, that the company would be making about \$61 MWh profit for every MWh it sold to BC Hydro under the terms of the deal. Alcan was also to get a "replacement fee" amounting to \$111 million, which BC Hydro agreed to provide, partly as an incentive to build a new smelter. Moreover, the deal did not lock in Alcan's commitment to this investment. Instead it was hedged with conditions that, arguably, would allow the company to continue power sales regardless of whether it built the smelter.

Incredibly, BC Hydro based its justification for paying \$71.30 MWh on the average price it paid in the 2006 tender for energy from newly built private power plants. Last December, the BCUC, which regulates BC Hydro, held hearings on the proposed contract. Numerous organizations and individuals, including the District of Kitimat, registered as intervenors, almost all of whom were outraged by the deal. Kitimat argued that Alcan's use of the public water resource should be limited to producing energy for aluminium production and that it should not be allowed to reconfigure its operations to expand energy sales. Trafford Hall, City Manager for Kitimat, calculated that the deal could, potentially, give Alcan a total profit of \$203 million annually if the smelter were not built and the company sold the power instead.

In a decision that surprised the government, the company and BC Hydro, the BCUC decided not to approve the contract.

The Alcan deal provides a clear example of the long-term consequences of allowing private ownership of generation assets. While the public, which owns BC Hydro, is able to benefit from an energy cost of \$5.81 per MWh from its hydro dams, the Alcan deal would have committed ratepayers to paying \$71.30 for energy produced from older facilities, whose cost of production is likely to be even lower than that of BC Hydro. Clearly, ownership of generation matters.

Better Alternatives are Available

As the negative consequences of the BC Energy Plan become more obvious, the need for a full public discussion of its direction is increasingly urgent. Yet there has been no real public consultation about the financial commitments BC Hydro is making or the long term consequences of the government's private power agenda. Most ratepayers are quite unaware of the nasty price shock they will be experiencing in a few years' time when they begin to pay for this high cost private energy. The government has tried to justify its policies by claiming there is an impending crisis. It has further claimed that we are becoming a major importer of energy and that we must buy more and more energy from private power developers to meet our future needs, as if this was the only possible option for meeting these needs.

There is no immediate crisis that would justify locking BC Hydro into such large future expenditures. Once the contracts have been signed, the public will be committed to purchasing the energy at the prices specified, even if changes in BC's economic position result in lower growth in energy demand in the coming years, or if energy prices in the Pacific Northwest energy market – as predicted – remain much lower than the contracted prices.

As the preceding discussion implies, the government had a number of other, much better options which it chose not to pursue in fulfilling our future energy needs.

First, BC has 1,200 MW (totalling 4,300 GWh) of downstream benefits from the Columbia River Treaty. This is energy the US owes BC for the benefit they receive from the storage of water in our major reservoirs on the Columbia and Peace rivers during the spring run-off. It is particularly valuable because it is firm energy that can provide capacity in BC during peak periods. Currently the government is selling this energy in the US market at prices far below what BC Hydro is paying private power developers under the terms of the 2006 purchase agreements. The return of this energy would substantially reduce the amount of new energy required by the province.



The provincial government could also require that private energy, such as that generated by Alcan and Cominco, stay in BC. In the context of BC Hydro claiming there is a looming energy shortage, it would be reasonable for the government to take steps to ensure that private energy generated in BC stays in BC for the use of BC customers. However, under the BC Energy Plan, the opposite has occurred. Far from preventing companies like Alcan and Cominco from exporting energy, the province is supporting their efforts by integrating BC's electricity system with that of the US and reorganizing the transmission grid to facilitate private energy exports. Through Bill 40, it has even abolished the requirement that companies wanting to export energy obtain an Energy Removal Certificate. Environment Minister Barry Penner told the Legislature on May 12, 2003 that the government was abolishing these certificates because they were "redundant."

Another option the provincial government could pursue is to re-power part, or all, of the existing Burrard thermal plant. Given the very high price BC Hydro is paying for private energy in the 2006 call, it would have made far more economic sense to retrofit this facility with modern – and much more efficient – combined cycle gas turbines. This 900 MW power plant, which supplies energy to the Lower Mainland, is currently kept in operation as an emergency backup in the event that the main power lines from the dams in the Interior go down. It is also used as a source of capacity near the load centre that can be utilized during periods of peak demand. That is, it provides energy when we really need it. However, BC Hydro now plans to shut it down in approximately five years' time.

The cost of re-powering Burrard would be only a fraction of the cost of the energy being purchased under the 2006 tender. While there is clearly some gas price risk – and gas prices did spike early in 2006, before coming down significantly in recent months – current estimates indicate that using Burrard would still be cheaper than the price BC Hydro is paying in the 2006 call. Given the ability of BC Hydro to store large amounts of energy in its reservoirs, it has the ability to use Burrard to assist in meeting peak demand, while continuing to rely on its traditional hydro-based electricity as the principal source of energy during other periods, thus providing a hedge against high gas prices. As illustrated in the Figure 2 comparison of price forecasts, even

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the high gas price scenario would be considerably cheaper than the 2006 call price for many years into the future. And, unlike other jurisdictions, BC still has the ability to choose to use energy from its hydro reservoirs during periods when gas prices are high.

Burning natural gas is, clearly, not the most environmentally sound way of generating electricity and its use for this purpose should be minimized. However, burning coal is, arguably, far less environmentally responsible. While from a climate change perspective it does not make sense to run Burrard all the time, it does make sense to maintain the plant as a backup for the Lower Mainland and to assist at peak periods of energy demand. It should also be remembered that other options also have significant drawbacks. Constructing new sub-stations, transmission lines, access roads and power plants on dozens of the most pristine rivers in BC also causes major environmental damage – a fact that is too often glossed over. This is especially the case when the cumulative impact on many of the province’s river systems is taken into account.

Another option is Site C. As noted earlier, the cost of energy from Site C is estimated by BC Hydro to be considerably below the price it is paying private energy developers under the energy purchase agreements. At the time Site C was cancelled in the 1980s, the energy it would have produced was earmarked for export. Understandably, this was a controversial option. The failure of previous governments to “make whole” the

First Nations and communities that were so adversely impacted by the construction of the major dams and reservoirs on the Peace and Columbia rivers left a legacy of frustration and bitterness. But two decades later, circumstances have changed. It may still be that when all the costs and benefits are tallied up, Site C should not go ahead. But this option should be properly evaluated in light of the other alternatives BC now faces. On this point, in the 2007 BC Energy Plan the government has finally conceded that a proper assessment is warranted. However, given its commitment to energy privatization, it is not clear whether it would allow such a facility to be built and owned publicly, or whether it would try to configure some form of public private partnership. In the latter case, it would put the private sector in the heart of BC Hydro’s generation system.

Because the price BC Hydro charges its industrial customers is so low, it has to subsidize them further, through Power Smart, to put in place energy conservation initiatives, when higher prices would encourage them to do so on their own.

Columbia Power Corporation, a regional public utility based in the Kootenays, is another potential source of new energy. It is publicly owned, but controlled by the people of the region through the Columbia Basin Trust. It has generation assets on the Columbia River and the capacity to expand its energy production significantly. One of its projects, the Wanita Expansion Project, could generate another 430 MW of energy by 2011 through constructing a second power house on the Wanita Dam. It has other potential power projects in the region as well. While BC Hydro did purchase a small amount of energy from Columbia as part of the 2006 tender, Columbia Power could deliver significantly more, if given the opportunity. But instead, the government has been pushing BC Hydro to purchase from the private sector.

Another option the government should reconsider is the policy of providing extremely low-cost electricity to major industrial users. The Heritage Contract, a piece of legislation that guarantees large industrial customers access to BC Hydro’s low-cost publicly-owned energy, acts as a major deterrent to energy conservation.¹¹ Currently, this category of customers, which uses approximately one third of BC Hydro’s energy, pays a bulk rate of roughly \$37 per MWh. This low price provides little incentive to reduce energy consumption. Perversely, because the price BC Hydro charges its industrial customers is so low, it has to subsidize them further, through



Power Smart, to put in place energy conservation initiatives, when higher prices would encourage them to do so on their own.

The current market price for energy at the US border is in the range of \$50 to \$55 per MWh. In selling at between 35 per cent and 50 per cent below market, BC Hydro is losing between \$300 and \$400 million in revenue each year.

But it gets worse. As noted, BC Hydro is paying \$87.50 for new energy in the 2006 tender. Thus it is selling its own energy at less than half the price it is paying to replace it. This is a great arrangement if you are the owner of a major mine or pulp mill. But from the perspective of ordinary ratepayers – who will be forced to pay for the high priced energy now being purchased by BC Hydro – the cost of this subsidy is substantial. And it will grow, with every new energy call.¹² Because it is such a large component of BC's electricity demand, the question of whether we should continue to provide such low cost power to pulp mills and mines may now need to be reviewed.

Another important option is Power Smart energy conservation. There are many methods of promoting energy conservation and hence reducing the demand for new energy. One key element should be to retrofit all public facilities with the most energy efficient equipment and systems. Reducing electricity consumption in schools, hospitals, municipal buildings and other public facilities has the added benefit of returning the resulting savings to the province in the form of lower energy costs.

Finally, there is the option of having BC Hydro construct small hydro, wind farm and other renewable generating facilities. BC Hydro enjoys a gold standard credit rating. It can borrow money for capital projects much more cheaply than private energy developers. On capital intensive hydro and wind power projects, the cost of borrowing is perhaps the most important element in the overall cost structure. Instead of paying the much higher cost of capital that banks and venture capital funds charge private power developers – costs that are reflected in the price BC Hydro pays when it buys this energy – it would be much cheaper for the Crown utility to borrow the money to build its own projects. With a mandate to build new projects it could also incorporate significant economies of scale, avoiding the enormous amount of duplication in the private sector as each firm learns how to construct power plants – duplication that, arguably, has been a factor pushing up the price of run-of-the-river projects. Moreover, the windfall increases in asset values – reflected in the instant profits being made by developers who are already “flipping” their projects – would remain with the public, rather than being captured by private investors.



Given its knowledge base, its existing province-wide infrastructure to service projects and its transmission expertise, the advantages of BC Hydro constructing and managing facilities are clear. Public ownership of these facilities would also enable the provincial government to work with First Nations and local communities to ensure there is a fair balance between the impacts of such projects and the benefits provided to local residents. Public ownership would also avoid the problem of foreign ownership of our water and wind farm resources, as well as guaranteeing that energy produced in BC would be available to meet the needs of BC customers. But again, the Energy Plan precludes BC Hydro from even considering such projects.

In sum, the government and BC Hydro had many other – and better – options than the one adopted in the 2006 tender call.

There is one last issue that merits comment: the role of the BC Utilities Commission, the statutory body that has responsibility for protecting the public interest. This regulatory agency is mandated to oversee the operation of our electricity system to ensure ratepayers get a fair deal. However, its mandate is severely restricted by the legislation under which it operates. While, as noted, it did stop the Alcan deal, nevertheless, it did approve BC Hydro's 2006 purchase agreements. Unlike the Alcan situation, the Commission did not find there was adequate justification to hold extensive public hearings about the expenditure of \$15.6 billion of ratepayers' money. Instead, it approved the contracts with private energy developers and shifted responsibility back to BC Hydro for the huge financial risks arising from the commitments it made in the 2006 tender call.

The very large sums BC Hydro is now allocating for the purchase of energy from private power developers should be generating a major public debate about the entire rationale of the government's energy policy. Far from guaranteeing reasonable prices, security of supply and self-sufficiency for the province – as was the case when BC Hydro built its own generation assets – the current policy is guaranteeing that BC ratepayers will pay more – a lot more – for their future electricity.

At the same time, ratepayers will be taking on major risks in terms of future prices, the security of future energy supplies and the ability of the provincial government to remain self-sufficient in energy. The huge financial commitments BC Hydro is now making may also preclude funding other, better, options in the future. However you look at it, \$15.6 billion in one tender call is a lot of money. It is time we had a full public debate about the entire direction of energy policy in BC.

**Appendix A: BC Hydro Expected Annual Energy Payments to Private Energy Developers
F-2006 tender call (2009–2051)**

Fiscal year	Payment (\$ million)	Energy GW/yr	Unit price (\$MWh)
2007	\$0	0	\$0.00
2008	\$0	0	\$0.00
2009	\$8	93	\$84.80
2010	\$94	1,019	\$92.10
2011	\$305	3,389	\$90.00
2012	\$438	4,987	\$87.80
2013	\$442	4,987	\$88.70
2014	\$447	4,987	\$89.50
2015	\$451	4,987	\$90.50
2016	\$456	4,987	\$91.40
2017	\$460	4,987	\$92.30
2018	\$465	4,987	\$93.30
2019	\$470	4,987	\$94.30
2020	\$475	4,987	\$95.30
2021	\$480	4,987	\$96.30
2022	\$486	4,987	\$97.40
2023	\$491	4,987	\$98.40
2024	\$496	4,987	\$99.50
2025	\$496	4,987	\$99.50
2026	\$498	4,987	\$99.90
2027	\$504	4,987	\$101.00
2028	\$510	4,987	\$102.20
2029	\$509	4,939	\$103.10
2030	\$508	4,898	\$103.80
2031	\$484	4,654	\$104.00
2032	\$469	4,463	\$105.00
2033	\$474	4,463	\$106.30
2034	\$477	4,424	\$107.90
2035	\$435	4,034	\$107.90
2036	\$402	3,731	\$107.70
2037	\$406	3,728	\$109.00
2038	\$411	3,728	\$110.30
2039	\$416	3,728	\$111.70
2040	\$385	3,404	\$113.10
2041	\$271	2,431	\$111.50
2042	\$191	1,682	\$113.60
2043	\$193	1,682	\$114.90
2044	\$195	1,676	\$116.10
2045	\$192	1,646	\$116.80
2046	\$145	1,311	\$110.50
2047	\$126	1,155	\$109.30
2048	\$128	1,155	\$110.60
2049	\$129	1,155	\$112.00
2050	\$115	1,013	\$113.70
2051	\$62	498	\$124.00
Total/Average	\$15,595	154,878	\$100.69

Source: BC Hydro submission to BCUC. August 31, 2006. (Figures include 30 per cent attrition and outages.)

Note: These figures include the two proposed coal-fired plants, whose future is now uncertain. If they do not proceed, the above figures would need to be adjusted downward. However, BC Hydro would likely then replace this energy with equally expensive proposals in subsequent calls.

Notes

- 1 Interestingly, the only US jurisdictions with energy prices that are even in the same ball park as those of BC Hydro are Portland and Seattle, both of whose prices are significantly influenced by publicly owned Bonneville Power Corporation.
- 2 One of the great ironies of the government's efforts to promote its BC Energy Plan is that it uses the data showing how well BC's energy prices compare to those of other jurisdictions to argue that its policies are successful. However, it fails to highlight the fact that the low prices are due to the very public ownership policies that it has now jettisoned.
- 3 In the original 2002 BC Energy Plan, the only exceptions were investments in installing new turbines in BC Hydro's existing dams, the refurbishing of the Burrard thermal generating station (now cancelled permanently) and possibly Site C with Cabinet approval. The 2007 BC Energy Plan indicates that the government is prepared to initiate discussions on this last energy option, but it is not clear whether the project would be owned by BC Hydro or reconfigured as a public private partnership. Arguably, the major reason for still permitting BC Hydro to refurbish its turbines is the need to provide backup capacity for private run-of-the-river and wind farm energy. Government of British Columbia, 2002, *Energy for Our Future: A Plan for BC*, http://www.gov.bc.ca/empr/down/energy_for_our_future_sept_27.pdf. See also the revised (2007) energy plan: *The BC Energy Plan: A Vision for Clean Energy Leadership*, http://www.energyplan.gov.bc.ca/PDF/BC_Energy_Plan.pdf.
- 4 BC Hydro, *Report on the F2006 Call for Tender Process*, p. 44. Initially, 48 potential bidders with 81 projects registered to participate in the EPA process. By the call deadline of April 7, 2006, BC Hydro had received 61 tenders from 38 bidders. <http://www.bchydro.com/info/ipp/ipp47608.html>.
- 5 In addition, the award included 226 GWh from the Brilliant Expansion project of Columbia Power, a subsidiary of the Columbia Basin Trust, the regional public utility set up in the mid 1990s to provide benefits to the people of the region most adversely affected by BC Hydro's major dams.
- 6 While BC Hydro maintains that there may be as much as 30 per cent attrition from the \$15.6 billion in tender awards from the 2006 call – which still leaves a huge financial obligation for ratepayers – in reality, there is no way of knowing in advance whether this attrition will actually occur. While previous energy calls resulted in the delivery of significantly less energy than initially contracted, these calls were at much lower prices. Whether a similar proportion of bids will fail to deliver the contracted energy volume is unclear, given the much higher price BC Hydro is now willing to pay for private energy.
- 7 This may explain why the one BC Hydro investment that is going forward is Resource Smart, a name given to upgrading or adding turbines in existing dams. This provides additional capacity in the system, balancing low capacity, run-of-the-river and wind energy.
- 8 The BC Energy Plan defines "clean" as follows: "BC Clean Electricity refers to alternative energy technologies that result in a net environmental improvement relative to existing energy production. Examples may include small/micro hydro, wind, solar, photovoltaic, geothermal, tidal, wave and biomass energy, as well as cogeneration of heat and power, energy from landfill gas and municipal solid waste, fuel cells and efficiency improvements at existing facilities." Government of British Columbia, Ministry of Energy, Mines and Petroleum Resources, Electricity and Alternative Energy

Division, *BC Clean Electricity Guidelines (Revised September 15, 2005)*, http://www.em.gov.bc.ca/alternativeenergy/Clean_Energy_2005.pdf.

- 9 The cost of energy at the hydro generating facility is only one of a number of the components of the final price paid by electricity ratepayers. The cost of transmission and the cost of local distribution are major factors in the final price, as well as the other costs associated with the utility's head office operations. This is not to suggest that the final price BC ratepayers are paying is the same as the cost to generate the energy.
- 10 This includes some long-term purchase agreements signed in the 1989 to 1991 period, an agreement with Alcan and new purchase agreements resulting from the 2001/02 energy call. The details of the various tender calls, including the projects and companies receiving contracts, are available on the BC Hydro web site. Additionally, the site contains the numerous research documents provided to the provincial Integrated Electricity Planning Committee. This includes projections of energy demand, costs of various resource options and a great deal of other background information. <http://www.bchydro.com/info/epi/epi8970.html>.
- 11 *BC Hydro Public Power Legacy and Heritage Contract Act*, RSBC Ch. 86, 2003. For the old industrial rate schedule (formerly called the 1821 rate), see: BC Hydro, *Electricity Tariff*, revised April 22, 2004, http://www.bchydro.com/rx_files/policies/policies1459.pdf. In March 2005, BC Hydro applied to the BCUC for a new rate structure to replace the 1821 tariff following a directive issued by the government under Policy Action 21 of the Energy Plan. The resulting stepped rate tariff was re-named the 1823 rate. The directive and subsequent BCUC decision were based on the principle of ensuring that stepped rates would be "revenue neutral." A number of other new categories were also introduced as part of this restructuring. See BC Hydro, *Transmission Service Rate Application*, March 2005, http://www.bchydro.com/rx_files/info/info21701.pdf.
- 12 When the BCUC introduced "stepped" rates to make the last 10 per cent of energy more expensive than the first 90 per cent as a way of inducing conservation, it did so in a way that was designed to be revenue neutral. Thus, companies that reduce their energy consumption so as not to require the last 10 per cent of their former level of energy consumption actually pay less than before.
- 13 Caldicott, Arthur, "Rivers of Riches" *The Watershed Sentinel*, Jan–Feb, 2007.
- 14 Calvert, John, "Private Power Developers and the BC Government's Water Licence Give-Away" *CCPA BC Commentary*, Vol. 9, No. 3 Fall, 2006; and Arthur Caldicott, op. cit.

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