



**Hydro-Québec Distribution Application for  
2008-2009 Tariff Design  
R-3644-2007**

**Direct Testimony of Dr. Zak El-Ramly**

**ZE PowerGroup Inc.**

**Unit 130, 5920 No. Two Road**

**Richmond, BC, Canada, V7C 4R9**

**On Behalf of**

**Association Québécoise des Consommateurs Industriels d'Électricité /**

**Le Conseil de l'Industrie Forestière du Québec**



## Table of Contents

Summary .....	3
Introduction and Overview .....	6
Rates and Marginal Cost Pricing.....	9
Evolution of Tiered Rate in British Columbia.....	11
Origin of the Tiered Rate Concept in BC .....	11
WKP’s Open Access and Tiered Rate.....	14
BC Energy Plan and Tiered Rate .....	16
Characteristics of BC Hydro’s Tiered Rate .....	21
The Stepped Rate Structure.....	21
Optional Time-of-Use Rate.....	22
CBL .....	23
Review of BC’s Implementation of Tiered Rates .....	25
The BC Hydro Experience Relevance to Québec.....	26
Comments on HQD’s Evidence .....	29
Establishing CBL.....	29
Energy Efficiency Programs as a Substitute .....	31
Business Risk.....	34
Conclusions and Recommendations.....	36
Appendix A: Resume of Dr. Zak El-Ramly .....	38
Appendix B: BC Hydro’s 1991 Industrial Rate Proposal .....	41

## Summary

La Régie de l'énergie ("The Régie") directed Hydro-Québec Distribution ("HQD") to study the two-tiered rate (also referred to as stepped rate) as it was implemented by British Columbia Hydro and Power Authority ("BC Hydro") in 2005 with the purpose of the potential introduction of tiered rates by HQD for its industrial customers.

The economic principle behind a tiered rate structure is to allow the trailing tier of the rate to send a price signal to the consumer. In its simplest form, a two-tiered rate allows the utility to reconcile the objectives of meeting revenue requirements while sending the correct price signal. The rate is broken into two tiers balancing the respective rates and allowable volumes. The value of the implementation of the rate is to expose consumers to the marginal cost of energy in their operational and planning activities. Tiered rates can only be adopted properly where the prevailing market conditions allow for diverse energy consumption / procurement options, such as: self-generation, purchases from the market, bilateral contracts and conservation and demand-side activities.

British Columbia (BC) has been struggling with the virtues of tiered rate and its implementation challenges since the original introduction of the concept in 1991. Only after a comprehensive energy plan was introduced by the BC Government, addressing many of the elements of creating a competitive market, was it possible in 2005 for BC Hydro and its customers to reach a negotiated agreement on a two-tier rate structure acceptable to the BC Utilities Commission ("BCUC"). I believe, however, that the negotiated structure includes too much compromise, dulling consumer price signals and the effectiveness of the rate while introducing major unnecessary administration.

I have direct personal experience in the development of the tiered rate in BC. I was involved as an expert witness or consultant, in the various regulatory

processes that led to its implementation. I provide my evaluation based on my professional observation and judgment.

HQD in its evidence expressed several concerns in connection with how the BC Hydro's two-tier rate can be adopted in Québec region. I mainly agree with the statements on the difficulty in establishing a Customer's Baseline Load ("CBL") and I believe that a properly structured Demand-Side Management ("DSM") program can be a proxy in providing some of the benefits of a two-tier rate. I am also in agreement with HQD's assertion that there could be business risk associated with the tiered rate. However, price risk management through consumption management and portfolio hedging activities is an integral part of implementing tiered rates. Marginal cost pricing could also produce reward for the customers participating in market risk.

Irrespective of the characteristics of the BC Hydro initiative, the Québec market is not, at this time, ready to offer or benefit from a tiered rate structure. The main concern is the absence of open market conditions to allow consumers to manage resources portfolios or utilize the intended advantages of a tiered rate. Moreover, the directly impacted key stakeholders demonstrate a resistance to the introduction of a tiered rate structure: industrial customers do not want a tiered rate and HQD does not see the merits in it. Absent appreciation by the affected parties, no initiative has a high chance of success.

It is my conclusion then that:

- Implementation of the tiered rate should not be imposed due to the lack of preparedness for the rate implementation by the utility and consumers. The right environment for the introduction of the rate is not available in Québec.
- HQD reservations to adopting the tiered rate structure by the example of how it was implemented in BC are reasonable and acceptable.

- If the Régie concludes that it is willing to accept the risk and cost associated with the introduction of tiered rates now, HQD and the industrial customers should be given an opportunity to work out the details of such rate in a consultative process.
- Irrespective of when a two-tier structure would be introduced, I recommend that an element of gradualism and choice be included in the rate design to reduce the risk associated with a change in regulatory paradigm. Only those industrial customers who are ready and equipped can take advantage of a tiered rate structure. Choice will permit a gradual rate implementation, which will allow HQD to keep the administrative complexities and implementation risk to a minimum. I believe that the introduction of a new rate is useful only to those customers who are willing to take advantage of the new rate and accept the corresponding risk.



## Introduction and Overview

I have been retained by the Association Québécoise des Consommateurs Industriels d'Électricité ("AQCIE") and Le Conseil de l'Industrie Forestière du Québec ("CIFQ") to provide an expert analysis of HQD's application for 2008-2009 Rate Design (R-3644-2007) submitted to the Régie. The purpose of my testimony is to assess the tiered rate as adopted by BC Hydro and provide recommendations as to its suitability to introduction in the Province of Québec, specifically to HQD's industrial customers.

My testimony is based on my understanding, familiarity and experience in the development of the original concept of the tiered rate for BC Hydro when I was directly responsible for introducing the concept of the tiered rate as Optional Rate 1823/24 for Industrial Customers and representing BC Hydro as its Policy Development Manager at the public oral hearing proceeding in 1991-1992. Later, in 1998 I participated in the hearing on the West Kootenay Power ("WKP") Application for Transmission Access/Access Principles representing Columbia Basin Trust, the main Intervenor in the proceedings. Finally, I participated in the hearing in 2005 when the tiered rate was re-introduced by BC Hydro in response to a BC Government directive stipulated in the 2002 Energy Plan for BC<sup>1</sup>.

I have over forty years of energy industry and public policy experience. Currently I am the president of ZE PowerGroup Inc., a company that provides strategic and regulatory support to clients throughout North America. I formed the company thirteen years ago after spending several years as the Executive Vice President Marketing at Powerex, a power trading subsidiary of BC Hydro. Prior to moving to Powerex, I held several executive and management positions at BC Hydro, with responsibility for energy management, load research, rates, forecasting,

---

<sup>1</sup> Ministry of Energy, Mines and Petroleum Resources of British Columbia, Energy for Our Future: A Plan for BC, 2002 <<http://www.gov.bc.ca/empr/popt/energyplan.htm#eof>> (October 15, 2007)



policy development, corporate and environmental planning, business development, and resource management. My resume is attached in Appendix A.

In the present testimony, I revisited, and reflected on, my past statements and recommendations to validate their applicability to the Québec's energy industry environment.

An example of BC Hydro's process of implementing the tiered rate was used as a reference in the Régie's recommendation to HQD in its Decision D-2007-122. HQD was directed to assess the costs and benefits of the tiered rate introduced by BC Hydro with the goal of setting an analogous structure in the Province of Québec. I have reviewed and analyzed the documents relating to the tiered rate filed by Hydro Québec.

At the outset, I agree with the general conclusion of HQD<sup>3</sup>. The introduction of the tiered rate concept at this time is unadvisable. Application of the rate will impose a heavy administrative burden with a limited upside as it is applied in an environment characterized by the absence of a customer choice. Additionally, the affected industrial customers do not appear to be welcoming the tiered rate initiative.

My testimony covers the following areas:

- The concept of marginal cost pricing, its economic benefits and the notion of a tiered rate as a proxy to marginal cost pricing, where the trailing tier is designed to send the "correct price signal".

---

<sup>2</sup> Régie de l'Énergie Decision D-2007-12, R-3610-2006 of February 27, 2007, p.84  
<<http://www.regie-energie.qc.ca/audiences/decisions/D-2007-12.pdf>> (October 15, 2007)

<sup>3</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, section 3.2.1.2. <[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)



- Evolution of the two-tier rate in BC.
- Characteristics of the current BC Hydro two-tier rate.
- Implementation challenges associated with a tiered rate structure.
- Review of BC Hydro's tiered rate.
- Relevance of the BC Hydro experience to the Québec market.
- Review of HQD evidence.
- Risk/benefit analysis of a new rate structure.
- Recommendations to the Régie.

## Rates and Marginal Cost Pricing

In a typical utility rate setting environment, rates are designed to collect the utility's revenue requirement. The rates charged to the consumers thus reflect the average cost of the system. In jurisdictions like Québec, where a low cost hydroelectric system is in place, the marginal cost of procuring new supply can far exceed the average cost of the embedded system costs. With a single tier or flat rate structure, the consumers or ratepayers are not exposed to the marginal cost; hence, they do not receive the correct price signal to guide their use of energy.

If ratepayers were exposed to, and are aware of, the marginal cost of providing for their energy needs, they would attempt to modify their energy use pattern to optimize their consumption and subsequent costs. In a fully open/functioning market, a rational consumer would explore any of the following options to modify the level or cost of consumption:

1. Invest in energy efficiency products
2. Explore alternate supply options
3. Develop a procurement strategy
4. Self generate
5. Adjust the level of operation based on the prevailing energy rates

Naturally, the level of interest in pursuing the above options will depend on the price being paid to the utility, the cost of the alternatives from the market and the ability to actively manage demand. Given that markets are typically volatile, there is always a risk associated with engaging in any of the above activities.



From a utility perspective, the appropriate marginal cost price to use as the correct price signal to its ratepayers will depend on the utilities resource conditions and its resource plan. If the utility is in a position of surplus condition, the marginal cost is the value the utility can receive from the market for its resources. If the utility is in a position of short supply, then the marginal cost will be reflective of the options available to the utility for adding resources to its portfolio.

From a rate setting perspective, the choice of the marginal cost signal to be sent to the ratepayers is very critical. The utility needs all the flexibility available to adjust the marginal cost as its plans and market offering change. The ratepayers need as much stability as possible in the marginal cost to make appropriate comparisons with other available options.



## Evolution of Tiered Rate in British Columbia

### *Origin of the Tiered Rate Concept in BC*

The concept of a tiered rate for industrial customers was originally introduced in British Columbia within the scope of BC Hydro Rate Design Application filed with the BC Utilities Commission (“the BCUC”, “the Commission”) on January 15, 1991<sup>4</sup>. This proposal was a response to the BCUC’s decision of April 30, 1990 on BC Hydro’s Rate Application, where the Commission rejected the requested across-the-board increase in revenue requirements over three years and suggested that Rate Design was a preferable vehicle for promoting conservation and efficient use through modified customer rates.

Rather than simply introducing a new rate, BC Hydro, at the time, opted to introduce a full scale redesign of how it is planning to serve its industrial customers. The initiative was referred to as the Industrial Rate Proposal or “IRP”. BC Hydro wanted to prepare itself and its customers to what was felt was the imminent advent of competition in electricity markets in a more gradual and elective manner, while it and its customers had the option to adjust. One of the components of the industrial rate proposal was a two-tiered Optional Rate developed for industrial customers. The Optional Rate had the following characteristics:

- The rate consisted of two equal size blocks, the trailing block rate (R2) would be set at the Long-Run Incremental Cost (“LRIC”) and the first block rate (R1) set so that the total bill will initially be the same as if the customer was billed under the fixed rate existing at that time;

---

<sup>4</sup> BC Hydro Rate Design Application of January 15, 1991  
<<http://209.17.158.138:8080/library01/005/101/208/ex/Exhibit-01.pdf> > (October 15, 2007)

- The size of the first energy block and the first step in demand to be set using regression analysis based on the past five year consumption after eliminating anomalies in consumption behavior;
- Allowed customers to access multiple sources of supply (e.g. Independent Power Producers (“IPPs”) or self-generation/cogeneration); and
- Customers would be able to take supply from BC Hydro under either the existing flat rate or the Optional Rate.

A short paper describing the Industrial Rate Proposal structure as proposed in 1991 is included in Appendix B.

The first introduction of the tiered rate proposal in BC was unsuccessful. The regulatory review process was extensive and thorough. The hearing proceedings were delayed for a half year to allow for an additional consultation process on the rate proposal. The oral hearing part lasted for 20 days.

The complexity of the proposal as it stood at that time, unclear status of the future of electricity market reform and uncertainty in the IPP development environment resulted in a negative outcome for the proposal. Industrial customers did not support the proposal and questioned BC Hydro’s motive for the introduction of the tiered rate. Their objections centered on the following:

- The nature of the two-tiered rate structure: in order to achieve efficiency and conservation, the two-tiered rate must demonstrate advantages over the present flat rate in conjunction with Power Smart initiatives;
- The choice in rate adoption: pressure may arise over time if future governments decide to reconsider the rate structures and remove the ability to opt in or out of the rate;
- Setting demand and consumption patterns, i.e., CBL: potential unfairness between customers; even a five-year history would be too simplistic and a

full business cycle would be a more appropriate window for setting the base consumption;

- The effectiveness of price signals: the price signals sent through the tiered rate could lead to less environmentally sound choices (i.e., use of fossil fuels); and
- The lack of available IPP electricity suppliers.

BCUC ultimately rejected the proposal<sup>5</sup>. They attributed their decision to the immaturity of the competitive electricity industry in the region, an underdeveloped IPP market, complexity of the proposal, potential for discrimination between similar customers, potential loss of interest to other conservation measures from the customers in the long-run and lack of interest from the industrial customers to the BC Hydro's proposal.

Nevertheless, the Commission recognized the link between the Optional Rate and the DSM initiatives in the Power Smart programs and perceived them complementary in achieving efficiency and conservation. BCUC saw benefit in the tiered rate in the long run as a means of encouraging IPP sales directly to industrial customers; thereby reducing BC Hydro's generation commitment to those customers<sup>6</sup>.

---

<sup>5</sup> BCUC Order G-36-92 of April 24, 1992 in the matter of BC Hydro's Application for Rate Design of its Electric Tariffs

<[http://www.bcuc.com/Documents/Decisions/1992/DOC\\_292\\_BCH\\_1992\\_Rate\\_Design.pdf](http://www.bcuc.com/Documents/Decisions/1992/DOC_292_BCH_1992_Rate_Design.pdf)>  
(October 15, 2007)

<sup>6</sup> BCUC Order G-36-92 of April 24, 1992, p.49,50

<[http://www.bcuc.com/Documents/Decisions/1992/DOC\\_292\\_BCH\\_1992\\_Rate\\_Design.pdf](http://www.bcuc.com/Documents/Decisions/1992/DOC_292_BCH_1992_Rate_Design.pdf)>  
(October 15, 2007)



The BCUC directed BC Hydro to further develop the Optional Rate to ensure that it would also encourage efficiency and conservation at the least long-run cost to all utility customers.

Following the BCUC rejection of the IRP, in September 1993, the BC Government allowed BC Hydro's subsidiary Powerex to sell power directly to industrial customers at market based pricing on a short-term (less than one year) basis under an initiative referred to as the "Powerex Exchange Operation"<sup>7</sup> using a special projects provision of the BCUC Act<sup>8</sup>.

### ***WKP's Open Access and Tiered Rate***

The second attempt to bring the concept of tiered rate to BC was within the scope of WKP's application. The application consisted of two separate parts: 1) the Access Principles Application ("APA") and 2) the Transmission Access Application ("TAA"), both filed on July 31, 1998. WKP's application was the first attempt in BC to open the market, including development of retail access through open transmission access. ZE PowerGroup represented Columbia Basin Trust ("CBT"), the main Intervenor, at the proceedings.

The TAA addressed the terms and conditions of non-discriminatory access to the transmission system and the pricing of transmission services. The APA related to the treatment of generation assets (Heritage Resources) in an open access environment. The TAA was reviewed at a public hearing while the APA became the subject of a Negotiated Settlement Process. CBT, a local power developer in the region, was the only Intervenor who refused to sign a settlement agreement

---

<sup>7</sup> BC Ministry of Energy, Mines and Petroleum Resources, 1993/1994 Annual Report , p.5  
<[http://www.em.gov.bc.ca/DL/GSBPubs/AnnualReports/AR\\_1993-94.pdf](http://www.em.gov.bc.ca/DL/GSBPubs/AnnualReports/AR_1993-94.pdf)> (October 24, 2007)

<sup>8</sup> BC Utilities Commission Act, Part 2, repealed in 2003

on the APA and the review moved to the oral hearing, which lasted for only two days.

WKP, in its application, proposed to allow its industrial customers access to the transmission system and the market, if the requesting customer relieved WKP from its obligation to serve; i.e. foregoing the customer's right to the embedded system energy (Heritage Resources). WKP supported the view of pricing the supply at embedded rates for all customers that continued to take all their needs from WKP. CBT was one of two Intervenors who opposed this notion and recommended the two-tier pricing of supply. CBT proposed the following structure for a tiered rate:

- The demand for power is split into two tiers for any customer wishing to leave WKP supply. The Tier 1 price reflects any system stranded costs or benefits. The Tier 2 price reflects WKP's avoided cost of power. The Tier 1 price and quantity are adjusted to produce a revenue neutral outcome at the historical consumption level at the time of departure from WKP supply.
- Tier 1 consists of only existing WKP resources and long-term purchases with the amount of power available from these resources prorated among all customer classes, and customers within these classes, with the price reflecting the cost of these resources.
- Tier 2 contains all other resources necessary to meet the expected load and reflects the cost of these resources. Customers with access to market supply would then be able to compare the cost of market supply with WKP's price for The Tier 2 power.

WKP argued that the two-tier pricing mechanism might be appropriate in the future since at the present it has several problems to be overcome before implementation of the concept:

- Customers, who choose to remain with WKP supply, will experience higher rates than the average embedded cost of supply;
- Additional administrative load from frequent re-estimation of stranded costs in order to determine rates and the establishment of a unique rate for each customer requesting access.

The Commission released its decision on March 10, 1999,<sup>9</sup> where it agreed with WKP's provision. Nevertheless, the BCUC accepted the presence of merit for a further examination of the two-tier pricing. The Commission recognized WKP's proposed structure as a useful step toward open access; however, the approved pricing structure would impose a barrier for alternative suppliers. The BCUC recommended further exploration into the use of rate structure to promote supply competition.

### ***BC Energy Plan and Tiered Rate***

Energy for Our Future: A Plan for BC<sup>10</sup> ("the Plan") released in 2002 by the BC Provincial Government, set the path for tiered rate implementation in BC. The plan envisioned open access in BC and developed many of the elements and prerequisites of an open competitive market:

- Policy Action #14 of the Plan indicated that large industrial or transmission rate customers would be able to meet all or part of their load from private generation, and that new stepped pricing would create an incentive for

---

<sup>9</sup> BCUC's Order G-27-99 on an Application by West Kootenay Power Ltd. for Approval of Access Principles <<http://www.bcuc.com/Documents/Decisions/1999Dec/WKPAPA.pdf>> (October 18, 2007)

<sup>10</sup> Ministry of Energy, Mines and Petroleum Resources of British Columbia, Energy for Our Future: A Plan for BC, 2002 < <http://www.gov.bc.ca/empr/popt/energyplan.htm#eof> > (October 15, 2007)

such customers to meet part of their needs from self-generation or IPPs when more cost-effective than utility supply.

- Policy Action #21 stated that stepped and time-of-use rates would be developed to encourage industrial and large commercial customers to meet part of their electricity needs through conservation and energy efficiency or non-utility supply. The stepped rates would be designed such that the last block of energy consumed would reflect the cost of new supply and would be revenue neutral.

On March 25, 2003, the BC Government issued Order-in-Council No. 253<sup>11</sup> directing the BCUC to conduct a public inquiry and provide recommendations relating to stepped rates to accomplish the objectives set out in the Energy Plan. To answer this directive, the BCUC's Order G-23-03 of April 3 2003<sup>12</sup> directed BC Hydro to submit a proposal with respect to changes to transmission voltage customer rates.

BC Hydro's subsequent proposal was filed on April 30, 2003, as a part of Proposal Regarding a Heritage Contract, Stepped Rates and Access Principles. BC Hydro's submission was modified on June 27 2003 and went through the oral public hearing between July 28, 2003 and August 13, 2003. The BCUC decision

---

<sup>11</sup> Province of British Columbia, Order in Council 253, Terms of Reference in the matter of the ACT and in the matter of Recommendations Relating to a Heritage Contract for BC Hydro's Existing Generation Resources and to Stepped Rates and Transmission, March 25, 2003

<sup>12</sup> BCUC's Order G-23-03 of April 3, 2003 on British Columbia Hydro and Power Authority Proposal regarding a Heritage Contract for BC Hydro's Existing Generation Resources and regarding Stepped Rates and Transmission Access  
<[http://www.bcuc.com/Documents/Orders/2003\\_Orders/Orders2003\\_2/G3/G23\\_Heritage\\_Contract.pdf](http://www.bcuc.com/Documents/Orders/2003_Orders/Orders2003_2/G3/G23_Heritage_Contract.pdf)> (October 15, 2007)

was released on October 17, 2003<sup>13</sup>. BCUC accepted BC Hydro's proposal and set the basic principles and directions for implementation of the stepped rates; as a subset of the overall energy plan:

#### Recommendation #8

- That stepped rates be implemented according to the following principles:
  - The Tier 2 rate should reflect the long-term opportunity cost of new supply, where long-term is understood to include the acquisition cost required to obtain that supply;
  - The quantity of power being sold to industrial customers at The Tier 1 of the stepped rate should be initially set at 90%, and the Tier 2 quantity should make up the remaining 10% (the Tier1/Tier 2 Split); and
  - The Tier 1 rate should be derived from the Tier 2 rate and the Tier1/Tier2 Split to achieve, to the extent reasonably possible, revenue neutrality.

#### Recommendation #9

- That a report be submitted to the Government of a three year review of the impacts of the stepped rates, including customers'

---

<sup>13</sup>BCUC Report and Recommendations on An Inquiry into a Heritage Contract for British Columbia Hydro and Power Authority's Existing Generating Resources and Regarding Stepped Rates and Transmission Access of October 17, 2003  
<<http://www.bcuc.com/Documents/Decisions/2003Dec/Heritage%20LGIC%20Rpt-Recommend.pdf>> (October 15, 2007)



demand response and the percentage of customers' load served by third party suppliers.

#### Recommendation #11

- That load aggregation within multi-plant ownership be allowed so long as it is restricted to operating units.

#### Recommendation #12

- That the Customer Baseline Load ("CBL") used for applying stepped rates to industrial customers should be based on past experience adjusted for anomalies and reviewed annually. Further, that the Commission will continue to approve CBLs and to resolve disputes as necessary.

#### Recommendation #13

- That time-of-use rates should be implemented at the same time as stepped rates.

#### Recommendation #15

- That Aquila, New Westminster and UBC, as entities that distribute all or a significant portion of their load to others, be exempted from the application of stepped rates at this time and form a new rate schedule(s).

#### Recommendation #16

- That BC Hydro's targeted PowerSmart and Customer Based Generation programs should be continued at funding levels justified on the basis of the Tier 2 rate, and that the programs be reviewed with the changes required for retail access for large power consumers.



On November 27, 2003, the BC Government accepted the above recommendations<sup>14</sup> and ordered Heritage Special Direction # HC2<sup>15</sup> that provided additional directions in regard to designing rates for transmission rate customers.

The Government directives and changes in the regulatory environment in BC set firm ground for the tiered rate to be reintroduced in the region and made its adoption mandatory. BC Hydro applied for the Stepped Rates through its Transmission Service Rate Application on March 10, 2005.

---

<sup>14</sup> Province of British Columbia, Order in Council 1124, BC Hydro Public Power Legacy and Heritage Contract Act , November 27, 2003  
<[http://www.bcuc.com/Documents/SpecialDirections/OIC\\_1124\\_Heritage%20Contract%20Act.pdf](http://www.bcuc.com/Documents/SpecialDirections/OIC_1124_Heritage%20Contract%20Act.pdf)> (October 15, 2007)

<sup>15</sup> Province of British Columbia, Order in Council 1123, Heritage Special Direction No. HC2 to BCUC <[http://www.bcuc.com/Documents/SpecialDirections/OIC\\_1123-SD-HC2.pdf](http://www.bcuc.com/Documents/SpecialDirections/OIC_1123-SD-HC2.pdf)> (October 15, 2007)

## Characteristics of BC Hydro's Tiered Rate

In its Transmission Service Rate Application,<sup>16</sup> BC Hydro responded to BC Government and BCUC directives by proposing to replace the existing flat rate with either a Stepped Rate or Time-of-Use Rate for all industrial customers with some exceptions. The two options include a tiered approach and allow the customers the choice of responding to a fixed and stable marginal cost signal, reflective of BC Hydro's long-term procurement options, or to a local market price reflective of BC Hydro's short term opportunity cost.

The regulatory hearing proceedings did not go to the oral phase and the whole review was conducted through a negotiated settlement. It took five months between the date of application and the BCUC's final decision approving the proposed rate<sup>17</sup>.

The reaction of the regulatory review participants was different from that in year 1991 in that the majority of Intervenors, including transmission voltage service customers who will be directly affected by the transmission service rates, supported the proposal; they were consulted and involved in their drafting.

### ***The Stepped Rate Structure***

The Stepped Rate consists of a tiered or stepped energy rate and a demand charge. The Stepped Rate is defined by a lower rate for initial consumption (The

---

<sup>16</sup> BC Hydro Transmission Service Rate Application of March 2005  
<[http://www.bcuc.com/Documents/Proceedings/2005/DOC\\_7161\\_B-1\\_Transmission%20Service%20Application.pdf](http://www.bcuc.com/Documents/Proceedings/2005/DOC_7161_B-1_Transmission%20Service%20Application.pdf)> (October 15, 2007)

<sup>17</sup> BCUC Order G-79-05 of August 29, 2005  
<[http://www.bcuc.com/Documents/Proceedings/2005/DOC\\_8278\\_G-79-05\\_BCHydro\\_TSRA%20Reasons%20for%20Decision.pdf](http://www.bcuc.com/Documents/Proceedings/2005/DOC_8278_G-79-05_BCHydro_TSRA%20Reasons%20for%20Decision.pdf)> (October 15, 2007)

Tier 1 Rate), a higher rate for further consumption (The Tier 2 Rate) and an amount of energy allocated to each rate (The Tier 1/Tier 2 Split).

Some of the Stepped Rate features are:

- Demand charge is collected as under the previous flat rate;
- CBL is calculated for each customer on the basis of the energy consumption for the previous calendar year;
- Customers with two or more plants can aggregate any combination of their plants and have an aggregated CBL determined;
- The Tier 2 Rate is calculated as the weighted average price of energy from the last province-wide Call for Tender, which is expected to be BC Hydro's actual cost of acquiring energy for the longer term;
- The Tier 1/Tier 2 Split is set at 90/10, which means that energy is billed at the Tier 1 Rate when annual energy consumption is less than 90% of the annual CBL and The Tier 2 Rate - for the consumption exceeding this level;
- The Tier 1 Rate is defined on the basis of the Tier 2 price and The Tier1/Tier2 Split with The Tier 1 Rate changing whenever the Tier 2 Rate is altered to maintain revenue neutrality.

### ***Optional Time-of-Use Rate***

The optional Time-of-Use Rate ("TOU") rate exposes the customer to market pricing; hence it is designed on a seasonal and time-of-day basis. The rate (charges) is reflective of the short-term economic value of energy to BC Hydro (opportunity cost); i.e. varying by season and time of the day. The basic



concept/structure of the TOU is very similar to the Stepped Rate, except for the following factors:

- CBL is established for each month and High Load Hours/On-Peak (“HLH”) and Low Load Hours/Off-peak, (“LLH”) periods;
- Consumption levels at which the rate switches from The Tier 1 to The Tier 2 vary by month and in the winter months - by HLH and LLH;
- The Tier 2 charge is defined by the long-term forecast of Mid-Columbia monthly price shaped for HLH and LLH;
- The demand charge is based on the higher of the highest actual demand during the HLH period each month and the demand CBL for that month.

### ***CBL***

Probably the main challenge to the development of a tiered rate structure is establishing the customers’ historical base load consumption or CBL. The CBL, in effect, defines the customers’ right to the embedded low cost Heritage (patrimonial) resources. No single formula will be acceptable to all customers as customers’ individual use and prevailing market conditions are all variable, volatile and disputable. Additionally, adjustments to the CBL are also problematic; the adjustments are typically trying to replicate what the customer would have consumed had it stayed on an old rate; again, a highly judgmental and disputable analysis.

BC Hydro developed guidelines for CBL adjustments and revisions that are performed on an annual basis or as required. According to the CBL Guidelines<sup>18</sup>,

---

<sup>18</sup>BCUC Order G-70-05 on BC Hydro’s Application for Transmission Service Rates of August 29, 2005, Appendix B, pp. 6-20 “Customer Baseline Load (CBL) Determination Guidelines of May 18,



the customer's CBL can be adjusted at the beginning of each year if the previous year's total consumption was less than 90% or more than 110% of the previously established CBL if the customer faced the following events:

- Force Majeure;
- Customer was taking retail access;
- Customer funded DSM Projects that realized an energy savings of at least 0.3 GWh/year;

The Customer's CBL will be revised in the middle of the year in the following cases:

- BC Hydro funded customer DSM Projects;
- Plant Capacity increased of at least 5% over the pre-project Energy CBL or 10 GWh, whichever is less.

The CBL Guidelines allow a customer to propose adjustments other than those that are defined in the CBL Guidelines, which can be filed with the BCUC.

All CBLs will be subject to final approval by the BCUC. In the event of disagreement between BC Hydro and the customer, the customer can file the disagreement with the Commission.

---

2005" <[http://www.bcuc.com/Documents/Proceedings/2005/DOC\\_8278\\_G-79-05\\_BCHydro\\_TSRA%20Reasons%20for%20Decision.pdf](http://www.bcuc.com/Documents/Proceedings/2005/DOC_8278_G-79-05_BCHydro_TSRA%20Reasons%20for%20Decision.pdf)> (October 15, 2007)

## ***Review of BC's Implementation of Tiered Rates***

The 2002 BC Energy Plan included many of the elements required for market development such as open access, retail access, and promotion of IPP development. Hence, the Plan attempted to create the proper environment for customer (large industrials) to access the market and exercise a wide range of choices before mandating the tiered rate structure. The Plan also included a provision for BC Hydro to offer the customers a TOU to exploit all available economic efficiency improvement avenues.

The government took conservative steps in introducing the tiered rate by asking the BCUC for recommendations before ultimately introducing a directive mandating the tiered rate. Even after issuing the directives, the government left the BCUC with enough implementation flexibility.

The BCUC spent the required time to collect stakeholders' feedback and ideas and explored all viable options. The introduction of the tiered rate coincided with the debate regarding the best approach to allocate the Heritage Resources to BC Hydro allowing for a wider spectrum of debate around BC Hydro's future rates.

My view, which I expressed openly to BCUC, is that BC Hydro and its industrial customers displayed limited desire and appetite for taking risk and/or venturing into new concepts. Both sides, and to a large extent most other stakeholders, were comfortable with the existing regulatory regime and did not see a need to change it.

Ultimately, BC Hydro and its stakeholders responded to BCUC directive with a watered down proposal that limited exposure and risk taking; and naturally the effectiveness of the tiered rate/price signal. Many safeguards were put in place to simulate and adjust for customers' potential behavior absent the tiered rate adding to the administrative cost of an already complex rate structure.

## **The BC Hydro Experience Relevance to Québec**

The importance of an industrial rate with a tiered structure that aims at improving efficiency and energy conservation is not deniable. However, the prevailing market, business, regulatory and political conditions can and do play a significant role in stakeholder acceptance of the tiered rate concept.

The electricity industry of the province of Québec is nearly at the same place as BC was in year 1991 when the BCUC directed BC Hydro to consider introduction of the tiered rate as a means to attain electricity efficiency; but accepted the industrial customers' opposition to it. Like in BC, Québec does not have a market environment favorable to the introduction of a tiered rate.

In Québec, the patrimonial resources (Heritage resources in BC) are assigned to HQD on hourly basis. This adds a degree of complexity to implementation of a tiered rate for HQD not faced by BC Hydro. For proper structure of a two tier rate in HQD service area, the customer should have its first tier volume assigned to it on a similar basis to the patrimonial resources, i.e. on hourly basis. I do not believe that such a proposition is particle, possible or cost justifiable given the limited options available to customers to benefit from the tiered rate structure.

If the Régie was to choose the example of BC as a reference case, it should consider how the concept proceeded. The expected opening of the market made the introduction of the rate more natural. It is the responsibility of the regulator and other legislative bodies to set the grounds for the rate implementation in the region. Customers need to have viable alternatives if a tiered/stepped rate is offered; to manage and justify the price risk exposure associated with a two tier rate.

Absent a functionally open market, it could be viable to offer a tiered rate on an optional basis. Choice allows customers to decide on the pace of change as they

gain comfort in the tiered rate and find opportunities to meet their needs. Offering the rate as an option would reduce the administrative burden on HQD.

One of the main challenges of a tiered rate is setting the historical consumption for each customer. This is an area where some compromises must be made and some risk is taken. A tiered rate structure is most suitable and beneficial when the customer taking the tiered rate has the flexibility to adjust to market conditions. Hence, once a customer is exposed to a tiered rate structure, its consumption pattern should change; this is precisely why such rate would be introduced. I believe that unless and until customers and the utility are willing to live with the risk/benefits associated with the tiered rate, there is no reason to introduce it. I believe that the BC Hydro stepped rate attempted to manage that risk exposure to an extreme, first by only allowing 10% of the consumption to be exposed to the marginal rate and second by allowing flexible rules for adjusting the CBL.

The issue of setting the long-term opportunity cost of new supply for the second tier is another matter that has to be considered closely in the course of developing the tiered rate. Without the proper determination of the Tier 2 rate, the very basis of implementing stepped rates is put into question. The price signal must be as representative or as correct as possible. The challenges in setting the appropriate marginal cost, the second step of the rate or ultimately the “correct price signal” include:

- Long-term versus short-term marginal cost; i.e. which time horizon is the utility focused on in its planning. For example if the utility is in a short-term resource surplus condition but expects a long-term resource acquisition needs, the choice of marginal cost would be particularly problematic. I believe that HQD is currently in resource surplus conditions and that the prevailing market value of its surplus power is below HQD’s long-term marginal cost. This condition could result in short-term revenue deficit if the second tier is priced at the long-term marginal cost. Setting the second

tier at the short-term marginal cost would send the wrong price signal for customers considering investing in long-term demand side activities.

- The duration or frequency of adjusting the rate. On one hand the utility needs to adjust the rate as its resource and/or market conditions change while on the other hand customers require as a stable rate as possible in order to make viable long-term choices; like investing in demand side management or self generation initiatives.

In the BC Hydro case, BC Hydro offered two different rates, one reflecting the long-term marginal cost and one representing the shorter term market opportunity cost. The long-term marginal cost is fixed for three years. However, BC Hydro decided to use the weighted average price of energy from the last province-wide Call for Tender (“CFT”). Most stakeholders agreed to use the CFT index. At the time of the BC hearings on the Stepped Rate in 2005, the previous CFT had resulted in the average price of \$54/MWh. Most participants preferred to see stability in the rate, hence accepted this price for the Tier 2 Rate for the period until the next CFT scheduled for April 2008. However, some parties were concerned that the rate would not represent future costs of new supply adequately. It can be argued that the price that the utility acquires resources at from the market at one point in time cannot be expected to reflect future costs of acquisition. The next BC Hydro call was not in 2008, but in 2006, the 2006 CFT<sup>19</sup>. The outcome of the 2006 CFT was announced on July 26, 2006. The average firm energy price was approximately \$74/MWh for large projects and \$70/MWh for small projects. The short-term variance is so high it renders the tiered rate price signal ineffective. Meanwhile, BC Hydro could adjust its demand side programs to reflect its marginal cost; putting the utility in a better position to manage demand side management than the customer.

---

<sup>19</sup> BC Hydro’s News Release ‘BC Hydro awards energy contracts’ of July 27, 2006  
<<http://www.bchydro.com/news/2006/jul/release47609.html>> (October 25, 2007)

## Comments on HQD's Evidence

In its testimony, HQD stated that after it performed analysis of BC Hydro's Stepped Rate, HQD concluded not to proceed with the introduction of the tiered rate in the Province of Québec<sup>20</sup>.

HQD presented a logical breakdown of factors that make the Stepped Rate, as it is in BC, not fitting in the Québec environment. Additionally, the Stepped Rate in BC was formed for conditions specific to BC. Québec has its own path and pace of industry development, which should not necessarily mirror those in BC. An introduction of a Stepped Rate should allow for services with features that would be specific to the region and developed in agreement with local customers.

Based on my knowledge of the business and regulatory environment of both the BC and Québec jurisdiction, I do agree with HQD's conclusion.

### ***Establishing CBL***

In its testimony, HQD commented<sup>21</sup> : «Pour l'instant, l'information disponible montre que l'introduction et la gestion de ce tarif chez BC Hydro se sont avérées jusqu'à présent très lourdes et complexes.»<sup>22</sup> We fully agree and it has always been clear that the issue of establishing a CBL is critical to program success.

---

<sup>20</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.48, lines25-26 < [http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

<sup>21</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.45, lines 12-14<[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

<sup>22</sup> Translated as: "At the moment, the available information shows that the implementation and the administration of this rate by BC Hydro is very difficult and complex."

Given that customers' consumption is dependent on many factors, no one system will produce fair results to all customers (another reason for proposing an elective rate initially).

Further, HQD deliberated on the complexity of the CBL issue<sup>23</sup>: «L'établissement des références initiales s'est avéré un processus lourd et complexe et a fait l'objet de nombreux différends entre BC Hydro et sa clientèle qui regroupe un peu plus d'une centaine de clients. À l'automne 2005, l'ensemble des références avait été approuvé, soit 114 références pour autant d'abonnements. De novembre 2005 à février 2006, 190 demandes d'ajustement ont été acheminées à BC Hydro. Ces demandes ont été analysées et 6 cas ont dû être tranchés à la BCUC. »<sup>24</sup> Again, this is not surprising: in BC Hydro's IRP of 1991 it was expected that some unfairness will result that has to be accepted as the cost of changing the basis of an established regulatory regime; yet again another reason for the need for choice. Choice removes the sense of unfairness.

HQD believes that the process of introducing and implementing a new concept carries very high administrative costs<sup>25</sup>: « Ce processus lourd et complexe nécessiterait de nombreuses analyses et plusieurs échanges entre le

---

<sup>23</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.48, lines 4-10 <[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

<sup>24</sup>Translated as: "The establishment of the initial CBL proved to be a difficult and complex process and was the subject of many disagreements between BC Hydro and its customers, which includes more than one hundred entities. In the fall 2005, 114 CBLs were approved. Between November 2005 and February 2006, 190 requests for adjustment were submitted to BC Hydro. These requests were analyzed and 6 cases were filed with the BCUC."

<sup>25</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.48, lines 19-22<[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

Distributeur, les clients et la Régie, ce qui induirait des coûts d'administration potentiellement importants et une perte d'efficacité, du moins à moyen terme.<sup>26</sup>»

I again agree and believe that this issue may become a source of dissatisfaction, manipulation and potentially litigation. I would recommend a decisive approach to a constantly adjusted CBL. A decisive approach can only be justified if the value of the outcome is high or if customers have several options available to them; or naturally the customer is exercising the option to choose the rate and is aware of the risks.

In fact, the main concern that came in the course of the BCUC regulatory proceedings on Stepped Rate was CBL setting and adjustment mechanisms. At the beginning of the regulatory review, the following issues came up:

- Whether or not the customer should be allowed to dispute the CBL filed by BC Hydro;
- What should be the process for resolving disputed CBLs;
- What should be the appropriate balance between the need for a transparent process and respecting the confidentiality of customer-specific information?

### ***Energy Efficiency Programs as a Substitute***

HQD, in its testimony, addressed the issue of energy efficiency programs, questioning the importance of the tiered rate introduction since the DSM programs had been in place in Québec and proved to be effective. In effect, there

---

<sup>26</sup> Translated as: “This difficult and complex process would require many analyses and several exchanges between the Distributor, customers and the Régie, which would induce potentially significant administrative costs and loss of efficiency, at least in the med-term.”

are three DSM programs in Québec that provide financial assistance on a first-come, first-served basis to customers who reduce their energy consumption:

1. Industrial Analysis and Demonstration Program – Major Customers. HQ offers financial assistance (the program's budget is \$4.3 million) for (1) an analysis covering all forms of energy; (2) projects demonstrating electricity savings realized through first-time implementation of a new, high-efficiency technology with the goal of disseminating the results and encouraging adoption of the technology by the industry in Québec. Goal: to save 66 GWh of electricity by 2010.
2. ENERGY WISE Industrial Initiatives Program – Major Customers. HQ offers financial assistance (the program's budget is \$75.6 million) for projects designed to reduce specific electricity consumption. HQ reviews electricity management proposals for granting financial assistance. The program goal is to save 698 GWh of electricity by 2010.
3. The Plant Retrofit Program – Major Customers. HQ offers financial assistance in the maximum amount of \$30 million per retrofit project that will considerably reduce the overall electricity consumption of at least 50 GWh per year for 10 years. Goal: to save 500 GWh of electricity by 2010.

HQD stated<sup>27</sup> : « Le Distributeur considère que ces programmes s'avèrent un outil plus efficace qu'un tarif à paliers pour atteindre les objectifs d'économie d'énergie. Ils lui permettent de mieux cibler les mesures en fonction de critères précis alors qu'avec le tarif à paliers, toute réduction de la consommation est rémunérée au coût marginal, quelle qu'elle soit. De plus, les programmes permettent de donner une aide financière en lien direct avec la valeur

---

<sup>27</sup> Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.46, lines 15-22 <[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

économique des économies réalisées, à l'avantage de l'ensemble de la clientèle. À l'opposé, le tarif à palier accorde la même valeur à toutes les mesures d'économie d'énergie. Ainsi, les mesures les moins coûteuses sont rémunérées à la pleine valeur du coût évité. Enfin, contrairement au tarif à paliers, les programmes apportent une plus grande flexibilité au Distributeur en lui permettant d'ajuster le rythme de déploiement des différentes mesures en fonction de l'équilibre énergétique. »<sup>28</sup> I do agree that a properly structured DSM program can become a proxy for a stepped rate and can be adjusted more frequently to reflect changing HQD supply and market conditions, as reflected in the marginal cost. On the other hand, a stepped rate needs an accurate, but stable, marginal cost to be effective.

To the extent that the HQD DSM programs are flexible and exhaustive, the need for a stepped rate is diminished considerably; particularly that industrial customers in Québec have no power procurement options available to them. DSM programs are typically developed as a means to fix market imperfection, either inefficient pricing or market failure, but are not aimed at providing efficient pricing. Absent market options for industrial customers to procure their needs for power, I consider the Québec's market to be inefficient from an economic perspective; i.e. customers can't take full advantage of price signals.

---

<sup>28</sup>Translated as: "The Distributor believes that these programs prove to be a more effective tool than a tiered rate to achieve the goals of energy saving. They allow for better adjustment measures according to precise criteria whereas with the tiered rate, any reduction of consumption is charged at the marginal cost. Moreover, the programs allow for a financial assistance in direct connection with the economic value of the savings, which is an advantage to all customers. On the contrary, the tiered rate grants the same value to all measures of energy saving. Thus, the least expensive measures are charged at the full value of the avoided cost. Finally, contrary to the tiered rate, the programs bring a greater flexibility to the Distributor by allowing it to adjust the rate of implementation of various measures according to energy balance."

## **Business Risk**

Further, in its testimony, HQD addressed the issue of increased business risk that will be associated with the introduction of the tiered rate in Québec<sup>29</sup>:

“Les entreprises aspirent généralement à une croissance de leur production d'année en année et ce, même si elles prennent des mesures pour améliorer l'efficacité énergétique de leurs équipements. Les tarifs d'électricité ne devraient pas avoir pour conséquence de freiner cette croissance. Avec un tarif à paliers, les entreprises ayant une croissance inférieure au seuil établi pour justifier une révision de la référence seraient injustement pénalisées puisque toute croissance inférieure au seuil fixé n'est pas reconnue et est facturée au client au coût marginal<sup>30</sup> .

HQD brought up an example of cyclical industries being subject to economic fluctuations. HQD concluded that the tiered rate will be penalizing these industries when their production and consumption profile vary from year to year<sup>31</sup>:

---

<sup>29</sup>Hydro Québec Distribution, Réforme des Tarifs GénérauxR-3644-2007 Original:2007-08-01 Hqd-12, Document 4, P.47, lines 8-15 <[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

<sup>30</sup> Translated as: “The companies generally aspire to a growth of their production year by year even if they take measures to improve energy efficiency of their equipment. Electricity rates should not counter such growth. With a tiered rate, companies, having a growth lower than the threshold established to justify a revision of the CBL, would be unjustly penalized since any growth lower than the fixed threshold is not recognized and is billed to the customer at the marginal cost.”

<sup>31</sup>Hydro Québec Distribution, Réforme des Tarifs Généraux, R-3644-2007 Original:2007-08-01 Hqd-12, Document 4, p.47, lines 16-19<[http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1\\_HQD-12Doc4\\_3644\\_3aout07.pdf](http://www.regie-energie.qc.ca/audiences/3644-07/Requete3644/B-1_HQD-12Doc4_3644_3aout07.pdf)> (October 15, 2007)

« De plus, certains secteurs de l'économie qui regroupent des industries cycliques, sensibles aux fluctuations économiques, seraient systématiquement pénalisés par rapport à la tarification actuelle étant donné les écarts importants dans leur profil de consommation d'une année à l'autre <sup>32</sup> ».

Although I generally agree with HQD's observation, I believe that it should be highlighted to HQD, the customers and the Régie that the risks associated with the introduction of the stepped rate is an integral part of tiered rates. An attempt to correct for every potential variance will render the rate unusable. Part of the reason for price signals to work from an economic perspective, is that they allow for the sharing of risk among various market participants. In the example given by HDQ, customers exposed to a cyclical production behavior would be at an advantage during a down cycle; or at the time they need help most. Choice in accepting the tiered rate will eliminate this concern, since the customer will not be obliged to switch to the tiered structure unless it sees the benefit and is able to manage its up and down sides. After analyzing costs, benefits and risks, customers can decide whether to remain under the existing rate or switch to a tiered rate.

---

<sup>32</sup> Translated as: "Moreover, certain sectors of the economy made up of cyclical industries, sensitive to economic fluctuations, would be systematically penalized as compared to the current rate given the significant variations in their profile of consumption from one year to another."

## Conclusions and Recommendations

I believe that the introduction of a stepped rate in Québec at this time is not likely to produce sufficient results to justify the administrative cost and potential disruption to industrial customers' operations. The Québec market, being dominated by HQD as a monopoly supplier, does not offer the customers enough options to allow for the economic benefits associated with marginal cost pricing (as it should be reflected in the second tier of the stepped rate).

If the intent of the stepped rate is to encourage demand-side management, I strongly believe that many utilities, including HQD, have or could offer sufficient DSM programs to maximize the benefits while tailoring the programs to suit the specific market environment. Industrial customers in Québec, specifically AQCIE /CIFQ, display a high level of satisfaction of their working relation with and the program offerings of HQD.

The stepped rate experiment in BC is too recent to offer a model of success or even the premise of success. We see the experiment as a compromise reached between the various stakeholders to satisfy a directive from the government. Based on my personal knowledge, many of the stakeholders wished the issue of a stepped rate had never arisen. From a pure technical perspective, I believe, the structure of the BC Hydro's stepped rate will not produce the desired results, even if all parties adopted it with zeal in Québec.

It is incongruent to force the use of free market economic principles on unwilling market participants. HQD is justified in its reluctance to implement a BC Hydro-like tiered rate and so are the industrial customers in their unwillingness to accept it. HQD reluctance and industrial customer unwillingness should be a good enough reason to make the Régie reconsider the timeliness of a stepped rate for HQD now. It should be stressed again that the current electricity market in Québec does not qualify as a free market, from the perspective of industrial customers.

Should the Régie still conclude that the benefits of a tiered rate far exceed the potential cost associated with its introduction, I would recommend that HQD and its industrial customers be allowed to develop the terms of such a rate in a consultative manner. I would also strongly recommend that the introduction of this new rate be on optional basis to the industrial customers. Offering the tiered rate as an option would achieve several objectives including:

1. Only customers who are likely to be able to use the rate to advantage will subscribe, reducing the administrative cost and exempting other customers, and HQD, from the collateral impact.
2. If the offer is optional then rules regarding CBL determination and future adjustment should be made more stringent. Customers, who chose the stepped rate, should be able to factor in associated risk and reward.
3. With a smaller sample of customers it would be much easier to analyze and examine results, adjust the rate, impose full implementation or even retreat from the concept all together; without disrupting a large and important class of customers.
4. The potential revenue impact on HQD and all its customers should be more manageable with a smaller sample of participants; i.e. controlled level of revenue risk.



## Appendix A: Resume of Dr. Zak El-Ramly

### Work Experience

#### **ZE PowerGroup Inc.**

1994 – Present      President

- ZE PowerGroup is a consulting firm specializing in electricity deregulation and competitive strategy for emerging markets. Dr. El-Ramly leads a group of technical staff and seasoned industry associates in variety of comprehensive projects. The group is active in regulatory consulting and intervention, active management and implementation of electricity trading and risk management, operationalization of new competitive business functions and trade and risk software development.

#### **Powerex**

(British Columbia Power Exchange Corporation, subsidiary of BC Hydro)

1993 - 1995      Executive Vice-president, Marketing

- Responsible for sales, long-term contract negotiation and resource acquisition and for managing daily activities. As one of the early executives credited for the development and structuring of Powerex and its trading operation.

1990 - 1993      Vice President, Development

- Responsible for the development of corporate direction to enhance the business. *Led the developed a short-term electricity market, the Power Exchange Operation (PEO).*



## **BC Hydro (British Columbia Hydro and Power Authority)**

- Held several key managerial positions related to various utility functions. He led the development of many innovative programs and policies some of which were modeled by other utilities in North America and abroad, most notably being the Power Smart program, wheeling policies and an application for a rate overhaul.

1991 - 1993            Manager, Business Development, Resource Management

- Development of corporate policies related to energy trade (in key areas such as rate strategy, wheeling and exchanges with other suppliers). Negotiating complex contracts. *Responsible for the development of a BC Hydro innovative system of unbundled rates referred to as the Industrial Rate Proposal*

1989 - 1991            Manager, Policy Development, Corporate & Environmental

- Development of corporate policies related to energy transactions. *Led the development of one of the first leading edge wheeling policies in North America.*

1988 - 1989            Manager, Rates & Forecasting

- Personnel and resource management of Rates, Load Research and Forecasting groups.

1985 - 1988            Marketing Manager, Residential & Commercial Energy

- Market program development, program implementation and providing general technical support for all marketing activities. Spearheaded the development of the demand side management program known internationally as Power Smart.



1983 -1985            Projects Supervisor, Energy Management Division

1981 -1985            Supervisor, HVAC Section Energy Conservation Division

1979 -1981            Energy Services Systems Engineer, Energy Conservation

1977 -1979            HVAC Engineer, Energy Conservation Division

**Prior to Joining BC Hydro**

1964 -1977            Teaching, research, graduate studies and worked overseas.

**Memberships**

1995 -1998            Honorary President of the Power Marketing Association

1995 -1996            Member of the New York Mercantile Exchange (NYMEX)  
Electricity Advisory Group for the development of NYMEX  
electricity futures

1994 -1995            Executive member of the Western Systems Power Pool  
(WSPP)

1994 -1995            Member of the Northwest Electric Light and Power  
Association

1977 -present        Member of the Association of Professional Engineers of BC

1977 -1995            Member American Society of Heating, Refrigeration, and Air  
Conditioning Engineers (ASHREA), BC Chapter. Held  
several executive positions and was president from 1987-  
1990



## **Appendix B: BC Hydro's 1991 Industrial Rate Proposal**

This page intentionally blank

## INDUSTRIAL RATE PROPOSAL

### OBJECTIVES

The Lieutenant Governor in Council's Special Direction No. 3 requires that B.C. Hydro's rates:

- contribute to conservation and the efficient use of electricity;
- recognize the higher cost of new electricity supply;
- provide for smooth and stable increases; and
- are otherwise fair, just and reasonable.

As set forth in the Executive Summary of B.C. Hydro's Rate Design Application, the effect of Special Direction No. 3 is no more than to give particular emphasis to certain traditional objectives of rate design which have been used to determine whether rates are fair, just and reasonable as required by the Utilities Commission Act. The overall objective in developing B.C. Hydro's Industrial Rate Proposal (IRP) was to satisfy the requirements of Special Direction No. 3 and the Utilities Commission Act.

A prerequisite to attaining the related goals of "ensuring rates contribute to conservation and the efficient use of electricity and recognize the higher cost of new electricity supply" is giving customers the correct price signal. The goal of the industrial rate redesign is to continue to provide B.C. Hydro's transmission voltage customers with access to and the benefits of the current system while providing a price signal that reflects future costs.

The current energy environment has developed over a long period of time and any modifications to it should allow industry enough time to adjust and to make the most of the new initiatives. This objective is reflected in the criteria in Special Direction No. 3 requiring rate changes to be smooth and stable and the related traditional objective of gradualism.

B.C. Hydro's intends to implement the IRP in an orderly and elective way. If customers are shown the benefits of the choices they are being offered under the IRP they will take advantage of these options when it is in their interest to do so and dictate the pace of change.

B.C. Hydro has also considered the requirement that its rates are otherwise fair, just and reasonable. The requirement includes the need to develop a rate structure which collects B.C. Hydro's revenue requirements which are based on the embedded cost of the system. This criteria involves consideration of both intra-class and inter-class issues. Although customers differ between classes, pricing represents the major link between these customers and B.C. Hydro's initiatives. Accordingly, under the IRP, B.C. Hydro seeks to ensure that its pricing and other initiatives form a coherent and cohesive policy to benefit all customers.

A related objective under the IRP is providing customers with an opportunity to match their electricity service with their needs by providing them with a wide range of choices. These choices include quality of service, price, supplier and degree of risk. Providing industrial customers with choices associated with their supply of electricity provides a mechanism for the optimization of resources for the customer and B.C. Hydro. In the absence of choice, the customer may be purchasing a product with characteristics that it does not need. Currently there is only one packaged industrial rate available at a uniform price from the same supplier. In matching the customer's needs B.C. Hydro and/or other suppliers may be able to provide these services at a lower cost than providing a standard package of services to all industrial customers.

### DEFICIENCY OF THE CURRENT RATE STRUCTURE

B.C. Hydro's long run incremental cost (LRIC) is projected to be much higher than its average rates. The LRIC is a measure of the cost of providing new demand for energy and capacity over a planning horizon. An average rate that is lower than the LRIC causes consumers to demand electricity based on historical cost in circumstances where this demand will impose significantly higher costs on the system in the future.

The impact of increasing incremental costs can be diminished by ensuring that least-cost planning criteria are employed when increasing supply and that every effort is made to encourage conservation through programs like Power Smart. However, increasing costs will remain a fact and in this environment the price

customer, under normal operation, is the same; i.e., revenue neutral. The first block will be fixed in size for a specific physical plant (as detailed under Rate 1823). Accordingly, changes in a customer's consumption (decrease or increase) is priced at the second block level or LRIC.

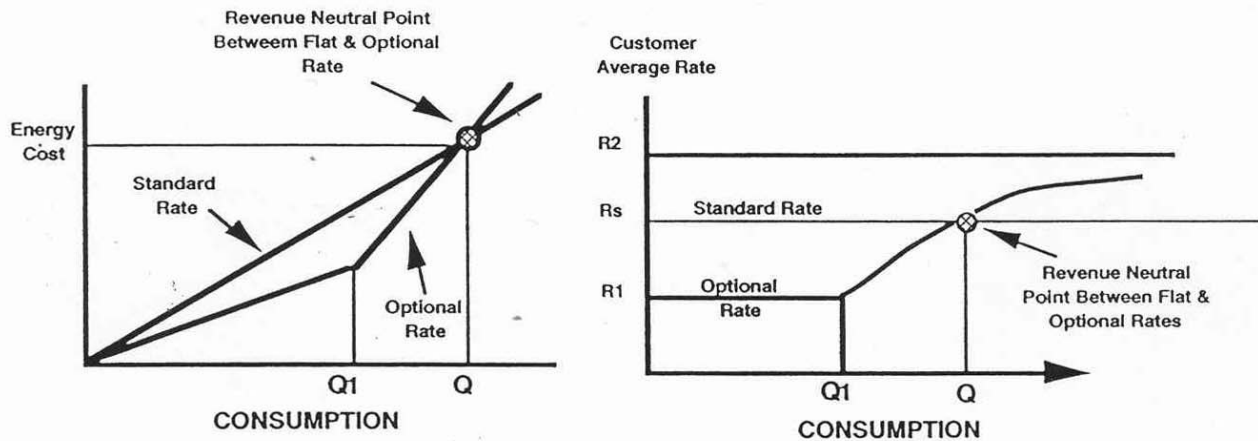


Figure 3 - Variation of Energy Cost and Average Rate With Consumption

As a result of this rate relationship, customers who elect to move to the optional rate and do not change their consumption level will be paying the same revenue as they would have under the standard rate 1821 regardless of changes in  $R_s$  or LRIC. However, customers who choose the optional rate and change their consumption patterns will experience an average rate which is higher or lower than under the standard rate 1821 ( $R_s$ ) depending upon whether they increase or decrease their energy requirements. The characteristics of the rate are shown in Figure 3. Under the optional rate customers will be facing the true long term cost for their marginal consumption. Another advantage of the optional rate, besides promoting conservation, self generation and purchase from independent producers, will be its response to business cycles. If a customer's consumption is reduced as a result of hard times, its average energy rate will decline; this represents a benefit, to some extent, since fixed costs per unit of production will probably be climbing. In boom times when production is increased, the average cost of energy would go up typically at a time when other fixed costs are decreasing per unit of production. In effect, customers electing the optional rate would also enjoy a form of production rate.

## THE INDUSTRIAL RATE FAMILY

B.C. Hydro expects that, as a result of customers taking this option, the competitiveness of the energy industry will be enhanced. Currently some customers have their own on site source of supply, under the IRP, all customers will have the potential for multiple sources of supply as:

- energy wheeled from Independent Power Producers (IPP) or a sister facility;
- self /cogeneration; or
- energy purchased from the Power Exchange Operation (PEO).

In anticipation of these new business dynamics, B.C. Hydro is proposing two additional basic firm rates to complement the standard 1821 rate and the optional rate which has been called 1823. These two other

- B.C. Hydro as the base load; first through the meter - nomination must be exhausted before receiving energy from other sources,
- B.C. Hydro is last through the meter - supply from other sources must be used to nomination levels before drawing on B.C. Hydro supply, or
- Proportional supply from B.C. Hydro and alternate source(s).

### Rate 1823 - Optional Rate with B.C. Hydro as Exclusive Supplier

This is the optional rate for customers electing B.C. Hydro as their exclusive supplier.

The rate is structured so that if the customer maintains his current consumption pattern the rate is revenue neutral.

Customers electing to take service under the optional rate will have to agree with B.C. Hydro on the level of consumption to be used in setting first block quantities. To establish a trend for a customer's existing facility up to 5 years consumption history will be extracted, excluding abnormal months. A regression analysis will be applied to this consumption history to estimate what the customer's consumption will be in the upcoming year. This is illustrated in Figure 7. Initially the first block, Q1 and D1, is set at 50% of the total annual energy consumption (Q) and average demand (D). This represents the customer's base consumption.

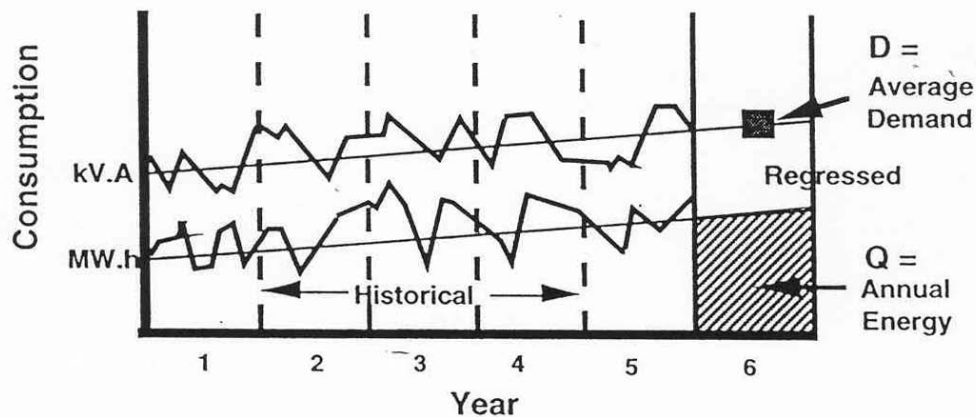


Figure 7 - Calculation of Q & D

A customer's base consumption is for existing facilities; permanent changes in customer facilities, plant additions or removal, would result in recalculating Q1 and D1 in a way that its increase or decrease in its electricity bill as a result of changing its consumption will be at an equivalent rate to the standard rate at the time.

For new customers, the consumption level would be estimated if both parties can agree. If agreement is not reached or if it is difficult to estimate the consumption, then the choice of the optional rate would be delayed until consumption history is available.

It is envisioned that the BCUC will resolve any dispute, between customers and B.C. Hydro, as to the appropriate consumption levels.

This same rule applies if that customer then wishes to switch again to the optional rate. This parameter is to prevent rate switching driven solely by economic considerations.

Customers who are on Rate 1822 or 1824 can go back to Rates 1821 or 1823 respectively on giving B.C. Hydro four years' notice and subject to fulfilling all other contractual obligations, e.g. wheeling contracts. This will allow B.C. Hydro enough time to plan for and acquire resources to serve the customer wishing to revert to exclusive supply from B.C. Hydro.

### STANDBY SERVICE

Customers on Rates 1822 and 1824 who have their own self generation or cogeneration on site may need standby service for a temporary loss of their supply (i.e. for hours or days).

B.C. Hydro is introducing two levels of standby service as a substitute to the customer investing in his own level of higher reliability for its on-site facility.

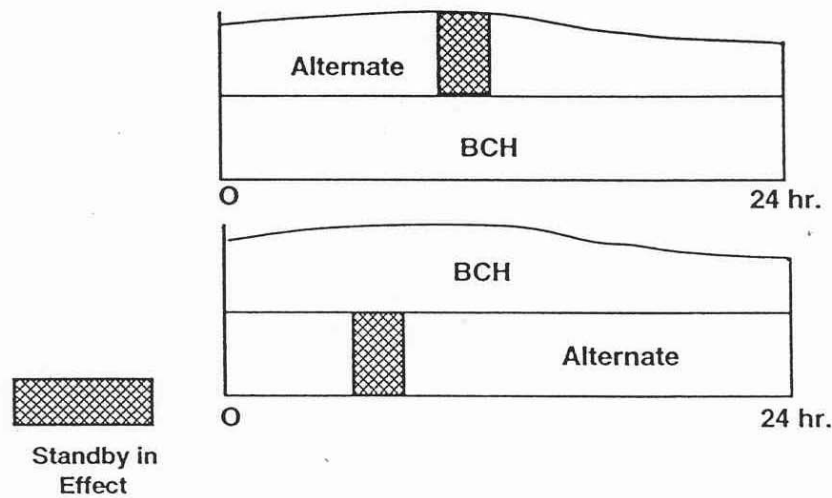


Figure 9 - Example of Standby Needs

#### Firm Standby - Rate 1881

A customer taking firm standby will be supplied automatically when its generation is derated or there is a forced outage, up to the amount of capacity reserved. There is no interruption of electricity due to the customer's source failure; the customer enjoys the same characteristics of supply as other B.C. Hydro customers. Standby energy will be supplied at short term market prices.

#### Interruptible Standby - Rate 1882

This rate provides a customer with automatic interruptible supply in case of the customer's source failure. This supply may be interrupted or curtailed by B.C. Hydro at any time. Customers taking interruptible supply must be connected to a circuit that can be interrupted and/or controlled by B.C. Hydro. B.C. Hydro will endeavour to give customers as much notice of interruption as practicable.

differentiated by time of day, season and region. The differentiation by time and region reflects the relative value of capacity with respect to time and to different geographical locations respectively.

This policy is designed to encourage favourable location of future power supply facilities. It gives the correct price signal and will facilitate the development of an efficient bulk power market in B.C.

#### **ACCESS TO THE PEO - RATE 1851**

Under the IRP customers will have access to short term market supply through the PEO. Customers may secure supply, from the PEO, as part of their alternate source supply or from time to time may find that taking supply from the PEO can reduce its energy costs. Instances under which a customer may seek access are:

- capacity requirement over and above normal capacity needs; or
- to provide energy for standby requirements to offset a shortage under a wheeling contract.

Access to the PEO for this type of supply is beyond a customer's normal supply arrangements with B.C. Hydro.

#### **RATE CHANGE AND REVENUE ADJUSTMENT**

With the introduction of the optional rates there will be three rate levels in the industrial rate family ; the level for the standard rate and the two levels for the blocks of the optional rate. R refers to the standard energy rate in ¢/kW.h and RD to the standard demand charge in \$/kVA (see Figure 8). R1 and RD1 are the first block rates and R2 and RD2 are the trailing block, LRIC, rates.

R2 and RD2 will change with B.C. Hydro's LRIC. The LRIC may change with time or with changes in B.C. Hydro's System Plan. The first block energy rate R1 will change to retain the relationship  $(R1 + R2)/2 = Rs$ ; similarly for the demand charge RD1. By maintaining the rate relationship  $(R1 + R2)/2 = Rs$  customers who do not change their consumption level pay the same average rate on the optional rate as they would have on the standard rate. Customers who do adjust their consumption level will see the change in their average rate at the margin. This is illustrated in Figure 3. The following scenarios illustrate how revenue for the industrial class would be adjusted.

##### **Long Run Incremental Cost Increasing or Decreasing No Change in Revenue Requirement**

Any change in the LRIC will result in a change in R2 and RD2. As there is no change in the revenue requirement Rs and RDs remain the same. Accordingly, R1 and RD1 move in the opposite direction as the change in R2 and RD2 to maintain the relationship between the standard and optional rates.

##### **Revenue Requirement Increase Without a Change in LRIC**

R2 and RD2 remain the same as there is no change in LRIC. To collect the revenue requirement Rs and RDs increase. R1 and RD1 increase to capture the remaining revenue requirement for the class and maintain the relationship between the standard and optional rates.

##### **Change in Revenue Requirement and LRIC**

R2 and RD2 change to reflect the new LRIC. Rs and RDs are changed to cover the class revenue requirement and R1 and RD1 change to recover the balance of the revenue requirement for the class and offset the change in R2 and RD2, maintaining the relationship between the standard and optional rate ensuring there is no over collection of revenue.

# Summary of Industrial Rates & Services

