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August 22, 2007

Mr. Robert J. Pellatt  
Commission Secretary  
British Columbia Utilities Commission  
Sixth Floor – 900 Howe Street  
Vancouver, BC V6Z 2N3

Dear Mr. Pellatt:

**RE: British Columbia Utilities Commission (BCUC)  
British Columbia Hydro and Power Authority (BC Hydro)  
Conservation Research Initiative (CRI) – Residential Time of Use (TOU)  
Second Year of CRI-TOU Pilot Program  
RS 1141; 1141A; 1141B; 1142; 1143; 1144A and 1145**

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BC Hydro is hereby submitting to the BCUC the enclosed CRI TOU Application (Application) and draft BCUC Order for the second year of the CRI TOU Pilot Program. BC Hydro is requesting approval of the Rate Schedules attached as Appendix A and revised Tariff Supplement No. 73, attached as Appendix F to the Application, all effective November 1, 2007.

As set out in BCUC Order No. G-120-06, which approved the CRI TOU Pilot Program, BC Hydro was encouraged by the BCUC to conduct meaningful consultation with stakeholders through a Stakeholder Advisory Committee and to incorporate the recommendations of the Advisory Committee into any proposed redesign of the TOU rates in the second year of the two year term of the program.

As described in the Application and Appendix C, BC Hydro set up a Stakeholder Advisory Committee and held a series of meetings through the first half of 2007. The requested revisions to the TOU rates and the addition of two Critical Peak Pricing (CPP) rates are the result of the consultations held and have either the support or acceptance of all members of the Stakeholder Advisory Committee.

BC Hydro respectfully requests that the Application be reviewed and approved on an expedited basis with no further process required. This request is made due to the fact that, with the exception of one, all of the intervenors who took part in the Negotiated Settlement Process which approved the first year of the CRI Pilot Program were also members of the Stakeholder Advisory Committee; that the committee also included individual residential customers; and that there was unanimous support or acceptance of the proposed rates.

For further information please contact Mr. Fred James at 604-623-4317.

Yours sincerely,

A handwritten signature in cursive script, appearing to read 'Joanna Sofield'.

Joanna Sofield  
Chief Regulatory Officer

Enclosure (1)

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**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER G-**

TELEPHONE: (604) 660-4700  
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**IN THE MATTER OF  
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473**

**and**

**British Columbia Hydro and Power Authority (BC Hydro)  
Application for Second Year of Conservation Research Initiative  
Residential Time of Use Pilot Program**

**BEFORE:** \_\_\_\_\_, Commissioner \_\_\_\_\_, 2007

**O R D E R**

**WHEREAS:**

- A. On August 28, 2006, British Columbia Hydro and Power Authority (BC Hydro) filed an application pursuant to sections 58 to 61 the Utilities Commission Act for approval of a set of residential Time of Use (TOU) rates to be offered under the Conservation Research Initiative (CRI) TOU program on an optional basis; and
- B. Pursuant to Commission letter L-48-06 a workshop and Negotiated Settlement Process (NSP) discussions were held on Tuesday, September 12, 2006 and
- C. By letter dated September 14, 2006 BC Hydro proposed certain amendments to its Application to address comments received from intervenors during the NSP ; and
- D. On September 29, 2006 the Commission issued Order No. G-120-06 approving the Application as amended by BC Hydro's September 14, 2006 letter; and
- E. Commission Order No. G-120-06 also directed BC Hydro to conduct meaningful consultations with stakeholders through an Advisory Committee and to incorporate the recommendations of the Advisory Committee, as appropriate, into any proposed redesign of CRI TOU rates for the second year of the two-year term of the program; and

- F. BC Hydro and the Advisory Committee held four meetings between January and June 2007 and the recommendations of the Advisory Committee were substantially agreed to by BC Hydro; and
- G. On August 20, 2007 BC Hydro filed an application for the second year of the CRI TOU Pilot Program (the Application) which contained the recommendations of the Advisory Committee and in particular requested approval of two new Critical Peak Pricing (CPP) rates and a revision to an existing TOU rate in order to shorten the number of hours in the peak period, in addition to changes to Tariff Supplement No. 73 required as a consequence of the CPP rates and requested revisions to existing TOU rates; and
- H. Due to the fact that the Advisory Committee was composed of substantially all of the intervenors who took part in the NSP on September 12, 2006 and also included individual residential customers, and that all members of the Advisory Committee indicated either support or acceptance of the Application, BC Hydro therefore recommended that the Commission proceed with approval of the Application without further process.

**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER** G-

**NOW THEREFORE** the Commission orders as follows:

1. The Commission approves BC Hydro's Application as filed on August 20, 2007.

**DATED** at the City of Vancouver, in the Province of British Columbia, this \_\_\_\_\_ day of \_\_\_\_\_ 2007.

BY ORDER



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**Conservation Research Initiative**

**Residential Time of Use Rate Program**

**Application for Second Year**

**2007/2008**

**August 2007**

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# **1 Introduction**

## **1.1 Purpose of Application**

BC Hydro is filing its Conservation Research Initiative Residential Time of Use Rate Program Application for Second Year 2007/2008 (the Application) seeking the following from the British Columbia Utilities Commission (BCUC):

- (i) approval of two amended residential Time Of Use (TOU) rates (RS1144 and RS1145), which have changes to the duration of the peak period when peak prices are applicable;
- (ii) approval of an additional TOU rate (RS1141A), which is the same as an existing TOU rate (RS1141) with the exception that it has a shorter peak period;
- (iii) approval of two new Time Of Use with Critical Peak Pricing (TOU/CPP) rates (RS1141B and RS1144A); and
- (iv) approval of a revised Electric Tariff Supplement No. 73 (Appendix F) which has been modified to accommodate the rate changes.

The rate schedules are included in Appendix A.

The Conservation Research Initiative Time of Use (CRI TOU) Program will offer these new and revised rates, in addition to existing rates RS 1141, RS 1142 and RS 1143 on an optional basis to approximately 2,000 subscribers for a one-year period, commencing November 1, 2007 and ending October 31, 2008.

## **1.2 Organization of the Application**

This application is organized as follows:

**Section 2** provides some background to the Application;

**Section 3** provides the rationale behind the current Application including the CRI stakeholder advisory committee consultation process, first year evaluation results and resulting recommendations for the second year;

**Section 4** provides details on the new TOU and TOU/CPP rate designs;

**Section 5** provides the terms and conditions of service under the CRI TOU rates for the second year of the program; and

**Section 6** provides details on how BC Hydro will implement the rates, including customer recruitment for the second year of the CRI TOU program, and section 7 addresses the evaluation of the second year results.

### **1.3 Approvals Sought**

Pursuant to sections 58 and 61 of the *British Columbia Utilities Commission Act*, BC Hydro hereby applies for an order from the BCUC approving the Rate Schedules attached as Appendix A to this Application and revised Electric Tariff Supplement No. 73, attached as Appendix F, both effective November 1, 2007.

All communications regarding this application should be directed to:

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## **2 Background**

### **2.1 Approval Process for Second Year CRI TOU**

BC Hydro filed its first CRI TOU Rate Application on August 28, 2006. A Negotiated Settlement Process (NSP) followed a BCUC staff hosted workshop. BC Hydro amended the CRI TOU Application to address comments received from intervenors during the NSP in a September 14, 2006 letter to the BCUC resulting in a successful settlement of the application. In that letter, BC Hydro proposed the following term length:

“BC Hydro originally proposed the CRI TOU rates to have a one-year term beginning on November 1, 2006 and ending on October 31, 2007. BC Hydro now proposes a two-year term for the CRI TOU rates, beginning on November 1, 2006 and ending on October 31, 2008.

However, BC Hydro may apply to the BCUC for approval to change, add or cancel elements of the CRI TOU rates for the winter of 2007/2008 (year 2 of the CRI initiative) based on the results of the winter of 2006/2007 and the input from the Advisory Committee discussed below.

If BC Hydro believes that changes should be made to the CRI TOU rates for the winter of 2007/2008, BC Hydro will file an application with the BCUC by the end of July 2007, unless the Advisory Committee agrees to a later date.”

The BCUC issued Order No. G-120-06 approving the NSP Settlement and directed that:

“1. The BCUC approves BC Hydro’s Application as amended by its September 14, 2006 letter.

2. The BCUC encourages BC Hydro to conduct meaningful consultation with stakeholders through the Advisory Committee and to incorporate the recommendations of the Advisory Committee, as appropriate, into any proposed redesign of CRI TOU rates for the second year of the two-year term of the program.”

BC Hydro is now filing the rate recommendations contained in this application in August 2007, with the agreement and acceptance of the Advisory Committee.

## **2.2 CRI TOU Program 2006/07**

BC Hydro implemented the CRI TOU program in fall 2006 by successfully recruiting approximately 2,100 residential customers that were put in either a control group or randomly assigned one of five TOU rates based on their geographic location. By the end of the peak winter period, there were approximately 1,860 customers remaining on the program (190 in Fort St. John, 250 in Campbell River and 1,420 in the Lower Mainland). The reduction in the number of customers in the program was due either to cancellations initiated by BC Hydro because of meter installation and communication issues, and cancellations initiated by customers because of moving or bill concerns.

The objectives of the program for BC Hydro were to learn about customers' acceptance and response to TOU pricing and to gain operational experience with smart metering infrastructure (SMI)<sup>1</sup>.

## **3 Rationale for Current Application**

### **3.1 CRI Stakeholder Advisory Committee**

As agreed to in the NSP Settlement, a stakeholder advisory committee was formed to provide input to changes and additions to the CRI TOU rates for the second year of the program. The committee was composed of 14 individuals that represented various residential, commercial, industrial and environmental interests and included two individual residential customers. The list of participants is provided in Appendix C, Table 1. The CRI Stakeholder Advisory Committee, or CRI Working Group as it was also called, held four meetings in the first half of 2007. The meeting agendas included presentations and discussions on several topics including rate design of the current CRI TOU rates, evaluation results from the first year of the program, and

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<sup>1</sup> Smart Metering Infrastructure (SDI) was previously called Advanced Metering Infrastructure (AMI).

changes and additions for the second year of the program. A Stakeholder Engagement Report is provided in Appendix C.

### **3.2 First Year Evaluation Results**

A summary of the evaluation results of the first year of the CRI TOU program is included in Appendix D.

The qualitative survey results of the program participants indicated that most had an overall positive experience with CRI TOU rates, with 81 per cent of the CRI participants (not in a control group) ranking their experience as good or excellent. In addition, 83 per cent of the CRI participants (not in a control group) indicated that they would likely continue with the CRI TOU rates in the second year of the program if they were offered the same TOU rate and conditions. Comments received also indicated that the CRI program made participants aware of ways to conserve energy and changed their energy usage habits and behaviours, as well as awareness of peak usage.

The process evaluation of the first year of the CRI TOU program indicated that key components of the program (program rationale, customer recruitment, customer information, self-reported energy use) all performed well, but there were some challenges with the rollout of the AMI technology.

The impact evaluation used statistical modelling to determine that there was an approximately 11.5 per cent reduction during peak. There was also a significant reduction in overall electricity consumption in the order of 7.6 per cent.

Based on interim evaluation findings at that time, an overall recommendation was made at the third CRI Stakeholder Advisory Committee meeting in May 2007 that the CRI TOU program be continued for a second year with a continuation of most of the rates in order to produce more precise information on energy conservation and load shifting impacts, on persistence of the first year behavioural changes and on the retention of participants into the second year. As indicated earlier, challenges with the rollout of the AMI technology (and given the short time frame to

1 implement the first year of the CRI TOU program) meant that information for the first month of  
2 November 2006 was less precise than desired for evaluation purposes.

3 A second recommendation addressed the finding that there is a significant probability of  
4 Vancouver Island having a peak on Saturdays or Sundays, and it would be useful to have a  
5 mechanism to deal with the weekend peaks. It was recommended that a Critical Peak Pricing  
6 (CPP) rate option be tested on Vancouver Island.

7 A third recommendation was that at least one rate option should include a shorter evening  
8 duration (e.g., ending at 8:00 p.m. rather than 9:00 p.m.), and it was further recommended that  
9 at least one rate option in Campbell River include a shorter morning peak (e.g., starting at  
10 8:00 a.m. rather than 7:00 a.m.). The rationale was that some customers had indicated that a  
11 five hour peak period leaves limited room for peak shifting activity such as doing laundry or  
12 washing dishes, which in turn cuts back on their ability to reduce or shift energy consumption.

13 A fourth recommendation was that at least one rate option should include the testing of an  
14 appropriate automatic enabling technology, such as a water heater timer. Some customers  
15 indicated that they felt that they had undertaken appropriate conservation actions and there was  
16 little else they could do to reduce consumption or peak. Load control technology may make it  
17 easier for customers to shift usage from peak periods to off-peak periods.

18 Lastly, as the in-house monitoring technology matures, it was recommended that an alternative  
19 monitoring technology to the Blue Line Monitor that was used in the first year of the CRI TOU  
20 program be field tested to see if it appropriately meets customers' needs for real time  
21 consumption information. A number of customers indicated that they were interested in using a  
22 monitoring program to understand the impact of conservation actions on their household  
23 electricity load, but some of those who had the Blue Line Monitor felt that this device did not  
24 meet their needs. BC Hydro is currently field testing a newer version of the Blue Line Monitor. If  
25 it proves to be an improvement BC Hydro will replace the monitors of customers who indicated  
26 that their Blue Line monitors were not performing satisfactorily with the new version to create a  
27 better customer experience.

### 1    **3.3 Recommendations for Second Year**

2    At the final CRI Stakeholder Advisory Committee meeting held in June 2007, BC Hydro  
3    proposed changes and additions to the rates for the second year of the program to address the  
4    recommendations outlined above in section 3.2 and discussed in detail below in section 4. All  
5    stakeholder advisory group members present at the June meeting supported or accepted these  
6    proposed changes as summarized in the Stakeholder Engagement Report (Appendix C).

## 7    **4 Rate Changes for Second Year of the CRI TOU Program**

8    This section provides a description of, and rationale for, the changes and additions to the CRI  
9    TOU rates for the second year of the program.

10   The rates and terms and conditions for the second year of the program are set out in the rate  
11   schedules and in the revised Electric Tariff Supplement No. 73 in Appendix A and Appendix F of  
12   the Application, respectively.

### 13   **4.1 Review of Peak Periods**

14   BC Hydro reviewed the timing of the peak periods with the CRI Stakeholder Advisory  
15   Committee to determine if there was any area for potential improvement for the second year of  
16   the CRI TOU program. In particular, the goal was to determine if there were any opportunities to  
17   improve customer acceptability by reducing the peak period while still matching system needs.

18   There was a consensus to leave the peak months the same as in the first year, since November  
19   to February have higher peaks than other months.

20   It was also agreed to keep the peak days to weekdays only. Although there was evidence that  
21   some weather driven peaks occurred on weekends, there was agreement to address these  
22   weekend peaks by CPP rates rather than by extending the TOU peak days to weekends. This is  
23   explained in further detail in section 4.3 below.

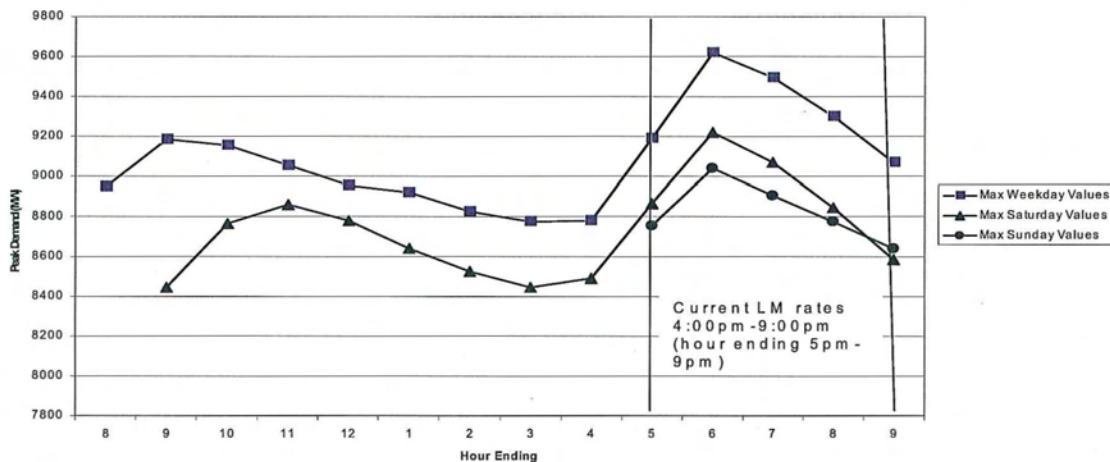


# 1    **4.1.1 Lower Mainland**

2    Regarding peak duration, Figure 1 shows the actual maximum peak hours for the Lower  
 3    Mainland for both weekdays and weekends over the period 2003-2005. The current peak period  
 4    for Lower Mainland TOU rates is 4:00 p.m. to 9:00 p.m. and is highlighted in Figure 1 as hour  
 5    ending 5:00 p.m. to hour ending 9:00 p.m.<sup>2</sup>

6    As Figure 1 shows, there are four hours in the evening that are high and three hours that are  
 7    higher than all of the other high usage hours. The time period starting at 5:00 p.m. and ending at  
 8    8:00 p.m. can be thought of as the peak.

9    **Figure 1: Comparing Weekday Vs. Weekend Peak Demands (2003-2005) – Lower Mainland**



<sup>2</sup> The "Hour Ending" is used in the figure since the line graph cannot include both the "Hour Starting" and the "Hour Ending". For example, the "Hour Ending" 6:00 p.m. covers the time period from 5:00 p.m. to 5:59 p.m. Although a bar chart could show both the "Hour Starting" and "Hour Ending", a line graph was chosen so that both weekdays and weekend days can be compared in the same graph.

1 Table 1 below shows additional data to support Figure 1. The first row repeats the data from  
 2 Figure 1. The second row shows the number of times over the three year period that weekday  
 3 demand increased above a certain threshold (one standard deviation below the maximum  
 4 demand observed). Again, this suggests that there is a time period from 5:00 p.m. to 8:00 p.m.  
 5 where demand is significantly higher than the threshold. However, the number of hours above  
 6 the threshold were much less for the previous hour (hour ending at 5:00 p.m.), and also less for  
 7 one hour following this period (hour ending 9:00 p.m.).

8 **Table 1: Maximum Weekday Demand in the Lower Mainland**

Hour Ending	5	6	7	8	9	10
Week Day MW	9190	9619	9497	9299	9608	8774
# of hr > Annual Treshold	34	87	96	72	56	31

9 Based on this information and customer responses to the qualitative survey that the last hour of  
 10 the current peak period posed the greatest challenge to peak shifting, BC Hydro recommended  
 11 that the duration of the peak rates used in the second year for a new additional Lower Mainland  
 12 experimental cell be reduced by one hour and end at 8:00 p.m. This shortens the duration of the  
 13 peak period, which would make the rate more attractive to some subscribers since it would  
 14 expose fewer hours to the peak prices.

15 BC Hydro considered changing the start of the peak period, because the hour ending 5:00 p.m.  
 16 had the second lowest maximum demand over the five hour peak period and the lowest number  
 17 of hours above the threshold. However, BC Hydro decided to keep the starting hour at 4:00 p.m.  
 18 to reduce the likelihood of creating a new peak in that hour, should, in the future, the program  
 19 be made available on a wider scale. This new peak could occur if subscribers shifted load from  
 20 the hour starting 5:00 p.m. to the hour starting 4:00 p.m.

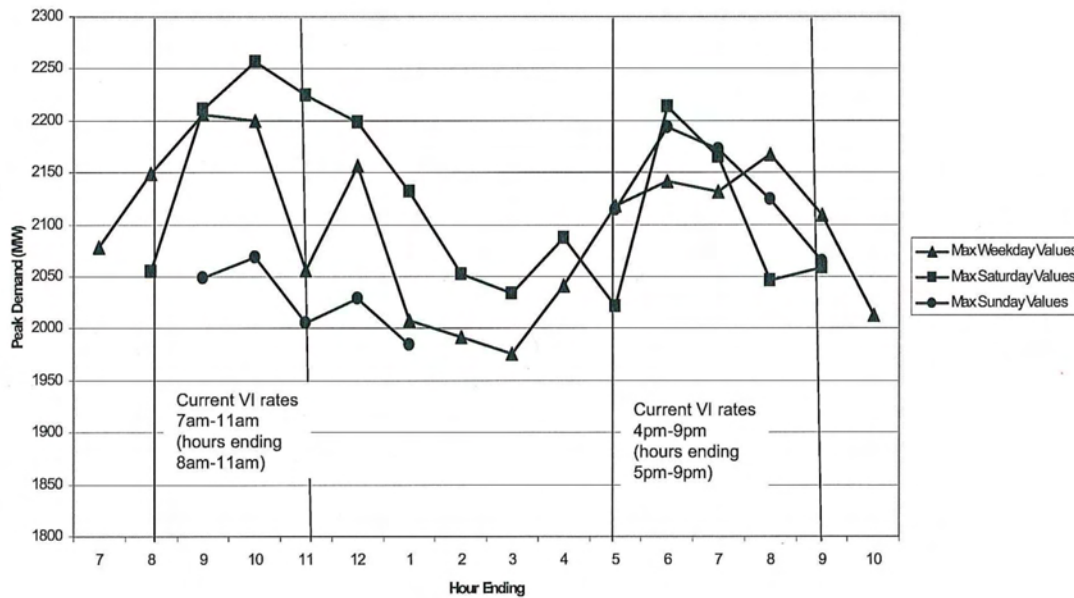
1 The creation of an additional experimental cell in the Lower Mainland allows comparison of  
 2 rates with different peak durations. It also allows measurement of second year impacts on  
 3 existing accounts on TOU rates with the original peak duration.

#### 4 **4.1.2 Vancouver Island**

5 Figure 2 below contrasts the weekly maximum peak demand to the weekend peak demands for  
 6 Vancouver Island. The current peak periods for Campbell River TOU rates are 7:00 a.m. to  
 7 11:00 a.m. and 4:00 p.m. to 9:00 p.m. These periods are highlighted in Figure 2 as hour ending  
 8 8:00 a.m. to hour ending 11:00 a.m. and hour ending 5:00 p.m. to hour ending 9:00 p.m.

9 In contrast to Figure 1 for the Lower Mainland, it is clear that there are weekend peaks that  
 10 exceed the weekday peaks.

11 **Figure 2: Comparing Weekday vs. Weekend Peak Demands (2003-2005) Vancouver Island**



1 As Figure 2 shows, Sunday mornings are far below all of the other peak demands, and so these  
2 can be removed from consideration. For the other periods and days, it is difficult to pick out a  
3 simple pattern. The Friday weekday and Saturday maximum values are driven by one cold  
4 weather spell (January 14-15, 2005). Only a few times each morning hour does weekend  
5 demand exceed 2000 MW over the whole period of 2003-2005.

6 Table 2 below also presents additional information similar to that found in Table 1 regarding the  
7 frequency with which demand is large at different times of the day during the week and on  
8 weekends.

9 **Table 2: Frequency of Large Demands on Vancouver Island, by Day**

Hour Ending	7	8	9	10	11	12	5	6	7	8	9
# of hr* > Annual threshold	1	8	7	4	1	1	6	13	11	6	4
# of hr > Annual Treshold		1	4	6	5	2	8	11	5	4	2
# of hr . Annual Treshold (Sunday)			2	3	3	4	6	9	9	4	2

10 The data shows the number of times that demand is “high” (i.e., above the annual threshold  
11 defined as one standard deviation below the maximum) and supports the observation that  
12 weekends may have peaks.

13 Based on this evidence, BC Hydro recommended that the weekend peaks be addressed by new  
14 CPP rate options on Vancouver Island. It also recommended that the current peak periods for  
15 the Campbell River rates of 7:00 a.m. – 11:00 a.m. and 4:00 p.m. – 9:00 p.m. be shortened to  
16 8:00 a.m. – 11:00 a.m. and 4:00 p.m. – 8:00 p.m. This was based on the relatively few peak  
17 hours between 7:00 a.m. – 8:00 a.m. and 8:00 p.m. – 9:00 p.m. on weekdays.

## 18 **4.2 Proposed Changes for Peak Duration**

19 The following table shows in bold the resulting CRI TOU rate additions (RS 1141A) and  
20 revisions (RS 1144 and RS 1145) as a result of changes to the definition of peak duration that

- 1 BC Hydro is seeking approval of in this application. The other existing CRI TOU rates will not be  
 2 changed.

3 **Table 3: Proposed Rate Changes for Peak Duration**

<b>Rate</b>	<b>Availability</b>	<b>TOU Period</b>	<b>Months for TOU Period</b>	<b>Hours for TOU Period</b>	<b>TOU Rate (cents/kWh)</b>
1141	Fort St. John, Lower Mainland	Peak	Nov 2007-Feb 2008	4:00 p.m.-9:00 p.m. Weekdays	19
		Off-Peak	Nov 2007-Feb 2008	All other hours	6.15
		Off-Peak	Mar 2008-Oct 2008	All hours	6.15
<b>1141A</b>	<b>Lower Mainland</b>	<b>Peak</b>	<b>Nov 2007-Feb 2008</b>	<b>4:00 p.m.-8:00 p.m. Weekdays</b>	<b>19</b>
		<b>Off-Peak</b>	<b>Nov 2007-Feb 2008</b>	<b>All other hours</b>	<b>6.15</b>
		<b>Off-Peak</b>	<b>Mar 2008-Oct 2008</b>	<b>All hours</b>	<b>6.15</b>
1142	Fort St John, Lower Mainland	Peak	Nov 2007-Feb 2008	4:00 p.m.-9:00 p.m. Weekdays	25
		Off-Peak	Nov 2007-Feb 2008	All other hours	6.15
		Off-Peak	Mar 2008-Oct 2008	All hours	6.15
1143	Lower Mainland	Peak	Nov 2007-Feb 2008	4:00 p.m.-9:00 p.m. Weekdays	28

Rate	Availability	TOU Period	Months for TOU Period	Hours for TOU Period	TOU Rate (cents/kWh)
		Off-Peak	Nov 2007-Feb 2008	All other hours	4.5
		Off-Peak	Mar 2008-Oct 2008	All hours	4.5
1144	Campbell River	Peak	Nov 2007-Feb 2008	8:00 a.m.-11:00 a.m. and 4:00 p.m.-8:00 p.m. Weekdays	15
		Off-Peak	Nov 2007-Feb 2008	All other hours	4.5
		Off-Peak	Mar 2008-Oct 2008	All hours	6.15
1145	Campbell River	Peak	Nov 2007-Feb 2008	8:00 a.m.-11:00 a.m. and 4:00 p.m.-8:00 p.m. Weekdays	20
		Off-Peak	Nov 2007-Feb 2008	All other hours	4.5
		Off-Peak	Mar'08-Oct'08	All hours	6.15

### 1    **4.3 Critical Peak Pricing Rates**

#### 2    **4.3.1 Rationale for CPP Rates**

3    TOU pricing generally provides a sufficient price incentive for customers to alter their use of  
4    electricity during the established TOU peak periods. Because system requirements can be  
5    influenced by weather, there are short-term system spikes that may be outside the established  
6    TOU peak hours or extreme cold snaps that strain the system's capability to meet the demand  
7    for electricity. With its TOU fixed on-peak definition, the TOU rates may be unable to address

1 these events. In addition, there may be a need for a greater price response than provided by  
2 TOU rates during these occurrences. One approach BC Hydro would like to test is to address  
3 these types of extreme peaks by combining CPP rates with TOU rates or other standard rates.  
4 BC Hydro is proposing combining CPP with TOU rates as an alternative rate option for some of  
5 the participants in the second year of the TOU program for both the Lower Mainland and  
6 Campbell River areas. In Campbell River, the hourly load data shows a significant number of  
7 hours during the weekends that are periods of high loads caused by extreme cold weather. For  
8 the Lower Mainland with its lower level of electric heating, the problem of high weekend load  
9 levels is not very significant; however there are periods of time during the weekdays that load  
10 stays at high levels.

#### 11 **4.3.2 How CPP Programs Work**

12 The following is a description of how CPP programs are generally structured (Appendix H  
13 provides a review of CPP programs offered in other jurisdictions). Typically, participants  
14 subscribe to a CPP program on a voluntary basis and agree to curtail load during CPP “events”  
15 or CPP hours in exchange for a dollar incentive. The numbers of days that can become CPP  
16 days are usually limited to less than twenty, with the duration of CPP events limited from four to  
17 eight hours. The utility has the option to call CPP events, which might be triggered by extreme  
18 weather or high market prices for securing additional resources. During these periods, reduced  
19 load as a result of the high CPP price the customer will need to pay replaces the need for the  
20 utility to make additional purchases or to run more expensive generation. Subscribers will be  
21 informed with sufficient notice of the timing and duration of the CPP event, typically the day  
22 before. The utility may use simple communication methods such as a phone call, text  
23 messaging, fax or e-mail to inform subscribers of CPP events. Some CPP programs use more  
24 advanced technology with two-way communication, which allows the utility to send signals to  
25 the household and to trigger load management devices in the house.

1    **4.3.3    *Alternative CPP Program Approaches***

2    The following is a description of three approaches widely used in current TOU/CPP programs  
3    which were considered by BC Hydro.

4    **4.3.3.1    Pay for Performance**

5    This approach uses the CPP price as the amount BC Hydro is willing to pay subscribers per  
6    kWh reduced during the CPP event. This allows BC Hydro to pay only for actual performance. If  
7    subscribers do not reduce their consumption, they will continue to pay the TOU price and not be  
8    subject to any penalty. The only means by which the subscribers can earn a benefit is by  
9    responding to the CPP events by reducing load. For example with a CPP price of \$.50/kWh, if  
10    customers reduce one kWh per hour for 70 hours the benefits are a payment of \$35 and a  
11    reduction in the TOU bill for the reduced kWh. The CPP price of \$.50/kWh is meant to reflect the  
12    value of resources required to meet short-term load spikes, when existing generation may not  
13    be sufficient to meet the increased demand in consumption. The Pay for Performance option  
14    would not require BC Hydro to guarantee the subscriber that they would not be paying a higher  
15    bill.

16    This approach requires a process for determining the actual amount of hourly load reduced  
17    during the CPP event. Generally comparing each subscriber's load level either for a similar  
18    number of hours before or after the event or the load level for the same hours of a non-event  
19    day to the metered load during the event, plus an adjustment for differences in weather, does  
20    this. This implementation requirement gives the Pay for Performance approach an additional  
21    level of complexity that has to be weighed against the attractiveness of this CPP program with  
22    customers. Customers generally view this CPP approach as less risky as they have no potential  
23    negative billing impact and are thus more likely to participate.

24    **4.3.3.2    Customer Credit**

25    This approach uses an upfront payment or credit to attract potential subscribers. The payment  
26    becomes the potential benefit for subscribers if they manage their responses to the CPP events.



1 The upfront payment is calculated so that subscribers with the average load level are not  
2 negatively impacted even if they fail to respond to all the CPP events - the payment offsets the  
3 higher bills that would result from paying the CPP price. Subscribers must respond to CPP  
4 events by reducing load to realize a monetary benefit. The upfront payment can be estimated  
5 individually based on each subscriber's historical peak usage so that each subscriber receives a  
6 different payment amount. The customer credit approach may require a guarantee to pilot  
7 subscribers that the CRI TOU/CPP bills will not be higher than the CRI TOU bills without CPP.

#### 8 **4.3.3.3 TOU Discount**

9 The third approach that BC Hydro considered uses a discount to the TOU peak price to attract  
10 subscribers. The discount is established so that if subscribers fail to reduce load and pay the  
11 \$.50/kWh CPP price for kWh used during 100 per cent of the CPP peak hours the bills for the  
12 peak season remain the same as under the standard TOU rate. Subscribers must reduce load  
13 to benefit. The level of discount is based on the average residential customer and thus the  
14 discount may not be sufficient for subscribers with greater usage. Subscribers will view this as  
15 the riskiest of the three approaches as they cannot elect to not participate once they are on the  
16 program and there is no up front payment. In addition, the discount may not be high enough to  
17 be beneficial for large customers.

#### 18 **4.3.4 *Proposed CPP Approaches for Vancouver Island and Lower Mainland***

19 The following proposed TOU with CPP rates for Vancouver Island and the Lower Mainland were  
20 supported or accepted by the CRI Stakeholder Advisory Committee members present at the  
21 final stakeholder meeting held in June 2007. The customers for the new rates will be recruited  
22 from either new participants (Vancouver Island) or from the existing control group from the first  
23 year of the program (Lower Mainland).

1    **4.3.4.1    Vancouver Island**

2    For the Vancouver Island CRI program BC Hydro considered the three CPP approaches  
3    discussed above.<sup>3</sup> All three approaches were assumed to have these features in common:

- 4    • Events are only called during November through February;
- 5    • Notice is given by 5:00 p.m. the day before by phone and email;
- 6    • Events may be called for any day of the week. Conditions that would permit BC Hydro to call  
7    a CPP Event would be for any of the following three reasons:
  - 8    ○ system emergency,
  - 9    ○ extreme cold temperatures,
  - 10    ○ discretionary CPP events for test purposes;
- 11   • Events are called for all seven CRI TOU peak hours from 8:00 a.m. – 11:00 a.m. and from  
12   4:00 p.m. to 8:00 p.m.;
- 13   • The maximum number of days is 10; and
- 14   • The maximum number of CPP event hours is 70 (10 days multiplied by seven CPP peak  
15   hours per day).

16   BC Hydro recommended the use of a CPP price of \$.50/kWh for both Vancouver Island and the  
17   Lower Mainland which is assumed to represent the avoided cost of having to procure additional  
18   supplies to serve additional capacity needs during the periods of highest demand in the year.  
19   This value was assumed for the pilot period to test how much incremental demand reduction  
20   could be produced in response to a relatively high price trigger relative to the standard TOU  
21   peak price. In the absence of hourly prices, BC Hydro derived the CPP price as approximately  
22   two and one half times the TOU on-peak price. This assumed CPP price to TOU on-peak price

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<sup>3</sup> Additional VI and LM program details and discussion on their development are provided in Appendix D.

1 ratio is at the low end of price ratios that are reported in the survey of CPP programs in  
2 Appendix H. The \$.50/kWh CPP price is the average CPP price in the programs surveyed.

3 The three program approaches that were considered were designed to be bill neutral for  
4 subscribers if all the CPP hours were called but they elected not to respond. This is shown in  
5 Table 3 in Appendix E that shows sample bill calculations for the three programs. The Pay for  
6 Performance option cannot negatively impact subscribers as only reduced load has the CPP  
7 price applied to determine the credit BC Hydro would pay for performance.

8 BC Hydro recommended the Pay for Performance CPP approach for the Vancouver Island test  
9 because it provides the potential for the greatest benefit as the subscribers are able to increase  
10 their responses and it has the lowest risk to the subscribers. The TOU discount approach  
11 requires such a large discount to the TOU prices it was not considered by BC Hydro. The TOU  
12 discount approach has an additional shortcoming for BC Hydro, as when less than all the  
13 potential CPP hours are called the benefit of the discount on the TOU prices continues to flow to  
14 the subscriber. The same shortcoming applies to the Customer Credit approach if subscribers  
15 have been paid and they do not face the full exposure of the CPP hours.

16 BC Hydro is proposing to measure a subscriber's response for the Pay for Performance  
17 approach by establishing a "baseline consumption" amount using consumption data from the  
18 three similar days (week day or week end) immediately prior to the CPP event. This data is  
19 used to determine the average hourly load for the same hours during those previous days that is  
20 then multiplied by the number of hours in the CPP event to determine the "baseline  
21 consumption" amount. The actual metered kWh during the CPP event will then be subtracted  
22 from the "baseline consumption" amount to determine the amount of load to be credited the  
23 \$.50/kWh. To illustrate, if the CPP event happens on a weekend day, then the three previous  
24 weekend days will be used to establish the baseline consumption. However, if the CPP event  
25 occurs on a weekday, the three previous weekdays would be averaged (if the CPP event is on a  
26 Wednesday, the averaged days would be the previous Friday, Monday and Tuesday). BC Hydro  
27 will weather-adjust the CPP period consumption levels for the non-event days, so that the

estimated “baseline consumption” does not underestimate what the customer would have otherwise used on critical days.

The Pay for Performance price is applied to the “baseline consumption” amount minus the actual consumption amount, and if positive, an amount will be credited to the subscriber’s bill. If the amount is negative, then the credit will be zero. BC Hydro is proposing this approach so that an impartial baseline can be established and also so that implementation of the rate will be relatively simple and transparent.

#### **4.3.4.2 Lower Mainland**

BC Hydro also considered the three CPP methodologies discussed in section 4.3.3.1 for the LM. All three approaches were assumed to have these features in common:

- Events are only called during November through February;
- Notice is given by 5:00 p.m. the day before by phone and email;
- Events may be called for any day of the week. Conditions that would permit BC Hydro to call a CPP Event would be for any of the following three reasons:
  - system emergency,
  - extreme cold temperatures,
  - discretionary CPP events for test purposes;
- Events are called for all five CRI TOU peak hours which are from 4:00 p.m. to 9:00 p.m.;
- The maximum number of days are 10; and
- The maximum number of event hours is 50 (10 days multiplied by five peak hours per day).

The three program approaches that were considered for the Lower Mainland were also designed to be bill neutral for the subscriber if all the CPP hours were called and the subscriber elected not to respond, as shown in Table 6 in Appendix E which shows sample bill calculations for the three programs. As with the example for Vancouver Island, the TOU discount approach

1 requires such a large discount to the TOU prices that it was not considered by BC Hydro for the  
2 Lower Mainland.

3 The approach recommended for the Lower Mainland is the Customer Credit approach. This  
4 allows the testing of an alternative approach to the customer Pay for Performance approach.  
5 The CRI pilot will therefore compare the two approaches in terms of ease of understanding and  
6 acceptance to the customer, ease of implementation and measured impact.

7 The Customer Credit for the “average” Lower Mainland CPP subscriber is calculated to be  
8 approximately \$31 (100kWh x \$.31 (\$.50-\$.19)). This is based on the average consumption over  
9 the 5-hour evening peak periods for the top ten highest load days in F2007. BC Hydro proposes  
10 to provide individual credits to each Lower Mainland CPP subscriber, estimated in the same  
11 manner and based on each subscriber’s F2007 data. The data for this calculation will be  
12 available since subscribers will be recruited from control group participants from the first year of  
13 the CRI TOU program who all had time of use metering in place during F2007. It is estimated  
14 that the customer credit will range from \$15 to \$217, with over 96 per cent of accounts under  
15 \$100, as shown in the frequency distribution by account size contained in Table 8 in  
16 Appendix E.

#### 17 **4.4 Balancing Amount for Rates**

18 BC Hydro is again proposing that a balancing amount, a feature of the first year of the CRI TOU  
19 program, also be continued in the second year. The annual balancing amount is defined to be  
20 the difference between billing the historical consumption under RS 1101 and the proposed CRI  
21 TOU rate. BC Hydro is proposing that the balancing amounts for the second year CRI TOU  
22 rates will be calculated with historical energy consumption from April 2005 to March 31, 2006.  
23 This is the same reference period for loads that were used to calculate the balancing amounts in  
24 the first year of the CRI TOU program. The balancing amounts will be calculated assuming the  
25 prevailing RS1101 and CRI TOU rates as of February 1, 2007, which was the date of the final  
26 rate change arising from BC Hydro’s F2007/F2008 revenue requirements application. BC Hydro  
27 will adjust the balancing amount and rates, if necessary, to reflect any interim rate changes that  
28 may occur in the second year. It will also adjust for the impact of any differences between

1 interim and final rate changes that take place during the year in the same manner as was done  
2 in the first year of the program.

3 The balancing amounts for the TOU/CPP rates will be calculated in the same way as for the  
4 TOU only rates. The reason for doing so is that if subscribers do not respond to both TOU and  
5 CPP events and their load is the same as the historical load, they will pay the same amount as  
6 they would have if they were on the default RS1101 rate.

#### 7 **4.5 Bill Guarantee for TOU/CPP Rates**

8 A bill guarantee is proposed for all rate options in the CRI TOU program, including TOU/CPP  
9 rates. For TOU rates, the bill guarantee will be the same as was offered under the first year of  
10 the program as outlined in Section 5.1.4. Under the bill guarantee, if customers do not find the  
11 CRI TOU prices and terms attractive enough to cause them to respond by adjusting their load  
12 and level of use, then the guarantee ensures they will pay no more for their current usage than  
13 on RS1101.

##### 14 **4.5.1 Pay for Performance Program**

15 Under this program, the bill guarantee will still be effective, but will only apply to the TOU portion  
16 of the rates. The bill guarantee will therefore be determined in the same manner as was done in  
17 the first year of the TOU program that guaranteed that subscribers would not pay more under  
18 TOU rates compared to under RS1101 using actual consumption. If customers do not reduce  
19 their peak consumption, they will face TOU pricing only, and the bill guarantee will work as in  
20 the case of TOU only rates. If customers do reduce their consumption during a CPP event, they  
21 will be fully compensated at the Pay for Performance price for any load reduction and will  
22 therefore see an overall decrease in their annual bill.

1    **4.5.2   Customer Credit Program**

2    Under this program, if customers do not reduce load during CPP events then they will be  
3    charged the CPP price that will reduce and eventually eliminate the benefit of the upfront  
4    customer credit.

5    If customers consume more during CPP events than they have done during similar historical  
6    high load periods in the previous year, then the upfront credit will be reduced to zero and they  
7    may no longer be assured that their bill under TOU/CPP will be lower than under RS1101, as  
8    would be the case under the regular TOU bill guarantee. The regular TOU bill guarantee  
9    assumes that any consumption increases during CPP events will only be billed at the TOU  
10   price. BC Hydro proposes to offer a TOU/CPP bill guarantee equal to the difference between  
11   the sum of the winter TOU/CPP bills, inclusive of the upfront credit, and the sum of the winter  
12   RS1101 bills all based on actual consumption. Effectively, BC Hydro is proposing to adjust the  
13   TOU bill guarantee for any increased consumption during CPP events at the CPP price so that  
14   subscribers will not pay more under the customer credit CPP program net of the upfront credit  
15   than they would under RS1101. This is proposed so as not to penalize subscribers if there are  
16   load increases due to unanticipated events such as colder than expected weather or  
17   demographic household changes.

18   **4.6   Enabling Technology for TOU/CPP Rates**

19   In order to test the role of enabling technology such as programmable thermostats for space  
20   heating and water heater timers, an additional test group will be added in the Campbell River  
21   region. BC Hydro will recruit up to 100 new customers for this test group. They will face  
22   TOU/CPP rates (RS1144A) but will have the help of load control technology to help manage  
23   their loads. BC Hydro will install the load control technology and TOU meters in the residences  
24   of these participants. The load control technology will allow BC Hydro to remotely reduce the  
25   temperature setting of subscribers' water and space heating equipment. The benefit is that  
26   individual subscribers may not notice any change in temperature and BC Hydro will obtain peak  
27   reduction. The subscribers may override the load control technology via the web or by phoning

1 BC Hydro. The evaluation for the second year will determine if these residences can manage  
 2 their loads better with the load control technology and if as a result participants have a better  
 3 experience under the proposed TOU/CPP pricing.

#### 4 **4.7 Proposed TOU/CPP Rates**

5 The following table summarizes the proposed TOU with CPP rates.

6 **Table 4: Proposed TOU with CPP Rates**

Rate/TOU/CPP Program	Availability	Pricing Period	Months for TOU/CPP Period	Hours for TOU/CPP Period	TOU/CPP Rate (cents/kWh)
1141B	Lower Mainland	TOU Peak	Nov 2007-Feb 2008	4:00 p.m.-9:00 p.m. weekdays	19
Customer Credit Program		CPP	Nov 2007-Feb 2008	4:00 p.m.-9:00 p.m. weekdays and weekends	50 (charge)
		TOU Off-Peak	Nov 2007-Feb 2008	All other Hours	6.15
		TOU Off-Peak	Mar 2008-Oct 2008	All hours	6.15
1144A	Campbell River	TOU Peak	Nov 2007-Feb 2008	8:00 a.m.-11:00 a.m. and 4:00 p.m.-8:00 p.m. weekdays	15
Pay for Performance Program		CPP	Nov 2007-Feb 2008	8:00 a.m.-11:00 a.m. and 4:00 p.m.-8:00 p.m. weekdays and weekends	50 (credit)
		TOU Off-Peak	Nov 2007-Feb 2008	All other Hours	4.5
		TOU Off-Peak	Mar 2008-Oct 2008	All hours	6.15



1   **5   Terms and Conditions of Service**

2   **5.1   Terms and Conditions of Service**

3   **5.1.1   Availability**

4   The existing and new rates in the CRI TOU program will be made available to both new and  
5   existing subscribers on a limited basis and under the same availability conditions that were  
6   offered in the first year of the program and as discussed below.

7   **5.1.2   Term Length**

8   The proposed TOU and TOU/CPP rates will take effect on November 1, 2008. The CRI TOU  
9   program will end on October 31, 2008, when all subscribing customers will be returned to  
10   RS1101.

11   **5.1.3   CPP Program Credits**

12   Participants in the Pay for Performance CPP program (which will be called the Peak Power  
13   Saver Performance Option) taking service under RS1144A will receive any credits for  
14   participating in CPP events on their next bill after the CPP event.

15   Participants in the Customer Credit CPP program (which will be called the Peak Power Saver  
16   Credit Option) taking service under RS1141B will receive their upfront credit in their first  
17   TOU/CPP bill after October 31, 2007.

18   **5.1.4   Bill Guarantee**

19   BC Hydro will provide a bill guarantee to customers on the TOU and Pay for Performance  
20   TOU/CPP rate as was defined in the first year. As indicated in Section 4.5 above, the bill  
21   guarantee for the Customer Credit TOU/CPP rate will be adjusted so that subscribers do not  
22   pay more as a result of any increased consumption during CPP events.

1 The following provides a review of the bill guarantee for existing rates and outlines the bill  
2 guarantee for the new rates.

3 BC Hydro will credit to the TOU subscriber's account the positive difference between the bill  
4 based on the TOU tariff and the bill based on the RS1101 tariff as described as follows:

5 For rates RS1141, RS1141A, RS1142, RS1144, RS1144A and RS1145:

- 6 1. the total dollar amount of all bills issued to the subscriber for service under the TOU rate  
7 during the 4 winter months (November-February), minus
- 8 2. the total dollar amount derived by rendering bills on the same metered usage, using the  
9 rates in RS1101.

10 For rate RS1141B (TOU/CPP with Customer Credit):

- 11 1. the total dollar amount of all bills and CPP Customer Credit issued to the subscriber for  
12 service under the TOU/CPP rate during the four winter months (November-February),  
13 minus
- 14 2. the total dollar amount derived by rendering bills on the same metered usage, using the  
15 rates in RS1101.

16 For rate RS1143:

- 17 1. the total dollar amount of all bills issued to the subscriber for service under the TOU rate  
18 during the entire year, minus
- 19 2. the total dollar amount derived by rendering bills on the same metered usage, using the  
20 rates in RS1101.

21 Additional conditions and provisions include:

- 22 1. The applicable credit shall be made to the account of the subscriber, within 60 days after  
23 the March 2008 billing date for subscribers on rates RS1141, RS1141A, RS1141B,

1 RS1142, RS1144, RS1144A and RS1145 and within 60 days after the October 2008  
2 billing date for the subscribers on rate RS1143.

3 2. The bill guarantee is not applicable to any subscriber that (i) in the case of rate  
4 schedules RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145  
5 ceases taking service before February 28, 2008, and (ii) in the case of rate schedule  
6 RS1143 ceases taking service before October 31, 2008.

7 The second condition will help discourage participants from leaving the program early and will  
8 help maintain the statistical sample.

## 9 **6 Implementation**

10 The following sections describe some of the main rate implementation tasks for the new TOU  
11 and TOU/CPP rates. Due to the short time period until commencement of the second year  
12 program on November 1, 2007, BC Hydro will be proceeding with re-enrolment and recruitment  
13 prior to the BCUC approval of the rate schedules contained in this application. If the BCUC  
14 approval is not granted, the customers on existing TOU rate schedules who re-enroll in the  
15 program will continue on the existing TOU rate they have been assigned to until  
16 October 31, 2008.

### 17 **6.1 Customer Recruitment**

18 BC Hydro will attempt to re-enroll the existing 1,800 plus current participants for the CRI TOU  
19 program over a two-month period in August and September 2007. During this time BC Hydro  
20 will also try to recruit approximately 200 new participants in Campbell River.

21 BC Hydro will pre-assign a CRI TOU rate and contact the customer providing information on the  
22 offer. Existing subscribers will be assigned the same rate as they had in the first year. The  
23 customer will then decide whether to accept the offer.

24 Customers in the control group during the first year will either be asked to remain in the control  
25 group for the second year or may be provided the option of participating in the new TOU/CPP

1 rate for the Lower Mainland. Approximately 100 of the Lower Mainland control group customers  
2 will be placed on the TOU/CPP rate (RS1141B) and another 100 will be used to backfill any  
3 attrition in the other rates. This will leave approximately 280 customers in the Lower Mainland  
4 control group, which will be a sufficient number for evaluation purposes.

5 BC Hydro is also targeting approximately 100 accounts on RS1141A in Campbell River, which  
6 has the shorter peak period. These accounts will be recruited from existing RS1141 accounts  
7 that are being provided enhanced communication (printed information plus e-mail  
8 communication).

9 Customers will initially be contacted by direct mail informing them how to get additional  
10 information on the research initiative. They will be provided with a call centre number that they  
11 can phone. Information will also be provided on BC Hydro's website. BC Hydro will also be  
12 calling the existing customers and potential new recruits in Campbell River as a follow up to the  
13 Direct Mail cards. Upon re-enrollment or recruitment customers will receive a confirmation  
14 welcome letter regarding their participation for the second year of the program.

15 All participants in the different rate groups will receive an informational "kick-off" package in  
16 mid-October outlining how their program option works and how they can participate in the  
17 program. Appendix E contains the TOU/CPP information that BC Hydro telephone agents will  
18 use when recruiting TOU/CPP participants in the Lower Mainland and Campbell River.  
19 Informational rate sheets similar to those provided in the first year will be provided to  
20 participants in the October kick-off package.

21 New subscribers to the program will receive a \$25 Canadian Tire gift certificate as an incentive  
22 for participation. This incentive was also provided in the first year of the program to all  
23 subscribers. Subscribers that are placed in the load control test group will receive an additional  
24 \$25 Canadian Tire gift certificate to compensate them for the time required to install the load  
25 control equipment in their residence.

## 1    **6.2 Customer Education and Information**

2    Customers will receive information on how they can benefit from the TOU rates by changing the  
3    times they use their appliances, by changing their behaviour and also by setting back their  
4    thermostats. In addition, customers will be able to view their previous day's hourly consumption  
5    pattern on the internet on an individual basis. They will also receive with their bill their average  
6    monthly consumption load profile.

7    BC Hydro will maintain the same level of customer education and communication for existing  
8    subscribing customers as they had in year one of the program. There were three levels provided  
9    in the first year (i) basic level consisting of print material; (ii) enhanced level consisting of print  
10   material and e-mail communication; and (iii) enhanced level with the Blue Line monitor.  
11   Customers on RS1141A will continue to receive enhanced communication as they did under  
12   RS1141 and participants taking service under TOU/CPP rates RS1141B and RS1144A will also  
13   receive the enhanced level of education and communication.

## 14   **6.3 Budget**

15   The budget for the second year of the CRI TOU program is approximately \$1.5 million. This  
16   accounts for the capital costs of the meters and meter data management system and costs for  
17   communications, customer care, demand-side management and program management and  
18   support. The CRI TOU program budget is not incremental to the expenditures forecasted in  
19   BC Hydro's F2007/F2008 Revenue Requirements Application.

## 20   **7 Evaluation**

21   BC Hydro intends to undertake an impact evaluation of the TOU/CPP rates over the four peak  
22   months. At the conclusion of the second year of the CRI TOU Program, BC Hydro also  
23   proposes to undertake a broader evaluation process, and will expect to have a report and  
24   recommendations by the summer of 2008.

## **APPENDIX A**

### **Residential TOU and CPP Rates Rate Schedules 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145 (Clean copy)**

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SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES

Availability: Available to selected customers in the Lower Mainland (Vancouver, Burnaby, North Vancouver and West Vancouver), Campbell River and Fort St. John who apply before October 31, 2007 and at the time of application are taking service under Rate Schedules 1141, 1142, 1143, 1144, 1145 or 1101.

Applicable in: Rate Zone 1 excluding the District of Kingsgate-Yahk and Lardeau-Shutty Bench.

Rate:

Basic Charge: \$3.69 per month.

Balancing Amount: For rates RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 a Monthly Balancing Amount equal to the annual revenue difference between billing the historical consumption under RS1101 and the Time-Of-Use (TOU) rate, divided into four equal amounts to be applied to the first four bills. For rate RS1143, a Monthly Balancing Amount equal to the annual revenue difference between billing the historical consumption under RS1101 and the TOU rate, divided into twelve equal amounts to be applied to the twelve monthly bills. The Monthly Balancing Amount calculations are defined in Electric Tariff Supplement No. 73 Revised, Appendix F of the Conservation Research Initiative Residential Time of Use Application for 2007/08 (BC Hydro, August, 2007) (the "CRI TOU Application").

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES

Energy Charge: A monthly amount equal to the sum of the quantity of energy delivered during off-peak hours multiplied by the off-peak rate and the quantity of energy delivered during peak hours multiplied by the peak rate, where peak rate, peak hours, off-peak rate and off-peak hours are as defined in the following eight rate schedules. For RS1141B, the Critical Peak Pricing (CPP) rate will be applied to any energy delivered during CPP event periods as outlined in Electric Tariff Supplement No. 73 Revised. Participating customers will be assigned a rate schedule applicable in their service area as outlined in the CRI TOU Application.

For Lower Mainland and Fort St. John

RS 1141: Peak Rate: 19.0 cents per kWh  
Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.  
  
Off-peak Rate: 6.15 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.

For Lower Mainland

RS1141A: Peak Rate: 19.0 cents per kWh  
Peak hours: 4:00 p.m. to 8:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.  
  
Off-peak Rate: 6.15 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.



SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Lower Mainland

RS 1141B: CPP Rate: 50.0 cents per kWh

Peak Rate: 19.0 cents per kWh

Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

CPP hours: 4:00 p.m. to 9:00 p.m. on any weekday or  
weekend day that CPP events are called. A maximum of 50  
CPP hours will be called November to February inclusive.

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in a year that are not peak hours.

For Lower Mainland and Fort St. John

RS1142: Peak Rate: 25.0 cents per kWh

Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in a year that are not peak hours.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Lower Mainland

RS 1143: Peak Rate: 28.0 cents per kWh  
Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

Off-peak Rate: 4.5 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.

For Campbell River

RS 1144: Winter

Peak Rate: 15.0 cents per kWh  
Peak hours: 8:00 a.m. to 11:00 a.m. and 4:00 p.m. to  
8:00 p.m. on all weekdays that are not Statutory Holidays in  
each of the months November to February inclusive.

Off-peak Rate: 4.5 cents per kWh  
Off-peak hours: All hours in each of the months November  
to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October  
inclusive. There are no peak hours or peak quantities in  
these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Campbell River

RS 1144A: Winter

CPP Rate: 50.0 cents per kWh

Peak Rate: 15.0 cents per kWh

Peak hours: 8:00 a.m. to 11:00 a.m. and 4:00 p.m. to 8:00 p.m. on all weekdays that are not Statutory Holidays in each of the months November to February inclusive.

CPP hours: 4:00 p.m. to 8:00 p.m. on any weekday or weekend day that CPP events are called. A maximum of 70 CPP hours will be called November to February inclusive.

Off-peak Rate: 4.5 cents per kWh

Off-peak hours: All hours in each of the months November to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October inclusive. There are no peak hours or peak quantities in these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Campbell River

RS 1145: Winter

Peak Rate: 20.0 cents per kWh

Peak hours: 8:00 a.m. to 11:00 a.m. and 4:00 p.m. to 8:00 p.m. on all weekdays that are not Statutory Holidays in each of the months November to February inclusive.

Off-peak Rate: 4.5 cents per kWh

Off-peak hours: All hours in each of the months November to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October inclusive. There are no peak hours or peak quantities in these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

Definitions: Statutory Holidays for the purpose of this Rate Schedule during the months November through February are Remembrance Day, Christmas Day and New Years Day.

Special Conditions:

1. Service under this rate schedule will be provided from November 1, 2007 through October 31, 2008. For meters that are installed after November 1, service under this rate schedule will be provided from November 15, 2007 or from December 1, 2007, as determined by BC Hydro following installation of the required meter at the customer's premises, through October 31, 2008. After October 31, 2008, or if the customer earlier terminates or is no longer eligible for service under the residential TOU rate, service will be provided under rate schedule RS1101.
2. A bill guarantee which is defined in Electric Tariff Supplement No. 73, Revised, Appendix F, of the CRI Residential TOU for 2007/08 Application, is provided under the rate schedule.
3. The terms and conditions of the critical peak pricing rates RS1141B and RS1144A are provided in Electric Tariff Supplement No. 73 – Revised, Appendix F, of the CRI Residential TOU for 2007/08 Application.

Taxes: The rate charges contained herein are exclusive of the Goods and Services Tax.

Rate Rider: Effective February 1, 2007 a Deferral Account Rate Rider in the amount as set out under Schedule 1901 shall be applied to all charges, before taxes and levies.

## **APPENDIX B**

### **Residential TOU and CPP Rates**

**Rate Schedules 1141, 1141A, 1141B, 1142, 1143,  
1144, 1144A and 1145 (Blacklined copy)**

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES

Availability: Available to selected customers in the Lower Mainland (Vancouver, Burnaby, North Vancouver and West Vancouver), Campbell River and Fort St. John who apply before October 31, ~~2006~~ 2007 and at the time of application are taking service under Rate Schedules 1141, 1142, 1143, 1144, 1145 or 1101.

Applicable in: Rate Zone 1 excluding the District of Kingsgate-Yahk and Lardeau-Shutty Bench.

Rate:

Basic Charge: \$3.69 per month.

Balancing Amount: For rates RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 a Monthly Balancing Amount equal to the annual revenue difference between billing the historical consumption under RS1101 and the Time-Of-Use (TOU) rate, divided into four equal amounts to be applied to the first four bills. For rate RS1143, a Monthly Balancing Amount equal to the annual revenue difference between billing the historical consumption under RS1101 and the TOU rate, divided into twelve equal amounts to be applied to the twelve monthly bills. The Monthly Balancing Amount calculations are defined in Electric Tariff Supplement No. 73 Revised, Appendix ~~FE~~ of the Conservation Research Initiative Residential Time of Use Application for 2007/08 (BC Hydro, August, ~~2006~~ 2007) (the "CRI TOU Application").

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES

Energy Charge: A monthly amount equal to the sum of the quantity of energy delivered during off-peak hours multiplied by the off-peak rate and the quantity of energy delivered during peak hours multiplied by the peak rate, where peak rate, peak hours, off-peak rate and off-peak hours are as defined in the following five-eight rate schedules. For RS1141B, the Critical Peak Pricing (CPP) rate will be applied to any energy delivered during CPP event periods as outlined in Electric Tariff Supplement No. 73 Revised. Participating customers will be assigned a rate schedule applicable in their service area as outlined in the CRI TOU Application.

For Lower Mainland and Fort St. John

RS 1141: Peak Rate: 19.0 cents per kWh  
Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.  
  
Off-peak Rate: 6.15 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.

For Lower Mainland

RS1141A: Peak Rate: 19.0 cents per kWh  
Peak hours: 4:00 p.m. to 8:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.  
  
Off-peak Rate: 6.15 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.



SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Lower Mainland

RS 1141B: CPP Rate: 50.0 cents per kWh

Peak Rate: 19.0 cents per kWh

Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

CPP hours: 4:00 p.m. to 9:00 p.m. on any weekday or  
weekend day that CPP events are called. A maximum of 50  
CPP hours will be called November to February inclusive.

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in a year that are not peak hours.

For Lower Mainland and Fort St. John

RS1142: Peak Rate: 25.0 cents per kWh

Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in a year that are not peak hours.

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SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Lower Mainland

RS 1143: Peak Rate: 28.0 cents per kWh  
Peak hours: 4:00 p.m. to 9:00 p.m. on all weekdays  
that are not Statutory Holidays in each of the months  
November to February inclusive.

Off-peak Rate: 4.5 cents per kWh  
Off-peak hours: All hours in a year that are not peak hours.

For Campbell River

RS 1144: Winter

Peak Rate: 15.0 cents per kWh  
Peak hours: 7:00 a.m. to 11:00 a.m. and 4:00 p.m. to  
9:00 p.m. on all weekdays that are not Statutory Holidays  
in each of the months November to February inclusive.

Off-peak Rate: 4.5 cents per kWh  
Off-peak hours: All hours in each of the months November  
to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October  
inclusive. There are no peak hours or peak quantities in  
these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Campbell River

RS 1144A: Winter

CPP Rate: 50.0 cents per kWh

Peak Rate: 15.0 cents per kWh

Peak hours: 8:00 a.m. to 11:00 a.m. and 4:00 p.m. to 8:00 p.m. on all weekdays that are not Statutory Holidays in each of the months November to February inclusive.

CPP hours: 4:00 p.m. to 8:00 p.m. on any weekday or weekend day that CPP events are called. A maximum of 70 CPP hours will be called November to February inclusive.

Off-peak Rate: 4.5 cents per kWh

Off-peak hours: All hours in each of the months November to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October inclusive. There are no peak hours or peak quantities in these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

For Campbell River

RS 1145: Winter

Peak Rate: 20.0 cents per kWh

Peak hours: 7:00 a.m. to 11:00 a.m. and 4:00 p.m. to 9:00 p.m. on all weekdays that are not Statutory Holidays in each of the months November to February inclusive.

Off-peak Rate: 4.5 cents per kWh

Off-peak hours: All hours in each of the months November to February inclusive that are not peak hours

Non-winter

Off-peak Rate: 6.15 cents per kWh

Off-peak hours: All hours in each of the months March to October inclusive. There are no peak hours or peak quantities in these months.

SCHEDULE 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145

RESIDENTIAL TIME-OF-USE AND CRITICAL PEAK PRICING RATES (Cont'd)

Definitions: Statutory Holidays for the purpose of this Rate Schedule during the months November through February are Remembrance Day, Christmas Day and New Years Day.

Special Conditions:

1. Service under this rate schedule will be provided from November 1, ~~2006-2007~~ through October 31, ~~2007~~2008. For meters that are installed after November 1, service under this rate schedule will be provided from November 15, ~~2006-2007~~ or from December 1, ~~2006~~2007, as determined by BC Hydro following installation of the required meter at the customer's premises, through October 31, 2008. After October 31, 2008, or if the customer earlier terminates or is no longer eligible for service under the residential TOU rate, service will be provided under rate schedule RS1101.

2. A bill guarantee which is defined in Electric Tariff Supplement No. 73, Revised Appendix-~~EF~~, of the CRI Residential TOU for 2007/2008 Application, is provided under the rate schedule.

Taxes:

3. The terms and conditions of the critical peak pricing rates RS1141B and RS1144A are provided in Electric Tariff Supplement No. 73 – Revised, Appendix F, of the CRI Residential TOU Application.

Rate Rider:

The rate charges contained herein are exclusive of the Goods and Services Tax.

Effective February 1, 2007 a Deferral Account Rate Rider in the amount as set out under Schedule 1901 shall be applied to all charges, before taxes and levies.

## **APPENDIX C**

### **Stakeholder Engagement**



# Conservation Research Initiative (CRI) Residential TOU

## Stakeholder Engagement Report

### 1. Background

When BC Hydro submitted its application for CRI Residential Time Of Use (CRI TOU) rates to the BCUC in August 2006, a number of intervenors raised concerns around the design elements of that study. At that time, BC Hydro committed to engage individuals interested in TOU rates in discussions on the rationale for its TOU rate design. In BCUC Order No. G-120-06, the BCUC provided the following direction:

“The BCUC encourages BC Hydro to conduct meaningful consultation with stakeholders through the Advisory Committee and to incorporate the recommendations of the Advisory Committee, as appropriate, into any proposed redesign of CRI TOU rates for the second year of the two-year term of the program.”

To this end, BC Hydro invited registered intervenors as well as some residential customers on the CRI TOU pilot program to participate in a CRI TOU Advisory Committee (“the Working Group”) to address rate design issues for its CRI TOU pilot study. This group met four times from January to July 2007 in Vancouver and produced a set of recommendations that included:

- a recommendation for continuing the pilot into a second year of data collection;
- a revised set of TOU rates;
- a set of Critical Peak Pricing (CPP) rates;
- a recommendation to pursue technological enablers to assist residential consumers to manage their demand;
- recommendations around further data collection; and
- recommendations around how to communicate with residential customers.

This application contains BC Hydro’s efforts to reflect the recommendations developed by the CRI TOU Working Group. The details of the engagement process can be found in the following section.

### 2. The CRI TOU Engagement Process

In January 2007, BC Hydro invited the 16 registered intervenors from its 2006 CRI Residential TOU rate application to join it in a working group to discuss TOU rate design issues. BC Hydro also invited four residential CRI TOU participants that had shown, through their contact with BC Hydro’s Customer Care representatives, an interest in the TOU rate design issues.

This engagement effort will be referred to here as the CRI Working Group. Its Terms of Reference, participation, issues discussed, and recommendations are summarized briefly in that order in the following sections. All meeting materials including pre-reading, presentations, meeting minutes and the full Terms of Reference of the group can be found at a dedicated BC Hydro website:

<http://www.bchydro.com/ex/cri/cr51774.html> (Username: crigroup, Password: cri2007).

## **2.1 CRI Working Group's Terms of Reference**

At a high level, the CRI Working Group's goal was to identify key questions, issues, and data gaps concerning residential TOU rates, and then to address these through a set of recommendations guiding the development of a second year of data collection. Ultimately, the data collected in this initiative would allow BC Hydro to use rates effectively in its efforts to shift demand, conserve energy, keep its rates low, and improve customer satisfaction.

In order to put some definition around their broad objectives, the CRI TOU Working Group reviewed, amended, and adopted a Terms of Reference to guide its work. The full Terms of Reference can be found on the CRI working group's web site, (as noted above). A summary of its tasks is as follows:

- a) Review BC Hydro's previous (commercial) TOU pilot program in terms of its structure and data collected;
- b) Review the current (residential) CRI TOU study design and data collected with the goal of drawing conclusions and recommendations from that data;
- c) Identify and prioritize remaining data gaps;
- d) Review the potential costs and benefits of a system-wide residential TOU program using high-level, "back-of-the-envelope" estimates;
- e) Review and comment on a work plan (including scope, work effort and timing) to address these data gaps;
- f) Review all of the new information collected during the first year of the CRI TOU pilot;
- g) Make recommendations to BC Hydro regarding whether, and what type, of additional residential TOU rates should be tested. These recommendations will be included in a report that will also include a discussion of remaining data gaps, uncertainties, and areas of agreement and disagreement within the working group; and



- h) Review the report by the BC Hydro project team summarizing the engagement process and recommendations from the group.

This Stakeholder Engagement Report is the report referred to in bullets g) and h) above. The participants in the working group have reviewed this report for accuracy and completeness before it filing with the BCUC and the project team has made efforts to include their suggested amendments.

## 2.2 Participation

BC Hydro invited the 16 individuals registered as intervenors for BC Hydro's submission to the BCUC in August 2006 for the CRI TOU study. As well, BC Hydro invited four residential customers that were on the TOU rate and that had shown interest in the program through their calls to BC Hydro's Customer Care representatives. Table 1 provides a list of all of the individuals that attended at least one meeting for the CRI Working Group. Individuals on this list also received all the information for the CRI Working group, including pre-reading materials, handouts presented at the meeting, meeting minutes, and access to BC Hydro's CRI Working Group website where relevant materials were posted.

**Table 1 – Participation in the CRI TOU Working Group**

Name	Organization	Mtg #1 Jan 22, 2007	Mtg #2 Mar 21, 2007	Mtg #3 May 8, 2007	Mtg #4 June 20, 2007	Received Engagement Report for Comments
Tony Atkins	Peace Valley Environmental Association		✓	✓	✓	✓
Ludo Bertsch	Energy Solutions for Vancouver Island (EVS)	✓	✓	✓	✓	✓
Ed Bickford	TOU Residential Participant	✓				
Gene Bryant*	COPE	✓	✓	✓		
David Craig	Commercial Energy Consumers Association	✓	✓	✓		✓

<b>Name</b>	<b>Organization</b>	<b>Mtg #1 Jan 22, 2007</b>	<b>Mtg #2 Mar 21, 2007</b>	<b>Mtg #3 May 8, 2007</b>	<b>Mtg #4 June 20, 2007</b>	<b>Received Engagement Report for Comments</b>
Stan Crocker	Terasen Gas	✓	✓	✓	✓	✓
Dennis Fitzgerald	Catalyst Paper and TOU Residential Participant		✓	✓	✓	✓
Lloyd Guenther	Joint Industry Electricity Steering Committee	✓	✓	✓	✓	✓
Tom Hackney	Sierra Club and BC Sustainable Energy Association	✓				
John Hamilton	TOU Residential Participant	✓	✓	✓		✓
Dan Potts	Joint Industry Electricity Steering Committee	✓	✓			✓
Derick Sinclair	TOU Residential Participant	✓	✓	✓	✓	✓
Julie Startup	TOU Residential Participant	✓	✓	✓	✓	✓
Bob Steele	BC Hydro	✓	✓	✓	✓	✓
Chris Weafer	Commercial Energy Consumers Association	✓				
Leigha Worth	BC Public Interest Advocacy Centre				✓	✓

\*formally withdrew from process, and alternate was unable to make the final meeting.

## **2.3 Main Issues Addressed**

At the first meeting in January 2007, BC Hydro presented its own summary of the issues and concerns raised by intervenors during the residential CRI TOU rate application proceeding in August 2006. Following this, the CRI TOU Working Group members created a list of issues to be addressed during the subsequent meetings. Over the course of the following meetings, topics were prioritized and meeting agendas were set by the group. While many issues were raised as important for consideration, the Working Group tried to limit itself to discussing changes that could be implemented within the scope of a second year of this pilot study. This section represents a list of the issues raised by the Working Group along with a brief summary of the group's discussions on each topic.

## **2.4 Review of Experiences from BC Hydro's TOU Initiatives**

The Working Group reviewed BC Hydro's previous commercial TOU program. The results from this initiative suggested that peak shifting was possible with TOU rates, but the results were not transferrable to residential customers. One member suggested that further work in this area was needed, and BC Hydro committed to pursuing this topic but separately from the residential TOU discussions.

The results from the first year of data collection under the residential CRI TOU pilot were also brought to the Working Group. The topics covered included the focus group research, the survey research, first person reports about the implementation issues, and the quantitative results. Since the Working Group meetings were occurring during the data collection, much of these results were preliminary. However, the Working Group emphasized that they were very encouraged by results from the first year, both in the amount BC Hydro learned around implementation and also with respect to the potential for energy savings and peak shifting.

## **2.5 Review of experiences from other TOU initiatives**

A main area of interest for the Working Group was comparing BC Hydro's residential CRI TOU pilot with other TOU programs. To this end, a consultant familiar with TOU programs in the United States was brought in to help examine approaches used in other jurisdictions. In all, five comparable programs were reviewed with the Working Group. The main points of comparison were: one part vs. two part rates, bill guarantees, price levels and ratios, duration of peak times, technological enablers provided by the utility, types of information/communications provided by the utility, and the level of success (e.g. number of participants, quantity of peak shifting) experienced.

## 2.6 Extending the Residential CRI TOU Study to a Second Year

One of the tasks the Working Group set for itself in its Terms of Reference was to recommend whether a second year of data collection was needed for the residential CRI TOU pilot. Despite promising preliminary results from the first year, the Working Group felt that there were enough gaps in the data collection in the early winter months and enough questions around the rate design itself that *the Working Group recommended that the pilot be continued into a second year of data collection in order to get a full season of observations from participants and also to implement the recommendations put forward by the working group to BC Hydro.*

## 2.7 One part vs. Two Part Rates

One of the more contentious issues addressed was that of one part vs. two part rates. That is, should customers be faced just with on and off-peak prices and be charged according to the quantity of electricity used in each period, or should the billing approach also incorporate a “balancing amount” adjustment designed to reward changing consumption patterns regardless of the initial consumption patterns of the customer.

Three main themes emerged from the Working Group’s discussion:

- TOU rates need to be attractive enough to entice customers to adopt them;
- TOU rates need to be structured in a way to retain participants, once they have started the program;
- TOU rates need to motivate behavioural change in the participants; and
- The fairness of a rate matters to people, even though different people will define this differently.

Table 2 below summarizes how these themes fit in with the alternative rate structures.

**Table 2 – Benefits and Drawbacks of One and Two-Part Rates**

	Benefits	Drawbacks
One Part Rate	The ease of understanding the mechanics of the rate will make this <u>attractive</u> .	Not <u>attractive</u> to all customers as some will be winners and some will be losers under this rate.
	The ease of understanding how their bill is calculated will make this <u>attractive</u> to some.	<u>Retention</u> of participants will be low if customers sign up but then cannot generate any significant savings for their efforts.

	Benefits	Drawbacks
	Rewards past energy conservation and peak shifting actions of participants i.e., those with beneficial load profiles, which may be viewed as <u>fair</u> .	If voluntary, attracts customers with beneficial load profiles, and this may lead to BC Hydro's revenues falling faster than its costs.
Two Part Rate	These rates can be an <u>attractive</u> deal for potential participants which can be communicated easily (e.g. "You will be no worse off, and will be rewarded for any shifts in your peak usage.")	It is difficult to explain the mechanics of the bill calculations, which will make this <u>unattractive</u> for those customers interested in that level of detail.
	The <u>retention</u> of participants should be high as any behavioural improvement will lead to bill savings.	The <u>attractiveness</u> of this approach will be low if customers view the balancing amount as temporary, or see the rates as a sure loss for them and a "money grab" by BC Hydro.
		These rates may "penalize" the low cost customer by not rewarding past behavioural changes, which is seen as <u>unfair</u> .

Initially, at the March 21, 2007 meeting, no consensus emerged from the Working Group as to which approach was best to take for residential TOU rates. Several key questions were highlighted around which type of rate would attract more participants if it was offered on a voluntary basis to customers, and which type of rate would retain more customers because of its financial benefits and its ability to be understood by participants. At a later meeting on May 8, 2007, after a graphical explanation of the two approaches, most of the Working Group supported that BC Hydro continue with the two part rate structure with the bill guarantee for the second year of the program. This was, in part, recognition that it would be difficult to test these questions raised in the pilot study setting, and that attempting to do so would mean other high priority issues could not be explored.

Since there was still some discomfort by some Working Group members over the level of understanding of the balancing amount among CRI TOU participants, some members felt that in the second year BC Hydro should test participants' understanding of the balancing amount and bill guarantee. On the other hand, some members felt that a detailed understanding of the balancing amount was not necessary, as long as the bill guarantee was in place.

## **2.8 Revenue Neutrality**

The revenue neutrality of the rate structure was raised as an issue early on by Working Group participants. It was recognized that this issue will be an important one to address when BC Hydro applies for a broader residential TOU rate. However, it was also recognized by the group that the discussions around this issue were not directly related to shaping the residential TOU rates for the second year of the pilot study. As a result, this topic was dropped from conversation by the Working Group for consideration in the second year of the pilot

## **2.9 Voluntary vs Mandatory Rates**

An issue raised by participants was whether the TOU rates would be of a voluntary or mandatory nature. The Working Group identified that, at a general level, this discussion should be postponed until BC Hydro puts forward an application for residential TOU rates for all customers.

The working group also discussed whether it would be appropriate to implement a mandatory TOU rate as part of the residential TOU pilot. This approach would allow researchers to assess the importance of the “self-selection” bias inherent in the CRI TOU pilot. If the self-selection bias could be eliminated, then results from this pilot could be applied with confidence to the population at large. However, if the self-selection bias could not be eliminated, generalizing results from this study to the population as a whole would not be straight forward.

Discussions within the Working Group about how to implement a mandatory, pilot rate highlighted the practical difficulties in implementing such an idea. *As a result, the recommendations put forward by the working group do not include a mandatory rate for consideration in the second year of the pilot.* However, no consensus emerged as to how easy or difficult it will be to generalize the findings from this residential CRI TOU process to the rest of the residential customers in the province.

## **2.10 Cost Effectiveness of Residential TOU Rates**

The working group agreed that the residential TOU rates should be designed with cost-effectiveness in mind. For some members, this meant that a good understanding needed to be developed around

the financial benefits of shifting residential peak demand. Other members felt that the costs of fully implementing a residential TOU rate, including realistic cost estimates about installing and maintaining metering technology, needed to be explored. For the purposes of informing discussions, the group agreed that high level financial estimates could be generated for the group's discussions. This objective was added to the working group's Terms of Reference.

Financial estimates were provided for the group, including the costs of providing peak shifting technology for use in residences and the cost of installing and maintaining metering technology.

Some preliminary estimates provided by BC Hydro regarding the Advanced Metering Infrastructure (AMI) business case suggested that the installation of these meters could likely be justified on their own merits, without needing to count the TOU benefits to be cost effective. This meant that the cost effectiveness of implementing TOU rates could be addressed without further reference to the AMI business case. The project team noted that the AMI business case numbers were under revision; updates and final numbers were not finalized before the last Working Group meeting.

One of the cost areas that was requested but not explored was estimating the value of postponing capacity (demand) additions in the BC Hydro system. In particular, some members of the group requested information around what the marginal capacity projects were in BC Hydro's capacity stack (both in terms of generation and in terms of transmission) and to what extent shifting residential demand would postpone these projects. BC Hydro indicated that the assumed marginal cost of capacity was in the order of \$50/kW as outlined in the 2006 CRI TOU Application, but had not examined deferring specific projects by time of use rates. The evaluation results from the first and second year of the CRI TOU program should provide BC Hydro with better information to help investigate this issue.

## **2.11 Price levels and Ratios**

One of the initial interests of the Working Group was to explore the existing rate structure and compare the price levels and ratios to TOU initiatives from other jurisdictions. This review suggested that a wide range of price levels and ratios have been applied to peak and off-peak rates, and that BC Hydro's residential CRI TOU rate pilot seemed to be testing an adequate range of both prices and price ratios. *As a result, testing new price levels and ratios was not given as high of a priority as other changes the Working Group was interested in pursuing in the second year of data collection. The Working Group recommended leaving the price levels and ratios unchanged for the second year of the residential CRI TOU pilot.*

However, the one area that did attract the attention of the group was the role of off-peak rates. Customer research showed that lower on and off-peak rates made the TOU option more attractive to customers. Similarly, it was pointed out that lower off-peak prices with the same on-peak prices sends a stronger price signal as the price ratio faced by the consumer is higher. It was noted by the Working Group that this surface appeal was hiding the fact that lower on and off-peak rates may actually lower the potential savings of individuals, given the role of the balancing amount and the bill guarantee. This highlighted the need for better communication with the customers around how a TOU rate works and how a TOU rate can benefit them.

While the lower off-peak rates made the TOU option more appealing to customers, some Working Group members feared that this may encourage more energy use during off-peak times (the “rebound effect”). *The Working Group was interested in knowing whether a rebound effect existed, and if it did, what the strength of it was.* However, data analysis to examine if this effect occurred in the winter period was not complete by the time of the last meeting.

Finally, some Working Group members felt that an additional experimental cell should be created in the Lower Mainland to implement a rate structure that offered an off-peak rate lower than the current 1101 rate. The suggested rate would be similar to the 1145 rate offered in Campbell River, but with only evening peak periods. At its last meeting, *the Working Group recommended that BC Hydro explore creating another experimental cell in the Lower Mainland to test the impact of offering lower off-peak rates to customers.* The caveat here was that this should only be done if there were enough “spare” participants in the control group. The project team reported back to the Working Group after its last meeting that, due to participation numbers, moving participants out of the control group and into a new experimental cell would jeopardize the ability to make comparisons among experimental cells. As a result, this proposal was not included in the recommendations taken forward by BC Hydro in its application.

## **2.12 Bill Guarantee**

The residential CRI TOU participants that took part in the Working Group highlighted that a simple message to the customer that the rate is a “no-lose” proposition is a simple and effective way to attract and retain participants. *Members of the group at several points highlighted the importance of maintaining a bill guarantee for the second year of this pilot and there was agreement with this in the final meeting of the Working Group.*



### **2.13 Geographic Location**

The first year of the pilot program focussed on three communities: the Lower Mainland, Campbell River, and Fort St John. Several Working Group members expressed interest in expanding the scope of the pilot for the second year. However, when the challenges of implementing this rate structure on a pilot basis were presented, this topic was not put forward again as one of interest to pursue.

### **2.14 Duration**

The duration of the peak period was discussed in several meetings by the Working Group members. The group recognized that there was a trade-off between setting a long duration, to ensure that customers would be influenced to load shift during the full duration of the peak period as experienced by BC Hydro's system, versus setting a shorter duration that would give customers the flexibility to shift a greater number of their activities. Discussion within the group revealed that there was no clear answer to this problem. As a result, *the Working Group recommended that BC Hydro test this question directly by creating some rates with a shorter peak duration.* The Working Group expressed a preference for trimming the duration of the evening peak at both ends by half an hour, but when forced to prioritize, *recommended that the evening peak be shortened from a 9pm to an 8pm ending time.*

The Working Group also discussed the duration of the peak on Vancouver Island *and recommended to BC Hydro that the duration of the morning peak be reduced to 8am to 11am.*

### **2.15 12 Months of the year**

The months of the year covered under the CRI TOU pilot were designed to coincide with the winter peaks that impact BC Hydro's system planning. However, given that there were a number of changes being discussed to the pilot, *the Working Group recommended maintaining the peak months identified in the first year of the pilot to simplify comparisons between Year 1 and Year 2 of the program.*

### **2.16 Days of the week**

BC Hydro's initial presentations to the Working Group suggested that the system peaks were being driven by peak demand during the work week. However, a closer analysis of the Vancouver Island data suggested that a handful of the largest peak events were occurring on both weekends and weekdays with equal probability. This led the Working Group to consider extending the CRI TOU

rate structure to weekends as well. The group wrestled with the conflicting need to reduce system peaks whenever they occur and the need to avoid making this rate structure unnecessarily burdensome for participants. The Working Group eventually recommended that the CRI *TOU rate structure remain restricted to the work week and not be extended to the weekends*. This decision was in recognition that another rate option (Critical Peak Pricing or CPP) could be used to address weekend and other extraordinary peaks.

## **2.17 Additional Rate Structures (Critical Peak Pricing)**

In looking through the data on system peaks for Vancouver Island, the Working Group discovered that some of the days with the highest demand coincided with days of extremely low temperatures. This suggested that, while TOU rates may be useful for addressing “normal” peaks, a CPP rate structure might be more appropriate for addressing these extreme and periodic peaks. An additional benefit to this was that it would allow the rare peaks on weekends to be addressed without needing to extend the residential CRI TOU rate to every weekend. Based on this logic, *the Working Group recommended that BC Hydro design and implement a CPP rate structure for Vancouver Island and the Lower Mainland for testing in the second year of the pilot.*

## **2.18 Technological Enablers**

A key interest of several participants, and one that matched experiences from other jurisdictions, was in examining the importance of technological enablers that assisted customers in shifting their demand. The Working Group made suggestions for types of technologies that might assist in demand shifting. The BC Hydro project team investigated these and several other types and presented the results to the group. In the end, *it was recommended that technologies that would assist in controlling electric water heaters and electric heating in homes should be tested in the second year of data collection.*

Several caveats were raised around these issues, however. The project team noted that recruitment for this part of the pilot could be difficult in that it wasn't clear that enough participants with electric water heaters and/or electric heating could be attracted into the pilot. Secondly, the project team noted that many of the specific details around what technologies could be used and how this could be accomplished still needed to be worked out. As a result, BC Hydro cautioned that this part of the pilot would be done on a “best efforts” basis.

## 2.19 Information to Customers

The topic of communication with customers was focal to a number of the issues discussed by the Working Group. One key point the group returned to often was the way in which “the message” put to prospective participants was key to attracting them into the program. The group’s struggles with describing and understanding the two-part rate suggested that a detailed explanation of the two-part rate’s mechanics would not work to entice new participants. It was stressed to BC Hydro that the key message to get across was that there is little or no downside risk to joining the program, and that participants can shift their energy and help BC Hydro with its system needs and reduce their bills at the same time.

A second theme that emerged from discussions was that customers are diverse, and so the communications approach needs to be able to serve different needs. Some participants will be satisfied with simple, high level explanations whereas other, more sophisticated participants may need the ability to dig down to more detailed explanations of how the rates work and how their bill is calculated.

Working Group members stressed the need for BC Hydro to provide information to people that would allow them to change their behaviour. The focus of these discussions was regarding the energy saving and shifting tips provided by BC Hydro. Some Working Group members felt that more tips, and more sophisticated tips, could have been provided.

The use of the CRI TOU website was also a focus of discussion. Working Group members noted that this would be an ideal way to meet the needs of participants that wanted to know more information.

The role of communications in supporting a CPP program was also discussed in depth. It was noted that there are significant differences between (as a first option) a CPP event being called and BC Hydro simply communicating this to customers, versus (as a second option) an event being called, and BC Hydro communicating this to customers and then requiring a response back to ensure that the CPP participant was really aware and responding to the signal. Different group members expressed different preferences regarding one-way versus two-way communications during a CPP event.

The group also deliberated over which media could best be used (web, phone, email, newspaper, and/or radio). *BC Hydro committed to investigating the use of the web for this communication.* The Working Group also concluded that either one-way or two-way communication was possible, but an

extra effort at spelling out roles and responsibilities of the utility and the customer would be needed so that misunderstandings would be minimized.

## **2.20 Additional research questions**

A number of issues were raised in discussion within the Working Group that were identified as important questions, but ones that did not lend themselves to testing through a pilot rate program. At several points it was suggested within the Working Group that these questions could be tested through other means such as focus groups or surveys. These topics are collected here, although no commitment or firm recommendation from the whole Working Group was made around these issues.

One vs. Two Part Rates was a topic that highlighted the need for more understanding. In particular, Working Group members were unsure about which rate structure would attract more participants if offered on a voluntary basis and which option would retain more participants once they had experience with it. This topic could be pursued through focus groups or survey work.

Participants' understanding of rates was called into question at a number of points. Working Group members were unclear as to whether participants understood the balancing amount, its benefit to them or how it made participants less likely to experience a risk of losing money. Moreover, it was not clear to what extent this device increased the attractiveness of the program to participants. These questions could be addressed through qualitative research.

The role of lower on and off-peak rates was highlighted as an issue of interest. Survey respondents liked the idea of lower on and off-peak rates and Working Group members pointed out that they do look more attractive to potential participants. However, an understanding of the rate mechanics shows that lower on and off-peak rates may reduce the potential benefit of participating. Some qualitative research needs to be done to test how participants' (mis)perceptions of these issues affect rate attractiveness. Secondly, the rebound effect of customers using more energy at off-peak prices was raised as a concern. This can be explored through quantitative analysis, but some Working Group members wondered whether participants would be attracted to the rate with a strategy of exploiting off-peak rates. This could be addressed through qualitative survey work.

The set-point adjustment done by technological enablers was raised as a concern by participants. If a signal from BC Hydro during a CPP event sets water heaters and thermostats to a set-point *that is above where participants had previously set it*, then this has implications for customers' acceptance of the technology. This needs to be investigated by BC Hydro.

The rationale for calling a CPP event was a final topic that could be explored through qualitative research. BC Hydro could in the future want to use a CPP rate to free up peak energy for export. Working Group members deliberated over whether this would impact customers' acceptance of the program, which in turn might undermine their participation in it. It was suggested in the Working Group that this question could be tested with CPP participants at the end of the second year of data collection.

### 3 Recommendations

At the final meeting in June 2007, the Working Group was presented with a package of rates for the second year of the pilot that incorporated changes to address the issues that the group had been discussing. This package of rates can be found at the Working Group's website as handouts ("Rate Group Overview" and "TOU CPP Program Attributes").

After discussing the details of the proposed rates and addressing clarifying questions, the Working Group participants were asked to show their level of support for this package in one of three ways:

- "Support" – meant that the participant enthusiastically endorsed the package;
- "Accept" – meant that the participant could live with the package, but had some reservations/qualifying issues that were then recorded; and
- "Oppose" – meant that the proposal did not meet the participant's minimum needs for the stated reasons.

The group was then polled, one by one, for their level of support for the package of recommendations. Their responses are listed below in Table 3.

**Table 3 – CRI TOU Working Group Participants' Level of Support for the Proposed Package of Rates**

Member	Level of Support	Comments
Ludo Birch	Accept	<p>Ludo stated that, overall, the proposal looked good. However, there were still a lot of details to be determined regarding load control on Vancouver Island. In particular, Ludo stated that he would like to have more information regarding the number of baseboard vs. forced air heating in Campbell River before filing with the BCUC.</p> <p>Ludo stated that he would need to check in with his constituent group (ESVI) before being able to give a definitive answer.</p>

Member	Level of Support	Comments
Leigha Worth	Accept	Leigha stated that she would need to check with her constituent groups (BCOAPO et al) before giving a definitive answer, but she felt that they will likely accept. Looked at in a universal way, Leigha stated that this package is a good thing and BC Hydro has been very responsive to participant's needs in this process.
Stan Crocker	Support	Stan stated that Terasen would support the recommendations as this is a pilot. He said that there are broader issues such as fuel switching that exist and will need to be addressed, but as a pilot Stan felt that this looks good.
Lloyd Guenther	Accept	Lloyd stated several ongoing concerns; it is not clear what technology will be best over the long term, and it is also not clear whether it will be valid to generalize the results from Campbell River to other areas.
Bob Steele	Support	Bob stated that BC Hydro supports the package of recommendations put forward, including the changes suggested during this meeting. BC Hydro has set aside enough resources to cover what is being recommended.
Dennis Fitzgerald	Accept	Dennis stated some reservations at a general level, given that the business case for the AMI and the CRI programs hasn't been tabled. Secondly, Dennis voiced his concern around the balancing amount, although this concern was somewhat offset through the use of CPP pricing in the second year. Given that the objective for this pilot is to learn, then the additional testing for a second year is acceptable.
Julie Startup	Support	Julie wanted to see more public promotion of this initiative, more focus on understanding and more communication to participants.
Derrick Sinclair	Support	Derrick stated that this package of rates and the group's recommendations represents a good research effort.
Tony Atkins	Accept	Tony felt that there still might be some variations that could be tried out. As an example, he was wondering whether, during peak times, people could have a fixed block of energy that they could use at a low rate, but then face a higher rate once they have used their "allotment" up.

At the end of the final meeting, the project team committed to writing up a high level summary of the Working Group's discussions and recommendations and then circulating this report to the group for them to check for accuracy and completeness. This section of the filing represents that report and BC Hydro has circulated this report to the participants of the Working Group and has incorporated the suggested changes of the participants.

## **APPENDIX D**

### **Evaluation Reports - First year of CRI Program**





# **Conservation Rate Initiative**

## **Executive Summary**

### **Milestone Report**

**July 4, 2007**

**Prepared by:**

**Ken Tiedemann**

**Power Smart Evaluation**



# EXECUTIVE SUMMARY

## Introduction

As a part of BC Hydro's Advanced Metering Initiative (AMI), a time of use rate pilot or Conservation Rate Initiative involving some 1,950 residential customers was developed for the winter of 2006/07 (Nov 1, 2006 – Feb 28, 2007). Customers participating in the pilot had an advanced meter installed at their house, which reported interval data on their demand and consumption on an hourly basis. They also received information on how they could save energy during the peak period and shift load from the peak period to the off peak period. Customers who were interested in participating in the pilot were randomly assigned to one of several participant groups with different rate structures or to a control group. The goal of the pilot is to determine whether customers respond to pricing signals and to information on energy use and to determine the magnitude of these responses. The study has several main findings including the following.

## Results

1. **Customer Recruitment.** The recruitment process has been assessed through a review of relevant materials and through a first set of focus groups in November. The recruitment process included several components including the direct marketing card (supplemented by advertising in community newspapers), call center registration and screening, welcome letter, rate sheet, launch package letter, launch package gift certificate, Power Smart tip sheet and the load shift tip sheet. Participants were generally enthusiastic about these materials and call centre screening and recruitment processes, and they felt that they had been handled knowledgeably and professionally.
2. **Customer Information.** Key customer information mechanisms including the Power Smart tip sheet, the load shifting tip sheet, the CRI website and the Blue Line Monitors were reviewed at the focus groups. Participants viewed the Power Smart tip and load shifting sheets as somewhat useful, but they generally felt that they were already doing what was practical and that a more detailed list of energy saving tips with an explanatory chart would be useful. Participants generally accessed their billing information online through their account, and they felt that the consumption chart was useful, but some would like to see more functionality such as real time data.
3. **Self-reported Energy Use and Behaviour.** The second set of focus groups explored energy conservation and load shifting behaviours. The key findings include the following: (1) there is some confusion about what the objective of the pilot is - load shifting, conservation or both; (2) conservation seems like the easier behaviour to understand and justify; (3) many customers already think of themselves as being energy efficient although they are interested in finding other ways to save energy; (4) ability to load shift is viewed as being conditioned by the fuel type for certain end uses; (5) those with natural gas self described themselves as successful load shifters – they felt there was little they could do to shift their electricity load and they were already doing it; (6) the easiest load shifting behaviours were perceived to be turning dishwashers on after 9:00 pm and doing laundry or clothes drying before or after peak periods.
4. **Energy Consumption.** Statistical modeling was used to estimate the impact of participation in one of the time of use rate options on consumption. The results were aggregated across regions based on the number of participants in each region. As expected, there was a significant total consumption response for each of the three winter months. In December, average treatment consumption was 180 kWh lower than average control consumption of 1321 kWh, for a 13.6% reduction in consumption. In January, average treatment consumption was 109 kWh lower than average control consumption of 1401 kWh, for a 7.8% reduction in consumption. In February, average treatment consumption was 47 kWh lower than average control consumption of 1205 kWh, for a 3.9% reduction in consumption.

5. Peak Consumption. Statistical modeling was also used to estimate the impact of participation in one of the Time Of Use rate options on peak, and again the results were aggregated across regions based on the number of participants in each region. There was a significant peak response for each of the three winter months. In December, average treatment peak consumption was 29 kWh lower than average control consumption of 284 kWh, for a 10.2% reduction in peak consumption. In January, average treatment peak consumption was 38 kWh lower than average control consumption of 356 kWh, for a 10.7% reduction in peak consumption. In February, average treatment peak consumption was 19 kWh lower than average control consumption of 265 kWh, for a 7.2% reduction in peak consumption.

# ***CONSERVATION RESEARCH INITIATIVE***

## ***Quantitative Analysis of Self-Reported On-Peak Behaviours***

### ***Executive Summary***



**Prepared by**

**Marc Pedersen - Power Smart Evaluation and Research**

**July 2007**

# EXECUTIVE SUMMARY

## Demographic Profile of CRI Participants

In considering the demographic profile of participants of BC Hydro's Conservation Research Initiative (CRI) as compared to the corporation's overall population of residential customers living in single detached houses, the pilot is somewhat over-represented by women, those 35 to 54 years old, and related to this life stage, by those living in homes with at least two other people. The most striking difference, however, is their level of education as 44 percent have earned university degrees compared to 25 percent among the related population of customers living in single detached homes. It follows that the total annual household income among participants is much higher than average as 45 percent reportedly earn \$80,000 or more compared to 34 percent among the related customer base.

## Attitudinal Profile of CRI Participants

Given that they were proactive in voluntarily opting-in to the pilot, **CRI participants – regardless of whether they were subsequently assigned to the treatment group or to the control group – bring a stronger pro-conservation ethic with them to the pilot** as compared to that shared by the majority of BC Hydro's residential customers. Participants emerge as being more knowledgeable than many others about how to conserve electricity in their homes, and more active in looking for opportunities to save energy in everything they do. Among other differences, they are also more willing to be flexible in their energy habits for a greater good, more likely than others to make the connection between their own household's energy use and its impact on the environment, and to believe that many people can make a difference overall in terms of conservation.

## Home Profile of CRI Participants

Like BC Hydro's overall population of customers in single detached houses, nearly all CRI participants own their homes. However, their houses are older than most others and, on average, about 100 square feet larger in floor area. Rolled-up together, households recruited into the CRI pilot are significantly more likely than single detached houses across BC Hydro's entire service territory to have natural gas as their main space heating fuel – 81 percent versus 64 percent.

**For the 12 months previous to the launch of the pilot, participating households used an average of about 1,700 fewer kilowatt hours of electricity than among all other single detached houses across the BC Hydro's service territory.** However, their lower consumption can not be attributed to their under-reliance on electricity for space heating as their average annual usage is lower for each of the main fuel types. **Instead, it appears as though their strong conservation behaviours overcome the fact that their homes are older, larger in area, and larger in occupancy – all drivers of higher consumption.**

## Changes in Peak Behaviours

**Statistical analysis uncovers strong evidence that treatment group households were successful in shifting their morning and evening on-peak use of many electrical end-uses to off-peak times, in turn, revealing favourable “demand response effects”.** This analysis is based on their self-reported behaviours for typical winter seasons before the pilot and for the CRI pilot period itself, and a control group to help isolate and validate the effects.

For the evening peak, treatment group households showed the most substantial drops in their top-two box usage scores (always + usually) for major household cleaning appliances such as dishwashers (31%⇒11%), clothes washers (25%⇒11%) and clothes dryers (24%⇒9%). They also showed very favourable shifts in their evening on-peak use of hot water for baths and showers (46%⇒35%) and, despite being in the space heating season, electric heaters including portables and baseboards (30%⇒23%).

To a lesser degree, CRI participants on a Time Of Use rate also shifted their on-peak use of stove top elements, ovens, microwave ovens and lighting in various rooms of the home. There does not appear to be a successful demand response effect for end-uses relating to the television and entertainment usage, nor for end-uses relating to computers and home office. Please see Section 8 for the complete details.

Campbell River participants on a morning time of use rate also showed the most substantial drops in on-peak usage for clothes washers (35%⇒10%), clothes dryers (31%⇒8%) and electric heaters (45%⇒38%). Unlike findings for the evening peak, Campbell River Households can boast some statistically significant shifting in their use of some television and entertainment systems as well as some computer and home office end-uses.

**Even though the morning Time Of Use rate was only explored among a limited group of CRI households, all evidence suggests that it was relatively easier for participants to shift electricity usage off of the morning peak, and more of it, than to shift electricity usage off of the evening peak.** For either time period, however, the ease in shifting usage and the extent in doing so is correlated to the same group of drivers – age, space heating fuel, home occupancy size, household composition, and consumption. That is, older participants, houses with electrical space heating, households with fewer occupants (especially those without children and/or young adults) and related, those with relatively lower electricity consumption all emerge as being the most successful – on this self-reported basis – in shifting their on-peak usage.

In terms of the specific treatment group, households on each of the various pricing plans report broad success in shifting their on-peak use of electricity. Having said this, households in Campbell River on the 1145 rate plan (4:1 on-peak to off-peak price) can be ranked number one. **For select end-uses – especially dishwashers, electric heaters and lighting – households which received enhanced communications throughout the pilot out-performed households which received standard communications.** Homes with Blue Line Power Monitors report less success than all others in the amount of electricity they believe they were able to shift.

## Changes in Conservation Attitudes and Behaviours

Statistical analysis of reported attitudes towards electricity and conservation fails to uncover any favourable changes or strengthening in mindset over the course of the pilot among treatment or control group participants. Keep in mind, however, that all participants had already brought pro-conservation attitudes to the pilot at much higher levels than the general public. However, **just as there has been a “demand response effect” for many end-uses, there has also been a “conservation effect”** in that treatment group participants are

reporting having reduced their use of electricity for some behaviours relating to space heating, water use/laundry and lighting.

## **Feedback on the CRI Touch Points**

**Treatment and control group participants alike rate the initial recruitment and call-centre support very favourably** with top-two box performance scores (excellent + good) in the high 80's and 90's for the ease in signing-up for the pilot, the professionalism of the representatives, their knowledge, their accessibility, and returning calls and providing service in a timely manner.

**The information in the welcome and launch packages was also well received** by the treatment group, with top-two box performance scores in the 80's for the explanation of the CRI rate, the explanation of the bill guarantee, and the explanations of tips on how to shift usage, and how to reduce usage. Scores slip to the low 70's, however, in terms of the practicality of those tips.

**Although a total of 78 percent of treatment group participants rate the explanation of the balancing charge favourably, qualitative research during the pilot revealed not only a poor understanding of the amount, but little awareness of it.** All evidence points to the belief that participants in this study have a misunderstanding of the balancing charge, despite their claim of having a good one.

**All facets relating to the meter installation process are evaluated favourably** by the treatment group participants, although the process was fairly transparent for a significant proportion of them. After discounting non-responses, the top-two box performance scores measure in the 90's for the professionalism of the meter technician, and in the mid 80's for the meter installation process at the onset of the pilot, and the meter replacement process – if necessary – later on.

About one in ten treatment group participants report having visited the **on-line CRI hourly profile** at least several times each week throughout the course of the pilot, but as many as four in ten did not visit the site at all. Among those that visited the profile at least once a month, their top-two box performance scores measure in the 70's for the usefulness of the hourly profile, the usefulness of the monthly consumption graph, and the usefulness of the program information. The usefulness score for the tips or ask an expert section, however, slips to the mid 60's.

Among Lower Mainland participants with **Blue Line Digital Display Monitors**, about five in ten of them report having used the monitors at least several times each week in the first month of the pilot. This proportion, however, decreased to about four in ten in the final two months. While the top-two box rating for the in-home monitor measures in the low 70s in terms of the ease in understanding the displayed information, the ratings become lukewarm and hover around 60 percent in terms of their usefulness in helping to shift electricity usage and reduce electricity usage. In fact, **there is significant division in opinion with respect to the overall performance of the monitor** – 43 percent rate it favourably and 31 percent rate in unfavourably. Please see Section 11 for additional insights.

## Overall Experience with the CRI Pilot

**Among treatment group participants expressing an opinion, 81 percent assess their overall experience with the CRI pilot as either “excellent” or “good”.** Most others rate their experience as having been “fair” rather than as “poor” or “very poor”. Perhaps due in part to a greater ease in trying shifting their on-peak use of electricity and a greater extent in doing so, at least on a self-reported basis, participants with electric space heating fuel are significantly more likely to rate their overall experience with the pilot favourably than participants with natural gas space heating fuel.

Demographically, the youngest of participants – those 25 to 34 years old – are significantly more likely than all others to assess their overall experience with the CRI pilot positively. Household size in terms of the number of occupants also discriminates overall opinions of the pilot, with participants living on their own reflecting upon the program significantly more favourably than all others. As a reminder, it is the single occupancy households which report the greatest ease and extent in shifting their electrical consumption from the on-peak to off-peak hours.

Very closely reflecting their overall experience with the pilot, **83 percent of treatment group participants indicate that they either “definitely would” or “probably would” continue for a second year of the program next fall** if it is offered under the very same set of conditions relating to the on-peak times, on-peak and off-peak rates, balancing charge, bill guarantee and meter. According to the participants, however, **the absence of a bill guarantee would have a very detrimental impact on their likelihood of signing-on for a second year of the program.** A total of 68 percent of individuals feel that they would be less likely than initially stated to re-enrol, including 41 percent who would be “much less likely” to do so. Please see Section 12 for the complete findings.

## **APPENDIX E**

### **CPP Program Details, Sample CPP Bill Calculations and Customer Program Information**



## 1 CPP Program Details and Sample CPP Bill Calculations

The following table outlines winter load data for an average residential customer for Vancouver Island (VI) and the Lower Mainland (LM). The table shows illustrative winter average on-peak and off-peak load for the two regions, the number of CPP hours in a year and the potential kWh load under the CPP program during the winter period. This data is used for the illustrative sample bill calculations shown later in this Appendix.

**Table 1 Customer Data**

Nov - Feb	VI	LM
On Peak	1,472	809
Off-Peak	4,907	4,759
Total kWh	6,379	5,568
CPP hr	70	50
Potential CPP kWh during Nov-Feb	184	101

### Vancouver Island (VI)

The following discusses the three approaches that were considered for the VI CPP programs and the recommendation made and the table summarizes the main features of the three programs initially considered for VI.

**Table 2 Program Parameters for Three CPP Program Approaches for VI**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>CPP and TOU Programs</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>
<b>Product Attributes</b>	<b>Pay for Performance</b>	<b>Customer Credit</b>	<b>TOU Discount</b>
<b>Basic Terms and Conditions</b>			
Availability / Restrictions	Pilot-limited # of subscribers	Pilot-limited # of subscribers	Pilot-limited # of subscribers
CPP Length	Nov 2007 - Feb 2008	Nov 2007 - Feb 2008	Nov 2007 - Feb 2008
<b>Metering and Equipment</b>			
Advanced Metering Required?	Yes	Yes	Yes

	<b>A</b>	<b>B</b>	<b>C</b>
<b>CPP and TOU Programs</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>
<b>Product Attributes</b>	<b>Pay for Performance</b>	<b>Customer Credit</b>	<b>TOU Discount</b>
Price / Event Communication Technique	phone, pager, e-mail or text messaging	phone, pager, e-mail or text messaging	phone, pager, e-mail or text messaging
<b>Event Terms</b>			
Months CPP Events may be called	Nov - Feb	Nov - Feb	Nov - Feb
Days CPP Events may be called	any	any	any
Hours CPP Events	From 8 AM to 11 AM & from 4 PM to 8 PM	From 8 AM to 11 AM & from 4 PM to 8 PM	From 8 AM to 11 AM & from 4 PM to 8 PM
Maximum annual number of Days	10	10	10
Maximum annual hours of Calls	70 hr	70 hr	70 hr
Events called per day	2	2	2
CPP Event Length	3 hr in AM and 4 hr in PM	3 hr in AM and 4 hr in PM	3 hr in AM and 4 hr in PM
Minimum CPP Event Notice	5 PM Day Ahead	5 PM Day Ahead	5 PM Day Ahead
Mandatory Event participation?	No	No	No
Conditions permitting Event Calls	Emergency, temperature, and discretionary for test purposes	Emergency, temperature, and discretionary for test purposes	Emergency, temperature, and discretionary for test purposes
Determination of load reduced	Average load during same hours for the three days of similar day type (weekend or weekday) prior to the call less the hourly average during the call times the number of hours in the call (consider making a weather adjustment)	N/A	N/A
<b>Event Pricing (CPP)</b>			
Is event buy-through option available?	Buy through not required - Opt In	yes - CPP	yes - CPP

	<b>A</b>	<b>B</b>	<b>C</b>
<b>CPP and TOU Programs</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>	<b>Campbell River TOU/CPP</b>
<b>Product Attributes</b>	<b>Pay for Performance</b>	<b>Customer Credit</b>	<b>TOU Discount</b>
Is buy-through price known in advance?	N/A	yes	yes
Critical Peak price/Buy-through price	N/A	\$0.50	\$0.50
Is event buy- back price known in advance?	yes	N/A	N/A
Critical Peak price/Pay for Performance price	\$0.50	N/A	N/A
Customer Bill Credit	N/A	\$65	N/A
<b>TOU Pricing</b>			
On Peak Season	Nov - February	Nov - February	Nov - February
On Peak Hours	Weekdays - from 8 AM to 11 AM and from 4 PM to 8 PM	Weekdays - from 8 AM to 11 AM and from 4 PM to 8 PM	Weekdays - from 8 AM to 11 AM and from 4 PM to 8 PM
Off Peak Season	All other months	All other months	All other months
On Peak Season Peak Price	\$0.15	\$0.15	\$0.125
On Peak Season Off-Peak Price	\$0.045	\$0.045	\$0.0412
Off Peak Season Price	\$0.0633	\$0.0633	\$0.0595
Basic Service Charge	\$3.69	\$3.69	\$3.69

The CPP price of \$.50 for both LM and VI is assumed to be the avoided cost of having to procure additional supplies to serve additional capacity needs during the periods of highest demand in the year.

The three alternatives were designed to be bill neutral for the subscriber if all the CPP hours were called and the subscriber elected not to respond. This is shown in Table 3 in the last three columns, which assumes that the illustrative average VI customer in each of the programs do not respond during the CPP events. In this case, the total bills are approximately the same under the three programs (\$456).

The Pay for Performance option shown in the first column of each example cannot negatively impact the subscriber as only reduced load has the CPP price applied to determine the credit BC Hydro pays for performance. Thus if the subscriber reduces 100% of the CPP load (184 kWh), it will receive a credit of 184 kWh multiplied by the \$.50 incentive, which equals a credit of \$92. The total bill net of the credit assuming all CPP load is reduced is equal to \$336.76 for the four winter months. This leads to a total saving of \$119.60 for the subscriber.

The Customer Credit option is shown in the second column. The upfront credit is equal to \$64.50, which is 184 kWh multiplied by \$.35 (\$.50-\$.15), to make the subscriber bill neutral if it does not reduce any load. The total bill assuming all CPP load is reduced is equal to \$364.28 for the four winter months. This leads to a slightly lower saving of \$92.10 for the subscriber.

The TOU discount approach is shown in the third column. This required such a large discount to the TOU prices, as shown in Table 4, that it was not considered by BC Hydro.

The middle columns in Table 3 show bill calculations under the three program cases, assuming limited response during CPP events.

**Table 3 CPP Program Impacts for Alternative CPP Programs for VI**

VI Customer with 1,472 kWh on peak and a potential of 184 kWh in 70 hours of CPP											
	Performance	Credit	TOU Discount		Performance	Credit	TOU Discount		Performance	Credit	TOU Discount
CPP	\$ 0.50	\$ 0.50	\$ 0.50		\$ 0.50	\$ 0.50	\$ 0.50		\$ 0.50	\$ 0.50	\$ 0.50
100% of hr called - all potential kWh reduced	184	184	184	100% of hr called - Limited response	70	70	70	100% hr called no response	0	0	0
Nov - Feb Bills Prior to CPP	\$ 456.38	\$ 456.38	\$ 456.38		\$ 456.38	\$ 456.38	\$ 456.38		\$ 456.38	\$ 456.38	\$ 456.38
Performance Credit	\$ 92.00	N/A	N/A		\$ 35.00	N/A	N/A		\$ -	N/A	N/A
Up Front Payment	N/A	\$ 64.50	N/A		N/A	\$ 64.50	N/A		N/A	\$ 64.50	N/A
Nov - Feb Bills after CPP response	\$ 336.78	\$ 364.28	\$ 364.62		\$ 410.88	\$ 421.28	\$ 421.62		\$ 456.38	\$ 456.28	\$ 456.62
Savings	\$ 119.60	\$ 92.10	\$ 91.76		\$ 45.50	\$ 35.10	\$ 34.76		\$ -	\$ 0.10	\$ (0.24)

**Table 4 VI TOU Rates**

VI	Std TOU	TOU Discounted
On Peak Season Peak Price	\$0.15	\$0.120
On Peak Season Off-Peak Price	\$0.045	\$0.0398
Off Peak Season Price	\$0.0615	\$0.0615
BSC	\$ 3.69	\$ 3.69

The Pay for Performance is the proposed CPP approach for VI because it provides the potential for the greatest benefit as the subscriber is able to increase his responses and has the lowest risk to the subscriber. The TOU discount has an additional short coming for BC Hydro, as when less than all the hours are called the benefit of the discount on the TOU prices continues to flow to the subscriber. The same can be said about the Customer Credit approach as the subscriber has been paid and does not face the full exposure of the CPP hours.

#### **Lower Mainland (LM)**

The following discusses the three approaches that were considered for LM CPP programs and the recommendation made. Table 5 summarizes the main features of the three programs initially considered for the LM:

**Table 5 Program Parameters for Three CPP Program Approaches for LM**

<b>CPP and TOU Programs Product Attributes</b>	<b><i>Lower Mainland TOU/CPP</i> Pay for Performance</b>	<b><i>Lower Mainland TOU/CPP</i> Customer Credit</b>	<b><i>Lower Mainland TOU/CPP</i> TOU Discount</b>
<b><i>Basic Terms and Conditions</i></b> Availability / Restrictions	Pilot-limited # of subscribers		Pilot-limited # of subscribers
CPP Length	Nov 2007 - Feb 2008	Nov 2007 - Feb 2008	Nov 2007 - Feb 2008
<b><i>Metering and Equipment</i></b> Advanced Metering Required?	Yes	yes	yes

<b>CPP and TOU Programs Product Attributes</b>	<b><i>Lower Mainland TOU/CPP</i> Pay for Performance</b>	<b><i>Lower Mainland TOU/CPP</i> Customer Credit</b>	<b><i>Lower Mainland TOU/CPP</i> TOU Discount</b>
Price / Event Communication Technique	phone, pager, e-mail or text messaging		phone, pager, e-mail or text messaging
<b><i>Event Terms</i></b> Months CPP Events may be called	Nov - Feb	Nov - Feb	Nov - Feb
Days CPP Events may be called	any	any	any
Hours CPP Events	From 4 PM to 9 PM	From 4 PM to 9 PM	From 4 PM to 9 PM
Maximum annual number of Days	10	10	10
Maximum annual hours of Event Calls	50 hours	50 hours	50 hours
Maximum Events called per day	1	1	1
CPP Event Length	5 hours	5 hours	5 hours
Minimum CPP Event Notice	5 PM Day Ahead	5 PM Day Ahead	5 PM Day Ahead
Mandatory Event participation?	Yes	Yes	Yes
Conditions permitting Event Calls	Emergency, temperature, and discretionary for test purposes		Emergency, temperature, and discretionary for test purposes
Determination of load reduced	Average load during same hours for the three days of similar day type (weekend or weekday) prior to the call less the hourly average during the call times the number of hours in the call (consider making a weather adjustment)	N/A	N/A
<b><i>Event Pricing (CPP)</i></b>			
Is event buy-through option available?	yes – CPP	Buy through not required – opt in	yes - CPP
Is buy-through price known in advance?	N/A	yes	yes

<b>CPP and TOU Programs Product Attributes</b>	<b><i>Lower Mainland TOU/CPP</i> Pay for Performance</b>	<b><i>Lower Mainland TOU/CPP</i> Customer Credit</b>	<b><i>Lower Mainland TOU/CPP</i> TOU Discount</b>
Critical Peak price/Buy-through price	N/A	\$0.50	\$0.50
Is event buy- back price known in advance?	yes	N/A	N/A
Critical Peak price/Pay for Performance price	\$0.50	N/A	N/A
Customer Bill Credit	N/A	\$20	N/A
<b><i>TOU Pricing</i></b>			
On Peak Season	Nov - February	Nov - February	Nov - February
On Peak Hours	Weekdays - from 4 PM to 9 PM		Weekdays - from 4 PM to 9 PM
Off Peak Season	All other months	All other months	All other months
On Peak Season Peak Price	\$0.19	\$0.19	\$0.145
On Peak Season Off-Peak Price	\$0.0615	\$0.0615	\$0.0615
Off Peak Season Price	\$0.0615	\$0.0615	\$0.0615
Basic Service Charge	\$3.69	\$3.69	\$3.69

The CPP price of \$.50 for both LM and VI is assumed to be the avoided cost of having to procure additional supplies to serve additional capacity needs during the periods of highest demand in the year.

The three alternatives were designed to be bill neutral for the subscriber if all the CPP hours were called and the subscriber elected not to respond. This is shown in Table 6 in the last three columns, which assumes that the illustrative average LM customer in each of the programs do not respond during the CPP events. In this case, the total bills are approximately the same under the three programs (\$461).

The Pay for Performance option shown in the second column cannot negatively impact the subscriber as only reduced load has the CPP price applied to determine the credit BC Hydro pays for performance. Thus if the subscriber reduces 100% of the CPP load (101 kWh), it will receive a credit of 101 kWh multiplied by the \$.50 incentive, which equals a credit of \$50.50. The total bill net of the credit assuming all CPP load is reduced is equal to \$391.46 for the four winter months. This leads to a total saving of \$69.69 for the subscriber.

The Customer Credit option is shown in the third column. The upfront credit is equal to \$31.25, which is 101 kWh multiplied by \$.31 (\$.50-\$.19), to make the subscriber bill neutral if it does not reduce any load. The total bill assuming all CPP load is reduced is equal to \$410.71 for the four winter months. This leads to a slightly lower saving of \$50.44 for the subscriber.

The TOU discount approach is shown in the fourth column. This required such a large discount to the TOU prices, as shown in Table 7, that it was not considered by BC Hydro.

The middle columns in Table 6 show bill calculations under the three program cases, assuming limited response during CPP events.

**Table 6 CPP Program Impacts for Alternative CPP Programs for LM**

LM customer with 809 on peak kWh and a potential of 101 kWh in 50 HOURS OF CPP											
	Performance	Credit	TOU Discount		Performance	Credit	TOU Discount		Performance	Credit	TOU Discount
CPP	\$ 0.50	\$ 0.50	\$ 0.50		\$ 0.50	\$ 0.50	\$ 0.50		\$ 0.50	\$ 0.50	\$ 0.50
100% of hr called - all potential kWh reduced	101	101	101	100% of hr called - Limited response	50	50	50	100% hr called no response	0	0	0
Customer Peak Bill Prior	\$ 461.15	\$ 461.15	\$ 461.15		\$ 461.15	\$ 461.15	\$ 461.15		\$ 461.15	\$ 461.15	\$ 461.15
Performance Credit	\$ 50.50	N/A	N/A		\$ 25.00	N/A	N/A		\$ -	N/A	N/A
Up Front Payment	N/A	\$ 31.25	N/A		N/A	\$ 31.25	N/A		N/A	\$ 31.25	N/A
Customer Peak Bill after response	\$ 391.46	\$ 410.71	\$ 410.81		\$ 426.65	\$ 436.21	\$ 436.31		\$ 461.15	\$ 461.21	\$ 461.31
Savings	\$ 69.69	\$ 50.44	\$ 50.34		\$ 34.50	\$ 24.94	\$ 24.84		\$ -	\$ (0.06)	\$ (0.16)

**Table 7 LM TOU Rates**

LM	Std TOU	TOU Discounted
On Peak Season Peak Price	\$0.19	\$0.146
On Peak Season Off-Peak Price	\$0.0615	\$0.0615
Off Peak Season Price	\$0.0615	\$0.0615
BSC	\$ 3.69	\$ 3.69

The approach recommended for the LM is the Customer Credit since it allows the testing of an alternative CPP approach. The Customer Credit is less for LM because of the reduced number of CPP hours.



Note that under the proposed Customer Credit program for the LM, individual credits will be estimated based on actual F2007 data for the 5-hour peak period for the 10 days with the largest loads on the system. Table 8 shows the distribution of average kWh for the 5-hour peak period over 10 highest days for the 495 accounts that were in the control group and the range of estimated credits. The last column of the table shows that 96% of the accounts will have credits between \$15 and \$93.

**Table 8 Distribution of kWh and Estimated Credits using Control Group Sample for F2007**

<b>kWh over Peak Period</b>	<b>Number of Accounts</b>	<b>% of Accounts</b>	<b>Avg kWh over 10 days</b>	<b>Credit</b>
0	4	0.80%	0	\$0.00
0 to 5kWh	54	10.90%	50	\$15.50
5 to 10 kWh	183	37%	100	\$31.00
10 to 15 kWh	132	26.70%	150	\$46.50
15 to 20 kWh	63	12.70%	200	\$62.00
20 to 25 kWh	26	5.30%	250	\$77.50
25 to 30 kWh	18	3.60%	300	\$93.00
30 to 35 kWh	8	1.60%	350	\$108.50
35 to 40 kWh	2	0.40%	400	\$124.00
40 to 45 kWh	3	0.60%	450	\$139.50
45 to 55 kWh	1	0.20%	550	\$170.50
55 to 60 kWh	0	0.00%	600	\$186.00
60 to 65 kWh	0	0.00%	650	\$201.50
65 to 70 kWh	1	0.20%	700	\$217.00
70 to 75 kWh	0	0.00%	750	\$232.50
76 to 80 kWh	0	0.00%	800	\$248.00
	0	0.00%		
	495			

## 2. CPP Customer Program Information

The following are the suggested scripts illustrating the language that BC Hydro telephone agents will use over the phone to recruit CPP program participants:

### **Peak Power Saver**

#### **(Performance option) – Campbell River**

BC Hydro is introducing the Peak Power Saver feature as part of its Conservation Research Initiative pilot program that will reward customers for reducing energy load during peak demand times. During extreme conditions (typically very cold weather during winter months) there is a greater demand on the BC Hydro system. By paying customers to reduce energy consumption, BC Hydro will be able to

reduce the need to run more expensive forms of power generation or purchase additional power. BC Hydro is willing to pay you \$0.50 per kWh of reduced electricity consumption during the Peak Power Saver days. BC Hydro will notify you by phone and email by 5 PM the day before to reduce your electrical load the following day during the hours of 8 AM to 11 AM and the hours of 4 PM to 8 PM. The requests to reduce your energy consumption will be limited to a maximum of 70 hours during the months of November through February, any day of the week. The decision to reduce your energy consumption is voluntary. We understand there are days when lowering your consumption of electricity upon our request will not always meet with you and your family's scheduled events etc. If you are unable to reduce your energy consumption you will not be charged more or penalised in any way. If you do reduce your energy consumption, you will receive a credit on your bill. These credit adjustments will be reflected on your next bill. Your average electrical usage during three similar days prior to the request to reduce your consumption will be compared with your energy usage during the requested time of day reduction to determine the amount of energy you were able to reduce.

If you don't receive these communication notices and do not reduce during these times you will not be charged more or penalized. Again the key features are

- You will be paid \$0.50 per kWh of reduced energy consumption
- There are no penalties or fees for not reducing energy consumption
- Peak Power Saver days are only called during November thru February,
- Notification will be provided by 5 PM the day before,
- Peak Power Saver days may be called for any day of the week,
- Peak Power Saver days may only be called for the same peak hours as the peak hours - 8 AM – 11 AM & from 4 PM to 8 PM
- Maximum number of days we will call a Peak Power Saver day is 10, and
- The maximum number of hours would be 70 (10 days X 7 hours)

## **Peak Power Saver**

### **(Credit option) – Lower Mainland**

BC Hydro is introducing the Peak Power Saver feature as part of its Conservation Research Initiative pilot program that will credit customers for reducing energy load during peak demand times. During extreme conditions (typically very cold weather during winter months) there is a greater demand on the BC Hydro system. By paying customers to reduce energy consumption, BC Hydro will be able to reduce the need to purchase additional power or to run more expensive forms of power generation. BC Hydro is willing to apply a \$XXXX one time credit to your bill for your participation in Peak Power Saver option in the one year pilot. There is no risk for you to participate as BC Hydro will guarantee that your bill on the Peak Power Saver and TOU rates will not be higher than your charges on the standard rate. The credit amount was established to reflect your maximum potential benefit for responding to BC Hydro's request to reduce energy consumption. An average customer uses about 100 kWh during 50 hours (10 events X 5 hours each) of peak time. Instead of paying \$0.19 per kWh during peak hours they are charged \$0.50 per kWh. The \$31 offsets the additional charge  $(\$0.50 - \$0.19) \times 100 \text{ kWh}$  that you will pay during these times. Your use during the 50 peak hours is XXX kWh therefore your credit amount is \$XXXX. Your credit amount will be reflected on your November bill.

If your efforts of reducing load result in savings, they are yours to enjoy. The decision to reduce energy consumption is strictly voluntary. We understand there are days when lowering your consumption of electricity upon our request will not always meet with you and your family's scheduled events etc. If you are unable to reduce any energy consumption your credit would be reduced to \$0 but you would not be charged more or penalized in any way.

BC Hydro will notify you by a phone call and email by 5 PM the day before to reduce your energy consumption the following day during the hours of 4 PM to 9 PM. The requests will be limited to a maximum of 50 total hours during the months of November through February any day of the week. During the 5 hours of each energy consumption reduction request you will be charged \$0.50 per kWh. These higher charges would be compensated by the upfront credit amount provided.

Again the key features are:

- You will be provided a one time credit based on your consumption history as an incentive to reduce your energy consumption.
- In order to insure your participation BC Hydro will guarantee that your bill on the Peak Power Saver and TOU rates will not be higher than your charges on the standard rate.
- Peak Power Saver days are only called during November thru February,
- Notification will be provided by 5 PM the day before,
- Peak Power Save days may be called for any day of the week,
- Peak Power Saver days may only be called for the same peak hours as the TOU rate - 4 PM to 9 PM
- Maximum number of times we will call a Peak Power Saver day is 10, and
- The maximum number of hours would be 50 (10 days X 5 hours)

## **APPENDIX F**

### **Electric Tariff Supplement No. 73 – Revised (Clean copy)**

# Electric Tariff Supplement No. 73

## Conservation Research Initiative

### Residential Time of Use (CRI TOU) Program

This Electric Tariff Supplement outlines additional terms and conditions for RS 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145 herein referred to as the CRI TOU rates. In particular, it defines the calculation of the Annual and Monthly Balancing Amounts, the provisions under the Bill Guarantee and the terms and conditions under the TOU with critical peak pricing (CPP) rates.

## **1 Balancing Amount**

### **1.1 Definition**

The Annual Balancing Amount is defined to be the annual revenue difference between the customer's Historical Consumption under RS1101 and the applicable CRI TOU rate. The CRI TOU revenue used in this calculation is based on revenue from the CRI TOU basic charge and energy charges only.

The Monthly Balancing Amount is determined by dividing the Annual Balancing amount equally over four or twelve months, depending on the applicable CRI TOU rate, and appears as part of the CRI TOU bill. The exception is for participants that start after November 1, 2006, as outlined in section 1.3.1 below.

### **1.2 Historical Consumption**

The Historical Consumption under RS1101 is the 12 months of weather normalized historical data for each customer ending at the completion of the customer's March 2006 billing cycle.

For purposes of the CRI TOU rates, this data is further separated into monthly consumption for peak and off-peak periods for the winter months as defined in the applicable CRI TOU rate (November-February). For the non-winter months, the data does not need to be separated since all consumption in these months is treated as off-peak consumption.

The following first outlines the derivation of the Historical Consumption under RS1101, and then the derivation of the Historical Consumption under the applicable CRI TOU rate.

### **1.2.1 Historical Consumption under RS1101**

The historical monthly consumption data for the twelve month period ending March 2006 is weather normalized by applying the weather normalization factors in the following table. The factors for Vancouver Island (VI Elec for electrically heated and VI Nelec for non-electrically heated) will be applicable to subscribers in Campbell River. Similarly, the factors for Lower Mainland (LM Elec and LM Nelec) will be applicable to subscribers in the Lower Mainland and factors for the North (NI Elec and NI Nelec) will be applicable to subscribers in Fort St. John.

<b>Weather Normalization Factors</b>						
<b>Months</b>	<b>VI Elec</b>	<b>VI Nelec</b>	<b>LM Elec</b>	<b>LM Nelec</b>	<b>NI Elec</b>	<b>NI Nelec</b>
<b>April 2005</b>	<b>0.053</b>	<b>0.039</b>	<b>0.071</b>	<b>0.039</b>	<b>0.09</b>	<b>0.062</b>
<b>May 2005</b>	<b>0.106</b>	<b>0.065</b>	<b>0.1</b>	<b>0.042</b>	<b>0.101</b>	<b>0.055</b>
<b>June 2005</b>	<b>0.097</b>	<b>0.058</b>	<b>0.065</b>	<b>0.024</b>	<b>0.088</b>	<b>0.05</b>
<b>July 2005</b>	<b>0.022</b>	<b>0.015</b>	<b>0.012</b>	<b>0.003</b>	<b>0.019</b>	<b>0.012</b>
<b>August 2005</b>	<b>-0.001</b>	<b>0.004</b>	<b>0.003</b>	<b>0</b>	<b>-0.032</b>	<b>-0.02</b>
<b>September 2005</b>	<b>0</b>	<b>0</b>	<b>0.003</b>	<b>0.001</b>	<b>-0.042</b>	<b>-0.022</b>
<b>October 2005</b>	<b>-0.013</b>	<b>-0.008</b>	<b>0.014</b>	<b>0.005</b>	<b>-0.013</b>	<b>-0.007</b>
<b>November 2005</b>	<b>-0.038</b>	<b>-0.023</b>	<b>0</b>	<b>0</b>	<b>0.03</b>	<b>0.017</b>
<b>December 2005</b>	<b>-0.039</b>	<b>-0.029</b>	<b>-0.02</b>	<b>-0.012</b>	<b>0.033</b>	<b>0.026</b>
<b>January 2006</b>	<b>0.032</b>	<b>0.027</b>	<b>0.042</b>	<b>0.029</b>	<b>0.087</b>	<b>0.085</b>
<b>February 2006</b>	<b>0.045</b>	<b>0.038</b>	<b>0.051</b>	<b>0.037</b>	<b>0.096</b>	<b>0.092</b>
<b>March 2006</b>	<b>-0.01</b>	<b>-0.008</b>	<b>-0.008</b>	<b>-0.005</b>	<b>0.001</b>	<b>0.001</b>

The factor used to adjust each subscriber's consumption is chosen according to his or her area of residence and heating code (i.e., electrically heated or non-electrically heated) in BC Hydro's records. The weather normalization adjustment is made by multiplying the monthly consumption data by (1+weather normalization factor). The 12 months of weather normalized data is then used to determine the revenue from the Historical Consumption under RS1101.

### **1.2.2 Historical Consumption under CRI TOU rates**

The weather normalized historical monthly consumption data is split into consumption for peak and off-peak periods for the four winter months (November through February) according to the percentages shown in the following table:

<b>Peak Usage %</b>		
<b>Single Peak – AM TOU Rates 1141, 1141A, 1141B, 1142 and 1143</b>		
<b>Months</b>	<b>LM Elec</b>	<b>LM Nelec</b>
<b>January</b>	<b>16%</b>	<b>19%</b>
<b>February</b>	<b>17%</b>	<b>18%</b>
<b>November</b>	<b>16%</b>	<b>19%</b>
<b>December</b>	<b>18%</b>	<b>21%</b>
<b>Dual Peak – AM + PM TOU 1144, 1144A and 1145</b>		
<b>January</b>	<b>30%</b>	<b>33%</b>
<b>February</b>	<b>30%</b>	<b>33%</b>
<b>November</b>	<b>29%</b>	<b>32%</b>
<b>December</b>	<b>33%</b>	<b>34%</b>

The percentage represents the portion of the month's consumption which occurs in the peak period. The percentages are provided by peak period month, heating fuel type, and Lower Mainland (LM) and Vancouver Island (VI) regions. For Fort St. John the Lower Mainland (LM) percentages will be applied.

The percentages used to adjust each subscriber's consumption are chosen according to his or her CRI TOU rate, area of residence and heating code (i.e., electrically heated or non-electrically heated) in BC Hydro's records.

### **1.3 Determination of Monthly Balancing Amounts**

The Annual Balancing Amount is defined to be the annual revenue difference between billing the historical consumption under RS1101 and the applicable CRI TOU rate.

The RS1101 revenue is determined by applying RS1101 to the 12 months of weather normalized data to determine the twelve monthly bills, which are then summed to provide the annual RS1101 revenue.

The CRI TOU Revenue for the Lower Mainland for the winter months is the sum of the basic charge and the CRI TOU energy charge, which is determined by applying the applicable CRI TOU rates to the monthly peak and off-peak kWh. For the non-winter months, the CRI TOU revenue is the sum of the basic charge and the energy charge, determined by applying the applicable CRI TOU off-peak rates to the monthly total consumption. The annual CRI TOU revenue is the sum of the monthly CRI TOU revenue.



For Fort St. John CRI TOU rates 1141 and 1142 are used to determine the CRI TOU revenue.

For Campbell River, CRI TOU rates 1144, 1144A and 1145 are used to determine the CRI TOU revenue.

The RS1101 revenue less the CRI TOU revenue is the Annual Balancing Amount. For CRI TOU rates 1141, 1141A, 1141B, 1142, 1144, 1144A and 1145 the Annual Balancing Amount is divided by four and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the first four of the customer's CRI TOU bills.

For CRI TOU rate 1143 the Annual Balancing Amount is divided by twelve and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the twelve CRI TOU bills.

### ***1.3.1 Balancing Amounts for Participants that Start After November 1***

Participating customers that have TOU meters installed after November 1, 2007, will have their CRI TOU bill start either on November 15, 2007, or on December 1, 2007, as determined by BC Hydro, following installation of the required meter at the customer's residence. They will also have their balancing amount adjusted to reflect the shorter time period that they are on the CRI TOU rate. The Annual Balancing Amount will be determined by estimating the standard and CRI TOU revenue based on the 11.5 months (for those starting November 15) and 11 months (for those starting December 1) of historical consumption data rather than the full 12 months.

For participants with CRI TOU billing starting on November 15, or December 1, 2007, and on CRI TOU rates 1141, 1142, and 1144, the Annual Balancing Amount is divided by three and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the first three of the customer's CRI TOU bills.

For participants with CRI TOU billing starting on November 15, or December 1, 2007, and on CRI TOU rates 1143 and 1145, the Annual Balancing Amount is divided by the number of remaining CRI TOU bills and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the remaining CRI TOU bills.

## **2 Bill Guarantee**

BC Hydro will provide a Bill Guarantee to customers on the CRI TOU rate calculated as follows.

BC Hydro will credit to the CRI TOU subscriber's account the positive difference between the amount billed to the customer based on the CRI TOU tariff and the amount billed to the customer based on the RS1101 tariff as described as follows:

For rates RS1141, RS1141A, RS1142, RS1144, RS1144A and RS1145:

1. the total dollar amount of all bills issued to the subscriber for service under the CRI TOU rate during the 4 winter months (November-February), minus,
2. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

For rate RS1141B:

1. the total dollar amount of all bills and CPP Customer Credit issued to the subscriber for service under the CRI TOU/ CPP rate during the 4 winter months (November-February), minus,
2. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

For rate RS1143:

1. the total dollar amount of all bills issued to the subscriber for service under the CRI TOU rate during the entire year, minus,
2. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

Additional conditions and provisions include:

1. The applicable credit shall be made to the account of the subscriber, within 60 days after the March 2008 billing date for subscribers on rates RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 and within 60 days after the October 2008 billing date for the subscribers on rate RS1143.
2. The bill guarantee is not applicable to any subscriber that (i) in the case of rate schedules RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 ceases taking service before February 28, 2008, and (ii) in the case of rate schedule RS1143 ceases taking service before October 31, 2008.

### **3 TOU and CPP Rates**

#### **3.1 Customer Credit Program - RS1141B (“Peak Power Saver Credit Option”)**

##### **3.1.1 Customer Credit**

BC Hydro will provide a one-time credit based on each subscriber’s consumption history, which will appear on each subscriber’s first bill under the program. BC Hydro will estimate the credit based on each subscriber’s actual F2007 consumption data. The consumption data will be the average total kWh consumed over the 5-hour peak period (4pm-9pm) for the 10 highest BC Hydro system load days in F2007. The credit will be set equal to the estimated consumption data multiplied by \$0.31. If the consumption data is not available for the 10 highest days, BC Hydro may make an estimate based on the subscriber’s monthly F2007 consumption and based on the average credit estimated for similar sized customers.

##### **3.1.2 Timing of CPP Events**

Peak Power Saver days are only called during November through February. Notification will be provided to subscribers by 5 PM the day before by phone, pager, e-mail or text messaging. Peak Power Saver days may be called for any day of the week. Peak Power Saver events will be called for the same 5 peak hours as the TOU rate i.e., from 4 PM to 9 PM. Each call will be for the full 5 peak hour period. The maximum number of times that BC Hydro will call a Peak Power Saver day is 10 times for the period November through February.

##### **3.1.3 Charge for Consumption during CPP Events**

During the 5 hours of each CPP event the subscriber will be charged \$0.50 per kWh consumed. The higher charge will be offset by the upfront customer credit amount provided.

BC Hydro provides a bill guarantee for subscribers on RS1141B as indicated in Section 2 above.

#### **3.2 Pay for Performance Program - RS1144A (“Peak Power Saver Performance Option”)**

##### **3.2.1 Timing of CPP Events**

Peak Power Saver days are only called during November through February. Notification will be provided to subscribers by 5 PM the day before by phone, pager, e-mail or text messaging. Peak

Power Saver days may be called for any day of the week. Peak Power Saver events will be called for the same 7 peak hours as the TOU rate i.e., from 8 AM to 11 PM and from 4PM to 8PM. Each call will be for the full 7 peak hour period. The maximum number of times that BC Hydro will call a Peak Power Saver day is 10 times for the period November through February.

### **3.2.2 Credit for Load Reduction during CPP Events**

BC Hydro will pay \$0.50 per kWh of reduced electricity consumption during the Peak Power Saver days. A subscriber who is unable to reduce energy consumption during a CPP event will be charged the standard TOU rate. A subscriber who reduces energy consumption will receive a credit of \$.50 per kWh of load reduced on its next bill. If a critical peak pricing event is called, the following procedure will be used to determine the credit for load reduction:

- (1) The credit will be the larger of: (i) baseline average CPP period consumption minus CPP period consumption on critical peak day, multiplied by the critical peak rate of \$.50 and (ii) zero.
- (2) If the critical peak pricing event occurs on a weekday, then the baseline average CPP period consumption is defined as the average of the consumption during the CPP period hours for the three previous weekdays, where consumption is on a weather adjusted basis; if the critical peak event occurs on a weekend day, then the baseline average CPP period consumption is defined as the average of the consumption during CPP hours for the three previous weekend days, where consumption is on a weather adjusted basis.
- (3) After weather adjustment, the baseline consumption should more closely reflect what the subscriber consumes on a critical peak day.

BC Hydro provides a bill guarantee for subscribers on RS1144A as indicated in Section 2 above.

## **APPENDIX G**

### **Electric Tariff Supplement No. 73 – Revised (Blacklined copy)**

# Electric Tariff Supplement No. 73

## Conservation Research Initiative

### Residential Time of Use (CRI TOU) Program

This Electric Tariff Supplement outlines additional terms and conditions for RS 1141, 1141A, 1141B, 1142, 1143, 1144, 1144A and 1145 herein referred to as the CRI TOU rates. In particular, it defines the calculation of the Annual and Monthly Balancing Amounts, ~~and also defines~~ the provisions under the Bill Guarantee and the terms and conditions under the TOU with critical peak pricing (CPP) rates.

## **1 Balancing Amount**

### **1.1 Definition**

The Annual Balancing Amount is defined to be the annual revenue difference between the customer's Historical Consumption under RS1101 and the applicable CRI TOU rate. The CRI TOU revenue used in this calculation is based on revenue from the CRI TOU basic charge and energy charges only.

The Monthly Balancing Amount is determined by dividing the Annual Balancing amount equally over four or twelve months, depending on the applicable CRI TOU rate, and appears as part of the CRI TOU bill. The exception is for participants that start after November 1, 2006, as outlined in section 1.3.1 below.

### **1.2 Historical Consumption**

The Historical Consumption under RS1101 is the 12 months of weather normalized historical data for each customer ending at the completion of the customer's March 2006 billing cycle.

For purposes of the CRI TOU rates, this data is further separated into monthly consumption for peak and off-peak periods for the winter months as defined in the applicable CRI TOU rate (November-February). For the non-winter months, the data

does not need to be separated since all consumption in these months is treated as off-peak consumption.

The following first outlines the derivation of the Historical Consumption under RS1101, and then the derivation of the Historical Consumption under the applicable CRI TOU rate.

### **1.2.1 Historical Consumption under RS1101**

The historical monthly consumption data for the twelve month period ending March 2006 is weather normalized by applying the weather normalization factors in the following table. The factors for Vancouver Island (VI Elec for electrically heated and VI Nelec for non-electrically heated) will be applicable to subscribers in Campbell River. Similarly, the factors for Lower Mainland (LM Elec and LM Nelec) will be applicable to subscribers in the Lower Mainland and factors for the North (NI Elec and NI Nelec) will be applicable to subscribers in Fort St. John.

Weather Normalization Factors						
Months	VI Elec	VI Nelec	LM Elec	LM Nelec	NI Elec	NI Nelec
April 2005	0.053	0.039	0.071	0.039	0.09	0.062
May 2005	0.106	0.065	0.1	0.042	0.101	0.055
June 2005	0.097	0.058	0.065	0.024	0.088	0.05
July 2005	0.022	0.015	0.012	0.003	0.019	0.012
August 2005	-0.001	0.004	0.003	0	-0.032	-0.02
September 2005	0	0	0.003	0.001	-0.042	-0.022
October 2005	-0.013	-0.008	0.014	0.005	-0.013	-0.007
November 2005	-0.038	-0.023	0	0	0.03	0.017
December 2005	-0.039	-0.029	-0.02	-0.012	0.033	0.026
January 2006	0.032	0.027	0.042	0.029	0.087	0.085
February 2006	0.045	0.038	0.051	0.037	0.096	0.092
March 2006	-0.01	-0.008	-0.008	-0.005	0.001	0.001

The factor used to adjust each subscriber's consumption is chosen according to ~~their~~his or her area of residence and ~~their~~ heating code (i.e., electrically heated or non-electrically heated) in BC Hydro's records. The weather normalization adjustment is made by multiplying the monthly consumption data by (1+weather normalization factor). The 12 months of weather normalized data is then used to determine the revenue from the Historical Consumption under RS1101.

### 1.2.2 Historical Consumption under CRI TOU rates

The weather normalized historical monthly consumption data is split into consumption for peak and off-peak periods for the four winter months (November through February) according to the percentages shown in the following table:

Peak Usage % Single Peak – AM TOU Rates 1141, <u>1141A</u> , <u>1141B</u> , 1142 and 1143		
Months	LM Elec	LM Nelec
January	16%	19%
February	17%	18%
November	16%	19%
December	18%	21%
Dual Peak – AM + PM TOU 1144, <u>1144A</u> and 1145		
January	30%	33%
February	30%	33%
November	29%	32%
December	33%	34%

The percentage represents the portion of the month's consumption which occurs in the peak period. The percentages are provided by peak period month, heating fuel type, and Lower Mainland (LM) and Vancouver Island (VI) regions. For Fort St. John the Lower Mainland (LM) percentages will be applied.

The percentages used to adjust each subscriber's consumption are chosen according to their his or her CRI TOU rate, their area of residence and their heating code (i.e., electrically heated or non-electrically heated) in BC Hydro's records.

### 1.3 Determination of Monthly Balancing Amounts

The Annual Balancing Amount is defined to be the annual revenue difference between billing the historical consumption under RS1101 and the applicable CRI TOU rate.

The RS1101 revenue is determined by applying RS1101 to the 12 months of weather normalized data to determine the twelve monthly bills, which are then summed to provide the annual RS1101 revenue.



The CRI TOU Revenue for the Lower Mainland for the winter months is the sum of the basic charge and the CRI TOU energy charge, which is determined by applying the applicable CRI TOU rates to the monthly peak and off-peak kWh. For the non-winter months, the CRI TOU revenue is the sum of the basic charge and the energy charge, determined by applying the applicable CRI TOU off-peak rates to the monthly total consumption. The annual CRI TOU revenue is the sum of the monthly CRI TOU revenue.

For Fort St. John CRI TOU rates 1141 and 1142 are used to determine the CRI TOU revenue.

For Campbell River, CRI TOU rates 1144, 1144A and 1145 are used to determine the CRI TOU revenue.

The RS1101 revenue less the CRI TOU revenue is the Annual Balancing Amount. For CRI TOU rates 1141, 1141A, 1141B, 1142, 1144, 1144A and 1145 the Annual Balancing Amount is divided by four and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the first four of the customer's CRI TOU bills.

For CRI TOU rate 1143 the Annual Balancing Amount is divided by twelve and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the twelve CRI TOU bills.

### ***1.3.1 Balancing Amounts for Participants that Start After November 1***

Participating customers that have TOU meters installed after November 1, 2006/2007, will have their CRI TOU bill start either on November 15, 2006/2007, or on December 1, 2006/2007, as determined by BC Hydro, following installation of the required meter at the customer's residence. They will also have their balancing amount adjusted to reflect the shorter time period that they are on the CRI TOU rate. The Annual Balancing Amount will be determined by estimating the standard and CRI TOU revenue based on the 11.5 months (for those starting November 15) and 11 months (for those starting December 1) of historical consumption data rather than the full 12 months.

For participants with CRI TOU billing starting on November 15, or December 1, 2006/2007, and on CRI TOU rates 1141, 1142 and; 1144 ~~and 1145~~, the Annual Balancing Amount is divided by three and rounded to the nearest whole dollar and

becomes the Monthly Balancing Amount to be applied to the first three of the customer's CRI TOU bills.

For participants with CRI TOU billing starting on November 15, or December 1, ~~2006~~2007, and on CRI TOU rate 1143 and 1145, the Annual Balancing Amount is divided by the number of remaining CRI TOU bills and rounded to the nearest whole dollar and becomes the Monthly Balancing Amount to be applied to the remaining CRI TOU bills.

#### ~~1.3.2 Balancing Amounts for Participants in the Second Year~~

~~Participants that decide to stay on the CRI TOU rate for the second year will have the same Monthly Balancing Amount as in the first year.~~

## 2 **2 Bill Guarantee**

BC Hydro will provide a Bill Guarantee to customers on the CRI TOU rate calculated as follows.

BC Hydro will credit to the CRI TOU subscriber's account the positive difference between the amount billed to the customer based on the CRI TOU tariff and the amount billed to the customer based on the RS1101 tariff as described as follows:

For rates RS1141, RS1141A, RS1142, RS1144, RS1144A and RS1145:

1. the total dollar amount of all bills issued to the subscriber for service under the CRI TOU rate during the 4 winter months (November-February), minus,
2. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

For rate RS1141B:

1. the total dollar amount of all bills and CPP Customer Credit issued to the subscriber for service under the CRI TOU/ CPP rate during the 4 winter months (November-February), minus,

2. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

For rate RS1143:

31. the total dollar amount of all bills issued to the subscriber for service under the CRI TOU rate during the entire year, minus,
42. the total dollar amount derived by rendering bills on the same metered usage, using the rates in RS1101.

Additional conditions and provisions include:

1. The applicable credit shall be made to the account of the subscriber, within 60 days after the March ~~2007-2008~~ billing date for subscribers on rates RS1141, 1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 and within 60 days after the October ~~2007-2008~~ billing date for the subscribers on rate RS1143.
2. The bill guarantee is not applicable to any subscriber that (i) in the case of rate schedules RS1141, RS1141A, RS1141B, RS1142, RS1144, RS1144A and RS1145 ceases taking service before February 28, ~~2007-2008~~, and (ii) in the case of rate schedule RS1143 ceases taking service before October 31, ~~2007-2008~~.
- ~~3. Participants that stay on the CRI TOU rate for a second year will be provided with a bill guarantee based on actual consumption in the second year. The bill guarantee will be determined in the same manner as in the first year.~~

### **3 TOU and CPP Rates**

#### **3.1 Customer Credit Program - RS1141B (“Peak Power Saver Credit Option”)**

##### **3.1.1 Customer Credit**

BC Hydro will provide a one-time credit based on each subscriber's consumption history, which will appear on each subscriber's first bill under the program. BC Hydro will estimate the credit based on each subscriber's actual F2007 consumption data. The

consumption data will be the average total kWh consumed over the 5-hour peak period (4pm-9pm) for the 10 highest BC Hydro system load days in F2007. The credit will be set equal to the estimated consumption data multiplied by \$0.31. If the consumption data is not available for the 10 highest days, BC Hydro may make an estimate based on the subscriber's monthly F2007 consumption and based on the average credit estimated for similar sized customers.

### **3.1.2 Timing of CPP Events**

Peak Power Saver days are only called during November through February. Notification will be provided to subscribers by 5 PM the day before by phone, pager, e-mail or text messaging. Peak Power Saver days may be called for any day of the week. Peak Power Saver events will be called for the same 5 peak hours as the TOU rate i.e., from 4 PM to 9 PM. Each call will be for the full 5 peak hour period. The maximum number of times that BC Hydro will call a Peak Power Saver day is 10 times for the period November through February.

### **3.1.3 Charge for Consumption during CPP Events**

During the 5 hours of each CPP event the subscriber will be charged \$0.50 per kWh consumed. The higher charge will be offset by the upfront customer credit amount provided.

BC Hydro provides a bill guarantee for subscribers on RS1141B as indicated in Section 2 above.

## **3.2 Pay for Performance Program - RS1144A ("Peak Power Saver Performance Option")**

### **3.2.1 Timing of CPP Events**

Peak Power Saver days are only called during November through February. Notification will be provided to subscribers by 5 PM the day before by phone, pager, e-mail or text messaging. Peak Power Saver days may be called for any day of the week. Peak Power Saver events will be called for the same 7 peak hours as the TOU rate i.e., from 8 AM to 11 PM and from 4PM to 8PM. Each call will be for the full 7 peak hour period. The

maximum number of times that BC Hydro will call a Peak Power Saver day is 10 times for the period November through February.

### **3.2.2 Credit for Load Reduction during CPP Events**

BC Hydro will pay \$0.50 per kWh of reduced electricity consumption during the Peak Power Saver days. A subscriber who is unable to reduce energy consumption during a CPP event will be charged the standard TOU rate. A subscriber who reduces energy consumption will receive a credit of \$.50 per kWh of load reduced on its next bill. If a critical peak pricing event is called, the following procedure will be used to determine the credit for load reduction:

- (1) The credit will be the larger of: (i) baseline average CPP period consumption minus CPP period consumption on critical peak day, multiplied by the critical peak rate of \$.50 and (ii) zero.
- (2) If the critical peak pricing event occurs on a weekday, then the baseline average CPP period consumption is defined as the average of the consumption during the CPP period hours for the three previous weekdays, where consumption is on a weather adjusted basis; if the critical peak event occurs on a weekend day, then the baseline average CPP period consumption is defined as the average of the consumption during CPP hours for the three previous weekend days, where consumption is on a weather adjusted basis.
- (3) After weather adjustment, the baseline consumption should more closely reflect what the subscriber consumes on a critical peak day.

BC Hydro provides a bill guarantee for subscribers on RS1144A as indicated in Section 2 above.

## **APPENDIX H**

### **Critical Peak Pricing (CPP) Programs in Other Jurisdictions**

## CPP Programs in Other Jurisdictions

The following provides a summary of CPP programs offered in other jurisdictions. The information is from a US EPA BCUC study entitled [“A Survey of Time-of-Use \(TOU\) Pricing and Demand Response \(DR\) Programs”](http://www.epa.gov/solar/pdf/surveyoftou_july06.pdf) (July 2006, prepared by Energy and Environmental Economics, Inc. [http://www.epa.gov/solar/pdf/surveyoftou\\_july06.pdf](http://www.epa.gov/solar/pdf/surveyoftou_july06.pdf)).

Among the 65 utilities surveyed by the study, 6 utilities offered a total of 9 critical-peak pricing (CPP) programs for residential customers. These are listed in Table A.6 taken from the study, and show the utility and program name, description of the program features, prices and customer participation cost, and tariff web site URL.

Among the 9 CPP programs, 6 were pilots of the California investor-owned utilities, used in the Statewide Pricing Project (SPP). Altogether, 7 of the 9 CPP programs were pilots. All were voluntary and opt-in programs.

Eight programs superimposed critical peak prices on a TOU background rate, while one program (Idaho Power) used flat-rate pricing as the background rate. Six programs (all in California) combined CPP with block pricing for usage above a location-specific baseline level. One program combined CPP with demand subscription, and 4 programs combined CPP with deployment of enabling technology (smart thermostats) for customer load management.

The study also reported the following variation between programs:

- In 7 of the 9 programs, CPP days fall year-round, and in 2 programs they are restricted to a particular season.
- The maximum number of CPP days per year ranged from 10 to 22.
- The maximum number of hours per day ranged from 4 to 16, and the maximum number of hours per year ranged from 40 to 352.
- The number of background TOU periods ranged from 2 to 3, and the number of seasons from 1 to 2.
- CPP prices ranged from 20.6¢/kWh to 84.3¢/kWh, with an average of 50.5¢/kWh.
- TOU on-peak prices ranged from 5.1¢/kWh to 27.4¢/kWh, with an average of 15.8¢/kWh.
- Off-peak prices ranged from 3.0¢/kWh to 12.1¢/kWh, with an average of 6.6¢/kWh.
- The ratio of CPP to on-peak prices ranged from 2.4 to 8.5, with an average ratio of 3.7.
- The ratio of CPP to off-peak prices ranged from 4.1 to 15.5, with an average ratio of 8.8.
- Finally, customer charges for participation in TOU pricing ranged from zero to \$4.95/month.

Table A.6. CPP Tariffs Offered by US and International Utilities

Utility	Tariff Name	Description	On Peak Price ¢/kWh	Off Peak Price ¢/kWh	CPP Price ¢/kWh	Std vs Pilot?	Vol vs Man	Opt-in vs Opt-Out	Cost \$/mon	Tariff Web Site	Notes
Electricite de France	L'option tempo	Demand subscription + CPP with 2 period TOU for each of 3 categories of usage days, with day-ahead notification by utility. CPP days fall Nov 1-Mar 31. Has load management enabling technology.	6.91	5.58	58.78	S	V	In	4.77	<a href="http://particuliers.edf.fr/rubrique112.html">http://particuliers.edf.fr/rubrique112.html</a>	Must be 9 kVA or greater. Exchange rate: 1 Euro = 1.25 USD. Smart thermostat installed.
Gulf Power	RSVP / Good Cents Select	CPP with 3 period, 2 season TOU. CPP days year round, with 30 min notification by utility, with limit of 1% CPP hours in year. Has load management enabling technology.	11.0	5.2	31.9	S	V	In	4.95	<a href="http://www.southerncompany.com/gulfpower/pricing/pdf/rsvp.pdf">http://www.southerncompany.com/gulfpower/pricing/pdf/rsvp.pdf</a>	Smart thermostat installed.
Idaho Power	Energy Watch	CPP with flat-rate tariff. Day-ahead notification of CPP events by utility. CPP days fall June 15-Aug 15. Has load management enabling technology.	5.09	5.09	20.60	P	V	In	0.00	<a href="http://www.idahopower.com/aboutus/regulatoryinfo/tariffPdf.asp?id=263&amp;.pdf">http://www.idahopower.com/aboutus/regulatoryinfo/tariffPdf.asp?id=263&amp;.pdf</a>	
PG&E	E-3, Rate A	CPP with 2-period, 2-season TOU. CPP days year round, day-ahead notification, up to 15 days/yr, 12 in summer, up to 3 consecutive days. Usage above CBL in each TOU period charged at inclining block rate.	23.10	8.04	67.44	P	V	In	0.00	<a href="http://www.pge.com/tariffs/pdf/E-3.pdf">http://www.pge.com/tariffs/pdf/E-3.pdf</a>	
PG&E	E-3, Rate B	CPP with 2-period, 2-season TOU. CPP days year round, day-ahead notification, up to 15 days/yr, 12 in summer, up to 3 consecutive days. No CBL, all usage charged at CPP/TOU rate.	16.32	8.36	39.36	P	V	In	0.00	<a href="http://www.pge.com/tariffs/pdf/E-3.pdf">http://www.pge.com/tariffs/pdf/E-3.pdf</a>	
SCE	TOU-D-CPPF-1	CPP with 2-period, 2-season TOU. CPP days year round, day-ahead notification, up to 15 days/yr, 12 in summer, up to 3 consecutive days. Usage above 130% of CBL charged at inclining block rate.	27.43	8.62	84.34	P	V	In	0.00	<a href="http://www.pge.com/tariffs/pdf/E-3.pdf">http://www.pge.com/tariffs/pdf/E-3.pdf</a>	Tariff calculations based on 70% utility retained generation, 30% DWR.
SCE	TOU-D-CPPF-2	CPP with 2-period, 2-season TOU. CPP days year round, day-ahead notification, up to 15 days/yr, 12 in summer, up to 3 consecutive days.	24.07	12.13	60.34	P	V	In	0.00	<a href="http://www.pge.com/tariffs/pdf/E-3.pdf">http://www.pge.com/tariffs/pdf/E-3.pdf</a>	Tariff calculations based on 70% utility retained generation, 30% DWR.
SDG&E	EECC-CPP-V	CPP with 2-period, 2-season TOU. Variable starting hour and duration, notification 4 hours ahead. Limited to 90 hrs/yr total. Has load	13.97	2.97	45.97	P	V	In	3.81	<a href="http://www.sdge.com/tm2/pdf/EECC-CPP-V.pdf#page=1">http://www.sdge.com/tm2/pdf/EECC-CPP-V.pdf#page=1</a>	Smart thermostat installed.



Utility	Tariff Name	Description	On Peak Price ¢/kWh	Off Peak Price ¢/kWh	CPP Price ¢/kWh	Std vs Pilot?	Vol vs Man	Opt-in vs Opt-Out	Cost \$/mon	Tariff Web Site	Notes
		management enabling technology.									
SDG&E	EECC-CPP-F	CPP with 2-period, 2-season TOU. CPP days year round, day-ahead notification, up to 15 days/yr, 12 in summer, up to 3 consecutive days. Usage above CBL in each TOU period charged at inclining block rate.	13.97	2.97	45.97	P	V	In	3.81	<a href="http://www.sdge.com/tm2/pdf/EECC-CPP-F.pdf#page=1">http://www.sdge.com/tm2/pdf/EECC-CPP-F.pdf#page=1</a>	