

**ISSUE:** Price Signals  
**REFERENCE:** Evidence of Leading Edge Inc., Page 1  
**PREAMBLE:** Leading Edge characterizes its rate proposals as follows:

Leading Edge Projects Inc. (Leading Edge) favours the objectives of the rate design Option A put forward by Yukon Energy Corporation (Yukon Energy) and The Yukon Electrical Company Ltd. (YECL) (together the Companies or the Utilities). However, it is our view that with the use of some adjustment to the proposed rates the same objectives would be better achieved. The objectives that Leading Edge would like to see achieved are as follows:

1. To send a significant rate signal to electric heat users and installers that this is not an appropriate use of electricity that is diesel generated on the margin in the winter (or year-round);
2. To send a noticeable rate signal to a larger percentage of customers that results in them taking action on energy conservation and efficiency;
3. To minimize the impact on users whose consumption is modest; and
4. To minimize the impact on Residential Non-Government customers should the Yukon government choose to terminate the Interim Electrical Rebate (IER).

**QUESTION:**

- (a) Is there a difference between the objectives of Option A (as put forth in the Application) and Leading Edge's objectives? If there is a difference, please set out Leading Edge's understanding of the objectives of Option A in the same bulleted format as the objectives that Leading Edge would like to see achieved (as set out in the quote above).
- (b) What are the actions that Leading Edge recommends customers take to promote energy conservation and efficiency?
  - a. Please provide the timeframe that LE estimates will be necessary for customers to implement these measures.
  - b. Please discuss the costs to customers, or otherwise, of implementing these measures?

- c. Please discuss who will bear the costs associated with these measures? Does LE anticipate that funding or grant money will be provided to those who wish to implement these measures?
- (c) Please quantify the net amount of energy that will be conserved in the Yukon as a result of LE's rate proposals.
- (d) Would an effective DSM program be a more direct way to accomplish these objectives in customer behavior? Please explain.
- (e) Please confirm that, in these proceedings, YEC prefers Option A to Option B and YECL has proposed rate Option B only.
- (f) What are the objectives of rate Option B and how do they differ from the objectives of rate Option A? How do the objectives of rate Option B differ from the objectives of LE's preferred proposal?
- (g) What is the difference between a "significant rate signal" and a "noticeable rate signal"? Please quantify.
- (h) In describing Options A and B, the Companies have used the term "efficient price signals" (e.g. Application, page 2), "reasonable price signal" (e.g. Application, page 4) and "incremental price signal" (e.g. Application, page 1-12). Are these terms synonymous with LE's significant and noticeable rate signals? If not, please discuss the differences.
- (i) With regard to LE's perceived appropriateness of the "use of electricity that is diesel generated on the margin in the winter (or year-round)", there are many heating applications of electricity such as space heating, vehicle block heaters, hot water heaters, electric stoves, etc.
- A) Please list all such heating applications known to LE.
- B) According to LE, are all of the listed uses inappropriate uses of electricity that is diesel generated on the margin or year round?
- C) If the answer in (B) is negative, please specify which heating applications are appropriate on the margin or year round. Please explain fully.
- (j) For each heating application listed in the response to i)(A) above, please provide a list of heating alternatives available to the Yukon consumer. For each alternative, please discuss the cost to the customer of converting to this alternative, the customer's ability to employ these alternatives and the environmental consequences of employing these alternatives.
- (k) CW-YEC/YECL-1-7(d) and CW-YEC/YECL-1-24(a) state that secondary sales are priced as a substitute for heating oil. Does Leading Edge consider the use of secondary or surplus electricity to be an inappropriate use of electricity? Please explain fully.

- (l) Leading Edge's evidence implies that heating is an inappropriate use of electricity at any time of the year (even when diesel generation is not on the margin). Please explain why heating using renewable energy sources is inappropriate.
- (m) Are there further examples of an inappropriate use of electricity not involving heating when diesel is generated on the margin in the winter (or year round), such as computers used for social networking, air conditioning, etc.? Please explain fully. Please discuss how Leading Edge would curtail the use of electricity for these other inappropriate purposes.
- (n) Please discuss what detriment customers will experience if the status quo is maintained with respect to the current rate structure until the relevant OICs expire (in 2012).

**ANSWER:**

- (a) Leading Edge's objectives are essentially the same as the stated objectives of Option A but Leading Edge feels that with some adjustment to the proposed rate design the objectives can be better achieved and in its evidence (quoted in the preamble) Leading Edge explains its refinements to the objectives of Option A. The one objective stated by Leading Edge which is not explicitly stated by YEC is to minimize the impact to Residential Non-Government customers of the termination of the IER. See also response to YUB-LE-1-2.
- (b) The Utilities have been ordered by the YUB to work jointly (and with interested parties and intervenors) to bring forward a DSM policy paper with their next GRA (Board Order 2009-2 Appendix a pages 43-44, and Board Order 2009-8 Decision document page 9, paragraph 40). Leading Edge would be pleased to participate with YEC and YECL and all other interested parties to develop such a DSM policy paper / DSM plan. Anyone wishing to conserve energy can consult with the Yukon Government's Energy Solutions Centre or can consult the websites of utilities, for example BC Hydro.
- (c) Leading Edge has no means to quantify the energy that would be conserved as a result of its particular suggested approach to rate design relative to Option A or Option B. However as outlined in response to YUB-LE-1-3(a) if the differential in UPC between Yellowknife residential consumers and YECL residential consumers can be reduced from the present of about 1,800 kWh per year to 500 kWh per year where it was from about 1994 to 2004, the potential savings could be 18 GWh per year.
- (d) In Leading Edge's view a DSM program in the absence of rate incentives would not be nearly as effective as a DSM program in conjunction with a rate design that encourages conservation. Leading Edge has advocated for a DSM program in both the YECL's and YEC's most recent GRAs.
- (e) Confirmed.

- (f) The stated objectives of Option B and Option A are the same, however very different conclusions are reached by YECL and YEC. Leading Edge does not disagree with the stated objectives; however, Leading Edge does feel that it is appropriate to take the possible termination of the Yukon Government's IER into account in rate design. It appears that this objective is not shared by YECL, but implicitly (not explicitly) by YEC. See response to YUB-LE-1-2 for a more detailed discussion.
- (g) Please see response to YECL-LE-1-3(a).
- (h) Leading Edge's use of the expressions used in its evidence are described in response to YECL-LE-1-3(a). Since Leading Edge did not write the Utilities' Application it cannot know for sure what was in the minds of the Applicants with respect to the meaning of the expressions they used, and Leading Edge can only provide an opinion based on their context in the referenced pages of the Application.

Leading Edge's opinion of the Utilities' use of the expression "efficient price signal" on page 2 of the Application is that it means the Board approved incremental cost of diesel.

Leading Edge's opinion of the Utilities' use of the expression "reasonable price signal" as used on pages 2 and 4 of the Application is that it means a rate or rates for certain consumption blocks of various customer classes that the Utilities' consider reasonable in the present circumstances that make their customers aware that incremental costs are increasing but are not necessarily equal to the Board approved incremental costs of diesel generation. In this context the expression "reasonable price signal" used by the Utilities appears similar in meaning the Leading Edge's use of the expression "significant rate signal".

Leading Edge's opinion of the Utilities' use of the expression "incremental price signals" on page 1-12 of their Application refers to rates that increase with increasing consumption blocks.

None of the three terms that the Utilities have used that are referenced in this question appear to the same as Leading Edge's use of the expression "noticeable rate signal".

- (i) Leading Edge was referring to electric *space* heat only. We accept that we were not adequately clear in our evidence. Note that this refers to primary electric space heating systems and does not include secondary sales for space heating purposes which is addressed separately in (k) below. Other applications that use electricity and involve heating, such as the examples listed in the question may perhaps be addressed in DSM programming, but are not encompassed by Leading Edge in its use of the term electric heat.
- (j) The space heating alternatives that Leading Edge is aware of for continuous automatic systems include oil, propane, and ground source earth energy. Automatic continuous systems consisting of combinations of air source heat pumps together with oil or propane,

are also possible, as are combinations of oil and wood. Wood pellet systems are automatic and continuous for short periods of time but do need to be refilled regularly (daily or near daily). Traditional cut firewood is a non-automatic and non-continuous heat supply that requires frequent attention (several times daily).

Leading Edge is not in a position to offer opinions on the specific costs for converting to these alternatives as this would be very dependent on the home (or other building); in particular the existing heating system (hydronic, forced air, baseboard), and whether or not there is a chimney in place. The type of building or home (e.g. a small condominium in a large building vs. a single detached home) could also have significant impact on costs. Leading Edge could only guess that retrofit costs would likely be in the range of \$5,000 to \$20,000 or more for a home depending on the circumstances. The Energy Solutions Centre or Yukon Housing Corporation would likely have better information available.

These relatively high costs really underline the importance of sending the appropriate rate signals now before we have high electrical energy costs on the margin (be it diesel or other expensive sources). This way the appropriate heating choice will be made now when the buildings are being built, and therefore these high retrofit costs will not need to be incurred in future nor will the consumers then be paying very high power bills due to their electric space heating.

The environmental consequences of various heating fuels and choices are also extremely variable depending on the choice of space heating fuel and circumstances. Wood heating is considered to be Green House Gas (GHG) neutral thus it has no negative long term CO<sub>2</sub> related impacts but there may be some local air quality issues during weather inversions. The City of Whitehorse has up-to-date requirements for new wood stove installations.

With respect to electricity, oil, and propane which are more suited to automatic heating systems it is necessary to understand the nature of the annual heating cycles (as well as emissions) in order to gauge their environmental consequences. Please refer to the attached table "Whitehorse typical home fuel requirements" for the subsequent discussion.

With respect to electricity on the margin the WAF system is assumed to have diesel power generated at Faro (Application page 3 and elsewhere) at an efficiency of 3.55 kWh per litre. Assuming that Yukon Energy's losses from the generator terminals to the distribution system in Whitehorse are offset by reductions in transmission losses, we then need to subtract the YECL Board approved distribution system losses of 6.2%, this leaves 3.33 kWh per litre at the household level for space heating. One litre of oil heating at a seasonal efficiency of 80% yields 8.20 kWh of equivalent heat  $[(35,000 \times 0.80)/3,413]$ , 2.46 times more heat. So electric heating with diesel generated power requires 2.46 times more fuel and will generate 2.46 times more GHG emissions than oil heating. Thus if 40.7% of the annual electric heating requirement is met by diesel generation the emissions are equal to year-round oil heating. Based on the average heating requirements if diesel generation is on

the margin for only 3 of the winter months of November through March, the electric heating related emissions will have been the same a full year of oil heating.

Leading edge does not have the detailed information necessary to make a similar comparison based on propane heating but would expect that since the emissions from natural gas are about one-third less than that for oil, propane would fall somewhere in between oil and natural gas, thus less than three winter months of diesel on the margin would equal a year of direct propane heating GHG emissions (for natural gas it would be about two months).

- (k) Leading Edge considers it appropriate for the utilities to market all available surplus hydro power. Leading Edge does not consider any net drawdown of hydro reservoirs to be surplus hydro power. Leading Edge considers the use of this surplus hydro power for space heating to be one legitimate use of this surplus hydro power and would favour SCADA controlled secondary loads so that even small amounts of surplus could be sold.
- (l) Leading Edge does not consider primary electric space heating to be an appropriate use of electricity. Some of the reasons for those views are described in response to (j) above. Another reason why Leading Edge considers this to be inappropriate is that it will drive up winter capacity requirements with low load factor electrical loads. Referring again to the attached table the average annual demand for an electrically heated home would be 20,510 kWh / 8760 hours per year = 2.34 kW. The heat requirement for 1 degree day is 70,000,000 / 6,812 degree days = 10,276 BTU per degree day. The design temperature for Whitehorse is -41°C thus the average electrical demand on a -41°C day would be  $\{[(18+ 41) \times 10,276] / 3,413 \text{ BTU per kWh}\} / 24 \text{ hours} = 7.40 \text{ kW per home}$ . The average annual load factor for electric space heating is thus  $2.34/7.40 = 31.6\%$ . So electric space heat adds significant winter energy and demand to the electrical systems which in turn is driving up costs for new energy supplies (without taxpayer subsidies the Mayo B project plus the transmission link to the WAF system would have cost ratepayers in the order of \$0.30 per kWh) and diesel on the margin which is just as expensive. It will also drive up costs for new capacity requirements under the N-1 planning criteria, be it diesel or other capacity.

Leading Edge does not consider it inappropriate to use renewable energy sources for space heating on a year-round basis per se. However, the particular situation of using renewable energy for space heating the warmer seasons of the year, and defaulting to diesel generation to satisfy that electric heating requirement for the coldest (winter) part of the year is not appropriate in Leading Edge's view.

- (m) See response to (i) above. Leading Edge was referring to electric space heating only (and not including secondary sales). Leading Edge considers space heat to be of sufficient magnitude and sufficiently different in character from all other uses that it needs to be dealt with on its own. All other uses, whether year-round or not, may be the subject of DSM

programming. And to be clear DSM programming may include encouraging certain electrical uses during the warmer lower load seasons (air conditioning for an example).

- (n) If the status quo is maintained (or Option B is implemented) until the relevant O-I-C expires as opposed to the implementation of Leading Edge's preferred option or Option A there will be a few short term and longer term effects. The following discussion refers to Residential Non-Government customers.

Leading Edge believes that the rate of installation of electric heat in homes will continue to increase rather than decrease. This will drive up winter energy and demand requirements, thus costs for new energy and new capacity supplies, faster than would otherwise be the case. This will drive up costs to all customers in the long run. Those customers that have chosen electric heat because they thought it was more economical based on status quo rates may incur high heating system retrofit costs in the longer term when rates do go up to reflect incremental costs.

In the short term status quo situation, those customers (within the Residential Non-Government rate class) who use electric heat are effectively being subsidized by those who do not use electric heat. So in the short term, with the status quo, customers who do not have electric heat would effectively be paying more than necessary (in order to subsidize those with electric heat). Under Leading Edge's option or Option A this would not be the case.

Whitehorse typical home fuel requirements

CW-LE-1-1

Whitehorse heating information								
Month	heating °days	% of annual		BTUs	kWh	litres oil	litres propane	
jan	1105	16.22%		11,354,962	3,327	406	505	
feb	895	13.14%		9,197,005	2,695	328	409	
mar	762	11.19%		7,830,299	2,294	280	348	
apr	513	7.53%		5,271,580	1,545	188	234	
may	345	5.06%		3,545,214	1,039	127	158	
jun	186	2.73%		1,911,333	560	68	85	
jul	124	1.82%		1,274,222	373	46	57	
aug	175	2.57%		1,798,297	527	64	80	
sep	326	4.79%		3,349,971	982	120	149	
oct	540	7.93%		5,549,031	1,626	198	247	
nov	822	12.07%		8,446,858	2,475	302	375	
dec	1019	14.96%		10,471,227	3,068	374	465	
Total	6812	100.00%		70,000,000	20,510	2,500	3,111	
Annual heating requirement based on 2500 litres per year of oil at 35,000 BTU per litre and 80% seasonal efficiency								70,000,000
Propane is assumed to have a 25,000 BTU per litre and a seasonal efficiency of 90%								
Electricity has 3,413 BTU per kWh and is assumed to be 100% efficient in its delivery								

**ISSUE:** LE Proposed Rates  
**REFERENCE:** Evidence of Leading Edge Inc., page 2  
**PREAMBLE:** Leading Edge provides the following bill analysis:

**Table 1 Comparison of Option A and Leading Edge’s Preferred Proposal on the bills of Residential Non-Government customers**

Description of Option	Monthly bill increases (+) or decreases (-)			
	Monthly use 750kWh	Monthly use 1250kWh	Monthly use 2000kWh	Monthly use 3000kWh
Option A with IER	-11.19%	-4.74%	+20.38%	+39.98%
Leading Edge with IER	-10.16%	-2.48%	+17.38%	+31.32%
Option A no IER	+12.98%	+14.77%	+31.95%	+47.49%
Leading Edge no IER	+14.01%	+14.78%	+28.97%	+38.83%

**QUESTION:**

- (a) Please provide the detailed calculations for Table 1.
- (b) To what specific rate does this analysis apply (i.e. Rate 1160, 1260, 1360 or 1460) or is it composed of a weighted average of all Non-Government rates?
- (c) Please provide the same information in Table 1 for each Residential rate (i.e. Rate 1160, 1260, 1360 and 1460).
- (d) Will LE’s proposed bill reductions, as compared to those current rates for customers within the first rate block (assuming that the IER continues), incent those customers to consume more energy? Please quantify the increased energy that will be consumed by all customers in this rate block receiving a rate reduction.

**ANSWER:**

- (a) Please see attachments to this response.
- (b) This analysis applies to Rates 1160, 1260, and 1360.

- (c) See (b) above. Leading Edge did not complete this analysis for Rate 1460, however since this Rate is the same as the above three Rates for consumption up to 1500 kWh per billing period the first two columns for 750 and 1,250 kWh per month would also apply to Rate 1460. Leading Edge considers it unlikely that there would be many (if any) residential non-government consumers with consumption levels of over 1,500 kWh per billing period in Old Crow
  
- (d) Please see response to YECL-LE-1-3(b). Price elasticity has not been quantified by any party to this Application thus far, including Leading Edge, furthermore information about the continuation of the IER in its present or altered form would need to be available. Should the IER be discontinued customers within the first block would experience an increase (for example 14.01% at 750 kWh per billing period) and they would be encouraged to conserve.

Yukon Residential Non-Government bill calculation, with IER				
Consumption level	750	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	750	kWh	\$0.11014301	\$82.6073
Block 2 energy	0	kWh	\$0.16000000	\$0.0000
Block 3 energy	0	kWh	\$0.20000000	\$0.0000
Base billing				\$97.2573
Yukon rebate of tax	\$97.2573		-0.50%	-\$0.4863
Yukon IER	750	kWh	-\$0.026600	-\$19.9500
Fuel adjustment rider	750	kWh	-\$0.003540	-\$2.6550
Sub total				\$74.1660
GST			5%	\$3.7083
<b>Total</b>				<b>\$77.8743</b>
Existing (Application)	\$86.68			
Increase over existing	-10.16%			

Yukon Residential Non-Government bill calculation, with IER				
Consumption level	1250	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	250	kWh	\$0.16000000	\$40.0000
Block 3 energy	0	kWh	\$0.20000000	\$0.0000
Base billing				\$164.7930
Yukon rebate of tax	\$164.7930		-0.50%	-\$0.8240
Yukon IER	1000	kWh	-\$0.026600	-\$26.6000
Fuel adjustment rider	1250	kWh	-\$0.003540	-\$4.4250
Sub total				\$132.9440
GST			5%	\$6.6472
<b>Total</b>				<b>\$139.5912</b>
Existing (application)	\$143.14			
Increase over existing	-2.48%			

Yukon Residential Non-Government bill calculation, with IER				
Consumption level	2000	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	500	kWh	\$0.16000000	\$80.0000
Block 3 energy	500	kWh	\$0.20000000	\$100.0000
Base billing				\$304.7930
Yukon rebate of tax	\$304.7930		-0.50%	-\$1.5240
Yukon IER	1000	kWh	-\$0.026600	-\$26.6000
Fuel adjustment rider	2000	kWh	-\$0.003540	-\$7.0800
Sub total				\$269.5890
GST			5%	\$13.4795
<b>Total</b>				<b>\$283.0685</b>
Existing (Application)	\$241.15			
Increase over existing	17.38%			

Yukon Residential Non-Government bill calculation, with IER				
Consumption level	3000	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	500	kWh	\$0.16000000	\$80.0000
Block 3 energy	1500	kWh	\$0.20000000	\$300.0000
Base billing				\$504.7930
Yukon rebate of tax	\$504.7930		-0.50%	-\$2.5240
Yukon IER	1000	kWh	-\$0.026600	-\$26.6000
Fuel adjustment rider	3000	kWh	-\$0.003540	-\$10.6200
Sub total				\$465.0490
GST			5%	\$23.2525
<b>Total</b>				<b>\$488.3015</b>
Existing (Application)	\$371.83			
Increase over existing	31.32%			

Yukon Residential Non-Government bill calculation, NO IER				
Consumption level	750	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	750	kWh	\$0.11014301	\$82.6073
Block 2 energy	0	kWh	\$0.16000000	\$0.0000
Block 3 energy	0	kWh	\$0.20000000	\$0.0000
Base billing				\$97.2573
Yukon rebate of tax	\$97.2573		-0.50%	-\$0.4863
Yukon IER	0	kWh	\$0.000000	\$0.0000
Fuel adjustment rider	750	kWh	-\$0.003540	-\$2.6550
Sub total				\$94.1160
GST			5%	\$4.7058
<b>Total</b>				<b>\$98.8218</b>
Existing (Application)	\$86.68			
Increase over existing	14.01%			

Yukon Residential Non-Government bill calculation, NO IER				
Consumption level	1250	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	250	kWh	\$0.16000000	\$40.0000
Block 3 energy	0	kWh	\$0.20000000	\$0.0000
Base billing				\$164.7930
Yukon rebate of tax	\$164.7930		-0.50%	-\$0.8240
Yukon IER	0	kWh	\$0.000000	\$0.0000
Fuel adjustment rider	1250	kWh	-\$0.003540	-\$4.4250
Sub total				\$159.5440
GST			5%	\$7.9772
<b>Total</b>				<b>\$167.5212</b>
Existing (Application)	\$143.14			
Increase over existing	14.78%			

Yukon Residential Non-Government bill calculation, NO IER				
Consumption level	2000	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	500	kWh	\$0.16000000	\$80.0000
Block 3 energy	500	kWh	\$0.20000000	\$100.0000
Base billing				\$304.7930
Yukon rebate of tax	\$304.7930		-0.50%	-\$1.5240
Yukon IER	0	kWh	\$0.000000	\$0.0000
Fuel adjustment rider	2000	kWh	-\$0.003540	-\$7.0800
Sub total				\$296.1890
GST			5%	\$14.8095
<b>Total</b>				<b>\$310.9985</b>
Existing (Application)	\$241.15			
Increase over existing	28.97%			

Yukon Residential Non-Government bill calculation, NO IER				
Consumption level	3000	kWh		
Description	Consumption	Units	Rate	Total
Customer Charge	1		\$14.65	\$14.6500
Block 1 energy	1000	kWh	\$0.11014301	\$110.1430
Block 2 energy	500	kWh	\$0.16000000	\$80.0000
Block 3 energy	1500	kWh	\$0.20000000	\$300.0000
Base billing				\$504.7930
Yukon rebate of tax	\$504.7930		-0.50%	-\$2.5240
Yukon IER	0	kWh	\$0.000000	\$0.0000
Fuel adjustment rider	3000	kWh	-\$0.003540	-\$10.6200
Sub total				\$491.6490
GST			5%	\$24.5825
<b>Total</b>				<b>\$516.2315</b>
Existing (Application)	\$371.83			
Increase over existing	38.83%			

**ISSUE:** General Service and Industrial Rates

**REFERENCE:** Evidence of Leading Edge Inc., page 1 and attachment, page 2

**PREAMBLE:** Leading Edge states:

Table 1 below presents a comparison of the impact on residential non-government bills of the Utilities' Option A rate proposal and Leading Edge's preferred proposal (page 2 of the attachment). We believe that a similar approach across all rate classes is appropriate.

**QUESTION:**

- (a) Please confirm that Leading Edge's proposals, as set out on page 2 of the attachment, pertain only to rate design for the Residential rate class.
- (b) Does Leading Edge believe that the objectives of Option A, as set out above, should apply to General Service and Industrial customers as a matter of equity and fairness or are there other reasons that Leading Edge's approach should be applied across all rate classes? Please explain fully.
- (c) Do General Service and Industrial customers have other heating applications for electricity? If so, please list them. Does LE consider all of these to be inappropriate uses of electricity on the margin or year round?
- (d) For each heating application, please provide a list of heating alternatives available to the Yukon General Service and Industrial consumer. For each alternative, please discuss the cost to the customer of converting to this alternative, the customers' ability to employ these alternatives and the environmental consequences of employing the alternative.
- (e) Would a "significant rate signal", similar to Leading Edge's proposal for residential customers, lead to changes in consumption patterns for General Service and Industrial customers? If yes, please quantify the expected change in consumption.
- (f) What changes would Leading Edge propose to General Service and Industrial Rates to apply the same approach to these rate classes.
- (g) What ability do General Service and Industrial customers have to respond to the price signals as proposed by Leading Edge?
- (h) Would an effective DSM program be applicable to General Service and Industrial customers as well as residential customers?

**ANSWER:**

- (a) Leading Edge's example proposal as set out on page 2 of the attachment pertain only to the Residential Non-Government rate class (Rate schedules 1160, 1260, 1360, and 1460).

- (b) Leading Edge suggests that the approach it proposed on page 1 of its evidence and on page 2 of the attachment to its evidence for the Residential Non-Government class should be applied to General Service class. Leading Edge had not considered the Industrial rate class as it believes that those rates are fixed by O-I-C 2007/94, nor the wholesale rates.
- (c) Please see response to CW-LE-1-1(i),(l), and (m). Leading Edge's view is that primary electric space heating is not appropriate for the reasons expressed. Space heating is an appropriate use for secondary sales. Leading Edge is not aware of all of the possible applications of heat using electricity in the General Service or Industrial rate classes. Any uses which are winter peaking and have a low load factor and for which there may be reasonable alternatives could be encouraged to switch through DSM programming. Similarly the use of those applications of electricity which may be summer peaking (when hydro supplies tend to be more abundant) could be encouraged through DSM programming.
- (d) Since Leading Edge is not aware of all of the possible applications of heat using electricity in the General Service or Industrial rate classes it is not possible answer this question. For a discussion on the environmental issues related to space heating please see response to CW-LW-1-1(j).
- (e) Leading Edge did not consider Industrial customers for the reason outlined in (b) above. Leading Edge would expect that significant rate signals, such as the example proposed for the Residential Non-Government rate class, would result in changes to consumption patterns in the General Service class. Leading Edge does not have the information necessary to quantify the expected changes in consumption, however, this does not mean that there is no price elasticity in this customer class, Leading Edge does believe that there is price elasticity in this class, particularly in the longer term.
- (f) Leading Edge has no proposals pertaining to Industrial rates. Speaking in general terms Leading Edge would propose a reduction of Option A General Service Block 3 rated from \$0.2239 to not more than \$0.2000 and an upward adjustment of blocks 2 and 4 to send stronger signals to the incremental consumption of a greater number of users. Leading Edge agrees with the Utilities that the General Service class needs attention and that it is likely appropriate to split this class into two or more groups according to size so that appropriate and effective rates will apply to all customers regardless of size.
- (g) Leading Edge has no comments on the Industrial class. Leading Edge cannot possibly know all of the possible uses of electricity in the General Service class, therefore cannot possibly know what all their opportunities to respond may be, but opportunities certainly do exist. DSM programs by utilities, such as BC Hydro, focused on General Service customer classes would provide a large range of examples. Customer specific energy audits may also be required to identify all the opportunities.

- (h) leading Edge is of the opinion that effective DSM programming for General Service customers can be developed, see also (g) above.

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**REFERENCE:** Evidence of Leading Edge Inc., page 1

**PREAMBLE:** Leading Edge States:

We believe that a similar approach across all rate classes is appropriate.

**QUESTION:**

- (a) LE states that it believes that “a similar approach across all rate classes is appropriate.” Please provide details of this approach.
- (b) Please explain how OIC 2008/149 would factor into this approach.

**ANSWER:**

- (a) Relative to Option A Leading Edge’s approach would involve reducing the highest rate blocks to no more than \$0.2000 per kWh (except in Old Crow) and increasing other rate blocks within each class so that more customers get a stronger rate signal with increasing consumption. It may be necessary in some cases to lower the Block 1 rates to achieve this objective. Leading Edge concedes that the government classes are particularly difficult to deal with as they pay so much more than their true cost of service. In summary Leading Edge’s option explores some of the middle ground between Option A and Option B but is much closer to Option A.
- (b) Leading Edge’s approach was intended to apply within the confines of O-I-C 2008/149 and the other O-I-Cs that apply. That is Yukon’s present rate making reality.