

BC Hydro Rate Design Workshop

SUMMARY

29 JUNE 2015

1.30 PM TO 3 PM

BC Hydro Offices
333 Dunsmuir Street, 16th Floor

| | |
|--------------------|---|
| TYPE OF MEETING | Meeting with Canadian Office and Professional Employees Union Local 378 (COPE 378) – Residential Rate Design |
| COPE 378 ATTENDEES | Iain Reeve, Jim Quail, Leigha Worth, Dr. Marvin Shaffer |
| BC HYDRO ATTENDEES | Anthea Jubb, Tom Loski, Justin Miedema, Paulus Mau, Craig Godsoe, Dr. Ren Orans |
| AGENDA | <ol style="list-style-type: none"> 1. June 2014 RIB Evaluation Report 2. COPE 378 Residential flat energy rate/credit concept 3. Residential rate class segmentation |

| MEETING MINUTES | | |
|--|---|--|
| ABBREVIATIONS | BCH BC Hydro BCOAPO.....British Columbia Old Age Pensioners' Organization BCUC.....BC Utilities Commission CARC.....Class Average Rate Change HLH.....High Load Hour LRMC.....Long-Run Marginal Cost | LGS.....Large General Service LLH.....Light Load Hour New Westminster City of New Westminster RDA.....Rate Design Application RIB.....Residential Inclining Block Rate |
| 1. <i>RIB Evaluation Report</i> | | |
| <p>COPE 378's major concern with the June 2014 RIB Evaluation Report¹ is the lack of a baseline for an alternative flat rate, such as one could have with a control group; nor is the June 2014 RIB Evaluation Report based on the methodology used by Ito.²</p> <p>COPE 378 sees the RIB Evaluation Report as providing stronger evidence on Step 2 large user elasticity as compared to Step 1 elasticity. However, COPE 378 is not convinced the RIB rate is delivering as much rate structure conservation as BCH says it is given that for Tier 1 to date, BCH can't see a change in consumption given the lack of price variation in Step 1 historical data.</p> | | |
| FEEDBACK | | RESPONSE |
| 1. | <p>BCH</p> <p>BCH examined whether New Westminster, with a flat residential rate, could be an effective control group. However, New Westminster's climate and residential dwelling mix are different than those of many other regions in BCH's service area (e.g., about 60 per cent of BC Hydro's residential accounts are single family dwellings versus 25 per cent in New Westminster). Also there are limitations in the New Westminster electricity billing data (e.g., limited tracking of housing type, no tracking of primary heating fuel type). BCH was unable to obtain a reliable estimate of price elasticity of demand for New Westminster's flat rate.</p> <p>BCH reported out on these findings to the BCUC; a copy of BCH's October 2014 letter in this regard is found as Attachment 1 to these notes.</p> | <p>COPE 378 would be interested in reviewing the New Westminster control group report out to the BCUC. Perhaps New Westminster could be compared to Burnaby or Coquitlam.</p> |

¹ The period used for data analysis for the June 2014 RIB Evaluation Report is from May 2004 to March 2012. A copy of the RIB Evaluation Report is found at the BCH RDA website: <http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/revenue-requirements/10-RIB-Evaluation-report.pdf>.

² K. Ito, "Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing", *American Economic Review*, 2014 (104(2)): 537-563; http://people.bu.edu/ito/Ito_Marginal_Average_AER.pdf.

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| 2. | <p>COPE 378</p> <p>Has BCH used FortisBC's control group information?</p> | <p>BCH is aware that FortisBC electric maintained a control group for its Residential Conservation Rate (an inclining block rate) made up of ~ 350 accounts. BCH has not requested this data, as it appears that the New Westminster data offers a better chance of success for modeling the response of BCH residential customers to a flat rate. Relative to the FortisBC control group, New Westminster offers far more accounts (roughly 30,000) and is geographically located within BCH's major load centre in terms of residential customers.</p> <p>Note that in its November 2014 Residential Conservation Rate Report,³ FortisBC did not use this control group as its primary impact evaluation method to estimate conservation. Like BCH, FortisBC used elasticity of demand. It is unclear from the FortisBC November 2014 Residential Conservation Rate Report why the control group was not used to estimate energy conservation.</p> |
| <p>2. COPE 378 Flat Energy Rate/Credit Concept</p> | | |
| <p>COPE 378 has concerns with the RIB rate on efficiency grounds: certain dwelling types such as apartments generally do not see the RIB Tier 2 rate. COPE 378 also has concerns with the RIB rate on equity grounds: BC Hydro is effectively distributing the low cost Heritage Resource energy disproportionately to apartment dwellers, and there are low income customers who cannot make changes to avoid RIB Tier 2.</p> <p>COPE 378 sees a flat energy rate as delivering an energy LRM price signal to all Residential customers. COPE 378 also envisions a customer credit system based on income and/or efficiency measures taken to re-distribute the over collection of revenue that would occur if all customers were charged a flat LRM-based energy rate.</p> <p>COPE 378 is also interested in a lifeline rate which could work with either a flat energy rate or the RIB rate.</p> | | |
| <p>FEEDBACK</p> | | <p>RESPONSE</p> |
| 1. | <p>BCH</p> <p>The flat rate modelled at Workshop 3 is revenue neutral and the energy charge of 9.63 cents/kWh (F2016) is within the energy LRM range for that year [lower end - 9.63 cents/kWh; upper end – 11.01 cents/kWh, F2016].</p> <p>This flat energy rate is revenue neutral and thus there is no over collection of revenue to re-distribute through a credit system.</p> <p>BCH calculated the over-collection of revenue for F2017; refer to Attachment 2 to these notes.</p> | <p>COPE 378</p> <p>The flat energy rate could be set to the upper end of the energy LRM range so that there would be over-collection of revenue.</p> <p>COPE 378's position is that this over-collection could be used to fund a credit system or a low income rate.</p> |
| 2. | <p>BCH</p> <p>BCH sees the credit system as similar and just as complicated to understand and implement as a residential customer-baseline rate which is not viable for 1.9 million residential customers.</p> | <p>COPE 378 does not agree that a credit system is like an individual customer baseline structure. COPE 378 envisions the credit system as structured more simply like targeting income or dwelling type or, when data is available, efficient energy consumption or behavior by dwelling type and/or region.</p> |

³ Copy available at http://www.bcuc.com/Documents/Proceedings/2015/DOC_43084_L-4-15_FBC-RCR-Evaluation.pdf.

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| <p>3. BCH</p> <p>COPE 378 has put forward two different ways to re-distribute revenue through a customer credit, one of which is income and the other is efficiency measures.</p> <p>BCH anticipates potential cash flow problems for low income customers who pay the upper end of LRMC energy rate and then wait for a credit back.</p> <p>The Workshop 11b slide deck at slide 61 sets out a number of building blocks to be established before developing a credit potentially linked to efficiency ratings or measures. The timeline is very long, perhaps between 10 to 15 years to effectively implement.⁴ Refer also to section 6.3.2 of BCH's consideration memo for Workshop 8A/8B.⁵</p> | <p>COPE 378 will review the Workshop 11b slide deck and consideration memo reference.</p> |
| <p>4. COPE 378</p> <p>Another potential flat energy rate mechanism could be time varying adjustments such as HLH/LLH and/or seasonal.</p> <p>Has BCH undertaking a jurisdictional assessment of Residential time varying rates?</p> <p>COPE 378 recognizes the political bar in place to prevent BCH from engaging in the development of a TOU rate at this time. However, the seasonal rate does present an opportunity to redistribute some of the overcollection that could occur from a flat rate. Also, given the movement in California towards a less complicated tiered rate structure paired with a TOU rate it would, in COPE's view, be a valuable exercise to keep stakeholders informed so they might evaluate the potential value in such a system.⁶</p> | <p>BCH</p> <p>In BCH's view, introducing time varying elements such as HLH/LLH into a default Residential flat energy rate results in a default TOU rate which the B.C. Government has ruled out as an option for BC Hydro to pursue.</p> <p>Yes. Refer to Workshop 8A slide deck at slides 27 to 31.⁷ Only Ontario in Canada has default TOU rates; of surveyed Canadian electric utilities, only Nova Scotia Power has a residential voluntary TOU rate, with little take-up. Virtually all Workshop 3 participants, including COPE 378, agreed BCH should not pursue a voluntary TOU rate for residential customers.</p> <p>BCH did model two seasonal rates at Workshop 3:</p> <p>(1) a higher Tier 1/Tier 2 threshold to potentially moderate bill impacts on electric space heating customers; and</p> <p>(2) a higher rate during the four winter peak months of November, December, January and February in exchange for lower rate during the non-winter months. BCH sees any higher seasonal rate as another form of TOU rates which the B.C. Government has said BCH cannot pursue; only one Canadian jurisdiction has such a rate – Newfoundland Power – which very low take-up.</p> <p>Does COPE 378 have any views on (2)?</p> |

⁴ <http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-matters/2015-06-26-wksp-pres.pdf>.

⁵ <http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-matters/2015-06-19-bch-rda-wksp-8a-8b-qsr.pdf>.

⁶ COPE 378 is referencing the California Public Utilities Commission decision concerning residential rate reform for Pacific Gas and Electric Company, Southern California Edison Company and San Diego Gas & Electric Company (**2015 CPUC Residential Rate Reform Decision**) which among other things orders a simplification of the existing multi-tiered residential inclining block rates to

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| 5. | <p>COPE 378</p> <p>A flat rate priced at the high end of LRMC with a lifeline rate component and a simple mechanism to re-distribute the over collection of revenue is something COPE 378 would like to see further explored.</p> <p>Overall COPE 378's goal is the most efficient residential rate with a lifeline component with a little conservation distorting effects as possible. COPE 378 will advocate for a gluttonous user rate, similar to the very high useage surcharge that California currently seems to be moving towards.⁸</p> | |
| 6. | <p>BCH</p> <p>BCH has concerns with a flat energy rate with no customer credit system – the average price for large users would go down, and the average price for small users would go up, as compared to the RIB rate.</p> <p>COPE 378's suggestion is RIB rate pricing option 2 explored at Workshop 9b. BCH is concerned with the distribution of the bill impacts under option 2. Smaller accounts experience a greater bill impact than CARC due to the proportionately greater increase in the Step 1 rate. While low income customers have a bill impact distribution that is similar to the distribution of the total RIB class, a greater portion of accounts in the low income sub-segment would have more adverse bill impacts (i.e., above CARC) under option 2 than for the class as a whole. This is because low income customers, on average, have a slightly greater portion of their usage in Step 1 than the RIB class, and option 2 has the price increase allocated to Step 1.</p> | <p>COPE 378 acknowledges the initial transition may have a conservation impact but believes over time the flat rate may deliver more conservation than the RIB rate.</p> <p>COPE 378 suggested that the impacts be mitigated by applying the general rate increases to RIB Step 1 and holding Step 2 steady at the LRMC until the two meet.</p> |
| 7. | <p>BCH</p> <p>The RIB Evaluation Report found that large consumers have higher elasticities than smaller consumers; this finding is consistent with other studies – there is a lot of evidence in the RIB Evaluation Report that higher users respond more than lower users.⁹</p> <p>BCH does not have an elasticity assumption for the Workshop 3 flat rate at 9.63 cents/kWh (F2016) and is open to COPE 378 suggestions.</p> | |

two tiered inclining block rates and timelines for development of TOU default rate pilots; <http://www.utilitydive.com/news/california-regulators-mandate-major-residential-electric-rate-reform/401793/>.

⁷ <http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-matters/2015-06-19-bch-rda-wksp-8a-8b-qsr.pdf>.

⁸ The 2015 CPUC Residential Rate Reform Decision order implementation of a 'super-user electric surcharge' that would charge residential customers of the three named investor-owned electric utilities if they use more than 400 per cent of the average California resident's monthly electricity consumption. Additional revenues are to be applied to reduce Tier 1 and Tier 2 rates of the three California investor owned electric utilities' residential customers.

⁹ Refer to the RIB Evaluation Report findings of: (1) large residential users consuming more than 2,400 kWh bi-monthly show a substantially higher than average response to higher prices. Table 3.9 indicates that the customer segment above 2,000 kWh has an estimated price elasticity of -0.16 to -0.18 and the price elasticity of the customer segment between 1,350 kWh and 2,400 kWh ranges from -0.07 to -0.13. These results are consistent with the RIB design assumptions that customers with a higher level of consumption tend to have a higher responsiveness to price (pages vi, 20); (2) higher consumption is correlated with both higher awareness of the RIB rate and higher price elasticity; however, no firm conclusions can be drawn about how RIB awareness is related to customer price response (pages vii, 28); and (3) page B-8 citing Reiss (2005) finding a highly skewed distribution of price elasticity within the California residential customer class, with a small fraction of households accounting for most aggregate demand response.

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3. Residential Segmentation

COPE 378 reiterated that it was only exploring this topic.

Justin Miedema walked through the presentation found at **Attachment 3** to these notes.

| FEEDBACK | | RESPONSE |
|----------|--|---|
| 1. | COPE 378 Is the change over time toward more electric space heating driven by housing stock choice? | Yes; and in particular, the move away from single family dwellings towards multiples, particularly in the Lower Mainland. Multiples tend to be heated electrically. There are long-term space heating trends assumed in BCH's load forecast; but at a very slow rate of change due to the large stock of existing housing, and the slow turnover of heating systems in residences (the cost and logistical changes involved in going from electricity to gas in particular). |
| 2. | COPE 378 The slides illustrate the problems with segmenting the Residential rate class on the basis of dwelling type, heating type or number of occupants. | |

4. Other Issue

Craig Godsoe outlined that BCH and BCOAPO were jointly working on a low income lifeline rate/low income terms and Conditions jurisdictional assessment. BCH send a first draft to BCOAPO on Friday, 26 June 2015; BCH will send the first draft to COPE 378 [**Note to Reader: This was done on 29 June 2015**].

Jim Quail inquired as to whether BCH would explore segmenting public institutions from the remainder of the LGS rate class. Craig responded that while there did not appear to be a cost of service basis for doing this, BCH would put its initial thoughts into the Workshop 11B summary notes for COPE 378 to respond to.

2015 Rate Design Application

**June 26, 2015 Meeting with COPE 378
Residential Rate Design**

BC Hydro Summary

Attachment 1

**BC Hydro Letter to BCUC dated October 27, 2014
Report on Control Group Re-establishment**

Janet Fraser

Chief Regulatory Officer

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bchydroregulatorygroup@bchydro.com

October 27, 2014

Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

**RE: Project No. 3698761
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
2013 Residential Inclining Block (RIB) Rate Re-pricing Application
(Application)
Report on Control Group Re-establishment**

BC Hydro writes in compliance with Commission Order No. G-13-14 to report on its evaluation of RIB Control Group re-establishment.

As set out below, BC Hydro evaluated aggregate City of New Westminster (**New Westminister**) residential consumption data to determine whether it could be used to derive a reliable and comparative estimate of price elasticity under a flat rate, for the purpose of on-going evaluation of the RIB. BC Hydro determined that with the available aggregate data its estimate of the price elasticity of New Westminster residential customers cannot be used as a proxy for the price elasticity of BC Hydro residential customers under a flat rate. BC Hydro is investigating whether account level New Westminster data can be used to inform its next evaluation of the RIB rate scheduled for F2017.¹

Introduction

As part of the Application, BC Hydro applied to the Commission to dissolve the RIB control group as it was providing little value for evaluating the RIB. By Order No. G-13-14, the Commission approved dissolution of the RIB rate control group, effective April 1, 2014.

During the Application review process, the Commission and intervener groups raised questions about whether BC Hydro was planning to re-establish a control group. The

¹ The F2009-F2012 RIB evaluation report was submitted as Appendix C of the Application.

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use of New Westminster residential consumption data was discussed as a potential option. New Westminster was proposed as a comparison group for analysis of the differences in customer price elasticity between BC Hydro's RIB rate and a flat rate structure because residential customers in New Westminster's service area are charged a flat rate. In its reply argument during the Application Stream-lined Review Process, BC Hydro sought to clarify expectations that a letter informing the Commission on RIB control group re-establishment "would be confined to how we think ... New Westminster would play out as an effective control group or not." By Order No. G-13-14, the Commission directed BC Hydro "to file a report with the Commission ... concerning its decision with regard to the Control Group re-establishment by or before the autumn of 2014".

BC Hydro understood that as a first step, New Westminster should be investigated as a potential comparison market. This letter documents the findings from an analysis of New Westminster residential consumption data. The objective of the analysis was to attempt to derive an empirical estimate of price elasticity under a flat rate to estimate "natural conservation" or reductions in consumption that would have occurred due to general electricity rate increases had the RIB rate not been implemented.

Elasticity Analysis of the City of New Westminster's Flat Electricity Price

As reported below, the analysis responds to four primary research questions:

1. Is aggregate residential consumption data available from New Westminster?
2. Is the data compatible with the econometric models used for the F2009-F2012 RIB evaluation?
3. Can the price elasticity of New Westminster residential customers be used as a proxy for the price elasticity of BC Hydro residential customers under a flat rate?
4. What (if any) additional data would need to be collected to estimate price elasticity under New Westminster's flat rate structure?

1. Is aggregate residential consumption data available from New Westminster?

In July 2014 New Westminster provided BC Hydro with the following data:

- Aggregate monthly electricity consumption of all residential customers from April 2004 through June 2014. This data was aggregated into two groups: single family dwellings, and multiple unit residential buildings (**MURBs**), which include apartments, row houses and town houses.
- Total customer accounts per billing period for each group
- Electricity price (energy charge) history from April 2004 up to June 2014

The consumption data was aggregated across large customer groups. The data did not contain personal information and there was no way to identify any individual customers. There were no privacy concerns.

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2. Is the data compatible with the econometric models used for the F2009-F2012 RIB Evaluation?

The data series provided by New Westminster extend to June 2014. BC Hydro analyzed data from April 2004 to March 2012, which is the same period used for the F2009-F2012 evaluation of the RIB rate. The main reason for selecting this period is that data of personal disposable income was not updated by Statistics Canada from 2013 onward. A summary of the data series available for BC Hydro's RIB model versus the New Westminster model is set out below in Table 1.

Table 1 Summary of Data Included in BC Hydro RIB Model vs. New Westminster Model

| Data Series | | RIB Model | New Westminster Model |
|---|---------------|-----------|-----------------------|
| Heating Degree Days (HDD) | | ✓ | ✓ |
| Cooling Degree Days (CDD) | | ✓ | ✓ |
| Disposable Income | | ✓ | ✓ |
| BC Hydro historical Demand Side Management (DSM) expenditure per account | | ✓ | ✓ |
| Space Heating Fuel (Electric/Non-electric) | | ✓ | Unavailable |
| Dwelling Type | Single Family | ✓ | Estimated |
| | Apartment | ✓ | Estimated (Aggregate) |
| | Row/Townhome | ✓ | |
| | Mobile | ✓ | |
| | Other | ✓ | |
| Region (Lower Mainland, Vancouver Island, Southern Interior, North) | | ✓ | n/a |

Compared to BC Hydro, the electricity consumption data from New Westminster are not as detailed. The BC Hydro billing system includes information on primary space-heating type by account, and also separates accounts into one of five different dwelling types. New Westminster does not track or estimate the account space-heating fuel type, nor does it track dwelling type. To estimate a dwelling type, New Westminster used details in the account address field as a proxy. Accounts containing a suite or unit number are assigned to the multi-family dwelling group in aggregate, and those with a street address only are assigned into the single family dwelling group.

New Westminster consumption data is not compatible with the econometric models used for the F2009-F2012 RIB evaluation. Without separate data for space heating fuel or a more granular breakdown of dwelling type, the wide variation in



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consumption between housing types and space heating fuel, or the interactions of each of these two factors with weather, cannot be analyzed in as much detail as in BC Hydro's RIB evaluation.

3. Can the price elasticity of New Westminster residential customers be used as a proxy for the price elasticity of BC Hydro customers under a flat rate?

A reliable estimate of the price elasticity under New Westminster's flat rate could not be obtained with the available aggregate residential data, and therefore the estimate cannot be used as a comparable proxy for the price elasticity of BC Hydro residential customers under a flat rate. The limitations of the data series described above required BC Hydro to use a much simpler regression model specification than what was used in BC Hydro's RIB evaluation. The imprecise model specification does not explain well the overall electricity consumption changes by factors such as price, disposable income or DSM expenditures. The coefficients associated with these variables are not statistically significant, as summarized in Attachment A.

4. What (if any) additional data would need to be collected to estimate price elasticity under New Westminster's flat rate structure?

More detailed New Westminster customer data would be required to support a more reliable model of customer electricity consumption. At a minimum, primary heating fuel (electric or non-electric) would need to be identified for each account. An alternative approach would be to conduct econometric analysis of a sample of individual customers in New Westminster supplemented with data collected through customer surveys.

However, even with an enhanced data analysis there would be a risk that a reliable estimate of flat rate price elasticity could not be produced. Changes in the flat rate price in New Westminster have been in lock step with BC Hydro's rate changes prior to the RIB rate implementation, and in both cases the changes were small. Thus, the flat rate has not been altered enough to be detected as a significant factor to account for consumption change. BC Hydro might develop a satisfactory model to explain New Westminster residential consumption, but it might not indicate price as one of the main factors.

Furthermore, New Westminster's climate and the residential dwelling mix are different than those of many other regions in the province (about 60 per cent of BC Hydro's residential accounts are single family dwellings versus 25 per cent in New Westminster). These factors have impacts on how customers respond to electricity price changes and would likely result in different elasticity estimates between New Westminster and other regions.



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Next Steps

BC Hydro is continuing to investigate whether the New Westminster data can be used in other ways to inform its next evaluation of the RIB rate scheduled for F2017. One opportunity is to enhance New Westminster data by adding heating fuel type information to individual account records, which may result in a successful model of elasticity of demand, subject to the limitations noted above. BC Hydro is also investigating an alternative evaluation method that does not require elasticity of demand modelling. This method would compare consumption levels between homes in New Westminster and similar homes in other Lower Mainland municipalities. One limitation of this approach would be difficulty extrapolating the results to the entire population of BC Hydro customers.

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Original signed

Janet Fraser
Chief Regulatory Officer

rg/rh

Enclosure

Copy to: BCUC Project No. 3698761 (2013 RIB Rate Re-pricing Application) Registered Intervener Distribution List.

Results from Regression Models on New Westminster Data

Regression Model:

$$\ln(\text{Consumption}) = \alpha + \beta \cdot \ln(\text{Price}) + \omega_1 \cdot \text{CDD} + \omega_2 \cdot \text{HDD} + \theta \cdot \ln(\text{Disposable_Income}) + \ln(\text{DSM_Expenditure}) + \mu$$

1. Modelling results for Single Family Dwelling in New Westminster:

| | |
|----------|--------|
| R-Square | 0.6575 |
| Adj R-Sq | 0.6385 |

| Parameter Estimates | | | | | |
|----------------------|----|--------------------|----------------|---------|---------|
| Variable | DF | Parameter Estimate | Standard Error | t Value | Pr > t |
| Intercept | 1 | 4.03318 | 2.49212 | 1.62 | 0.1091 |
| Ln_price | 1 | -0.17662 | 0.21352 | -0.83 | 0.4103 |
| CDD | 1 | 0.00089618 | 0.00110 | 0.82 | 0.4170 |
| HDD | 1 | 0.00098467 | 0.00010277 | 9.58 | <.0001 |
| Ln_Disposable_Income | 1 | 0.28823 | 0.20857 | 1.38 | 0.1704 |
| Ln_DSM_Expenditure | 1 | -0.02466 | 0.02728 | -0.90 | 0.3686 |

2. Modelling results for MURBs in New Westminster:

| | |
|----------|--------|
| R-Square | 0.7078 |
| Adj R-Sq | 0.6915 |

| Parameter Estimates | | | | | |
|----------------------|----|--------------------|----------------|---------|---------|
| Variable | DF | Parameter Estimate | Standard Error | t Value | Pr > t |
| Intercept | 1 | -1.08795 | 2.92505 | -0.37 | 0.7108 |
| Ln_price | 1 | -0.25035 | 0.25062 | -1.00 | 0.3205 |
| CDD | 1 | 0.00171 | 0.00129 | 1.33 | 0.1879 |
| HDD | 1 | 0.00126 | 0.00012062 | 10.42 | <.0001 |
| Ln_Disposable_Income | 1 | 0.66967 | 0.24480 | 2.74 | 0.0075 |
| Ln_DSM_Expenditure | 1 | -0.01941 | 0.03202 | -0.61 | 0.5460 |

2015 Rate Design Application

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Attachment 2

Calculation of Over-Collection of Revenue for F2017

F2017 excluding rate rider

| | RIB Rate – Status Quo (SQ) | Flat Energy Rate | Flat Energy Rate Priced at Upper End of LRMC |
|-----------------------------|-----------------------------------|-------------------------|---|
| S1 (c/kwh) | 8.29 | 10.02 | 11.23 |
| S2 (c/kwh) | 12.43 | 10.02 | 11.23 |
| Basic (\$/day) | 0.1835 | 0.1835 | 0.1835 |
| *Forecast Rev (\$) | 1,941,841,146 | 1,941,562,822 | 2,161,900,476 |
| Difference from SQ RIB (\$) | | Negligible (200k) | ~ 220 million |
| LRMC upper limit (c/kwh) | 11.23 | 11.23 | 11.23 |

* computed from the resulting rounded tariff rates after pricing is complete. For SQ RIB and Flat Energy Rate, they are within the acceptable variation limits of the target revenue.