



600 Welke Rd  
Kelowna  
BC, V1W 1A7

July 31 2018

Patrick Wruck  
Commission Secretary  
BC Utilities Commission  
6<sup>th</sup> Floor 900 Howe Street  
Vancouver, BC V6Z 2N3

Re: FortisBC COSA 2017 & Rate Design Application  
Project No. 1598939

Enclosed, please find evidence respectfully submitted by Resolution Electric Ltd.

Detailing the following;

1. Introduction
2. Annual energy use evaluation
3. Cost implications for moving from the RCR to flat rate.
4. Conclusion

Regards,

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**PROMOTING *INTELLIGENT* POWER USE**



## 1. Introduction

The evidence submitted within this document is in support of the existing Residential Conservation Rate (RCR). The generation, transmission/ distribution and final consuming of electrical energy provide a critical life support mechanism for society.

The billing information presented herein was provided and approved by the owners for use within this document. Three properties with billing data spanning a two year period are charted to indicate usage over the six billing cycles per year.

## 2. Annual Energy Use Evaluation

The two properties at Big White exhibit seasonal usage during the winter skiing season. One property is a single family dwelling (SFD) capable of housing up to fifteen occupants; the dwelling is electrically heated with two electric hot water tanks to cope with demand, it is typically occupied for five months of the winter ski-season, rented to seasonal staff at the Big White ski resort. The owners of the SFD occupy the property sparingly throughout the summer months to perform maintenance in preparation for the next ski season.

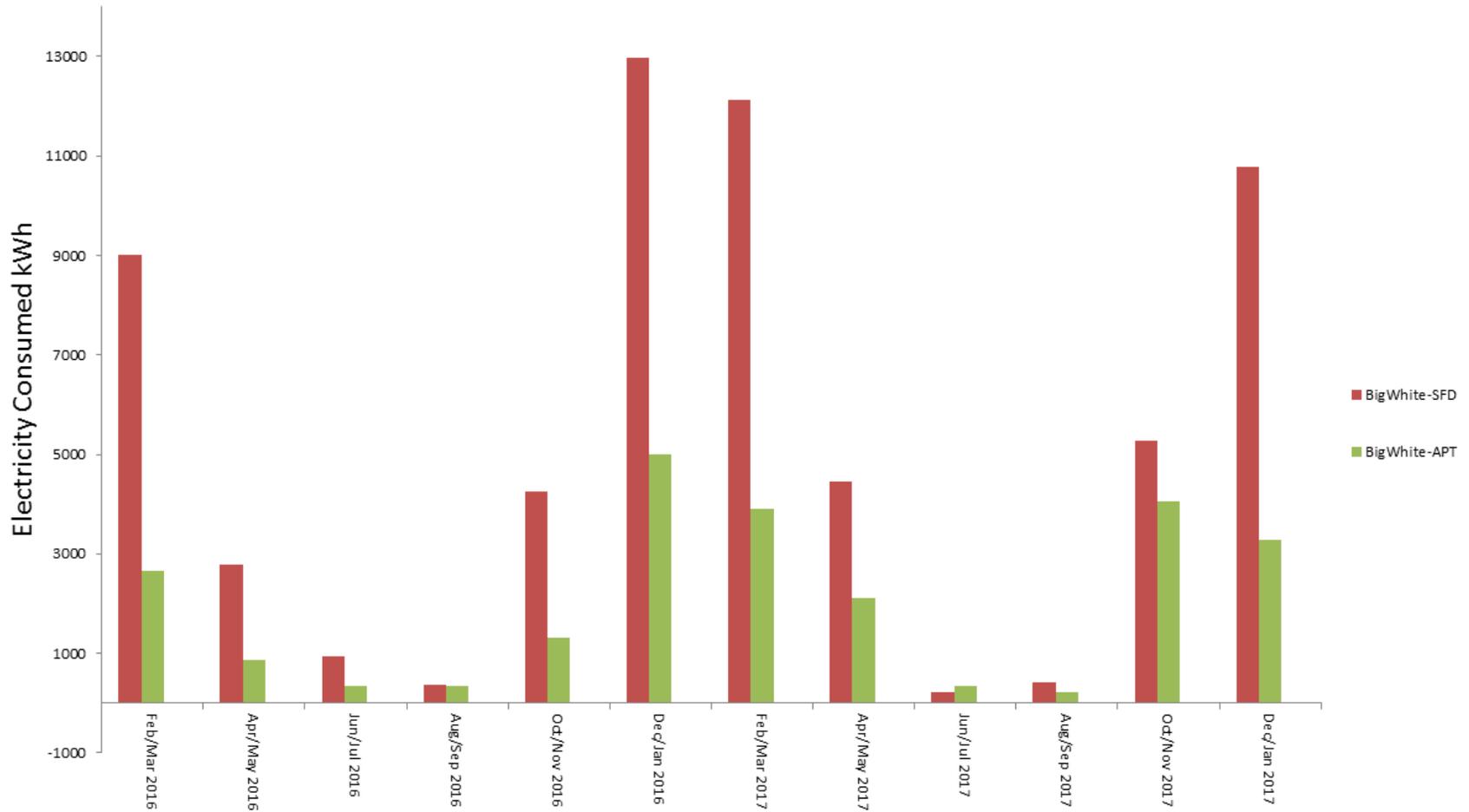
The other Big White property is an electrically heated apartment (APT) which can accommodate six to eight occupants and is used frequently by the family members throughout the ski-season and vacated for the summer, with the hot water electric supply switched off during the summer.

Billing Period	Big White SFD		Big White APT	
Feb/Mar 2016	9022		2661	
Apr/May 2016	2785		855	
Jun/Jul 2016	945		339	
Aug/Sep 2016	362	Big White SFD	336	Big White APT
Oct/Nov 2016	4263	total annual kWh	1312	total annual kWh
Dec/Jan 2016	12959	30336	4989	10492
Feb/Mar 2017	12123		3911	
Apr/May 2017	4448		2104	
Jun/Jul 2017	207		347	
Aug/Sep 2017	413	Big White SFD	227	Big White APT
Oct/Nov 2017	5286	total annual kWh	4062	total annual kWh
Dec/Jan 2017	10778	33255	3291	13942

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Electrical consumption indicating seasonal electrical usage for the Big White Residences.



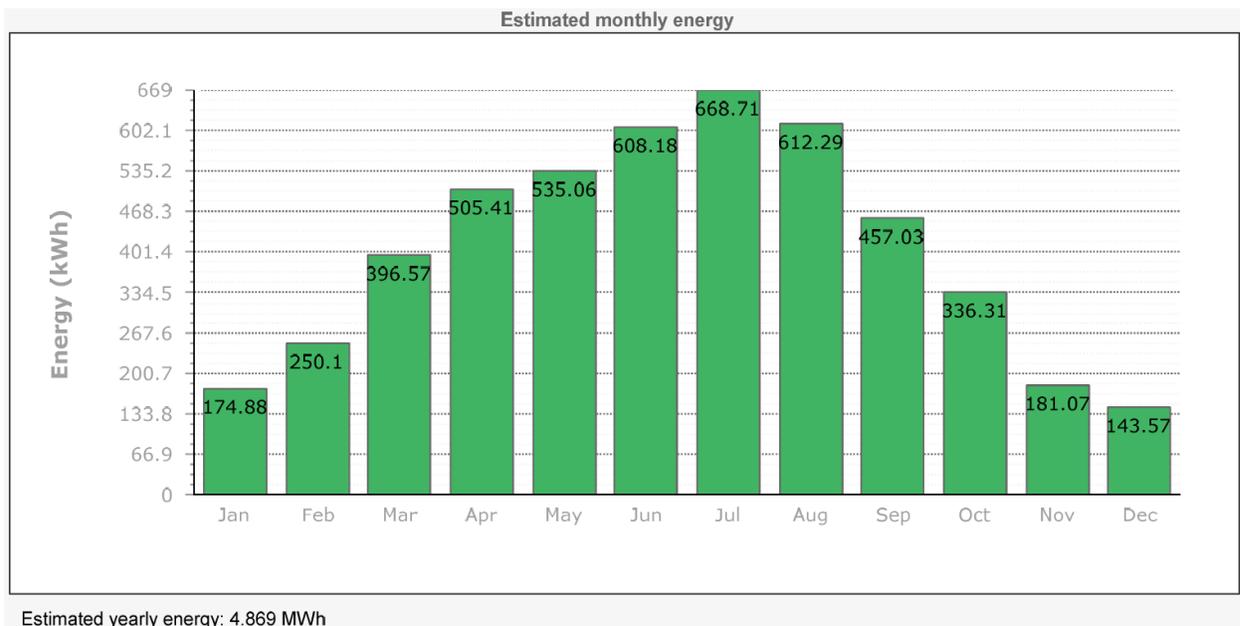
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The third property is a single family dwelling (SFD + SPV), this natural gas hot-water and central-air heated home is located in Kelowna and was fitted with a 3.64kWp solar electric system in August 2016. The data below details an annual period pre-solar, the second year of data is with solar installed. Note the year (2016) was omitted, this was the year when solar was installed.

	Billing Period	Kelowna SFD	
Pre-Solar	08/20/2015	2987	
Pre-Solar	10/20/2015	1295	
Pre-Solar	12/21/2015	1835	
Pre-Solar	02/22/2016	1878	Kelowna SFD
Pre-Solar	04/20/2016	1016	total annual kWh
Pre-Solar	06/20/2016	1657	10668
Post-Solar	08/21/2017	1432	
Post-Solar	10/20/2017	587	
Post-Solar	12/19/2017	630	
Post-Solar	02/20/2018	748	Kelowna SFD
Post-Solar	04/20/2018	198	total annual kWh
Post-Solar	06/25/2018	-204	3391

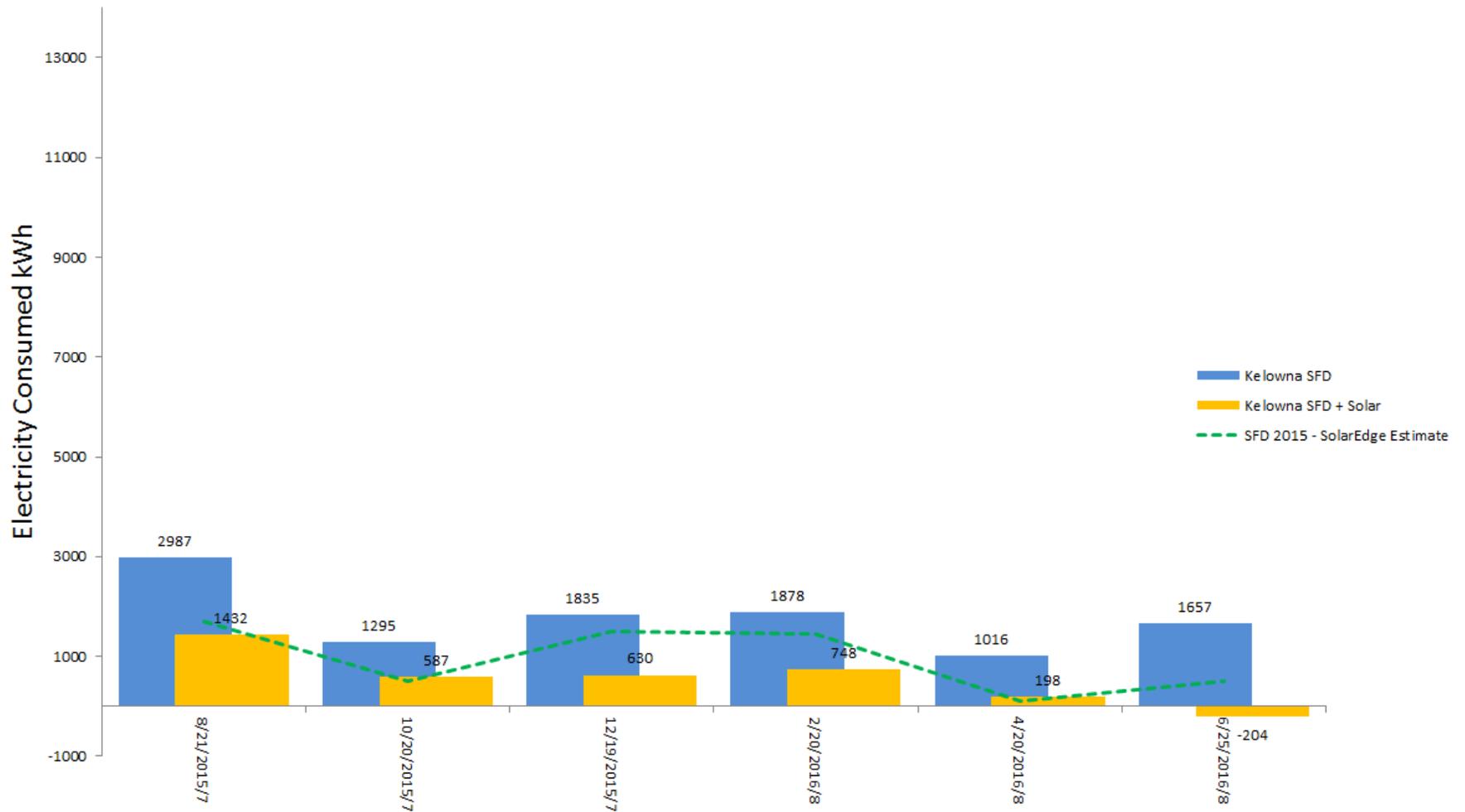
The chart below is the solar inverter design software estimate for annual solar power output and is taken from the design report for this installation.



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Electrical consumption indicating seasonal electrical usage for the Kelowna Residence.



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In the chart above for the Kelowna SFD with solar installed it is evident the energy consumed from the grid in 2017 is dramatically reduced from that consumed in 2015. The green dotted line represents the 2015 energy usage minus the anticipated solar electric generation.

On investigation with the home owner regarding the larger than expected saving it was revealed by the home owner that changed to energy consuming habits were made, with an emphasis on saving electrical energy. The significant change among others was the move to drying clothes on a washing line whenever possible during the summer, fall / spring periods instead of using the electric clothes dryer, an idea fostered by the FortisBC Power-Sense program.

The solar electric installation had created a focal point for this family of four, resulting in a conscious shift towards reducing energy. The other factors that have not been investigated for the lower energy consumption are season weather variations from one year to the next. Also to note is the FortisBC meter reading date that is not quite aligned with Solar Edge report estimates, this would also generate some variation. I am lead to believe from the home owner that the occupancy level was unchanged during these periods, except for the summer of 2016 when one of the family members was away for four months.

The motivation from the home owner to install a solar electric system was primarily to reduce the grid consumed energy to below tier two levels. It can be seen the system installed is of modest size (3.64kWh) and the annual generation output provided the saving the customer desired.



### 3. Cost implications for moving from the RCR to flat rate.

Calculations performed below were made to determine the cost for power and the impact to each of the three residences by moving away from the RCR to a flat rate. The calculations for each of the years are based on today's rate for tier 1 and tier 2 together with the proposed Flat Rate Option value of \$0.12021/kWh - Table 6-8 Bill Impact & Flat Rate Options (page 70 – FBC 2017 COSA & Rate Design).

#### Kelowna Single Family Dwelling

				Current RCR (\$)		Current RCR (\$)			Proposed flat rate(\$)			
				\$0.10117		\$0.15617			\$0.12021			Cost
	Billing Period	Kelowna SFD	tier 1 kWh	tier 1 cost	tier 2 kWh	tier 2 cost	Total cost					Difference
Pre-Solar	08/20/2015	2987	1600	\$161.87	1387	\$216.61	\$378.48		\$359.07			
Pre-Solar	10/20/2015	1295	1295	\$131.02			\$131.02		\$155.67			
Pre-Solar	12/21/2015	1835	1600	\$161.87	235	\$36.70	\$198.57		\$220.59			
Pre-Solar	02/22/2016	1878	1600	\$161.87	278	\$43.42	\$205.29		\$225.75	Projected		
Pre-Solar	04/20/2016	1016	1016	\$102.79			\$102.79	Annual \$	\$122.13	Annual \$	Annual \$	
Pre-Solar	06/20/2016	1657	1600	\$161.87	57	\$8.90	\$170.77	\$1,186.92	\$199.19	\$1,282.40	\$95.48	
Post-Solar	08/21/2017	1432	1432	\$144.88			\$144.88		\$172.14			
Post-Solar	10/20/2017	587	587	\$59.39			\$59.39		\$70.56			
Post-Solar	12/19/2017	630	630	\$63.74			\$63.74		\$75.73			
Post-Solar	02/20/2018	748	748	\$75.68			\$75.68		\$89.92	Projected		
Post-Solar	04/20/2018	198	198	\$20.03			\$20.03	Annual \$	\$23.80	Annual \$	Annual \$	
Post-Solar	06/25/2018	-204	-204	(\$20.64)			(\$20.64)	\$343.07	(\$24.52)	\$407.63	\$64.56	

An increase to annual cost for power is experienced for this energy conscious home fitted with solar. The pre-solar 2015 power usage was 10668 kWh; this resulted in an increase of \$95.48 per year, reviewing the FBC - Table 6-8 Billing Impact & Flat Rate Options it can be seen that fifty-eight percent of customers take supply less than 10,000kWh per year, reflecting an increase in annual costs for low power consumers. The return on investment for the solar electric install was based on removing the tier 2 energy which results in a modest system size (kWp).

It can be seen that the flat rate option provides a better return on investment over the RCR for the Net Excess Generation (NEG power at the tier 1 rate); this could give rise to much larger solar electric systems being installed under a flat rate tariff, as economies of scale installing a much larger system would now prevail.



## Big White Single Family Dwelling

			Current RCR (\$)		Current RCR (\$)		Proposed flat rate(\$)		Cost Difference
			\$0.10117		\$0.15617		\$0.12021		
Billing Period	Big White SFD	tier 1 kWh	tier 1 cost	tier 2 kWh	tier 2 cost	Total cost			
Feb/Mar 2016	9022	1600	\$161.87	7422	\$1,159.09	\$1,320.97	\$1,084.53		
Apr/May 2016	2785	1600	\$161.87	1185	\$185.06	\$346.93	\$334.78		
Jun/Jul 2016	945	945	\$95.61			\$95.61	\$113.60		
Aug/Sep 2016	362	362	\$36.62			\$36.62	\$43.52	Projected	
Oct/Nov 2016	4263	1600	\$161.87	2663	\$415.88	\$577.75	Annual \$ \$512.46	Annual \$	Annual \$
Dec/Jan 2016	12959	1600	\$161.87	11359	\$1,773.94	\$1,935.81	\$4,313.69	\$1,557.80	\$3,646.69 (\$667.00)
Feb/Mar 2017	12123	1600	\$161.87	10523	\$1,643.38	\$1,805.25	\$1,457.31		
Apr/May 2017	4448	1600	\$161.87	2848	\$444.77	\$606.64	\$534.69		
Jun/Jul 2017	207	207	\$20.94			\$20.94	\$24.88		
Aug/Sep 2017	413	413	\$41.78			\$41.78	\$49.65	Projected	
Oct/Nov 2017	5286	1600	\$161.87	3686	\$575.64	\$737.51	Annual \$ \$635.43	Annual \$	Annual \$
Dec/Jan 2017	10778	1600	\$161.87	9178	\$1,433.33	\$1,595.20	\$4,807.33	\$1,295.62	\$3,997.58 (\$809.75)

## Big White Apartment

			Current RCR (\$)		Current RCR (\$)		Proposed flat rate(\$)		Cost Difference
			\$0.10117		\$0.15617		\$0.12021		
Billing Period	Big White APT	tier 1 kWh	tier 1 cost	tier 2 kWh	tier 2 cost	Total cost			
Feb/Mar 2016	2661	1600	\$161.87	1061	\$165.70	\$327.57	\$319.88		
Apr/May 2016	855	855	\$86.50			\$86.50	\$102.78		
Jun/Jul 2016	339	339	\$34.30			\$34.30	\$40.75		
Aug/Sep 2016	336	336	\$33.99			\$33.99	\$40.39	Projected	
Oct/Nov 2016	1312	1312	\$132.74			\$132.74	Annual \$ \$157.72	Annual \$	Annual \$
Dec/Jan 2016	4989	1600	\$161.87	3389	\$529.26	\$691.13	\$1,306.23	\$599.73	\$1,261.24 (\$44.98)
Feb/Mar 2017	3911	1600	\$161.87	2311	\$360.91	\$522.78	\$470.14		
Apr/May 2017	2104	1600	\$161.87	504	\$78.71	\$240.58	\$252.92		
Jun/Jul 2017	347	347	\$35.11			\$35.11	\$41.71		
Aug/Sep 2017	227	227	\$22.97			\$22.97	\$27.29	Projected	
Oct/Nov 2017	4062	1600	\$161.87	2462	\$384.49	\$546.36	Annual \$ \$488.29	Annual \$	Annual \$
Dec/Jan 2017	3291	1600	\$161.87	1691	\$264.08	\$425.96	\$1,793.75	\$395.61	\$1,675.97 (\$117.78)

In the case for both Big White properties moving away from the RCR to the flat rate results in a reduction for annual energy cost. The greatest savings made by the Single Family Dwelling, with an annual energy usage of over 30,000kWh / year. The savings are somewhat representable for the three percent of the FBC customer base which use over 30,000 kWh on an annual basis.



The Big White properties examined here exhibit extremely high energy usage during the winter ski season compared to the remainder of the year; this high seasonal energy peak was one of the main drivers along with reliability of supply for the capital asset upgrade project for the Big White and Joe Rich area.

In the BCUC - Big White Supply Project Rate Design Application - Project 3698457 dated 2007, determined that postage stamp rates should be maintained for the Resort and residents of Big White and that the project costs of \$20.3M be placed on the FortisBC rate base.

In the BCUC ruling - Order No. G-87-07

*“The Commission Panel determines that the new evidence and submissions provided in this proceeding support including the costs of the Project in the FortisBC rate base, with no additional contribution required from the BWSR or Big White ratepayers, new or existing.”*

#### 4. Conclusion

The Residential Conservation Rate (RCR) provides a positive stimulus for electrical consumers wanting to reduce their grid energy usage, particularly in the summer months when air conditioning loads impose significant loadings on the electrical grid system. The focus on conserving energy for the Kelowna residence fitted with solar electric is evident, with habitual changes to energy usage and the determination to reduce further.

The BCUC ruling to apply postage stamp rates to the Big White and Joe Rich area was justified; this ruling aligns with other populated areas difficult to reach or not cost effective to serve with natural gas supplies, but served with electrical supplies. The cost for electrical supply infrastructure is absorbed into the rate-base and reflected in the cost for electrical energy and service. In the case for the Big White 138,000Volt transmission line and Substation Project for which the project costs were around \$20.3M, the project costs were absorbed by all FBC customers. It would appear that a fair billing structure is already in existence with the tier 1 and tier 2 rates recovering costs under the Residential Conservation Rate.

Moving to a flat rate could result in larger solar electric systems being installed; economies of scale and the cost effectiveness to install large solar electric systems that wipe out all annual power would be more economically viable.

The two tier rate system allows for a certain amount of electrical energy to be delivered at a lower rate to assist British Columbians living modest lifestyles - life support mechanism for society. The higher rate electricity provides - life style support mechanism for society.

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