

Date Submitted: April 16, 2019

Proceeding name: Nelson Hydro 2019 Rural Rate Application

Are you currently registered as an intervener or interested party:

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Province: British Columbia

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Comment:

Nelson hydro does not abide by its own bylaw and public grant money installs solar systems on public buildings and Nelson hydro buys their excess at full retail. This removes income from sales and subsidizes these solar systems.

2019 Nelson Hydro Rate Increase

Rural Ratepayers should Not Have to Fund The Cities Political Projects

I think this needs to be restated, I made a similar comment to last year's Nelson hydro rate change submission.

Since then even more solar has been installed being subsidized by Nelson hydro ratepayers.

Its my contention the misinformation created by the Nelson community solar garden project continues to mislead and results in public money being spent on solar power in the Nelson area.

Columbia Basin Trust has just released another \$900,000 for community alternate energy projects. Nelson hydro ratepayers are already paying for previous systems installed with grant money as well as the community solar garden and this will add more.

Nelson hydro's own bylaw says they will only buy power if it makes economic sense.

Nelson hydro needs to enforce its bylaw([6.4 Net Metering](#)) ***Rates paid for electricity will be subject to the approval of the Nelson Hydro General Manager and will be determined based on economic benefit to Nelson Hydro.***

Why does Nelson have the community solar garden? It had no business case nor did it meet hydro's own bylaw regarding any benefit to Nelson hydro (ratepayers). Yet the Nelson hydro general manager brought city council a business case. Council must depend on and trust their experts..

If a solar project can payback in 25 years (life expectancy of solar panels) its considered to have a business case. The consultant provided a report showing a 25 year payback, his report was flawed.

I believe the Nelson community solar garden project was spawned when the past mayor and hydro general manager returned from their trip to Europe.

The first submission to the BCUC stated the project would be fully funded by those opting in. The following years submission repeated that, it is not fully funded.

It was pitched as a volunteer fully funded project by those who chose to buy a 25 year contract for a solar panels power, credited annually on their Nelson hydro bill.

Original information said the solar power would come at a premium cost. Similar to the Fortis solar project for Kelowna. That project was denied by the BCUC, reasons-it was of no benefit to anyone.

The project is being subsidized by all Nelson hydro ratepayers, Nelson hydro pays full retail, inflation protected, for any solar power, that money is distributed among those who opted in. The media statement was made “only those who opt in will benefit”. At the expense of all Nelson hydro ratepayers.

I am a retired electronics technologist supervisor from likely the largest user of remote solar systems in BC, with over 120 sites when I retired.

My first meeting with the general manager of Nelson hydro I thought I could help, providing him and his consultant with the years of known actual local solar data showing no benefit here for solar.

I asked him if Nelson hydro was a business, he replied “yes”, I then said there has to be a business case for the solar garden. He replied “it won't proceed without one”. He also said the years of local data I was providing was irrelevant. I provided this to his consultant, he thanked me in an email saying it was good to consider information from all sources.

The general manager of Nelson hydro's bio states he installed his first solar system around 2000 and has experience with many other systems, I see no excuse he accepted his consultants report showing a business case with a payback in 25 years.

The report was done by the same engineer for the Kimberley SunMine using the same Swiss computer program.

The Kimberley SunMine was a \$5.8M project subsidized by \$3.8M. Kimberley residents voted on a referendum to borrow the remaining \$2M. The referendum said there would be no future costs to taxpayers.

Even though BC Hydro's stand purchase offer pays seen in the chart below beginning in 2015 11c/kWh and increasing with inflation. (BCH legacy dams make power for little over 3c/kWh). Kimberley still cannot make the payments on the \$2M. Kimberley taxpayers fund this shortfall as do BC Hydro ratepayers paying the SOP rates for power they don't need.

Why did this engineer produce such widely different reports for the SunMine and Nelson? I have pointed all of this out to the Nelson hydro general manager, mayors and council. I made two applications to speak to council, both denied by the CAO.

FINANCIAL PAGE FROM THE KIMBERLEY SUNMINE REPORT

APPENDIX B											
CASHFLOW AND OPERATING BUDGET - 1.05 MW											
		a	b	c	d	e	f	g	h	i	j
#	Year	Annual Energy 1 MWh	Annual Energy 1.05 MWh	BCH tariff \$/MWh	Revenue MW (\$) a x c \$	Loan Payment on \$2 Mil \$	Revenue - Loan \$ c-d \$	O & M Cost \$	Other Cost \$	Net Operating Cash Flow e-f-g \$	Cumulative Cash Flow \$
1	2015	1,850	1,943	110.01	213,694	139,233	74,461	57,246	19,168	(1,953)	(1,953)
2	2016	1,841	1,933	111.99	216,483	137,633	78,850	58,028	19,551	1,270	(683)
3	2017	1,828	1,919	114.01	218,815	136,033	82,782	48,810	19,942	14,029	13,347
4	2018	1,815	1,906	116.06	221,172	134,433	86,739	44,338	20,341	22,060	35,406
5	2019	1,802	1,892	118.15	223,554	132,833	90,721	45,446	20,748	24,527	59,933
6	2020	1,789	1,879	120.27	225,962	131,233	94,729	48,583	21,163	24,984	84,917
7	2021	1,777	1,865	122.44	228,397	129,633	98,764	47,719	21,586	29,459	114,375
8	2022	1,764	1,852	124.64	230,857	128,033	102,824	51,912	22,018	28,894	143,269
9	2023	1,751	1,839	126.89	233,344	126,433	106,911	53,209	22,458	31,243	174,512
10	2024	1,739	1,826	129.17	235,857	124,833	111,024	54,540	22,908	33,577	208,089
11	2025	1,727	1,813	131.50	238,398	123,433	112,965	57,903	23,366	31,696	239,785
12	2026	1,714	1,800	133.86	240,966	123,833	117,133	57,267	23,833	36,033	275,819
13	2027	1,702	1,787	136.27	243,562	122,233	121,329	58,698	24,310	38,321	314,140
14	2028	1,690	1,775	138.72	246,186	120,633	125,553	60,166	24,796	40,591	354,730
15	2029	1,678	1,762	141.22	248,837	119,033	129,804	74,670	25,292	29,843	384,573
16	2030	1,666	1,750	143.76	251,518	117,433	134,085	65,174	25,798	43,113	427,686
17	2031	1,654	1,737	146.35	254,227	115,833	138,394	64,678	26,314	47,403	475,089
18	2032	1,643	1,725	148.99	256,966	114,233	142,733	66,295	26,840	49,598	524,687
19	2033	1,631	1,713	151.67	259,734	112,633	147,101	67,953	27,377	51,772	576,459
20	2034	1,619	1,700	154.40	262,532	111,033	151,499	69,651	27,924	53,923	630,382
21	2035	1,608	1,688	157.18	265,360	-	265,360	73,393	28,483	163,485	793,867
22	2036	1,596	1,676	160.01	268,219	-	268,219	89,106	29,052	150,060	943,927
23	2037	1,585	1,664	162.89	271,108	-	271,108	74,875	29,633	166,599	1,110,526
24	2038	1,574	1,653	165.82	274,028	-	274,028	76,747	30,226	167,055	1,277,582
25	2039	1,563	1,641	168.80	276,980	-	276,980	78,666	30,831	167,484	1,445,065
	Total	42,607	44,738		6,106,756	2,502,660	3,604,096	1,545,073	613,957	1,445,065	1,445,065
	Average	1,704	1,790	137	244,270	100,106	144,164	61,803	24,558	57,803	
Assumptions											
1 Based on Conergy energy production estimates, 100% energy output											
2 Degredation in year 2 of 0.49% and each year after 0.71%											
3 Revenue/KWh escalates at CPI, estimated to be 1.8% per year											
4 Maintenance costs based on information from Conergy, Jetson Consulting and City of Kimberley staff											
5 Administration costs include 2.5% inflationary increase (blended 3% wages and materials at CPI 1.8%)											

Several columns are missing in his Nelson Community Solar garden report and those shown are incorrect.

For the Nelson report the consultant forgot to input degradation, solar panels age making less power every year.

Assumption Note 2 above - degradation, 0.49% in year 2, increasing to .71% each year after.

Using word search, degradation appears 22 times in the Kimberley report. It never appears in the Nelson report.

For Kimberley the annual tariff he used the CPI inflation index of 1.8%, for Nelson he used 3.5%, this affects all the other columns and results.

Kimberley shows annual (O&M) - running costs Nelson shows \$0.
The Kimberley has contingency costs (other) Nelson has none.

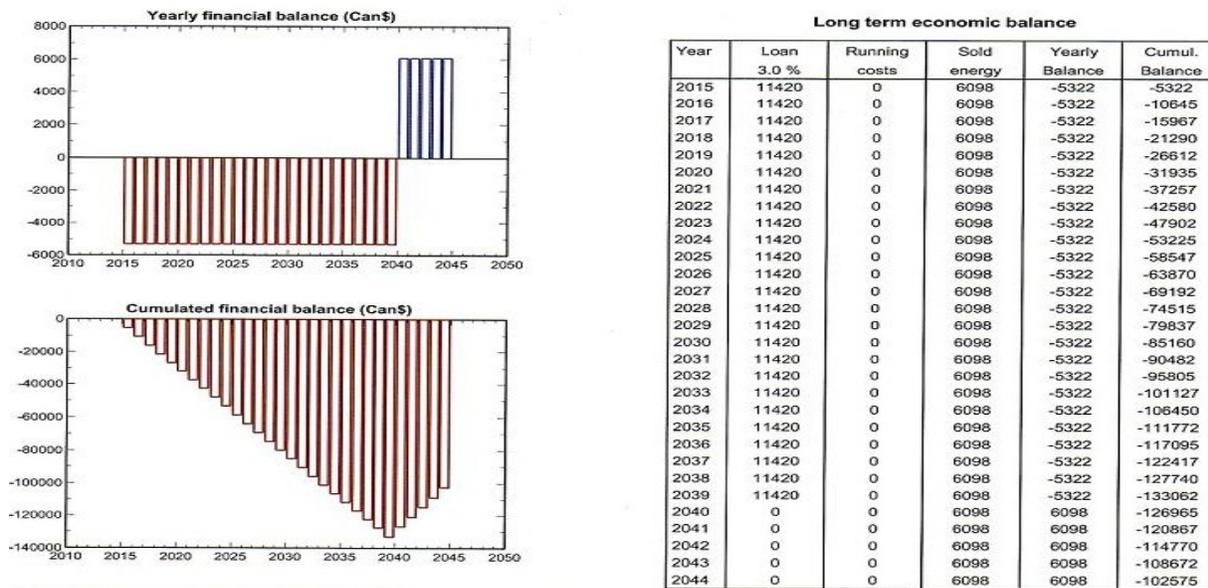
Many deceptive statements have appeared several times in various public articles.
Such as “the solar power will reach parity in 7 years”
The solar garden will payback in 12 to 15 years.

Solar power reduces the excess Fortis power purchases by Nelson hydro. False, Nelson hydro sells excess power for a huge profit. Solar removes that.

At a public meeting the hydro manager stated distributed solar reduces infrastructure costs. The opposite occurs, one still needs all the infrastructure for firm power, solar only adds.

At a public meeting I asked the GM what makes the solar garden power green, his reply “nobody said it was green”. I am sure if you asked the churches, co-ops and individuals who bought a contract they would all tell you it is green energy.

Below from the engineers report for the Nelson Community solar Garden



No degradation is shown, running costs are \$0, no “Other “ column. How does the Cumulative Balance increase? the other columns don't change.

I went on the support forum for the computer program asking if the degradation was built into the program, the reply, yes. So did the engineer manually restrict this input for his Nelson report? Notice payback occurs immediately at year 25. It appears to me the computer inputs were selected not from real data but to achieve a 25 year payback.

No economic analysis as to the value to Nelson hydro was done. At last years Nelson hydro public budget meeting the engineer (no longer with Nelson) was looking at microhydro on the cities gravity water system. He stated he was using the NPV method to determine value and whether that power could be made for the price Nelson hydro now buys power.

This year, I asked him at the budget meeting about the project, he stated further analysis showed it could not compete with the cost of what Nelson hydro wholesale power costs are.

Why was this not done for the solar garden?

From last years [Nelson hydro response to the BCUC](#) request for cost of power they supplied the following.

15.3 Based on Nelson Hydro’s cost of production compared to the 2018 cost to purchase power from FortisBC Inc. (FBC), please provide the percentage mark-up being applied to the WRA power.

RESPONSE:

Because it is difficult to calculate the cost of capacity for the operation of the power plant we will attribute all costs to energy production for a simplified calculation.

Nelson Hydro cost of production

³⁵/₁₇ 2017 Power Plant Operating Costs (Electric Supply) = \$445,265

³⁵/₁₇ 2017 Power Plant Energy Production = 92,496,858 kWh ³⁵/₁₇ Capital Expenditures 2011 – 2021 = \$2,921,855 + \$990,221. Average = \$355,643

³⁵/₁₇ Approx. cost of energy prod. = \$(445,265 + 355,643) / 92,496,858 kWh = **\$0.0087 / kWh**

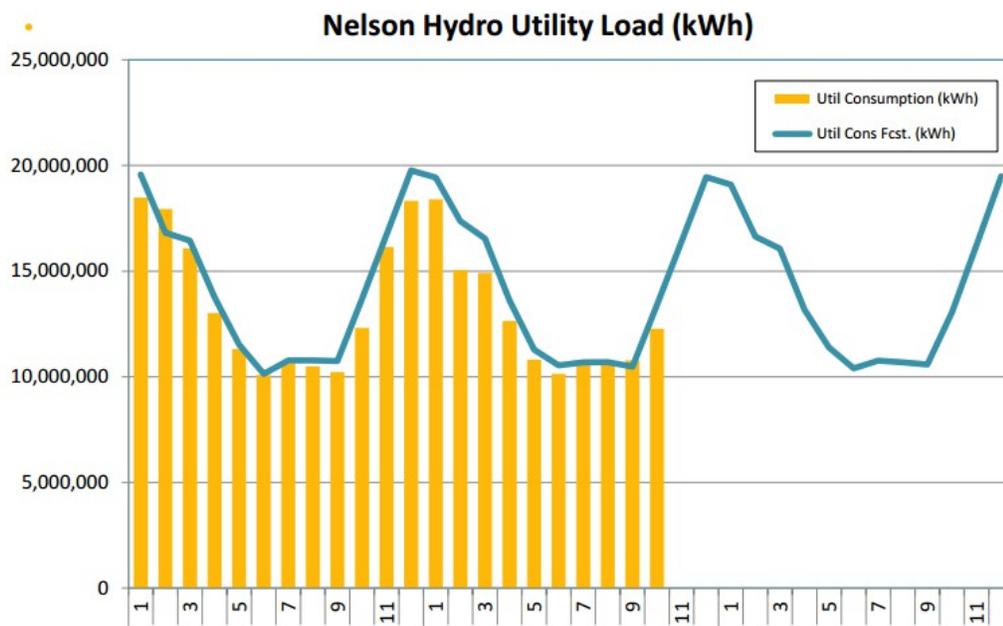
³⁵/₁₇ FortisBC 2017 Costs of Energy under RS 41 = **\$0.04501 / kWh**

³⁵/₁₇ FortisBC Rate / NH Cost of Energy = \$0.04501/\$0.0087 = 520%

Nelson hydro shows their cost of production as \$0.0087/kWh and excess power purchase from Fortis as \$0.04501/kWh.

Why would Nelson let water that makes power for less than a penny let that water spill downstream with huge profits to buy anyone's solar never mind paying full retail.

Utility Load Forecast



Seen above from spring runoff months April through October, Nelson hydro has water available for their nameplate 16MW production. The same time almost all annual solar is made, its not necessary. In winter when solar is next to nothing Nelson hydro is reduced to their water licence generation of 9MW and buying excess power from Fortis.

One might presume solar power to be valued at the Fortis 4.5c/kWh rate. During the months solar works the least amount of excess Fortis power is purchased.

Therefore the blended real value contribution of solar might be something slightly more than Nelson hydro's power production costs shown above as .0087c/kWh.

The consultant estimated the Nelson community solar garden power from his simulated computer analysis as 61,000kWh/yr.

This exceeded years of real known data by up to 25%. I was providing this to all concerned. At one point the manager of Nelson hydro said he would block my emails I was wasting everyone's time.

The final installed system added 25% more panels, from a 200 panel 49.9kW system it became a 248 panel 60kW system, it did earn the simulated energy production the first year.

The last public numbers seen before construction stated they had sold 147 of the 200 panels. How did this project go from 200 panels to 248?

I would like to see the records and dates supporting the sales of the next 100 panels.

There was a period of time the city was advertising that panels were available.

Apparently 130 opted in for the 248 panels.

The buy in for a panel was set at \$923 long before final costs were known. As costs rose this was never adjusted. All ratepayers fund these extra costs as well as any and all future costs.

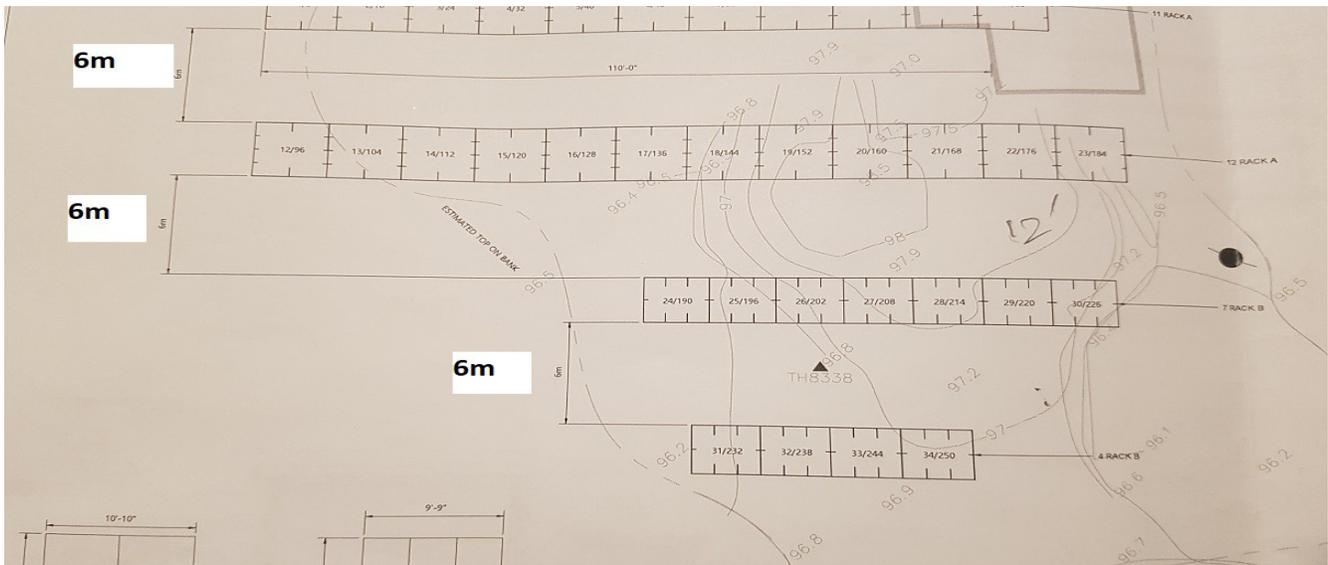
The original plan was for 3 solar gardens this was system number 1.

The first years annual credit to those who opted in was for slightly more than a year, the contract stated they would receive their credit on the anniversary date.

Why were they credited for more than one year?

The engineering drawings for construction were changed. I have asked who signed off on these changes. I submitted an FOI asking for the records showing who signed off. FOI responses are supposed to be responded to within 30 days. On day 57 I phoned to inquire, the city person responsible said I would receive an email that day. The response "There are No Records".

The changes involved solar panel row spacing, panel tilt from optimal 35 degrees to 30 degrees and ground compaction required by the consultant.



Above is a copy of the engineers layout showing rows of solar panels spaced at 6 meters, this was changed to around 3 meters, resulting in front rows shading back rows, the panel tilt angle reduced from a more optimal 35 degrees to 30 degrees (somewhat mitigating shading)

The engineering drawings also asked for a 1200lb Vibratory roller and a geotech engineer to qualify the ground before the concrete ballasts were mounted.

I never saw a vibratory roller in the time lapse, I did see a plate tamper.

The engineers drawings stated if they were not involved notes were to be kept by the owner (city). I contacted the engineer responsible for the drawings asking if they were responsible for the changes, I received no reply. I don't know if there was a geotech engineer. My FOI to the city regarding the changes and asking how they were made and the notes, their response to my FOI, "no records".



Above one can see the front row of panels shading the back rows because the inter row spacing shown on the engineers drawings was reduced.



Above one can see frost heaving buckling panels, ratepayers are responsible for all future costs. There was a long delay in construction when the specified metal racking put a strain on the budget and they came up with a replacement wood structure.

The first purchasers put down their \$500 non refundable in Dec. 2015 the system wasn't operational till June 2017, 18 months later.

Social media is calling for a Board of Directors, Nelson hydro seems to be paying for too many what should be city taxpayer funded costs. Social media refers to the Nelson community solar garden as the phoney solar garden, appropriately named.

Now its fibreoptic underwater cable for what purpose or benefit to Nelson hydro ratepayers. City council made the decision "in camera". This doesn't in my opinion meet the criteria for those items that can be discussed in private. So far no financial record requests for this have been obtained. There is an outstanding FOI request.

The original metal commercial solar racking supports apparently put the project over budget this caused almost a years delay, they came up with this wooden support structure.



Its unlikely this wood will survive the 25 years of the contract that requires Nelson hydro ratepayers to maintain the system. More of a backyard installation than a professional electric utility.

Rural Nelson hydro ratepayers should not be responsible for funding the cities political projects.

The decision to install submarine fiberoptic was done in cameras by council, why?

The Nelson hydro general manager is the first contact for the cities geothermal heating system at the city owned college buildings. The maintenance people there tell me they have nothing to do with that, any alarms are received the the hydro manager and he attends the site for troubleshooting. For the cities highest paid employee to do a maintenance task doesn't make sense.

The past cities “Corporate GreenHouse Gas” consultant was managed by the hydro manager as well as the EcoSave Coordinator. Aren't these taxpayer funded items in cities that don't have their own hydro generation and distribution?

Withn about a kilometre as the crow flies from the Nelson solar garden is this professionally installed solar system.



The above system properly mounted in below the frost line concrete hasn't moved in three winters.

Social Media is requesting a Board of Directors for Nelson hydro, there is no confidence in city hall.

Capacity factor for private solar systems might be calculated using the 10% availability that BC Hydro uses below. This could avoid 10% of a private users annual power.

This 10% avoidance calculation doesn't work with a public utility such as Nelson. One has to use the cost of power to Nelson hydro from its own generation and excess from Fortis. It also must consider when the power is earned, solar must be used when its made. Most solar is earned from spring runoff into high reservoir levels when you can't give power away. Therefore solars only value might occur in the season when reservoirs begin to draw down, Annual Capacity factor possibly 1 or 2%.

Yet public money continues to be spent on solar power every year and every kW removes Nelson hydro power sales (income) never mind paying full retail for anyone's excess, when the bylaw states they will only buy this power if its of economic benefit.

Why would the only city in Western Canada with its own hydro generation and distribution making huge profits put solar panels at the dam? Or buy anyone's excess solar power?

When Nelson hydro is reduced to 9MW and buying most excess power from Fortis



Nelson hydro picture March after a winter of Nelson hydro reduced to water licence 9MW and purchasing excess from Fortis, solar has done nothing for six months.

Spring Runoff has begun, water overflows the Nelson hydro dam



Phot above taken April 6th, spring runoff has begun, Nelson hydro can return to its 16MW nameplate generation as water is available, solar hasn't begun to make any appreciable power and since we cannot even use all the water, solar has no value.

Nelson Community Solar Garden in Winter



When solar might have value it doesn't work Nelson community solar garden in winter

Why make the cities political project a rural ratepayers or any ratepayers cost?
This was to be fully funded by those opting in.