

From: BCUC <commission.secretary@bcuc.com>
Sent: Thursday, May 31, 2018 1:06 AM
To: Commission Secretary BCUC:EX
Subject: Letter of Comment
Attachments: SSREC_BCUC_NM_submission_Fnl.pdf

Date Submitted: May 31, 2018

Proceeding name: BC Hydro Amendment to Net Metering Service

Are you currently registered as an intervener or interested party: No

Name (first and last): Thomas Mommsen

City: Galiano

Province: British Columbia

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Phone number: 778-999-7025

Comment:

We are a renewable energy co-operative whose members are directly affected by the net-metering program. Most of our members are either current net-metering customers or intend on becoming net-metering customers in the near future. We have three purposes, one of which is to advocate for positive renewable energy policy, and particularly for community-based solar photovoltaic, in British Columbia. Our members are all aware of BC Hydro's application and they have asked us to intervene on their behalf to ensure that the BCUC understands the negative impacts of this application, its frivolous nature, and the positive impacts of the net-metering program as a contribution to the energy mix, economy and employment in British Columbia.



Box 13, Galiano, BC, V0N 1P0

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May 30, 2018

Mr. Patrick Wruck, Commission Secretary
BC Utilities Commission
900 Howe Street, Suite 401
Vancouver, BC V6Z 2N3

Dear Commission Secretary,

On behalf of the Salish Sea Renewable Energy Coop (SSREC) I am submitting comments on **BC Hydro Application to Amend the Net-Metering Service**.

Our recommendation is to reject BC Hydro's application.

SSREC is a renewable energy co-operative registered in British Columbia. Our 95 members, as of May 29, 2018, are either current net-metering customers or intend on becoming net-metering customers directly in the future.

Our cooperative has three purposes, one of which is to advocate for positive renewable energy policy, and particularly for community-based solar photovoltaics, in British Columbia. Our members are aware of BC Hydro's application and have asked me to intervene on their behalf to ensure that the BCUC understands the negative impacts of this application, its frivolous nature, and the positive impacts of the net-metering program on the energy mix, economy and employment in British Columbia.

We have a new web-site (currently under development) where you can read our ["Short Primer on Community Solar in BC"](#) . We have also produced a white paper on Solar in BC, presented to Minister Heyman and staff from Minister Mungall's office, which we would also be pleased to share with you.

As a scientist, and founding director of SSREC, I have been researching renewable energy trends for the past five years and accumulated considerable expertise during that time. I would be pleased to share my expertise with BCUC and BC Hydro to help modernize and improve the net metering environment in BC.

Sincerely,

A handwritten signature in black ink, appearing to read "Dr. T. Mommsen", written over a horizontal line.

Dr. Thomas Mommsen
Director



Box 13, Galiano, BC, V0N 1P0

SSRECinfo@gmail.com

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To: BC Utilities Commission

Prepared by: Dr. Thomas Mommsen

On behalf of: Salish Sea Renewable Energy Co-op

Contact: [REDACTED]

Letter to BCUC Re: **BC Hydro Application to Amend Net-Metering Service**

Summary

Thank you for the opportunity to respond to BC Hydro's interim application to amend their net-metering service (RS1289) to restrict net-metered customers to self-consumption.

We implore you to reject this interim request outright.

We also encourage you to ask BC Hydro to return to BCUC with a well-thought out proposal on how they can improve their net-metering (NM) program, bringing it in line with innovations in residential, business and community solar in other jurisdictions across Canada and internationally.

We provide numerous lines of evidence to support our recommendation. BC Hydro's application:

- does not provide evidence of a need for interim action
- has numerous factual and mathematical errors which need to be corrected before BCUC can make a rational evidence-based decision
- does not address the real problems with NM
- will put a chill on potential NM customers and the burgeoning residential solar industry, working against the mandate of BCUC to support BC's economy, BC Hydro's customers and without any long-term vision to address these impacts
- does not demonstrate a negative effect on non-participating customers
- contradicts its own arguments made in 2017 about demand increases
- ignores the positive effects of net-metering on the grid
- has not considered important aspects of rolling-out such an interim measure
- will lead to unintended negative consequences which will hurt BC Hydro, such as grid-defection
- is silent on the relationship between net-metering and climate change mitigation

1. No evidence of need and faulty math

BC Hydro has not demonstrated a need for these interim measures as they have not provided evidence of a 'rush of applications for oversized generation facilities'.

BC Hydro actually experiences an exponential decrease in overproduction per NM customer

BC Hydro claims they are observing a large increase in actual overproduction by those 330 NM customers who overproduce (in early 2018). It is obvious that as the number of overproducing NM customers increases (see Fig.1a), the amount of overproduction will scale with it. The relevant analysis lies in the nature of the scaling. When the number of overproducing NM customers is plotted against the amount of overproduction per customer, the resulting curve unmistakably shows a drastic decrease in overproduction from 40.7 MWh per customer in 2012 to 12.2 MWh per customer in 2017 (Fig. 1b). The best mathematical fit for this curve is an exponential decrease (Fig. 1b) - far from the massive increase implied by BC Hydro’s narrative. It is our experience that the vast majority of NM customers do not see overproduction as a way to make money! The data certainly do not support the idea that customers are ‘rushing’ into overproduction to cash in at Hydro’s expense.

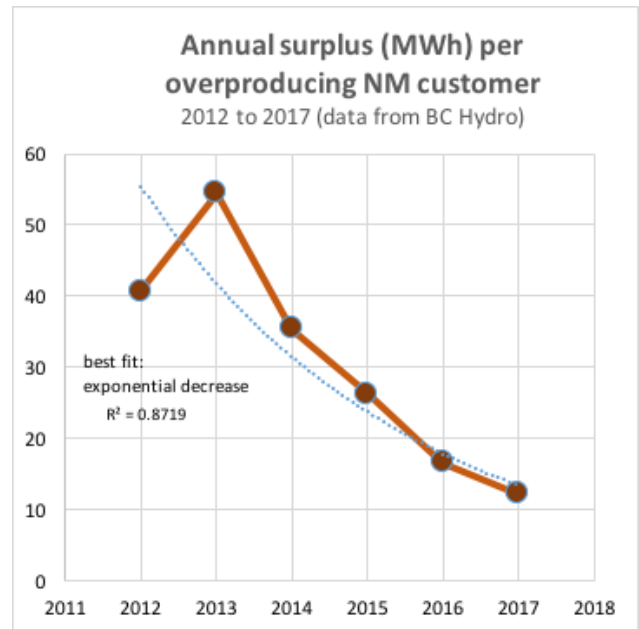
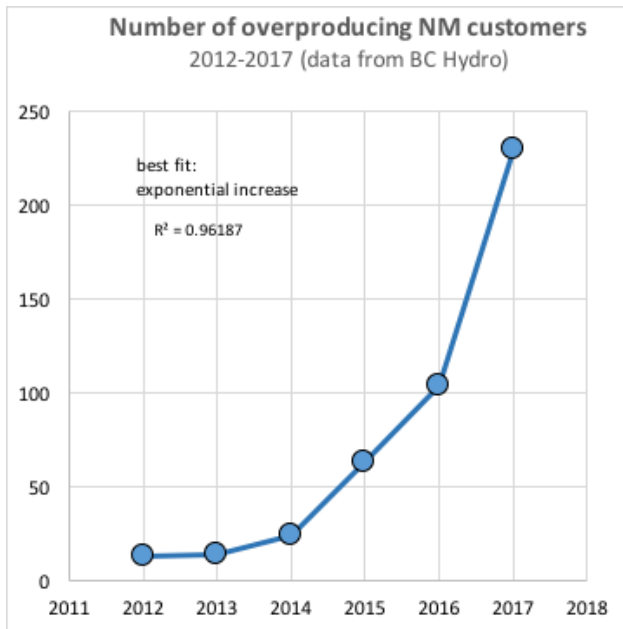


Fig 1a: Number of overproducing net-metered customers has increased since 2012. Fig. 1b: However, the amount of overproduction per customer has been decreasing exponentially, indicating that NM customers are not investing with the intent of large overproduction.

Order of magnitude error in calculations

BC Hydro presents two examples to support the supposed ‘rush’. One of the examples is for a residential customer who they claim installed a 50 kW service to offset a residential service of 10 kW. This is not **40 to 50 times** greater than the anticipated load, as BC Hydro claims: It is actually **5** times greater – an order of magnitude difference. It seems that they have mistakenly exaggerated their ‘perceived’ problem. The other example is for a commercial customer on a new service without providing any data. How does BC Hydro know the customer has minimal load when the

service is new? This highlights another problem with this application: BC Hydro has not indicated how they would determine the load for new services.

Sharp decreases in net metering rate do not attract investors

Without real evidence, it is hard to ascertain if the implied rush of people wanting to put in large PV, wind or RoR installations as money-spinning ventures is actually true. Anyone investing large amounts of money in oversized systems would be aware of the attack on net-metering in BC, including the successful application by Fortis BC in 2016 to drop the NM rate from 9.99 cents/kWh to 4.771 cents/kWh (BCUC approved in March, 2018). Similarly, BC Hydro’s own interim evaluation report on NM No.4 (April 2017) clearly states ‘that SOP rates will be decreased and NM rates are generally consistent with SOP pricing’.

Claims of large payouts impossible – must be another mathematical error

BC Hydro states that they have paid out between \$10,000 and \$60,000 to six NM customers for a total of \$220,000. It seems impossible for anyone to make \$60,000 from a 100 kW system, which is the NM limit. Using BC Hydro’s own numbers, a 100 kW RoR system generates a maximum of 400,000 kWh at a capacity factor of 0.4 (page 6-2 of the application). The maximum anyone could make at the NM rate of 9.99 cents/kWh is less than \$40,000, and only in the absence of self-consumption. A 100 kW PV system generates a maximum of 100,000 kWh at a capacity factor of 0.1 (page 6-2 of the application). The maximum anyone could make from a NM PV systems, at a rate of 9.99 cents/kWh, is \$10,000.

BC Hydro’s analysis shows NM customers are high electricity consumers – contributing \$18.6 million to BC Hydro’s bottom line!!

There appears to be a significant contradiction in the actual ‘losses’ that BC Hydro incurs through its NM program (\$280,000 to overproducers plus \$230,000 for administration). Assuming that the vast majority of NM customers are using solar (96% as per NM evaluation 2017), these customers averaging a capacity of 6.5 kW of PV will still purchase over 5000 kWh per year from BC Hydro. One would think that BC Hydro would be striving to retain these high energy consuming customers. As an aside, it is impossible to determine the delivery of grid-energy to the 640 NM customers in 2018, since the numbers included in the NM evaluation report (#4, 2017) do not make sense. The table in section 6.3 (page 16) claims BC Hydro delivered 163,543 MWh to 640 NM customers in 2016, amounting to 255 MWh per customer (!). In this case, BC Hydro would have received over 18.6 million dollars from their 640 NM customers.

	F2012	F2016
Number of NM customers	154	640
Total installed generation capacity, MW	0.9	3.8
BC Hydro delivered to Net Metering customers, MWh	29,545	163,543

Excerpt from table in section 6.3 of BC Hydro’s NM evaluation report from 2017.

2. Real problems with NM are not addressed

We agree there are problems with the current net-metering program. However, an interim ruling will not address the long-term systemic problems with BC Hydro's net metering approach. For instance, the NM program should evolve positively and not be amended with unjustified restrictions because NM had been applied inappropriately to large run-of-river projects. This flaw had been identified years ago, but no amendments were forthcoming. Why request what appear to be retaliatory measures for the 96% of customers with PV, when RoR is the problem and represents 1% of BC Hydro's NM customers.

BC Hydro does not allow community (virtual) NM – a standard practice in most north American jurisdictions - which presents a barrier to small (<100 kW) community installations.

Quirks in NM design result in perceived overproduction

The date at which a customer enters the NM program can create the appearance of overproduction, when in fact there really is none. If a NM customer enters into the NM program in October, BC Hydro monetizes the surplus accumulated during the months with high insolation on the customer's anniversary. Thus, the NM customer will not have any banked kWh going into the winter and may enter tier 2 pricing more often than necessary if they were able to draw on their kWh bank. A customer with the same generation who enters into the program in April will be using banked kWh during the winter and will likely never have a surplus to monetize. The appropriate fix for this issue would be to do all customer adjustments of surplus in March or April, so that all (solar) customers are given the chance to off-set their increased winter demand with kWh banked during the summer months.

Overall, the current set-up shows up as an 'overproduction' on BC Hydro's books, and brings inflated pay-outs to those overproducers, but in reality represents simply a quirk of how BC Hydro handles the NM program.

It is also important to reiterate that the numbers for overproduction presented by BC Hydro in this application are likely artificially inflated due to the fact that solar anniversary dates tend to peak in the fall. This gap will widen over time when net metering rates are decreased while the rates for consumed power continues to increase.

Another design flaw of the NM program is that generation from various sources with widely differing capacity factors (CF), like solar (CF 0.1) and RoR (CF 0.4) are lumped together, skewing the picture on overproduction. With its low CF, low risk and short installation times, solar should be treated separately.

There are other problems with the NM program that could easily be resolved with a proper review. We would like to participate in that review and offered some evidence of our expertise in the cover letter.

3. Chill on a burgeoning industry and on the general public

The application creates uncertainty around net metering in the general public and seems specifically aimed at erecting psychological barriers to renewables in BC. At the same time, it

exerts a chilling effect on the solar industry in BC - a burgeoning, job-creating industry that relies on BC Hydro's cooperation in every aspect of their industry.

4. Absence of injury to non-participating customers

Surplus from overgeneration is exaggerated

BC Hydro has not provided evidence of injury to non-participating customers. Total surplus generation from NM customers (in FY2017) was about 2.8 GWh, yet this compares to 57,652 GWh sold by BC Hydro in the year ending at March 31 2017. How can BC Hydro possibly make an economic argument for NM surplus 'affecting non-participating customers', when the entire NM overproduction amounts to a miniscule 0.006% of overall generation in 2017. We believe most non-participating BC Hydro customers would gladly absorb an 'upward rate pressure' of 0.006% due to generation of truly clean energy by overproducing NM customers. This rate increase should be compared to the - 500-fold higher - actual increase of 3% in 2018, as approved by the BCUC!

Even if NM took off **exponentially** in the next five years (*cf.* Fig. 1a) – which seems likely considering the interest our renewable energy co-operative encounters everywhere we make presentations on solar and other renewable energies (incl. non-traditional hydro) – the estimated 'overproduction' from all NM customers playing by the established rules, would amount to some 42.5 GWh in 2022, equalling 0.07% of BC Hydro's capacity in 2017. This number could not even remotely be interpreted as 'affecting non-participating customers'.

Non-existent 'upward rate pressure'

BC Hydro goes a little further in their NM evaluation report #4 by stating: "*The cost to non-participating customers increases as BC Hydro sees greater participation in the Net Metering program. A sustained increase in the number of Net Metering customers will contribute to a decline in base customer revenues which could result in upward rate pressure to BC Hydro and its customers.*" Here, BC Hydro appears to switch from complaining about the 'rush' and increased overproduction from a few customers, to commenting on the NM program in general. Again, the data fail to reveal 'upward rate pressure'. Assuming the previously mentioned exponential growth in NM customers, BC Hydro will have fewer than 10,000 net-metered customers by the end of 2022. This would mean that BC Hydro potentially loses some (not all) electricity-related income from 0.25% of their 4 million-strong customer base (BC Hydro website). Assuming linear increase in individual solar array capacity over these years (Fig. 2), overall NM capacity may reach 94 GWh, a miniscule amount compared with 57652 GWh generated by BC Hydro in 2017. Just to put this into perspective, those 10,000 NM customers by 2022 are a fraction of the annual net immigration of people into BC.

Inconsistencies with other BC Hydro Programs

One could equally interpret participants in BC Hydro's PowerSmart program as harming non-participants, because their investments in conservation result in an overall reduction in electricity sales similar to the NM program. As well, the rate structure with preferred rates for some customers, causes significantly more upward pressure on residential electricity rates than either the NM or PowerSmart programs. It appears that: 1. BC Hydro has failed to think this application

through; and 2. BC Hydro should not be an arbiter of energy conservation, because this clearly conflicts with their business model.

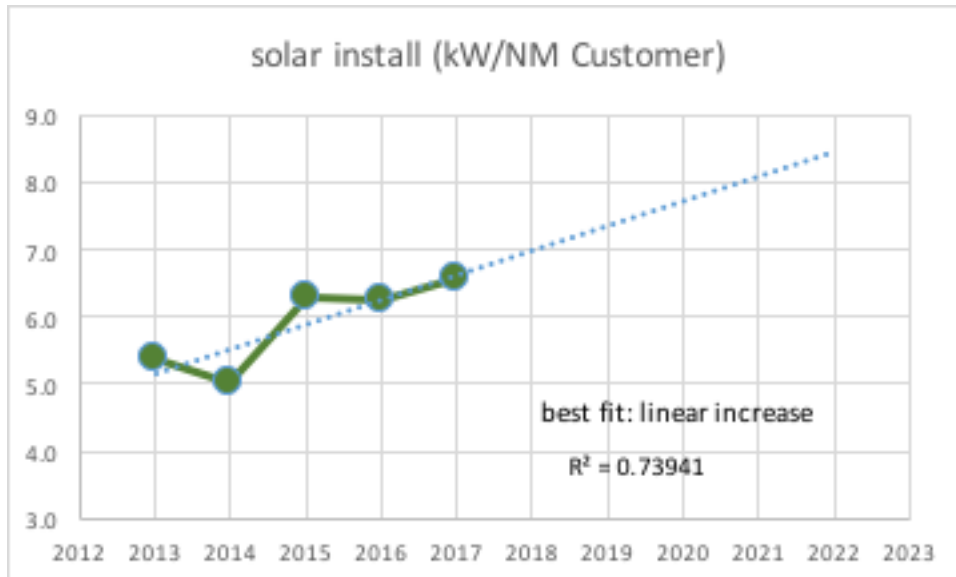


Fig. 2: Average size of a solar installation (kW/NM BC Hydro customer)

5. Positive effects of net-metering are ignored

Positive effects of NM on the Grid

BC Hydro in its Net Metering Evaluation report #4 (April 2017) states specifically that ‘customer generation may also allow BC Hydro to avoid or defer system costs or regional transmission such as upgrades to enhance the reliability of the system in a particular area’ (page 18/19).

Unfortunately, BC Hydro fails to provide any estimates for these cost savings on their part. Later in the report, BC Hydro comments that they are not aware of any avoided or deferred costs. ‘Not aware’ could be absence of data collection; or, it is possible that the contributions of other energies to the energy mix in BC (reminder: SOPs initially capped, currently suspended) are artificially kept too minute to exert any impact?

Positive effects of NM on greenhouse gas emissions and decarbonization

BC Hydro considers the costs of administering the NM program in RS 1289. We believe it is strange to consider as a negative the costs of administering a program that is good for climate change, good for customers and leads to decarbonization (Fig. 3). Every kWh produced by NM customers using solar, wind, geothermal and small hydro avoids the production of hundreds of grams of CO_{2(e)} compared with large-scale hydro or fossil fuels – an environmental and societal advantage that is ignored in BC Hydro’s narrative.

We also identified a weakness with the presentation of the costs (BC Hydro NM evaluation #4, Table 3, p.17). BC Hydro sums up the overall expenditure on the NM program over 3 years. However, the cost of the program per NM customer has actually decreased by almost 40% from 2014 (\$276/customer) to 2016 (\$175/per customer).

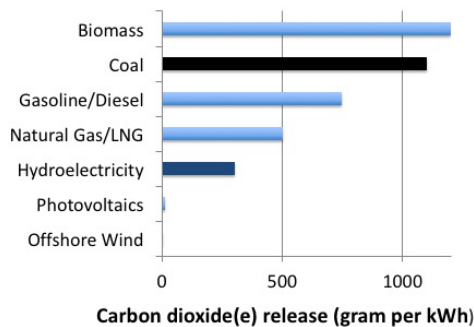


Fig. 3:
Carbon dioxide and methane production (expressed as CO₂(e) per kWh) from key energy carriers.

Positive effects of NM on local business and jobs

The NM program has had large positive effects on the BC economy and employment. In spite of restrictions and artificial barriers, solar NM customers (>96% of all BC Hydro’s NM participants), with an average PV array of 6.5 kW and an average cost of \$3500 /kW (installed) have contributed over \$ 26.5 million to the local economy, not forgetting that per kW installed, solar generates 10-times more jobs than traditional hydro.

6. Important details of roll-out are not considered

The application proposes to limit net-metering to a customer’s use as an interim measure. We believe that improvements are needed in the net-metering program, and we would be pleased to participate in a review of the NM program. Restricting production does not address the real problems with the program and key details are ignored.

No allowance for electrical vehicles

No allowance is made in the amendment for customers whose future demand may increase, due to their attempts to avoid fossil fuels and embrace clean electrical energy – like solar or wind – through the purchase of an electric vehicle. As data from the USA have shown, about half of EV owners also own solar arrays – with the crucial consequence that estimates for load demand due to increased EV penetration of the market tend to be twice as high as they should be.

No allowance for future electrification

BC Hydro fails to include a strategy to accommodate customers who increase their load by increasingly relying on electricity to: 1. Charge an electric vehicle 2. Heat a house with a heat-pump or geothermal, 3. Switch to ‘on demand’ electric hot water heaters and 4. Many other options to abandon use of fossil fuels and switch to electricity as a source of power. By preventing such increased demand through the proposed amendment, BC Hydro actively discourages GHG-sparing initiatives.

No allowance for new construction

No allowance is made in the application for new construction. Will the NM allowance be based in the average BC power consumption (11 MWh/y) or average consumption plus a substantial allowing for EVs, heat pumps, etc?

7. Unintended Negative Consequences for BC Hydro are not addressed

Grid defection

Wherever restrictive policies, including self-consumption caps, have been instituted in North America, many (solar) customers have become frustrated and abandoned their utility, resulting in 'grid defection'. This is as counterproductive to the utility as it is for the environment.

Utility death spiral

First, with customers abandoning the utility costs per remaining customers increase, initiating the so-called 'utility death spiral' hitting such utilities that refuse to recognize that a distributed model of energy production is the future. Restricting net-metering has a bigger potential effect on BC Hydro's bottom line and non-participating customers than improving the NM program to retain customers would.

Reversion to fossil fuels

Second, in regions of Canada with relatively small insolation in winter and (still) prohibitive costs of battery storage, such grid defection will result in previous grid-tied customers having to supplement solar/battery by burning fossil fuels, partially defeating the purpose of going solar in the first place. From a purely energy viewpoint, BC Hydro imposes wasteful and climate-forcing behaviour on ex-customers, since a large amount of the summer insolation will be wasted once the batteries are full and winter demand will be supplemented with burning of fossil fuels in times of insufficient insolation.

8. Silence on impacts on climate change mitigation and consideration of the future of BC's energy production

The interest of the rate-payers and of BC citizens, who deeply care about climate change, energy security, distributed generation and local jobs, is ignored in this application. Citizens are willing to invest their own money to do something positive about all these issues and a public utility is actively working to discourage a cleaner energy mix. Due to space limitations, we are not going to address the environmental impacts of large hydro developments, but if evidence is required that solar PV is significantly cleaner and less expensive than traditional hydro we would be happy to provide it.