

**Response to British Columbia Utilities Commission  
Information Request No. 1 On Shadrack Late Intervener Evidence**

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**FortisBC Inc.  
2016 Long Term Electric Resource Plan & Long Term Demand-Side Management Plan**

- 1.0 Reference: KASLO GREEN ENERGY OPPORTUNITIES  
Exhibit C10-9, pp. 20, 25; Exhibit B-11, BCUC IR 64.1; *The Clean Energy Act, Part 1*  
British Columbia energy objectives**

On page 20 and 25 of Shadrack Intervener Evidence, Mr. Shadrack (Shadrack) describes a potential Kaslo micro hydro system and solar electricity system.

*The Clean Energy Act* (CEA) includes as British Columbia (BC) energy objectives:

(a) to achieve electricity self-sufficiency; (c) to generate at least 93% of the electricity in British Columbia from clean or renewable resources; (g) to reduce greenhouse gas emissions; and (l) to foster the development of First Nation and rural communities through the use and development of clear or renewable resources.

FortisBC Inc. (FBC) states in British Columbia Utilities Commission (BCUC) Information Request (IR) 64.1 that it plans to purchase 89.9% of its energy from sources that meet the CEA definition of electrical self-sufficiency in 2017.

- 1.1 Does Shadrack consider that the potential micro hydro and solar electricity system project would be supportive of the BC energy objectives under the following scenarios: (i) the energy produced was used to displace lower-cost (non-BC, non-clean) market purchases; and (ii) the energy produced was used to displace lower-cost purchases from the British Columbia Hydro and Power Authority (BC Hydro)? Please explain.

**Response:**

The first determination must be to ascertain whether FBC would allow the Corporation of the Village of Kaslo to aggregate all of its accounts as one entity. In 2016 the Village purchased \$65,121.99 in aggregated electrical services (please also see response to BCSEA IR#2.5.1), and I estimate the value to offset that, at a net metered retail General Service tariff rate of \$.09921 per kWh, to be 656.406 MWh in 2016. Allowing the Village to offset all of its power service purchase costs meets the *Clean Energy Act* criteria of attaining “*electricity self-sufficiency*”, and in the long term would allow the local government to either lower taxes or focus those tax dollars on other services and projects, which in turn could assist businesses operating within the jurisdiction of the Village to lower their costs too.

Any production beyond that value should be used to displace non-BC and non-clean market purchases, noting that I question the economic viability of FBC building a solar PV farm pilot project in Kelowna and then selling that power at a retail rate of \$.231 per kWh when, in 2016, the Company could have purchased the same kind of power from the Village for \$.09921 per kWh.

Next, with reference to B-18 (FBC Response Shadrack IR#2.21.iii), I observe that net metering (NM) power has no fixed costs, whereas all other purchased power comes at 100% of what it is contracted at, while PPA comes in at 75% of annual nomination and 50% of contractual demand throughout the contractual period. In addition there is the whole question of factoring in the cost of line losses versus none to little with NM power, depending on the distance that it has to travel before it is resold.

What is actually needed is an actuarial table of FBC purchases, including their own power production, which shows the true cost of annual purchases from various sources, including net metered power, and not just the theoretical contract rate. Columbia Basin Trust's 2015/16 annual report, for example, notes that income from sale of Arrow Generation Station power will rise under a new contract, which begs the question as to what FBC's purchase price point differential is between PPA Tranche 1 and Arrow Generation Station power.

Without seeing a table that lays out what FBC is actually expending for what amount of power from each source, I cannot tell you whether NM power is actually more expensive than PPA Tranche 1 energy and/or whether PPA Tranche 1 is the fair price point to consider for NM Net Energy Generation (NEG), as I am not convinced that all the fixed and variable costs are being fully costed or discounted as in the case of NM transfers/purchases.

Generally speaking I am not in favour of FBC subsidizing power purchases, but we now have a contradictory situation in which BC Hydro is offering higher rates of purchase through its SOP, MSOP and Net Metering programs in the same economic region of British Columbia, which is leading to a bifurcated policy.

So the question has to be asked: should one utility, through its power purchasing policies, be allowed to impact the economic development of an entire region of British Columbia?

**2.0 Reference: KASLO GREEN ENERGY OPPORTUNITIES  
Exhibit B-1 (Application), pp. 74, 109, 127; The BC Energy Plan, Appendix A, p. 39;  
Exhibit B-11, BCUC IR 72.4, 75.2, 75.3.1  
Value of energy generated from clean distributed generation**

FBC states in response to BCUC IR 72.4 that net metering customers delivered approximately 310 MWh of energy in 2016. FBC further shows in Table 5-1 on page 74 of the Application, that the 2016 available energy volume from "Market and Other Contracts" is 241 GWh (or 241,000 MWh).

FBC also states in BCUC IR 75.2 that it cannot consider small-scale distributed generation, and in particular net metering, a long-term resource.

Policy Action No. 25 of the BC Energy Plan states: "Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources."<sup>1</sup>

FBC estimates the long-run marginal cost (LRMC) of its preferred portfolio (i.e. A4) at \$96/MWh, on page 127 of the Application. FBC further estimates on page 109, that the unit energy cost (UEC) of market purchases is \$34-\$64/MWh and the unit energy cost (UEC) of PPA Tranche 1 Energy is \$47-\$56/MWh.

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<sup>1</sup>[http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/bc\\_energy\\_plan\\_2007.pdf](http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/bc_energy_plan_2007.pdf)

FBC states in response to BCUC IR 75.3.1 that it does not believe it is correct to apply the BC Hydro Standing Offer program (SOP) adjustments to FBC. However, by applying SOP delivery factor adjustments to FBC's \$84/MWh LRM of acquiring energy, FBC estimates a seasonally adjusted LRM of \$81/MWh (i.e. 96% of FBC's LRM) for Photo Voltaic (PV) solar and \$78/MWh (i.e. 93% of FBC's LRM) for micro hydro.

- 2.1 Does Shadrack consider that clean distributed generation would be a short-term or long-term resource for FBC? Specifically, please describe:
- i. the expected variability in the volume of energy produced year-over-year for a portfolio of clean distributed generation that included micro hydro and solar electricity;

**Response:**

I think net metering, and distributed generation (DG) in general, deliver two kinds of electrical power to FBC:

- ii. reduced power consumption (solar produced power substituting for grid purchase power)
- ii. actual transfer of kWh

Between 2015 and 2017 our household has seen a permanent decline in grid consumption - from 15.5% in our first year of production to 24.7% in our third year, in the first four billing periods of the year, and a transfer of power to offset remaining grid consumption that has risen from 32.5% in year one to 73.7% in year three. That tells me that the bulk of these grid use declines are long term and should be treated as such by FBC.

It also tells me that it is perfectly feasible for FBC to sign long term power delivery contracts with net metering customers, as was the case with the proposed 1994 "Small Power Producer" micro-hydro contract that required the Village to deliver 50,000 kWh to West Kootenay Power Ltd (WKP), as per clause 4 of the agreement (see materials attached to BC Sustainable Energy Association and Sierra Club BC INFORMATION REQUEST ROUND NO: 2.5.1).

I would, for example, be perfectly happy to sign a 1 MWh annual agreement with FBC, and that kind of contract should not be any problem for any micro-hydro producer who has a relatively constant streamflow as the source of production. In other words I am willing to stand behind an 80% confidence level for delivery of NM produced power.

I also believe that I can operate our solar PV system such that our household would not draw power from the grid during peak hours for four, possibly five, of the billing periods during any year. Our household can currently determine when we heat hot water, as we have an on/off switch installed, and we can also determine when we use the stove top and oven. Other power consumption, I believe, can be taken care of through instructing the inverter to draw down on the batteries during peak hours and only allow top up of the batteries during non-peak hours.

To date we have run our system for up to eighteen hours in the middle of winter without any infusion of power from the grid, and we believe that we can run for up to 48 hours before our batteries would be fully drained, in the event that there was no-recharge from solar PV production.

I currently have a device attached to my computer via my modem (Schneider Electric Conext ComBox) that allows me to constantly monitor solar PV production from the system, as well as

the flow of power to the household (load), flow to and from the batteries, and flow to and from the grid.

What I still cannot do, as FortisBC only manually read their bi-directional meters (unlike BC Hydro who have now automated their bi-directional meter reading) is obtain computerized information from FBC on the flow of electricity to and from their grid. In fact I get more accurate statistics from the Schneider system, down to three decimal points in terms of watts transferred, than I do from the bi-directional meter that only works to the nearest kWh.

I thought the whole purpose of smart meters was to allow FBC and the customer to better manage the flow of power to the customer. However, to date my FBC online account cannot even handle the fact that I am transferring power onto the grid from my solar PV system.

Until FBC automates their bi-directional meters and allows a customer's inverter to talk to the FBC grid, I think that it is premature for FBC to claim that they cannot utilize net metered power as a long term resource, while in Europe and now in California, the combination of smart inverters and storage allows a customer to deliver power to a utility when they need it.

Instead of constantly telling the Commission about all the obstacles and barriers to DG and NM power being considered a long term source of electricity, why doesn't FBC outline the parameters that need to be considered for it to become a long term source, and then sit down and discuss with NM customers how they can work together toward that achievement.

- ii. the likelihood that the facilities be relocated outside of FBC's service area; and

**Response:**

There is, in my opinion, no possibility for the Corporation of the Village of Kaslo to relocate either the solar PV farm or the micro-hydro systems outside of FBC's service area, and wheeling the power to BC Hydro 14 km away in Schroeder Creek or 35 km to Nelson Hydro in Queen's Bay (on the south side of Coffee Creek) is likely not economically viable either.

This begs the question as to why one utility, FBC, should be allowed to potentially negatively impact economic development of an entire region and cause the rate of local government taxation to be higher than necessary.

A prime example of this situation is that of the Village of Slocan having to wheel power from its proposed micro-hydro project, inside FBC's service area, to BC Hydro, as FBC has thus far declined to purchase the production.

- iii. the ability of the customer to sell the energy fed into the grid to a party other than FBC.

**Response:**

Please see the response to 2.1.ii

- 2.2 Please estimate the annual cost to FBC ratepayers if FBC purchased energy from the Kaslo micro hydro and the PV solar project at a price of \$91.2/MWh (95% of \$96/Mwh).

**Response:**

If the Village of Kaslo is allowed to aggregate all of its energy purchases as one entity, there should be no cost to FBC ratepayers as the amount of electricity generated by the two micro-hydro projects should be less than that consumed by all of the Village accounts.

CEA estimates production from the micro-hydro plant at the reservoir at 149 Mwh, based on a 15 to 20 kW system, and the size of the KPR system is estimated at 12-15 kW. This should provide 264.5 MWH annually, though I note that Don Scarlett's original 1994 estimate was 7kW annual production, which calculates out to about 61 MWh annually.

At a General Service tariff rate of .09921 per kWh in 2016, the loss in revenue to FBC would have been between \$6,052 and \$26,241, less any fixed production/purchase and variable production/purchase costs that were not utilized in producing/purchasing and transmitting the power.

If the entire micro-hydro production range were to be purchased by FBC at the \$91.20 per MWh rate, the cost to FBC ratepayers would be between \$5,563.2 to \$24,095. In contrast, purchase of an equivalent amount of power from FBC's solar PV farm pilot project would cost FBC ratepayers between \$14,091 and \$61,100.

No size for the solar PV farm was given so it is not possible to estimate potential ratepayer costs.

- 2.3 Please estimate the incremental cost to FBC ratepayers assuming FBC would have otherwise purchased energy at \$50/Mwh.

**Response:**

At \$50 per Mwh, the cost to FBC ratepayers for the micro-hydro project would be between \$3,050 to \$13,225, which is between \$11,041 and \$47,875 less than the cost of purchasing an equivalent amount of power from FBC's solar PV farm pilot project.

- 2.4 Please estimate the percentage of FBC's total load that the output from the micro hydro and PV solar project would represent.

**Response:**

It is likely to be an immeasurable amount in relation to FBC's total load, but in reverse may have a measurable impact on the cost of operating the Corporation of the Village of Kaslo's utilities and hence the cost to resident and business taxpayers.

**3.0 Reference: KASLO GREEN ENERGY OPPORTUNITIES**  
**Exhibit B-2, BCUC IR 10.2; Exhibit B-11, BCUC IR 23.2, 72.2.2, 72.4.1, 73.3; BC Hydro Standing Offer Program - Program Rules, Version 3.2, April 2016, p. 4; BC Hydro Standing Offer Program - Standing Offer Program Review Engagement Guide, dated April 2014, p. 3; BC Hydro Micro-Standing Offer Program - Program Rules, Version 1.0, March 2017, pp. 3, 4; BC Hydro Application to Amend Rate Schedule 1289 - Net Metering Service and Cancel Tariff Supplement No. 63 – Net Metering Interconnection Agreement, Order G-57-12 and Reasons for Decision dated May 14, 2017, p. 21**  
**Market barriers to clean distributed generation**

FBC states in BCUC IR 10.2 that “the Company seeks to neither advantage nor disadvantage DG [distributed generation] regardless of size, type, or ownership” and also provides the following table:

DG Policy Issue	FBC Comments
Should grid-side benefits of customer DG be monetized and allocated among stakeholders?	FBC has a Self-Generation Policy Stage II Application before the Commission in which it proposes to share any net benefits of self-generation on a 50-50 basis between the DG customer and other customers.
Should DISCOs participate in DG?	Not Applicable.
Should DG interface with grid operations and markets?	Self-Generating customers in the FBC service area have access to markets utilizing the Company's Open Access Tariff and wheeling related rate schedules.
Should the interconnection technical requirements, processes, and contracts be modified for DG?	FBC has established interconnection guidelines that are applicable to DG customers.
Should utilities be compensated for stranded costs associated with DG installations?	In cases where assets are put in place to serve a load customer who then installs DG, it would generally be appropriate for the utility to be compensated for stranded costs.
Should utilities be compensated for providing standby services?	FBC has an approved standby rate.
Should siting and permitting requirements be modified for DG?	Not a consideration for the utility.
Should DG technologies be supported by financial incentives, subsidies, or public funding of R&D?	Not a consideration for the utility.

FBC states in BCUC IR 73.3 that “it does not consider it is currently incented to mitigate (or exacerbate) market barriers to DG [distributed generation] / SG [self-generation].”

FBC states in BCUC IR 72.4.1 that it does not consider distribution-connected generation is less mature of an industry compared to transmission-connected generation.

FBC states in BCUC IR 23.2 that it is possible that clean distributed generation resources could defer the requirement for network system reinforcement.

BC Hydro’s SOP rules, dated April 2016 state that eligible project size is over 100kW and up to and including 15MW, and that customers from a utility other than BC Hydro are not eligible.<sup>2</sup> Target volumes are limited to 150 GWh/year.<sup>3</sup>

BC Hydro’s Micro-SOP rules, dated March 2016, state that the program was developed as a component of the SOP to enable small-scale clean energy projects over 100 kW up to 1MW in BC, particularly for

<sup>2</sup><https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/standing-offer/standing-offer-program-rules.pdf>

<sup>3</sup><https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/standing-offer/standing-offer-program-engagement-guide-april-2014.pdf>

those developed by First Nations and Communities. It also states that projects must be located within BC Hydro's service area.<sup>4</sup> Available energy volumes are managed under the SOP.<sup>5</sup>

FBC states in BCUC IR 72.2.2 that, where a large commercial customer uses generation to offset against their own supply, the energy will inherently have a value to the customer equal to the retail rate. For a customer on Rate Schedule (RS) 30, that would be 5.6c/kWh and for a customer on RS 31 it would be 5.5 c/kWh.

The Commission stated, on page 21 in its 2012 Reasons for Decision attached to Order G-57-12 on BC Hydro's Net Metering tariff (RS 1289):

To this end, the Panel adopts the following evaluation framework for this Application:

- RS 1289 should not impose any unnecessary economic or other barriers to ratepayers seeking to install small-scale clean DG.
- RSA 1289 should not incur any substantial cost on the utility.
- Interconnections must be safe, but interconnection rules must not be excessive or burdensome.

3.1 Does Shadrack consider that FBC should mitigate market barriers to clean distributed generation? Please explain.

**Response:**

FBC should have a clearly worded tariff rate schedule (RS) 95 that is both easily understandable and contains all of the rights and obligations of the Company to the customer, so that there are no surprises after a customer-generator has made his or her long term investment and enrolled in the NM program.

FBC should also survey its NM customers to directly find out what market barriers they face and have direct discussions with NM customers to see if the Company and the customer-generators can implement some mutually beneficial changes to the program.

I also think that the Commission needs to assess the fact that BC Hydro has a MSOP policy for between 100 kW and 1 MW, whereas FBC only has an NM program up to 50 kW and no MSOP policy at all. As well, the Commission needs to assess what the impact is on economic development for First Nations and rural communities within the FBC service area given the requirements of the *Clean Energy Act* and stated objectives of the 2007 *BC Energy Plan*.

I also think that the Commission needs to be aware that some FBC customers are now so frustrated with FBC that they are actively considering organizing a petition to apply to the Commission to have the FBC service area, located between Nelson Hydro and BC Hydro at the north end of Kootenay Lake, relocated to BC Hydro.

I am not one of those customers, but I am extremely frustrated at our inability as customers to be able to sit down with FBC and discuss distributed generation policy and NM policy in specific.

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<sup>4</sup><https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/standing-offer/micro-sop-program-rules.pdf>

<sup>5</sup>[https://www.bchydro.com/energy-in-bc/acquiring\\_power/current\\_offerings/micro-sop/current-applications.html](https://www.bchydro.com/energy-in-bc/acquiring_power/current_offerings/micro-sop/current-applications.html)

3.1.1 Please identify the market barriers, if any, faced by investors looking to invest in the Kaslo micro hydro and solar PV projects.

**Response:**

First I want to acknowledge that FBC is helping to fund the RDCK's SCEEP. However, as an ex-RDCK director I note that we had considerable difficulty persuading FBC to initially help us convert RDCK lighting to LED lights, until we pointed out that (after a Federation of Canadian Municipalities conference) the city of Halifax had both installed and was operating LED lighting.

That said, FBC has no acknowledged policy as to what percentage of its load it would accept from distributed generation and NM customers, and unlike BC Hydro it does not promote its NM program on its website:

<https://fortisbc.com/Electricity/CustomerService/NetMeteringProgram/Pages/default.aspx>

[https://www.bchydro.com/search.html?site=bchydro-com&client=bchydro-com&proxystylesheet=bchydro-com&output=xml\\_no\\_dtd&q=Net+Metering+Program](https://www.bchydro.com/search.html?site=bchydro-com&client=bchydro-com&proxystylesheet=bchydro-com&output=xml_no_dtd&q=Net+Metering+Program)

Specific market barriers include the fact that BC Hydro's NM NEG, SOP and MSOP purchase prices are currently above their tier 1 residential rate, and very close to their small commercial rate. In contrast, FBC, while currently paying retail rates for NM NEG, has no defined MSOP purchase price, and is actively applying to the Commission to reduce/eliminate NM NEG and reduce NEG payments, when they occur, to less than half the current value.

Further, BC Hydro's basic charge for residential customers is 18.99 cents per day whereas the equivalent for FBC is 52.75 cents, and that for small commercial customers is 24.29 cents in the BC Hydro service area compared to an equivalent of 63.78 cents in FBC's. Consequently any residential or small commercial customer trying to offset the cost of the basic charge through NM currently has to produce and transfer between 263% and 278% more electricity to do that in the FBC service area, and if FBC obtains approval to more than halve the value of NEG (if they allow its sale at all), the amount of electricity produced is going to be between 500% and 600% higher than in the BC Hydro service area.

Given that outside the Okanagan FBC service area there are no communities with populations at or above 10,000, FBC's policy is having a huge impact on economic development, which can be seen in the fact that BC Hydro NM projects in north Kootenay Lake are already double the size of those in the FBC service area (C10-8, BC Sustainable Energy Association and Sierra Club BC Information Request #1 Response, 1.5, P.6).

3.2 Please explain whether there could be any grid-side benefits arising from the Kaslo micro hydro and the solar PV project (such as deferral of network infrastructure investment). If yes, please explain whether, under existing FBC policies, project investors would be compensated for this benefit.

**Response:**

Beyond any power consumed in the Kaslo and Area D service area, FBC also has a wholesale service contract for the BCH Lardeau Valley service area, so the power produced in Kaslo would be immediately available for resale at a lower line loss level than if it were transmitted from

FBC's hydro-electric production facilities some 100 km plus away.

FBC has not either acknowledged the existence of or offered to compensate NM customers for the line loss premium their power provides to the Company.

Beyond the issue of line loss, I would first refer to the observations and testimony of James Greavatt, of Energy Futures Group Inc (C5-5, BCSEA Submitting Intervener Evidence) who is probably much more well versed in understanding "non-wires alternatives" than I am.

Finally I will refer to FBC's answer in B-9 to Shadrack's IR#1

*Please list the documents and reference the sections where FBC has previously provided to the BC Utilities Commission cost benefit analyses of the overall positive and negative financial and system stability attributes of Distributed Generation (DG) and Net Metering (NM) in particular.  
Response:*

*FBC is not aware of any such submissions to the BCUC."*

And then note their answer at B-9 to Shadrack's IR#1.5.iv:

*"Are there remote and rural portions of FBC's service delivery area where take up of FBC's NM program, using micro-hydro, wind or solar PV etc, would allow FBC to defer upgrades of transmission lines, etc?"*

*Response:*

*No. Assuming a level of program uptake such that localized, aggregated Net Metering (NM) systems could have an impact on actual system peak loads and thereby influence FBC's load forecast, NM systems could in theory result in the deferral of future capital growth projects.*

*However, given the uncertainties associated with non-firm power produced by customer DG, it is not considered a practical alternative to the firm capacity and the more certain construction timelines associated with conventional infrastructure upgrades. The primary issues are that net generation produced by NM customers is often intermittent and is unlikely to peak concurrently with system peak load".*

As a life long social scientist I do not see how FBC can make these kinds of assertions, without first undertaking the studies and holding the discussions to see what might be feasible under the circumstances.

3.3 Please explain whether there are market barriers related to being compensated for the value of energy generated from the Kaslo micro hydro and the solar PV project. Please include a description of the options available to the Kaslo micro hydro and solar PV for the sale of their energy, including:

- net metering rates;
- sales to BC Hydro or FBC under 'standing offer' programs;
- sales to Powerex and/or marketers; and
- sales into the Mid-C spot market (i.e. using the Open Access Transmission Tariff).

**Response:**

I believe that I have already explained some of the market barriers in answering 3.1.1 and 3.2 above, but will list them again:

- i. BC Hydro's NM NEG, SOP and MSOP purchase prices versus FBC's proposed NM NEG purchase price, and an assumption that FBC's SOP price, if it exists, is very similar to its PPA Tranche 1 proposal for NM NEG.
- ii. Basic charge price differential between BC Hydro and FBC, and the ability to offset the basic charge and at what transfer value to FBC.
- iii. Lack of FBC MSOP.
- iv. Unwillingness of FBC to consider purchase of micro-hydro power produced by the Village of Slocan, despite requirements of section 2 (l) of the *Clean Energy Act*
- v. Uncertainty surrounding FBC's NM program that has been going on since July 2016.

I do not have the knowledge or time to speak to the available wheeling opportunities, other than to observe that small producer projects that are already proposing to operate in very marginal economic situations do not need additional costs such as wheeling charges.

3.3.1 Please explain whether opportunities to access the market exist. If yes, do you consider them overly-complex for clean distributed generation investors?

**Response:**

I have confirmed with the Mayor of the Village of Slocan that FBC has so far declined to purchase power produced by their proposed micro-hydro project, and that, as a result, this local government is in discussion with BC Hydro about wheeling the power to them.

Absence of a MSOP policy in the FBC service area is a huge disadvantage for local governments, small businesses and residential customers who are considering developing DG systems that would interconnect with the FBC grid.

The further fact that FBC declined to rewrite the RS 1295 NM tariff wording as directed, but instead chose to seek reconsideration of all key issues instead, and add in a claim to a previously undeclared right, means that currently FBC customers have no clearly agreed upon small producer program that they can consider investing in.

3.3.2 Please explain whether some or all of the energy produced by the Kaslo micro hydro and the solar PV projects could be offset against retail rates (i.e. whether it is 'behind-the-meter' generation). If yes, please estimate the credit that would be received.

**Response:**

My understanding is that in 2016 the Corporation of the Village of Kaslo expended \$65,121.99 on purchasing electrical services from FBC. At the then small commercial rate of \$.09921 per kWh, 656.406 MWh would have to be produced to offset that total service cost, whereas my estimate of the power production available from the Green Energy Scan calculations is that only 264.5 MWh would be produced annually.

Therefore all of the power produced at the two micro-hydro sites could be used to offset retail purchases made by the Village, on all of their accounts. Having no estimate of the potential production level for the proposed solar PV system, I cannot estimate any potential offset value.

The above would be moot if each metered account was treated as a separate entity as is noted in the CEA report.

3.3.3 Please describe and explain the option Shadrack considers would be most appropriate to mitigate any 'access-to-market' barrier for the Kaslo micro hydro and the solar PV project (e.i. expansion of the net metering program, micro-SOP, SOP, Open Access Transmission Tariff, etc.).

**Response:**

i. I think that the first option that should be available to the Corporation of the Village Kaslo is for them to be able to treat all their electric accounts as a single entity, in terms of being able to offset power purchases at retail rates.

ii. Then, given the current differentiation in basic charge costs between BC Hydro and FBC, and the proposed purchase price rates for NEG between BC Hydro and FBC, I then think that FBC customers should be allowed to offset the basic charge at retail rates as well.

3.4 Does Shadrack consider that FBC interconnection arrangements are overly-complex for clean distributed generation investors? Please explain.

**Response:**

I found the FBC net metering agreement that I signed:

<https://fortisbc.com/Electricity/CustomerService/NetMeteringProgram/Documents/Net%20Metering%20Interconnection%20Agreement%20final.pdf>

...very one sided, in that it outlines all of the obligations that the contractor and customer-generator have to abide by, but none of the obligations of FBC to the customer-generator, and it completely missed out that FBC subsequently claimed that it had a right to remove a customer from the program for producing excess NEG.

After I read it the first time I wondered why FBC was a signatory to the agreement as they did not spell out any of their obligations to the customer, which are actually found in tariff RS 95.

For the average customer I am sure that the NM Interconnection Guidelines are quite technical, but very necessary for the contractor and self-installer to understand.

3.5 Does Shadrack consider that clean distributed generation is an 'immature industry' compared to transmission-connected generation? Please explain.

**Response:**

Yes, compared to Europe and some US states like California, I find FBC's approach to lack the

same understanding that BC Hydro has, for example.

FBC has only done one NM report to the Commission in the eight years since the program's inception, and to the best of my knowledge the NM program enrollee group as a whole has never been surveyed to ascertain their thoughts on how the program could be improved.

In contrast BC Hydro has now done, I believe, three reports, including customer-enrollee surveys. It also promotes the program on its website, holds webinars, and sends out regular email updates.

In California, where 13.4% of the state's energy is now produced by solar PV, the California Public Utilities Commission has been a leader in driving a consensus-based process, which has brought together utilities, customer groups and manufacturers to resolve DG issues:

<https://www.solarpowerworldonline.com/2014/10/understanding-california-rule-21-means-solar-inverters/>

<http://www.irecusa.org/2016/06/californias-rule-21-decision-comes-with-big-wins-for-customers/>

Why can we not have the same consensus driven approach to DG in BC, instead of the debilitating legalistic-technical adversarial approach that we appear to be trapped in now?

3.5.1 If yes, does Shadrack consider that there could be a net benefit to BC if FBC attempted to mitigate this market barrier, provided it does not result in a substantial cost to the utility? Please explain.

**Response:**

Not unlike large commercial enterprises, like Celgar, small rural local governments and commercial businesses are looking for innovative ways to lower operational costs by finding alternative sources of revenue. DG, whether it be through a MSOP or NM program, has that potential.

Further, in C10-8 I provided background information in Shadrack Evidence Information Request #1: Background Information 2016 NM#1 FortisBC Electrical Charges and Net Metering Transfer Values that showed that an NM Program residential enrollee could eliminate paying tier 2 residential rates by offsetting tier 2 consumption values during other times of the year.

Thus the FBC NM program has huge potential to assist electric heat customers (who do not have access to natural gas) eliminate their tier 2 power costs altogether. In addition the NM program has the potential to assist natural gas customers switch to electric heating that can be offset by an NM installation, so that they never have to pay tier 2 residential rates either.

**4.0 Reference: KASLO GREEN ENERGY OPPORTUNITIES  
Exhibit B-2, BCUC IR 11.3  
Technical considerations**

FBC states in BCUC IR 11.3 that the connection policy does not address distribution stability concerns.

- 4.1 Please explain whether the Kaslo solar electricity project could include advanced inverters. If yes, please explain whether this would allow the project to improve grid stability, support power quality and provide ancillary services.

**Response:**

With reference to my answer in 3.5, my initial answer is yes, the technical capability now exists to do that. Further, having visited the Drake Landing Solar Community (DLSC) project in Okotoks in the late 1990's, as part of an Alberta alternative energy tour organized by the Canadian Federation of Municipalities, I believe that it is likely that storage solutions like those used by DLSC, and more advanced solutions, will address FBC's concerns about timing and flow of intermittent resources such as solar PV.

Having seen a flow of electricity from my batteries to the FBC grid when my solar PV system is not producing, for example, I believe that I have an inverter that could deliver up to 12 kWh of stored electricity to FBC over a defined period of time, and then those batteries could be recharged either in the off-peak from the grid or by production during the off-peak.

**5.0 Reference: KASLO GREEN ENERGY OPPORTUNITIES  
Exhibit B-2, BCUC IR 11.6; Exhibit B-11, BCUC IR 73.1  
Level playing field**

FBC states in response to BCUC IR 11.6 that the Community Solar Pilot Project being considered by FBC would be included in rate base and that self-generators are not in a position to make an investment that is analogous to the Community Solar Pilot Project.

FBC was asked in BCUC IR 73.1 whether it ensures customer investments in PV are on a level playing field with its own PV investments.

- 5.1 Please explain whether the Kaslo solar electricity project could be considered analogous to the FBC Community Solar Pilot Project.

**Response:**

As noted earlier:

Policy Action No. 25 of the BC Energy Plan states: *"Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources."*

So it is not just about the Village of Kaslo or the Village of Slocan, it is about the *"aggregate value"* that intermittent resources could provide not simply to FBC, but also to very small rural local governments and micro-businesses who are always creatively looking for alternative sources of income.

FBC is guaranteed a rate of return on all its investments, and the proposed contract between WKP and the Corporation of the Village of Kaslo in 1994 proposed a set rate of return in exchange for a minimum amount of electricity being generated annually.

The current FBC NM program only guarantees a kWh exchange value up to the point that the kWh purchased are matched by the kWh transferred back to the grid. After that FBC is proposing to only pay the close to lowest value for power that would be used to offset basic charges and taxes, and even then it wants to reserve the right to remove certain customers from the program for producing excessive NEG.

Imagine if the Commission told FBC that it would only guarantee FBC a certain rate of return on a portion of the power it supplied to its customers, a lower rate for a certain portion, and none at all for an amount above that. So no, the situation is not analogous at all.

Customer-generators, be they local governments, or small or large commercial or residential, need some kind of certainty of return on their investment like FBC.

5.2 Does Shadrack consider that FBC policies result in a level playing field between customer investments in PV and its own proposed PV investments? Please explain.

**Response:**

No. I have no problem with FBC ensuring that it obtains a “fair” return on capital investment, and ensuring that customer groups do not cross-subsidize each other “unfairly”. That said, FBC has not, so far, considered in its applications how it could address or work with DG investors to make sure that they obtain a fair return on their capital investment also.

FBC’s solar PV farm pilot project in Kelowna proposes a \$.231 per kWh retail rate, however the Company never considered inviting pre-existing NM customers to enter into a joint venture so that a blended rate could be charged that was the equivalent of the current tier 2 residential rate of \$.15617 per kWh.

While I am aware that FBC currently has no generation capability in the Okanagan, I observe that a joint venture between FBC and its current NM customers could deliver solar PV power into practically every service area neighbourhood under a slogan like:

*“Buy clean green power from your neighbour”*

Instead FBC proposes to sell solar PV power from a single centralized plant in Kelowna to customers all over its service area, with all the resultant line losses that that entails. In contrast FBC could have, in a joint venture, stated:

*“Our partners in the West Kootenay include the Villages of Kaslo and Slocan and your neighbours”.*

*“Supporting local investment, creating jobs and providing electricity where you live”.*

That is why I signed up to the NM program: to become a partner with FBC in providing excess power to my neighbours, thus offsetting FBC’s need to transmit power over great distances, over 100 km, to supply them.

Consequently I think that the idea of the Villages of Kaslo and Slocan supplying power from their water systems, as does the Village of Nakusp, to their respective communities makes infinite sense and assists them in lowering the operating cost of those utilities.

I was on the RDCK Board when the Village of Slocan had to make the tough choice to withdraw from many shared RDCK programs when it lost its industrial tax base, after the lumber mill closed, and I understand that the investment in the proposed micro-hydro system is an attempt to recapture some of that lost revenue.

DG, including NM, represents a huge economic development opportunity in the rural and remote areas of BC, but in order for that to happen the utility companies need to become and remain partners in that joint venture.