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July 7, 2017

Resolution Electric Ltd.
600 Wike Rd
Kelowna, B.C.
V1W 1A7

Attention: Mr. John Cawley, ASCT

Dear Mr. Cawley:

Re: FortisBC Inc. (FBC)
Project No. 1598911
Application for Community Solar Pilot Project
Response to Resolution Electric Ltd. (Resolution) Information Request (IR) No. 1

On April 26, 2017, FBC filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-89-17 setting out the Regulatory Timetable for the review of the Application, FBC respectfully submits the attached response to Resolution IR No. 1.

If further information is required, please contact Corey Sinclair at 250-469-8038.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties



FortisBC Inc. (FBC or the Company) Community Solar Pilot Project Application (the Application)	Submission Date: July 7, 2017
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1 **IR#1**

2 **Reference Exhibit B-1 Community Solar Pilot Project**

3 **Section Executive Summary; page 6 Lines 4-6**

4 *“The CSPP is proposed for the Ellison area in the north of Kelowna, and will provide an*
5 *opportunity for FBC customers to meet a portion of their needs with solar power.”*

6 Please explain the consideration for choosing the Ellison location, and did FortisBC consider
7 other substation locations for the pilot solar project? What other location options are available to
8 expand the solar pilot project should the pilot program prove popular?

9

10 **Response:**

11 Please refer to the response to ICG IR 1.4.2.

12

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15 **IR#2**

16 **Reference Exhibit B-1 Community Solar Pilot Project**

17 **Section Executive Summary; page 6 Lines 29-30**

18 *“FBC may add the FortisBC Solar Offset as an available rate option, if the Company believes*
19 *that rate option will attract additional subscribers.”*

20 Please explain how this second rate would attract more customers? Given the challenge of
21 managing a varying customer electrical demand vs varying solar energy output how do FortisBC
22 propose to manage the complexity of this system billing option?

23

24 **Response:**

25 The Company believes that individual customers may have a preference for one of the two rate
26 structures described in the Application. In the event that the Virtual Solar rate offering does not
27 result in full subscription of the output, there may be additional customers that respond to the
28 additional choice. While the additional option would complicate billing (which is a reason it is
29 not being offered initially) FBC will ensure that the sum of subscriptions to both options is limited
30 to the total expected output of the array.

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1 **IR#3**

2 **Reference Exhibit B-1 Community Solar Pilot Project**

3 **Section Community Solar Pilot Opportunity; page 8 Lines 2-3**

4 *“The CSPP is not a significant source of energy in the context of FBC’s overall requirements;*
5 *the Program is driven primarily by customer considerations.”*

6 Please explain which customer consideration you are addressing given the cost of the solar
7 option is significantly higher than regular retail rate? The results of the survey indicate cost
8 reduction as the number one driver with a residential survey result of 81% (page 44).

9

10 **Response:**

11 The customer consideration driving the Application is the desire on the part of some customers
12 to meet a portion of their electricity needs with energy derived from a solar resource. There is a
13 subset of these customers that are not able to install rooftop solar that could be served from an
14 installation of this type. FBC notes that it has experienced an annual increase in participation in
15 its Net Metering Program despite the relatively high cost of this source of supply relative to retail
16 energy rates so comparative power prices do not always seem to be a deterrent to participation
17 in the solar arena.

18

19

20

21 **IR#4**

22 **Reference Exhibit B-1 Community Solar Pilot Project**

23 **Section Customer Feedback; page 9 Lines 12-14**

24 *“Key results of the survey indicate broad support for FBC to begin offering solar energy as an*
25 *alternative to help meet customer demand, with three-quarters of both residential and*
26 *commercial customers stating that FBC should offer solar.”*

27 Please indicate what the percentage of customers would support FBC offering solar at the cost
28 levels proposed. Given that the following paragraph on page 49 of the survey states;

29

30 *“Among those who think that FortisBC should offer solar electric energy as an*
31 *alternative, 10% would definitely consider contributing a small amount on a*
32 *monthly basis to help offset the increased cost of generating solar energy”*

33

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1 **Response:**

2 One of the stated reasons for running the Program described in the Application as a pilot is to
3 gauge customer interest and participation. The Company cannot speculate at participation
4 levels beyond the information provided by its customer research and its expectation that the
5 CSPP will be fully subscribed.

6

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9 **IR#5**

10 **Reference Exhibit B-1 Community Solar Pilot Project**

11 **Section Customer Feedback; page 9 Lines 16-18**

12 *“However, there are a number of strong secondary reasons, beginning with GHG emissions*
13 *reductions, followed by energy independence, resource preservation and energy security.”*

14 Given the limited knowledge of market researchers asking the questions and typical customers
15 answering the survey would FortisBC accept these secondary reasons as legitimate reasons?
16 Main questionable responses are the “energy independence” and “energy security”. Would
17 FortisBC accept these results to be customer misconceptions? If not please provide an
18 explanation on how you would market the Ellison solar generation with respect to “energy
19 independence” and “energy security” for the customer education.

20

21 **Response:**

22 FBC has presented the research results as generally supportive of the rationale for developing a
23 solar resource. The Company believes that a segment of its customers are supportive of utility
24 involvement in providing solar options. This belief is supported by the customer research and
25 other less formal customer interactions. It is unlikely that there is a single interpretation by
26 customers of the meaning of terms such as energy independence and energy security so FBC
27 does not believe that they can be dismissed as misconceptions. However, and in part for this
28 very reason, it does not plan to market the CSPP in these terms. The CSPP is only portrayed
29 as an option that allows customers to purchase, on a voluntary basis, a portion of their energy
30 needs from a solar resource.

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1 **IR#6**

2 **Reference Exhibit B-1 Community Solar Pilot Project**

3 **Section Background; page 11 Lines 9**

4 With reference to the Compass report in pdf format the following statement is quoted from page
5 12 of the report

6 “Choosing the correct technology for a given project involves a trade-off between
7 system efficiency (kWh/kW) and overall project economics and cost (LCOE, or
8 \$/kWh)”.

9 FortisBC have already indicated the use of Mono-crystalline technology, please indicate what
10 technology is to be used for the DC/AC inverter, and if module level monitoring is offered as an
11 option. What is the expected lifespan of the inverter technology?
12

13 **Response:**

14 SkyFire has proposed to use SMA Sunny Tripower 24000TL-US inverters for the CSPP.
15 Technical information regarding this product is readily available on SMA’s website.

16 While module-level monitoring is possible, FBC has designed the system to be monitored at the
17 inverter-level, not at the module-level. The inverters will be monitored by an SMA Cluster
18 Controller.

19 The lifespan of an inverter typically ranges from 10 to 20 years; however, the lifespan is highly
20 dependent on the surrounding environment.

21
22

23

24 **IR#7**

25 **Reference Exhibit B-1 Community Solar Pilot Project**

26 **Section Background; page 11 Lines 24-27**

27 *“The proposed Community Solar Pilot Program will provide an opportunity for*
28 *those customers not able to install a PV system, such as those that live in rental*
29 *properties, MURBs, or townhomes, **or that cannot afford the up-front capital***
30 ***costs, with a new renewable energy option.”***

31 Have FortisBC reviewed customer assistance financing which is secured to the utility bill to
32 assist with the full or partial installation cost to alleviate the up-front costs of solar PV for
33 customers?

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1 This is a current offer on your website for Kelowna customers for heat pump technology
 2 <https://www.fortisbc.com/Rebates/RebatesOffers/Pages/Results.aspx?type=homes&city=Kelowna>
 3 [na](#)



Heat pump loans

Instead of a rebate, finance your heat pump with a low 1.9 per cent interest rate.

Up to \$6,500
loan

4

5 **Response:**

6 FBC last reviewed solar PV technology for DSM-related cost-effectiveness in 2010, and at that
 7 time residential PV installations did not meet the Total Resource Cost test and FBC therefore
 8 did not offer incentive or financing programs. The measure has not been evaluated since.

9

10

11

12 **IR#8**

13 **Reference Exhibit B-1 Community Solar Pilot Project**

14 **Section Project Proposal & Cost Estimate; page 13 Lines 16-18**

15 *“FBC has added a 5% contingency amount to all costs, reflecting that the majority of costs will*
 16 *be firm per the Skyfire contract. These amounts are set out in Table 4-1 below, which shows the*
 17 *total estimated capital cost of \$961 thousand, or \$3.9 CAD/Watt.”*

18

19 Given the final cost could finish at \$4.095 / Watt, can FortisBC justify the proposal as financially
 20 viable (or value for money) to people seeking power who live in rented accommodation of in
 21 MURB’s? How confident is FortisBC in selling the proposed 720 modules / output?

22

23 **Response:**

24 FBC is not seeking to justify the Project on the basis that it provides an economically attractive
 25 source of energy. The output of the array is clearly priced above retail rates. However, the
 26 economics of installing solar facilities to supply individual premises does not seem to be an
 27 important consideration given the increasing rate at which it is occurring (as evidenced by net
 28 metering installations in the province). FBC believes that the Project will be fully subscribed or it
 29 would not have proposed the Project at this time. However, the proposal is structured as a pilot
 30 in part to verify the level of customer interest.

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4 **IR#9**

5 **Reference Exhibit B-1 Community Solar Pilot Project**

6 **Section Project Proposal & Cost Estimate; page 14 Lines 4-7**

7 *“FBC expects that operations and maintenance (O&M) for the facility will begin at \$9 thousand*
8 *in 2019 and escalate at 2 per cent inflation thereafter. Forecast O&M costs are included in the*
9 *rate calculations and are forecast to be fully collected from participants in a fully subscribed*
10 *Program.”*

11 After reviewing the budget for annual O&M costs it appears a significant costing is missing. I
12 refer to the anticipated replacement cost of the inverter technology after year 15 and year 30.
13 Please explain your reasons for omitting this significant O&M costing? Advise on the anticipated
14 replacement costs for the inverter technology and recalculate the projects expected
15 maintenance costings over the life of the project.

16 Factoring in for anticipated inverter replacements please indicate the recalculated project
17 offering for cost per kWh and / or monthly module rental.

18

19 **Response:**

20 Please refer to the response to ICG IR 1.4.4.

21

22

23

24 **IR#10**

25 **Reference Exhibit B-1 Community Solar Pilot Project**

26 **Section Rate Descriptions; page 18 Lines 30-31**

27 *“The BC Hydro Power Purchase Agreement (BCH PPA) has been assumed as the resource to*
28 *value energy displacement cost due to solar generation.”*

29 In the event of low customer take-up on this pilot project, FortisBC assume the cost of power to
30 be set at the BCH 3808 rate, however this BCH rate is inclusive of their generation O&M costs.
31 FortisBC anticipate an additional cost of \$9,000 per year, increasing at a rate of 2% per year.
32 Given that the O&M cost for operating the Solar Pilot operation are approximately 64% (\$9,000 /
33 \$14,000) of the wholesale value of the kWh output of the system, total cost per kWh is

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1 approximately 8.13 C/kWh (\$23,000 / 282,939kWh). Please comment on how this is a fair
2 proposal for the rate base to absorb the excess kWh in the event the pilot program fails.

3

4 **Response:**

5 When FBC states that BCH 3808 has been assumed as the resource to value energy
6 displacement cost due to solar generation, it means that when one kWh is generated from the
7 solar array it will displace one kWh of BCH 3808 power. This displacement will happen
8 regardless of whether the output of the solar array is subscribed or not.

9 In the event that the pilot program is not subscribed, it is the marginal cost of the two resources
10 that should be compared. In this case, FBC will receive the output of the solar array for
11 approximately \$9,000 per year of O&M, versus purchasing BCH 3808 power at approximately
12 \$14,000. FBC would not be paying both costs, just one or the other. The embedded
13 undepreciated capital cost of the solar array in rate base is not relevant to this comparison.

14

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17 **IR#11**

18 **Reference Exhibit B-1 Community Solar Pilot Project**

19 **Section Rate Schedules Terms & Conditions; page 21 Lines 17-18**

20 *“Based on FBC’s experience with this pilot, there may be future solar projects for which rates*
21 *may need to be developed. To accommodate this eventuality, the rate schedules have been*
22 *drafted such that rates will be specific to “Defined Solar Generation Resources, or DGSR”. This*
23 *will allow for future solar projects to be added to the existing rate schedule as they are approved*
24 *by the Commission. In the current case, the DGSR is defined as the Ellison Solar Array.”*

25 11.1 Please explain which additional rates FortisBC refer to. And with reference to
26 other locations if the Ellison Solar Array proves successful please indicated how
27 the cost per kWh or monthly leasing cost would be calculated given the solar
28 exposure and associated solar array output can vary significantly throughout the
29 FortisBC service territory.

30

31 **Response:**

32 The additional rates are those that would be relevant to other projects that may be proposed if
33 experience with the CSPP is such that FBC applies to make the Program permanent and the
34 Commission approves such a request.

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1 While experience with the CSPP may impact the methodology used to determine rates in the
2 future, at this time the Company expects that rate derivation would be similar to that used in the
3 CSPP.

4
5

6

7 11.2 How do FBC intend to manage future subscriptions to other solar arrays in years
8 to come, and how will the kWh / kWh cost be evaluated?

9

10 **Response:**

11 The answers to these questions are expected to be developed based on experience with the
12 CSPP. The CSPP is being established as a pilot for this very reason.

13

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17 There would potentially be a significant demand for the Ellison panel subscription in future years
18 because the cost for this array will be fixed at today's rates, other solar arrays built in the future
19 will have a different cost associated. If customers drop out of the Ellison subscription these
20 panel allotments are more cost effective and desirable than say arrays built in 10 year's time.

21 11.3 How will FBC manage customer wait list and allocations to potentially multiple
22 solar array subscription options in the future?

23

24 **Response:**

25 FBC has indicated that if there are more customers interested in subscribing to the CSPP than
26 the expected output will allow, it will maintain a list of customers on a first come, first served
27 basis. If output becomes available as a result of customers dropping off the Program, they will
28 be offered to those on the wait list. Managing this wait list is not a complicated endeavor. If
29 there are multiple installations in the future the basic practice will not be changed.

30

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1 **IR#12**

2 **Reference Exhibit B-1 Community Solar Pilot Project**

3 **Section Rate Schedules Terms & Conditions; page 22 Lines 5-8**

4 *“The customer’s participation in the Program is transferable. If participants move to a new*
5 *premise within the FBC electric service area, their subscription will transfer with them at no*
6 *charge. If a participant moves outside of the Company's service area, the customer will be*
7 *removed from the Program and the panels or output will be made available to other customers.”*

8 Please indicate how long a customer will be allowed to be without a FortisBC account. If a
9 customer is in an interim stage of a sale/purchase of a home or between rentals for a period of
10 time (weeks /months) how will this be handled? Will there be a grace period for solar
11 subscribers to relocate to new properties within the FBC service area?
12

13 **Response:**

14 A customer that is moving to a new premise within the service area can maintain an account
15 without having it attached to a particular location.

16 In other words, should a customer be planning to move within the service area but there will be
17 a gap in consumption on the account FBC can work with the customer to ensure that any
18 subscribed panel(s) are not reallocated to someone else.

19

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22 **IR#13**

23 **Reference Exhibit B-1 Community Solar Pilot Project**

24 **Section Rate Schedules; page 26 Eligibility**

25 *“The Virtual Solar Rate is available to all Customers of FortisBC with the exception of those*
26 *being served under Rate Schedule 81 (Radio-Off Advanced Meter Option), on a rate in which*
27 *energy charges are either time differentiated (such as Time-of Use rates), or do not form a*
28 *separate component of the rate, (such as with Lighting rates).”*

29 13.1 Please clarify whether an existing Net Metering customer on rate schedule 95
30 would be allowed to supplement their own home generation if they wish to
31 participate in the solar pilot project?
32

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1 **Response:**

2 Yes, customers currently enrolled in the Net Metering program are eligible to also participate in
3 the CSPP, provided they are not already supplying all of their annual electricity needs with the
4 Net Metering program. In this case, billing related to the NM installation of the customer would
5 be completed prior to the CSPP output being applied to any remaining net consumption at the
6 premise.

7

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9

10 13.2 Please confirm whether a customer subscribing to the solar pilot program
11 (schedule 85A) would be eligible to install their own solar array in addition to the
12 subscription panels and be eligible for Net Metering under schedule 95.

13

14 **Response:**

15 Yes, provided that the total kWh output of the NM system and CSPP subscription was sized
16 such that they would not be expected to exceed the projected annual consumption on the
17 associated account.

18

19

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21 **IR#14**

22 **Reference Exhibit B-1 Community Solar Pilot Project**

23 **Section Rate Schedules; page 26 Billing**

24 *“Customers will be required to have meters read on the last day of each month and are required*
25 *to be billed on a monthly basis.”*

26 Please identify the reason why monthly billing a requirement. Bi-monthly billing is presently
27 employed for the Net Metering rate schedule 95 program and seems to be working satisfactory.

28

29 **Response:**

30 Since the CSPP is a shared resource, it is necessary to align both the production data and the
31 consumption information of all participating customers. Currently, customers may have meters
32 read on any day in a billing period which would make reconciliation of production and aggregate
33 consumption impossible. This issue could be addressed by having all customers either billed
34 monthly or bimonthly, as long as all customers are on the same billing schedule. Monthly was

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1 chosen to provide more timely information and so that the March 31 date to zero the
2 accumulation of unused output could be easily managed.

3
4

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6 **IR#15**

7 **Reference Exhibit B-1 Community Solar Pilot Project**

8 **Section Rate Schedules; page 27 Billing**

9 *“Each month, the total energy output, measured in kWh, of the DSGR will be divided by the total*
10 *number of panels in the DSGR and the resulting kWh will be allocated to the individual*
11 *customers in proportion to the number of the panels allocated to the customer relative to the*
12 *total number of panels in the DSGR.”*

13 Please indicate the point of metering, will it be at the Module level? DC inverter input? AC
14 inverter output? 13.8kV bus connection point (13.8kV feeder)?

15

16 **Response:**

17 The point of metering will be a revenue meter installed at the point of interconnection, which is
18 the low voltage side of the distribution padmount transformer.

19

20

21

22 **IR#16**

23 **Reference Exhibit B-1 Community Solar Pilot Project**

24 **Section Rate Schedules; page 27 Billing**

25 16.1 Given that solar array output is dependent on efficient operation and
26 maintenance and repairs, what service and maintenance and inspections will
27 FortisBC provide with respect to module cleaning, vegetation management,
28 equipment failure and return to service time?

29

30 **Response:**

31 FBC's proposed preventative maintenance program includes, but is not limited to, the following:

32

33

- electrical testing of each PV module string at the combiner box;
- physical and mechanical inspections of the racking and PV modules; and



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- 1 • inspections and testing of inverters as per inverter manufacturer requirements (annual
2 maintenance inspections, intake filter change-outs).

3 Monitoring at the inverter-level will allow FBC to quickly diagnose low-production issues or
4 equipment failure. Low production issues, resulting from equipment failures or excessively
5 soiled panels, will be addressed on an as-needed basis.

6 From a landscaping perspective, FBC is planning on using low maintenance grass seed.
7 Vegetation management will be completed on an as-needed basis.

8
9

10
11 16.2 Will the system design enable faulty components to be (manually) sectionalized?
12 Can a faulty element of the system be isolated in the event of an issue with a
13 solar module or inverter? This would enable a reduced output as opposed to no
14 output. Do FBC intend to carry strategic spares to expedite repairs?

15
16 **Response:**

17 In the event of a faulty PV module, FBC may have to isolate the respective module string in
18 order to replace the faulty panel. If a replacement PV module is not readily available, FBC may
19 be able to remove the PV module and reconfigure the module string in order to produce power
20 while a replacement PV module is sourced. The module string must operate within the voltage
21 limits set by the inverter.

22 FBC plans on purchasing an additional inverter as a strategic spare. FBC does not plan on
23 purchasing spare panels.

24
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27 **IR#17**
28 **Reference Exhibit B-1 Community Solar Pilot Project**
29 **Section Rate Schedules; page 27 Billing**

30 *“The rate paid for electricity represented by kWh remaining in the kWh Bank at the billing period*
31 *immediately following March 31 in each year shall be the BC Hydro 3808 Tranche 1 energy rate*
32 *in effect at the time.”*

33 Please comment on why this rate is appropriate, given the Net Metering customers are
34 compensated at the tier 1 rate for NEG. Given that the maintenance cost (\$9k+ / annum) to run



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1 the generation facility are attached to the solar subscribers, how can the solar pilot subscriber
2 be responsible for these costs?

3

4 **Response:**

5 Please refer to the response to BCUC IR 1.14.4.

6