



FOR GENERATIONS

Janet Fraser

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

February 28, 2014

Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

**RE: British Columbia Utilities Commission (BCUC)
British Columbia Hydro and Power Authority (BC Hydro)
Application to Amend Rate Schedule (RS) 1289 for Net Metering Service
(the Application)**

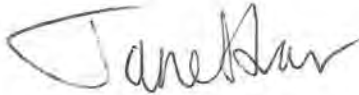
BC Hydro writes to the BCUC for approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, to amend the Net Metering Rate Schedule 1289 (RS 1289). The primary purpose of this application is to increase the nameplate capacity limit for a Generating Facility from 50 kilowatts (**kW**) to 100 kW. BC Hydro is also proposing to amend RS 1289 to allow it to recover incremental costs incurred as a result of the larger generator size. In its 2013 Net Metering Evaluation Report No. 3, BC Hydro recommended an increase in the RS 1289 generator limit to 100 kW for General Service rate customers only. In the Application, BC Hydro is proposing to increase the limit to 100 kW for all eligible customers, including residential customers.

In Order No. G-57-12, the BCUC approved amendments to RS 1289 to allow BC Hydro to recover costs associated with synchronous generators and customers taking service at a primary potential. BC Hydro is applying to amend RS 1289 to clarify that synchronous generators and customers taking service at a primary potential are only required to pay the incremental costs caused by their generators, consistent with current BC Hydro practice and BC Hydro's proposed incremental cost recovery in the context of generators greater than 50 kW and up to 100 kW.

February 28, 2014
Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Application to Amend Rate Schedule (RS) 1289 for Net Metering Service (the
Application)

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bhydroregulatorygroup@bchydro.com.

Yours sincerely,



Janet Fraser
Chief Regulatory Officer

Is/ma

Enclosure (1)

Copy to: BCUC Project No. 3698662 (Application to Amend Rate Schedule 1289 – Net Metering Service and Cancel Tariff Supplement No. 63 – Net Metering Interconnection Agreement) Registered Intervener Distribution List.

**Application to Amend Rate Schedule (RS) 1289 for
Net Metering Service**

February 2014

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1 **1 Application**

2 BC Hydro proposes to increase the maximum generator size in Rate Schedule
3 **(RS)** 1289 (Net Metering rate) from 50 kW to 100 kW, for all eligible customers,
4 including residential customers.

5 **2 Background**

6 RS 1289, commonly known as the Net Metering rate, was established in 2004.
7 Currently, there are over 300 RS 1289 customers representing about 1.6 megawatts
8 **(MW)** of total installed capacity. Approximately 90 per cent of the installed Net
9 Metering generators are solar photovoltaic and 97 per cent have a nameplate
10 capacity of 25 kilowatts **(kW)** or less.

11 Under RS 1289, eligible customers who install a “Generating Facility” are billed for
12 electricity service based on the “net” amount of metered energy (i.e., electricity
13 delivered by BC Hydro to the customer net of electricity delivered by the customer to
14 BC Hydro). If the customer delivers more electricity to BC Hydro than BC Hydro
15 delivers to the customer in a given month, the difference is “banked” and netted
16 against electricity deliveries in later months. If a customer has delivered to BC Hydro
17 more electricity over the course of a full year than BC Hydro has delivered to the
18 customer during that year, the customer is paid for the net electricity based on the
19 Energy Price then in effect as set out in RS 1289. The Energy Price is approved by
20 the British Columbia Utilities Commission **(BCUC)** and is generally consistent with
21 electricity prices paid to generators under BC Hydro’s Standing Offer Program
22 **(SOP)**. More than 95 per cent of net metering customers take more electricity from
23 BC Hydro than they deliver to BC Hydro in any given year and therefore, in practice,
24 very few customers are ever paid the Energy Price.

25 To be eligible to participate in RS 1289 a customer must use a generator with a
26 “*nameplate rating of not more than fifty (50) kilowatts*”. The 50 kW capacity limit has

1 been a part of RS 1289 since 2004, when the rate was first approved. In 2004, the
2 BCUC accepted that the 50 kW limit: (i) is consistent with the intent of net metering
3 namely, to allow individual customers to meet all or part of their electricity demand in
4 a simple and cost-effective manner; (ii) is consistent with the maximum amperage
5 and voltage at which most residential and many commercial customers take
6 electricity; and (iii) mitigates the risk of cost-shifting to non-participating ratepayers.
7 For projects larger than 50 kW and up to 15 MW the SOP is available.

8 In 2011, BC Hydro filed an application to amend RS 1289 (**2011 Application**).
9 BC Hydro did not propose changes to maximum generator size because the 50 kW
10 limit on generator size was more than sufficient to allow most customers to generate
11 electricity for their own consumption, which was the intent of the RS 1289 when it
12 was established in 2004. Several interveners, however, argued that the 50 kW
13 generator limit should be increased to improve economies of scale and to attract
14 more distributed generation, and that in comparison to RS 1289 the SOP is too
15 complex and costly for small scale generators.

16 In its final and reply submissions in the 2011 Application proceedings, BC Hydro
17 opposed any changes to the 50 kW limit in the context of that application. First,
18 BC Hydro took the position that the 50 kW served several purposes including
19 mitigating the risk of cost-shifting to non-participating ratepayers, keeping the rate
20 simple, and maintaining the primary purpose of the rate (i.e., load displacement).
21 BC Hydro submitted that it was not appropriate to remedy the alleged deficiencies of
22 the SOP by increasing the RS 1289 generator capacity limit for the primary purpose
23 of allowing additional sales of electricity and instead proposed a review of SOP to
24 determine whether or not a simplified “micro-SOP” process might resolve some of
25 the concerns about the SOP. Finally, BC Hydro cautioned that the financial,
26 technical and safety implications of increasing the maximum eligible generator size
27 had to be considered carefully.

1 In its decision on the 2011 Application (Order No. G-57-12) (**2012 Decision**), the
2 BCUC directed BC Hydro to further consider and report on RS 1289 generator size
3 limits. Subsequently, BC Hydro considered the issue and consulted with
4 stakeholders. Generator size is addressed in some detail at pages 35 to 39 of the
5 2013 Net Metering Evaluation Report No. 3 (**2013 NM Report**). On page 49 of the
6 2013 NM Report, BC Hydro recommended the following actions in specific response
7 to concerns about generator size and the SOP:

8 A1. Increase the Net Metering cap from 50 kW to 100 kW for
9 General Service rate customers (e.g., commercial, institutional,
10 industrial, municipal and First Nations customers), provided
11 BC Hydro is satisfied there will be no adverse cost impacts on
12 non-participating ratepayers.

13 B1. Design a streamlined acquisition process that supports
14 small-scale DG projects (50 kW to 1 MW) under the umbrella of
15 the SOP.

16 On November 25, 2013, the B.C. Government approved BC Hydro's Integrated
17 Resource Plan (**IRP**).¹ Chapter 8 of the IRP describes BC Hydro's "*Clean Energy*
18 *Strategy*" and section 8.4 describes specific actions BC Hydro plans to undertake to
19 implement the strategy. Two of the actions are aligned with the 2013 NM Report: (i)
20 increasing the maximum project size eligible under RS 1289 from 50 kW to 100 kW
21 and (ii) the introduction of a "micro-SOP" component within the existing SOP for
22 projects in the 100 kW to 1 MW range. These proposed actions are also discussed
23 in section 9.2.10 of the IRP.

24 This application fulfills the commitments made in the 2013 NM Report (and now
25 expanded to include residential customers) and the IRP to increase the maximum
26 eligible size of Generating Facilities in RS 1289 from 50 kW to 100 kW

27 Concurrently, BC Hydro is beginning its review of the SOP including assessing the
28 merits of a streamlined electricity acquisition process for small clean or renewable

¹ Order in Council 514, November 25, 2013 *Clean Energy Act*, S.B.C 2010, c.22,s.4(1)a.

1 distributed generation (100 kW to 1 MW). It is expected that the engagement and
2 development of the micro-SOP will be completed in 2014 and that this streamlined
3 process may address some of the concerns raised in respect of the SOP.

4 **3 Stakeholder Consultation**

5 Several interveners provided feedback on the issue of generator size during the
6 course of the 2011 Application regulatory proceeding. BC Hydro subsequently
7 engaged in extensive consultations with interveners, contractors and other
8 interested parties from September 2012 to February 2013 during the preparation of
9 the 2013 NM Report. The size of eligible generators was one of a number of
10 subjects addressed during those consultations. Finally, BC Hydro consulted in
11 preparation of its IRP. The nature and extent of those consultations is described in
12 Chapter 7 of the IRP. All of the consultations over the past two years have informed
13 this application.

14 **4 Proposed Capacity Increase to 100 kW**

15 In this section of the Application, BC Hydro addresses the proposed increase in
16 rated capacity of Generating Facilities in RS 1289 in the context of the three BCUC
17 criteria identified at page 21 of the 2012 Decision:

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

23 BC Hydro, participating customers and other stakeholders appear to agree that a
24 significant benefit of RS 1289 is the simplicity of the rate: it is inexpensive for
25 BC Hydro to implement and administer; the Net Metering Interconnection
26 Requirements (**NMIR**) is straightforward; and the RS 1289 customer application

1 process is low cost, efficient and timely. In that context, BC Hydro also has
2 considered the impact of increased generator size on the “simplicity” of RS 1289.

3 BC Hydro continues to be of the view that the primary purpose of RS 1289 is to
4 allow individual customers to meet all or part of their electricity demand in a simple
5 and cost-effective manner, and not to sell energy to BC Hydro. Consistent with
6 BC Hydro’s DG strategy, the development of a simple and more streamlined
7 micro-SOP process should reduce the barriers in developing small-scale projects.

8 **Criterion 1: RS 1289 should not impose any unnecessary economic or other**
9 **barriers to ratepayers seeking to install small-scale clean DG.**

10 Based on past and current experience, the capacity limit of 50 kW has not been a
11 significant barrier to the large majority of customers seeking to participate in the
12 current Net Metering program. The Net Metering program has only received a
13 modest level of interest from customers who have potential projects greater than
14 50 kW. To date, over 70 per cent of the projects participating in RS 1289 are 5 kW or
15 less.

16 An increase in the allowable generator size to 100 kW may lessen the barriers for
17 some customers seeking to take service under RS 1289 by allowing for improved
18 economies of scale for net metering installations. The proposed 100 kW capacity
19 size may benefit some customers with larger premises, such as municipalities,
20 government agencies, and First Nations communities. It may also increase the
21 opportunities for some technologies, such as small-scale hydro, to access RS 1289.
22 It is unlikely that the increase in generator size will have much impact on customers
23 installing solar projects, which represent the vast majority of RS 1289 projects,
24 because project-rated capacity is generally limited by the size of rooftops on a
25 customer’s premises. Most residential and commercial solar projects are quite small,
26 well below 50 kW.

1 As discussed under Criterion 2 below, BC Hydro is proposing to bill RS 1289
2 customers for the incremental costs caused by the installation of generators larger
3 than 50 kW. This may be a financial barrier to some applicants in cases where the
4 interconnection of their generator would require, for example, upgrades to
5 BC Hydro's distribution system. However, it is necessary because it ensures that
6 costs are not imposed on non-participating customers.

7 **Criterion 2: RS 1289 should not incur any substantial cost on the utility.**

8 The BCUC agreed, when RS 1289 was first established in 2004, that the small size
9 of eligible generators (50 kW or less) limited the risk of cost shifting to BC Hydro and
10 non-participating ratepayers. Increasing the generator size increases that risk.
11 Nevertheless, BC Hydro is of the view that an increase to 100 kW, along with the
12 proposed cost-recovery amendments to RS 1289, will not result in substantial costs
13 to BC Hydro and non-participating ratepayers.

14 *Technical Review, Study and System Upgrade Costs*

15 In view of the experience to date with RS 1289, as well as some of the proposed
16 changes to interconnection requirements (discussed below), BC Hydro does not
17 expect an increase in the maximum rated capacity for RS 1289 generators to
18 100 kW to have a significant impact on the costs of administering RS 1289 or
19 undertaking technical reviews of applications. BC Hydro also does not expect there
20 to be significant incremental study costs or requirements for upgrades to BC Hydro's
21 system.

22 However, as noted, the increase in generator size increases the risk that these kinds
23 of costs could be incurred which, in turn, increases the risk of cost-shifting to
24 non-participating customers. To address this risk, BC Hydro is proposing to amend
25 RS 1289 to allow BC Hydro to recover the incremental costs, if any, from a RS 1289
26 applicant where such costs are attributable to the installation of a generator larger
27 than 50 kW.

1 “Incremental costs” is intended to cover three main categories of costs:

- 2 1. Technical review costs
- 3 2. Study costs
- 4 3. System upgrade costs

5 Technical review costs are measured by the time and associated costs in excess of
6 the time and costs normally required to review and process a typical Net Metering
7 customer project application up to 50 kW. In practice, BC Hydro would use these
8 levels of effort as a baseline for assessing incremental costs. The table below shows
9 the various types of projects² that come through the Net Metering program and the
10 associated time it typically takes in practice to review them on a technical basis.

Project Type	Technical Review
Simple Projects	Minimal
Complex Projects, Inverter-based	4-6 hours
Complex Projects, Non Inverter-based	6-8 hours

11 If a generator wishes to interconnect to the BC Hydro’s distribution system,
12 BC Hydro may require studies to determine the impacts to the system and whether
13 any upgrades are required. Generally, there are minimal (if any) study or system
14 upgrade costs associated with RS 1289 projects of 50 kW or less. If larger projects
15 (51 to 100 kW) require studies or system upgrades, BC Hydro proposes recovering
16 those costs from the RS 1289 customer.

17 In the 2012 Decision, the BCUC approved the recovery of costs from primary service
18 customers and synchronous generators. In practice, BC Hydro recovers its
19 “incremental costs” from these customers and generators. In this application,
20 BC Hydro is proposing to clarify the RS 1289 cost recovery language in respect of
21 primary service customers and synchronous generators so the language is

² For more details refer to the NMIR document, section 3.1 What Qualifies as a Simple Net Metering Generator and section 4.1 What Qualifies as a Complex Net Metering Generator:
<http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/net-metering/net-metering-interconnection-requirements-50kw-and-below.pdf>.

1 consistent with that proposed for generators greater than 50 kW and up to 100 kW
2 (refer to Appendix B).

3 ***Other Potential Financial Impacts***

4 RS 1289 customers may also have the following potential financial impacts on
5 BC Hydro and non-participating ratepayers:

- 6 1. To the extent that the generation from Net Metering customers reduces the
7 demand for BC Hydro-supplied energy, BC Hydro will experience reduced
8 revenues. Those reduced revenues may be offset by the avoided cost of
9 energy supply. On the supply side, BC Hydro does not include any electricity
10 generated by RS 1289 customers in excess of their load in its Load Resource
11 Balance portfolio of existing or planned resources because of the intermittent
12 nature of RS 1289 energy and the very small volumes.
- 13 2. To the extent that the accounts of Net Metering customers are in a credit
14 position at the end of the year and BC Hydro purchases that energy at the
15 RS1289 price, BC Hydro's cost of energy will be impacted. The relationship
16 between the RS1289 price and BC Hydro's overall marginal cost of energy
17 supply will establish the incremental cost of energy for those energy volumes
18 purchased under RS 1289.

19 In BC Hydro's view, these potential financial impacts are currently negligible
20 because the total installed capacity of all RS 1289 customers is only 1.6 MW and
21 very few customers are ever paid the Energy Price. BC Hydro does not expect the
22 increase in eligible generator size from 50 kW to 100 kW to significantly change this.

1 **Criterion 3: Interconnections must be safe, but interconnection rules must not**
2 **be excessive or burdensome.**

3 The general purpose of BC Hydro's interconnection requirements is to ensure that
4 the interconnection of generators to BC Hydro's distribution system is safe and does
5 not adversely affect the reliability of the distribution system or the electricity service
6 received by customers.

7 The current NMIR allows generators up to 50 kW to interconnect to BC Hydro's
8 system in a simple and cost-effective manner, reflective of their relatively low risk.
9 These requirements apply to any generator of 50 kW or less that wishes to
10 interconnect to BC Hydro's system, regardless of whether or not the generator is
11 participating in RS 1289. In the context of RS 1289, the simplified requirements in
12 the NMIR have been an important factor in the development and implementation of a
13 simple and cost-effective Net Metering rate. BC Hydro has also been commended
14 for implementing a simplified interconnection process for Simple projects
15 (Appendix B of 2013 NM Report).

16 BC Hydro has reviewed its interconnection requirements and compared them to
17 practices in other jurisdictions and has concluded that the NMIR may be applied to
18 generators up to 100 kW without significantly increasing risk to BC Hydro and other
19 customers. However, some additional or different interconnection requirements may
20 be necessary for generators between 51 kW and 100 kW. If the proposed 100 kW
21 capacity limit for RS 1289 is approved by the BCUC, BC Hydro expects to issue,
22 approximately 90 days after a BCUC decision, a revised NMIR document applicable
23 to all generators up to 100 kW interconnecting to BC Hydro's distribution system. In
24 this application, the RS 1289 tariff pages (Appendix B) have been updated to refer to
25 NMIR/50 or other interconnection requirements applicable to the Generating Facility.

26 BC Hydro is not proposing to apply the NMIR to projects above 100 kW for the
27 reasons addressed in section [5](#) of this application.

5 Generator Capacity Above 100 kW

1 This section of the Application explains why BC Hydro is proposing a maximum
2 eligible generator capacity size of 100 kW.
3

4 Through the stakeholder consultation process leading up to the 2013 NM Report,
5 some stakeholders expressed concerns with the SOP and remarked that it acted as
6 a barrier to their small-scale projects. This included concerns about the due
7 diligence process, commercial agreements and the interconnection requirements
8 and related costs. Some stakeholders suggested that increasing the eligible
9 generator size for RS 1289 would resolve some or all of these issues. BC Hydro has
10 listened to these concerns and is taking certain actions in response, as discussed in
11 this application. However, it is important to note that RS 1289 does not have the
12 same purpose as the SOP. SOP is an electricity procurement program for small
13 (15 MW or less) clean or renewable generators and is mandated by the *Clean*
14 *Energy Act*. RS 1289 is an Electric Tariff rate under which BC Hydro provides
15 electricity service to its customers. The primary purpose of RS 1289 is to allow
16 BC Hydro customers the opportunity to offset, through a simple Net Metering rate,
17 part or all of their electricity deliveries from BC Hydro by self-generating electricity at
18 their premises.

19 A generator size greater than 100 kW would complicate the rate because: (i)
20 BC Hydro would have to import various due diligence, technical, development and
21 financial requirements, processes, terms and conditions associated with the
22 procurement of electricity under the SOP into the Net Metering program; and (ii) the
23 relatively more cumbersome, time-consuming and costly interconnection
24 requirements for projects larger than 100 kW would be applied to projects eligible to
25 participate in RS 1289. BC Hydro is of the view that projects larger than 100 kW
26 should participate in the SOP, not RS 1289.

27 The remainder of this section addresses the due diligence, commercial risks, and
28 interconnection requirements associated with generators larger than 100 kW.

1 Due Diligence and Commercial Risk

2 The SOP due diligence processes and associated commercial agreements are
3 designed to address commercial, technical, development and financial risks
4 associated with the procurement of electricity from generators with a capacity of
5 15 MW or less. Increasing the RS 1289 generator size does not mean that these
6 risks are no longer applicable. If eligible RS 1289 generator size is increased,
7 BC Hydro must either accept and absorb these risks to maintain the simplicity of
8 RS 1289, or import some or all of the more cumbersome and costly due diligence
9 and commercial requirements into the Net Metering rate, thereby compromising the
10 simplicity of the rate.

11 In proposing to increase maximum size of eligible RS 1289 generators to 100 kW,
12 BC Hydro is accepting that it will not require 100 kW generators to undergo the
13 commercial due diligence process applicable to SOP projects, nor will it require
14 these customers to enter into long term electricity purchase agreements. Such
15 acceptance stems from the fact that 100 kW generators are relatively small and the
16 associated commercial, financial and technical risks are therefore manageable.

17 For projects larger than 100 kW, BC Hydro is proposing, as part of its suite of small
18 Distributed Generation opportunities, to develop a “micro-SOP” component within its
19 current SOP that should simplify the SOP’s due diligence processes and commercial
20 agreements for small-scale (100 kW to 1 MW) projects.

21 Interconnection and Technical Considerations

22 The interconnection requirements for generators interconnecting to BC Hydro’s
23 distribution system apply to anyone who interconnects a generator of a certain size
24 or voltage and are independent of RS 1289 and the SOP. Increasing the eligible
25 generator size in RS 1289 does not change BC Hydro’s standard interconnection
26 requirements. Moreover, simply increasing the RS 1289 generator size does not
27 eliminate the need for interconnection studies or system upgrades.

1 BC Hydro believes that the 100 kW size limit for RS 1289 will still allow for simplified
2 engineering studies and minimal risk of upgrades to the BC Hydro system provided
3 the generation is primarily for offsetting a customer's own load. As noted earlier,
4 BC Hydro proposes to amend its NMIR such that it applies to generators up to
5 100 kW.

6 The following explains from a technical and safety perspective why BC Hydro is not
7 applying NMIR to the generators larger than 100 kW.

- 8 1. BC Hydro's distribution system is generally designed for power flow from the
9 substations to the load. Introducing generation, particularly generation that is
10 larger than load, introduces a two-way power flow that may impact system
11 safety and may require costly system upgrades.
- 12 2. Installing larger generation may have different impacts depending on where the
13 generators are located. The BC Hydro distribution system has physical capacity
14 limitations that restrict the amount of power that can be transferred from the
15 distribution feeder. By limiting the maximum generator size to 100 kW, it will
16 help mitigate any potential risk of exceeding system capacity and costly
17 substation transformer upgrades.
- 18 3. In some areas of the BC Hydro system, interconnecting generators larger than
19 100 kW increases the risk of incompatibility with BC Hydro's standard
20 protection scheme and may require more complex and costly protection
21 devices. The upper limit of 100 kW helps mitigate this potential safety risk.
- 22 4. As noted by the Canadian Standards Association (**CSA**), projects over 100 kW,
23 if not effectively grounded, can impact power quality and cause temporary
24 overvoltages that could damage BC Hydro's and customers' equipment. While
25 mitigation is possible, it could be complex and costly.

26 BC Hydro's technical interconnection requirements ensure that generator
27 interconnections do not negatively impact the safety and reliability of its system. The

1 simplified requirements of NMIR are sufficient for projects under 100 kW; however,
 2 for projects larger than 100 kW, a more rigorous engineering review and additional
 3 interconnection requirements would be necessary which is inconsistent with the
 4 simplicity of the NMIR.

5 [Table 1](#) below provides an overview of potential issues caused by distributed
 6 generation greater than 100 kW in size, the studies that may be required, and the
 7 potential costs similar to those associated with projects eligible for the SOP. The
 8 impacts to the system and the costs to mitigate such impacts increase with the
 9 project size.

10 **Table 1 Impacts of Greater than 100 kW DG on BC Hydro’s System**

DG Impacts	Impacts on Safety, Reliability and Power Quality	Safety	Reliability	Power Quality	Potential BC Hydro System Upgrades
Increased Short Circuit Current	Desensitizes feeder protection	✓	✓	✓	To ensure a safe and reliable system, the following upgrades may be required: <ul style="list-style-type: none"> ▪ Upgrade feeder and substation protection / Add CTs and VTs ▪ Add or upgrade re-closers ▪ Add Current Limiting Reactors ▪ Replace under-rated equipment ▪ Neutral Grounding Reactor at Generator These costs are estimated at \$100,000 or higher per project
	Desensitizes substation protection	✓	✓		
	May exceed equipment ratings causing safety issues	✓			
Power Injection to BC Hydro’s System	Reverse Power Flow through devices designed for one direction of power flow	✓			To maintain a safe system, BC Hydro may require the following upgrades: <ul style="list-style-type: none"> ▪ Add supervised closing of substation breakers (requires new protective relay and voltage transformers) ▪ Replace circuit re-closers for reverse power flow and sync check capability ▪ Replace voltage regulators and modify voltage regulation controls. ▪ Protection changes ▪ Voltage regulation control changes These costs are estimated at \$100,000 or higher per project

DG Impacts	Impacts on Safety, Reliability and Power Quality	Safety	Reliability	Power Quality	Potential BC Hydro System Upgrades
Equipment Loading	Increased power flow may exceed equipment thermal ratings and result in capacity issues.	✓	✓		To ensure the capacity of the system is maintained, BC Hydro may require the following upgrades: <ul style="list-style-type: none"> ▪ Various equipment upgrades such as conductor replacement, transformer replacement, and voltage regulators These costs are estimated at approximately \$180,000 per Km to replace conductors
Temporary Overvoltage	Generators can raise the voltage above equipment ratings and damage BC Hydro's equipment and the sensitive electronic equipment of surrounding customers	✓		✓	To ensure the safety and maintain the integrity of the system, the following upgrades may be required: <ul style="list-style-type: none"> ▪ Transformer winding connection ▪ Grounding transformer These upgrades will cost ~ \$20,000-30,000 depending on size of transformer
Power Quality	Generators can cause fluctuations in BC Hydro's system, resulting in service impacts such as voltage rise/regulation, flicker, harmonics and sags/swells	✓		✓	To ensure continued high quality service to our customers, the following upgrades may be required: <ul style="list-style-type: none"> ▪ Various line and equipment upgrades ▪ Replace Distribution Transformers These cost estimates are approximately \$10,000 to \$1 million depending on location and length of line to be replaced
Unintentional Islanding	When BC Hydro equipment isolates a feeder a customer generator may continue to feed power back into the system. The risk of islanding increases with the generator size.	✓		✓	To maintain a safe system, BC Hydro may require the following upgrades: <ul style="list-style-type: none"> ▪ Add supervised closing of substation breakers (requires new protective relay and voltage transformers) ▪ Replace circuit re-closers for reverse power flow and sync check ▪ Add Direct Transfer Trip and communications

6 Summary and Proposed Actions

1 In summary, BC Hydro is of the view that the current 50 kW limit for RS 1289 is not a
2 significant barrier to participation in the Net Metering program. Nevertheless, some
3 stakeholders have requested an increase to the size of eligible generators to allow
4 for economies of scale and to address concerns about the current SOP. The
5 increased size may also allow greater access for municipalities and First Nations to
6 the Net Metering program.
7

8 BC Hydro is proposing three actions which should allow RS 1289 to remain a simple
9 and cost-effective rate.

- 10 1. Allow generators up to 100 kW to participate in RS1289. On balance, a rated
11 capacity limit of 100 kW will maintain the simplicity of RS 1289 without imposing
12 significant additional financial, safety and reliability risks on BC Hydro's system
13 or material costs on non-participating ratepayers.
- 14 2. Adapt the NMIR interconnection requirements so they apply to generators up to
15 100 kW
- 16 3. Introduce a simplified, streamlined "micro-SOP" component within the existing
17 SOP for projects over 100 kW and up to 1 MW. All projects larger than 1 MW
18 (up to 15 MW) would be subject to the existing SOP due diligence processes
19 and commercial agreements.

20 It is expected that this three-pronged approach to small distributed generation will
21 allow BC Hydro to keep RS 1289 simple and cost-effective while addressing some of
22 the concerns raised by stakeholders.

7 Request for BCUC Approval

BC Hydro is requesting approval from the BCUC to amend RS 1289 to increase the nameplate capacity limit for a Generating Facility from 50 kW to 100 kW and to recover from RS 1289 customers any incremental costs incurred by BC Hydro for generators larger than 50 kW. BC Hydro is also requesting approval to amend RS 1289 to clarify that synchronous generators and customers taking service at a primary potential are only required to pay the incremental costs caused by their generators, consistent with current BC Hydro practice.

8 Regulatory Review Process

BC Hydro will be providing a copy of this application to all registered interveners in the previous 2011 Application to Amend Rate Schedule 1289.

BC Hydro proposes that this application be reviewed through a written proceeding and proposes the following regulatory schedule:

Action	Date (2014)
Registration Deadline for Intervenors and Interested Parties	March 20
Deadline for Submitting Participant Assistance/Cost Award Budgets	March 27
BCUC and Intervener Information Requests (IRs) to BC Hydro	March 31
BC Hydro Responses to BCUC and Intervener IRs	April 17
BC Hydro Submission	TBD
Intervener Submissions	TBD
BC Hydro Reply Submission	TBD

9 Communications

All communications regarding this proceeding are to be addressed to:

<p>Janet Fraser Chief Regulatory Officer</p> <p>BC Hydro 1600-333 Dunsmuir Street Vancouver, BC V6B 5R3</p> <p>Telephone: (604) 623-4046 Fax No.: (604) 623-4407 e-mail: bhydroregulatorygroup@bhydro.com</p>

**Application to Amend RS 1289 for
Net Metering Service**

Appendix A

Draft Order

BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER G-

TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC V6Z 2N3 CANADA
web site: <http://www.bcuc.com>



IN THE MATTER OF
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473

and

Application by British Columbia Hydro and Power Authority (BC Hydro)
To Amend Rate Schedule 1289 for Net Metering Service

BEFORE:

_____, 2014

ORDER

WHEREAS:

- A. On February 28, 2014, British Columbia Hydro and Power Authority (BC Hydro) applied for approval pursuant to sections 58 to 61 of the *Utilities Commission Act* (the Act), to amend the Net Metering Rate Schedule 1289 (RS 1289) to increase the nameplate capacity limit for a Generating Facility from 50 kW to 100 kW, to recover any incremental costs incurred from generators larger than 50 kW and to clarify that it may recover incremental costs associated with synchronous generators and customers taking service at primary potential;
- B. The Commission has reviewed the Application and has determined that the amendments to RS 1289 in the Application are in the public interest.

NOW THEREFORE the Commission orders as follows:

- 1. The amendments to RS 1289 proposed in the Application are approved effective __ 1, 2014 (*the first day of the month following the date of the Order*)

DATED at the City of Vancouver, in the Province of British Columbia, this ____ day of _____, 2014 .

BY ORDER

**Application to Amend RS 1289 for
Net Metering Service**

Appendix B

**Proposed Amendments to RS 1289
Clean and Black-lined**

**Application to Amend RS 1289 for
Net Metering Service**

Appendix B

**Proposed Amendments to RS 1289
Clean**

SCHEDULE 1289 – NET METERING SERVICE

Availability: For any Residential Service Customer and for any General Service Customer who install a Generating Facility to generate electricity to serve all or part of their electricity requirements, subject to the Special Conditions below.

With the consent of BC Hydro, Customers taking service under other Rate Schedules may be admitted to service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

“Generating Facility” for purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

- (a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a “clean or renewable resource” in the “*Clean Energy Act*”(as updated from time to time) to generate electricity;
- (b) Has a nameplate rating of not more than one hundred (100) kilowatts; and
- (c) Is owned by the Customer and is located on the same parcel of land as the Customer’s Premises for which service is being provided under any of the Rate Schedules described above, or on an adjacent parcel of land owned or leased by the Customer, and is connected to the same Point of Delivery as the Customer’s Premises being served under any of the Rate Schedules described above,

and includes all wiring, protection-isolation devices, disconnect switches, and other equipment and facilities on the Customer’s side of the Point of Delivery.

Applicable in: All Rate Zones.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro
Rate Schedules
Effective:

Third Revision of Page 31

Rate: Energy Charge: Charges for Net Energy consumed by the Customer will be in accordance with the Rate Schedule under which the Customer is receiving service from BC Hydro.

Energy Price: For all electricity represented by the Generation Credit Balance remaining in the Customer's Generation Account at any Anniversary Date, BC Hydro shall pay 9.99 ¢ per kW.h.

Metering:

1. Inflows of electricity from the BC Hydro system to the Customer, and outflows of electricity from the Customer's Generating Facility to the BC Hydro system, will normally be determined by means of a single meter capable of measuring flows of electricity in both directions.
2. Alternatively, if BC Hydro determines that flows of electricity in both directions cannot be reliably determined by a single meter, or that dual metering will be more cost-effective, BC Hydro may require that separate meters be installed to measure inflows and outflows of electricity.
3. The Customer shall install, at its cost, the meter base and any wiring, protection-isolation devices, disconnect switches, and other equipment and facilities on the Customer's side of the Point of Delivery as required under BC Hydro's "Net Metering Interconnection Requirements, 50 kW and Below" ("NMIR/50") or other interconnection requirements applicable to the Generating Facility. BC Hydro will supply and install the meter or meters and make the final connections.
4. Any meters or meters required for purposes of this Rate Schedule shall be in addition to any demand meters (if applicable) required under the Rate Schedule under which the Customer is receiving service from BC Hydro.

Billing: Determination of the Customer's bill will be as follows:

1. Meter reading and billing frequency will be in accordance with the Rate Schedule under which the Customer is receiving service from BC Hydro.
2. At the end of each billing period BC Hydro will determine the "Net Energy" applicable for that billing period, defined as the difference between the electricity supplied by BC Hydro to the Customer during the billing period and the electricity delivered from the

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro
Rate Schedules
Effective:

Second Revision of Page 33

8. The procedures set forth above shall apply in each succeeding 12-month period and at each succeeding Anniversary Date for so long as the Customer continues to take service under this Rate Schedule. If service under this Rate Schedule is terminated prior to any Anniversary Date, the procedures set forth above shall be applied as of the date of termination. In that event, BC Hydro will pay the amount owing in respect of any credit balance in the Generation Account to the Customer within 45 days of the date of termination, subject to any rights of deduction or set-off BC Hydro may have.
9. In no case will any credit balance in the Generation Account have any cash value or be convertible to cash, except as provided above. If the amount determined to be owing to the Customer at any Anniversary Date as set forth in item 7 above is equal to or less than the charges BC Hydro anticipates are likely to be billed to the Customer during the six month period following the Anniversary Date, BC Hydro may withhold the amount owing and credit it against charges owing by the Customer for future billing periods. If the amount determined to be owing is greater than the charges BC Hydro anticipates are likely to be billed to the Customer during the six month period following the Anniversary Date, BC Hydro shall pay the amount owing to the Customer within 45 days of the Anniversary Date.

Special
Conditions:

1. Subject to the provisions of RS 1289 and any applicable Rate Schedule(s) under which the Customer is from time to time receiving electric service from BC Hydro, the provisions of BC Hydro's Electric Tariff, and the terms and conditions, BC Hydro will supply electricity to, and accept delivery of electricity from, the Customer at the Point of Delivery.

BC Hydro will act with reasonable promptness to perform any inspections and/or give any approvals that it is authorized or required to give under the terms and conditions, and will not unreasonably withhold or delay the giving of its consent in any case where its consent is required.

To receive service under this Rate Schedule, the Customer must submit the required Application. For Generating Facilities having a rated generating capacity of greater than five (5) kilowatts, and for which BC Hydro determines that a site acceptance verification is required, the Customer must also pay the Net Metering Site Acceptance Verification Fee as set out in the Schedule of Standard Charges.

A Customer who utilizes a synchronous generator or is a Customer taking service at a primary potential will be required to pay all incremental costs incurred by BC Hydro for interconnecting their Generating Facility where "incremental costs" means the additional costs incurred by BC Hydro relative to typical non-synchronous generator and/or typical Customer who is taking service other than at a primary potential.

A Customer who utilizes a Generating Facility with a nameplate rating greater than fifty (50) kilowatts will be required to pay all incremental costs incurred by BC Hydro for interconnecting their Generating Facility where "incremental costs" means the additional costs incurred by BC Hydro relative to a typical Generating Facility with a nameplate rating of 50 kW or less.

The Customer must not commence parallel operation of its Generating Facility until written approval has been provided to it by BC Hydro. Written approval will normally be provided by BC Hydro within 14 days following BC Hydro's receipt of a copy of the final inspection report or approval issued by the governmental authority having jurisdiction to inspect and approve the installation. Where Customer has been notified that inspection and acceptance by BC Hydro's Field Services – Protection and Control

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro
Rate Schedules
Effective:

First Revision of Page 33-1

Department will also be required before the Generating Facility will be accepted for parallel operation, BC Hydro's approval will normally be provided within 14 days following the date of inspection and acceptance. BC Hydro may require the Customer to supply additional information and/or provide access to the Customer's Generating Facility to carry out additional inspections, as set forth in BC Hydro's NMIR/50 or other interconnection requirements applicable to the Generating Facility.

2. Customers shall design, install, operate and maintain the Generating Facility, and all ancillary facilities on the Customer's side of the Point of Delivery in accordance with all governmental laws and regulations from time to time applicable, and BC Hydro's NMIR/50 or other interconnection requirements applicable to the Generating Facility. Customers shall obtain and maintain any required governmental authorizations and/or permits required for the installation and operation of the Generating Facility. The Generating Facility shall meet all applicable safety and performance standards, including the codes and standards identified in BC Hydro's NMIR/50 or other interconnection requirements applicable to the Generating Facility. BC Hydro, acting reasonably, may from time to time prescribe additional requirements which in its judgment are required for the safety of its system.

The Customer shall at all times operate the Generating Facility in accordance with applicable governmental standards and requirements, and any manufacturer's instructions, and shall further comply with BC Hydro standards and requirements from time to time in effect relating to parallel operation of independent net metering installations with its system. The Customer shall promptly notify BC Hydro of any malfunction or breakdown of the Generating Facility that could constitute a safety hazard or reasonably be expected to cause disturbance or damage to BC Hydro's system.

The Customer shall not operate the Generation Facility so as to generate electricity at a rate greater than 110% of the Nameplate Rating of the Generating Facility, and will not add to or modify the Generating Facility without the prior written consent of BC Hydro.

3. Service under this Rate Schedule is conditional on the continuance of service to the Customer under any of the Rate Schedules described under the Availability section above, and is further conditional on the Customer being billed monthly or bi-monthly under BC Hydro's regular billing plan. If service under the applicable Rate Schedule is suspended or terminated for any reason, or if the Customer ceases to be billed under BC Hydro's regular billing plan, service under this Rate Schedule will be deemed to have automatically been suspended or terminated concurrent with suspension or termination of service under the applicable Rate Schedule, or change to a different billing plan, as applicable.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

**Application to Amend RS 1289 for
Net Metering Service**

Appendix B

**Proposed Amendments to RS 1289
Black-lined**

BC Hydro

Rate Schedules

Effective: 01 June 2012

~~Second-Third~~ Revision of Page 30

SCHEDULE 1289 – NET METERING SERVICE

Availability: For any Residential Service Customer and for any General Service Customer who install a Generating Facility to generate electricity to serve all or part of their electricity requirements, subject to the Special Conditions below.

With the consent of BC Hydro, Customers taking service under other Rate Schedules may be admitted to service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

“Generating Facility” for purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

- (a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a “clean or renewable resource” in the “*Clean Energy Act*”(as updated from time to time) to generate electricity;
- (b) Has a nameplate rating of not more than one hundred fifty (~~5100~~) kilowatts; and
- (c) Is owned by the Customer and is located on the same parcel of land as the Customer’s Premises for which service is being provided under any of the Rate Schedules described above, or on an adjacent parcel of land owned or leased by the Customer, and is connected to the same Point of Delivery as the Customer’s Premises being served under any of the Rate Schedules described above,

and includes all wiring, protection-isolation devices, disconnect switches, and other equipment and facilities on the Customer’s side of the Point of Delivery.

Applicable in: All Rate Zones.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedules

Effective: ~~01 June 2012~~~~Second-Third~~ Revision of Page 31

Rate: Energy Charge: Charges for Net Energy consumed by the Customer will be in accordance with the Rate Schedule under which the Customer is receiving service from BC Hydro.

Energy Price: For all electricity represented by the Generation Credit Balance remaining in the Customer's Generation Account at any Anniversary Date, BC Hydro shall pay 9.99 ¢ per kW.h.

Metering:

1. Inflows of electricity from the BC Hydro system to the Customer, and outflows of electricity from the Customer's Generating Facility to the BC Hydro system, will normally be determined by means of a single meter capable of measuring flows of electricity in both directions.
2. Alternatively, if BC Hydro determines that flows of electricity in both directions cannot be reliably determined by a single meter, or that dual metering will be more cost-effective, BC Hydro may require that separate meters be installed to measure inflows and outflows of electricity.
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ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedules

Effective: 01 June 2012First Second Revision of Page 33

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9. In no case will any credit balance in the Generation Account have any cash value or be convertible to cash, except as provided above. If the amount determined to be owing to the Customer at any Anniversary Date as set forth in item 7 above is equal to or less than the charges BC Hydro anticipates are likely to be billed to the Customer during the six month period following the Anniversary Date, BC Hydro may withhold the amount owing and credit it against charges owing by the Customer for future billing periods. If the amount determined to be owing is greater than the charges BC Hydro anticipates are likely to be billed to the Customer during the six month period following the Anniversary Date, BC Hydro shall pay the amount owing to the Customer within 45 days of the Anniversary Date.

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COMMISSION SECRETARY

BC Hydro

Rate Schedules

Effective: 01 June 2012~~Original~~ First Revision of Page 33-1

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COMMISSION SECRETARY