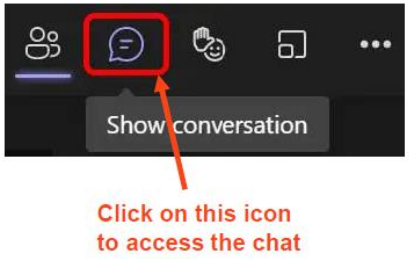
Welcome to BC Hydro's

2024 Rate Design Applications (RDA) Workshop

We'll be getting started shortly

How to participate

- Let us know you're here. **Please enter your first name, last name, and organization in the chat.**
- Video and microphone have been turned off to save bandwidth and eliminate background noise
- The chat function is available for questions and comments
- A copy of this presentation will made available following this session



Technical issues?

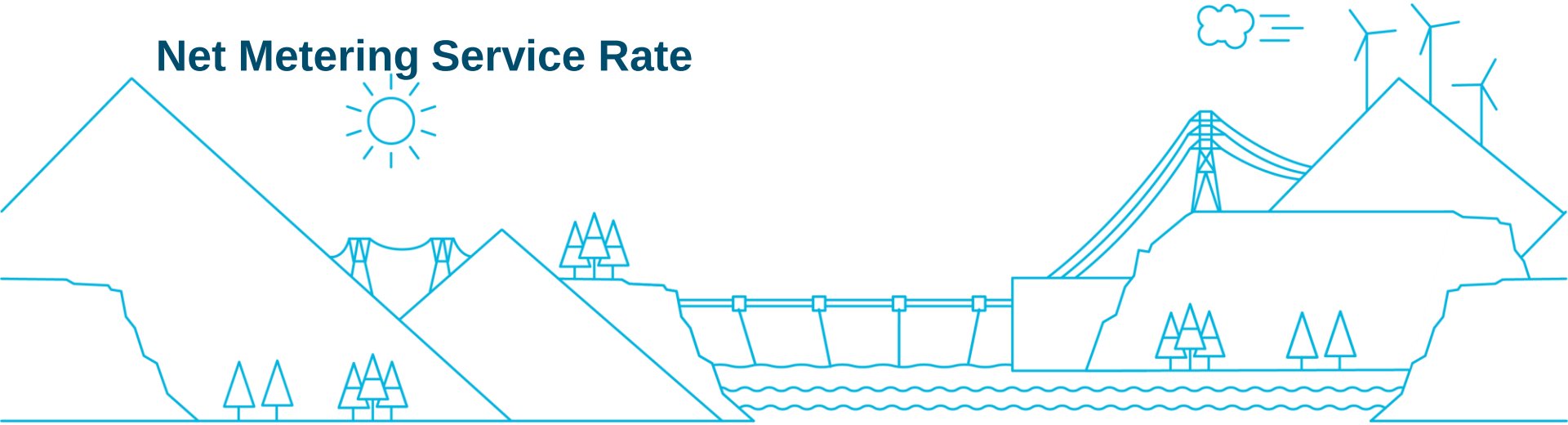
- Send an email to bchydroregulatoryfeedback@bchydro.com

BC Hydro 2024

Rate Design Applications

Workshop 4 – Session 2

Net Metering Service Rate



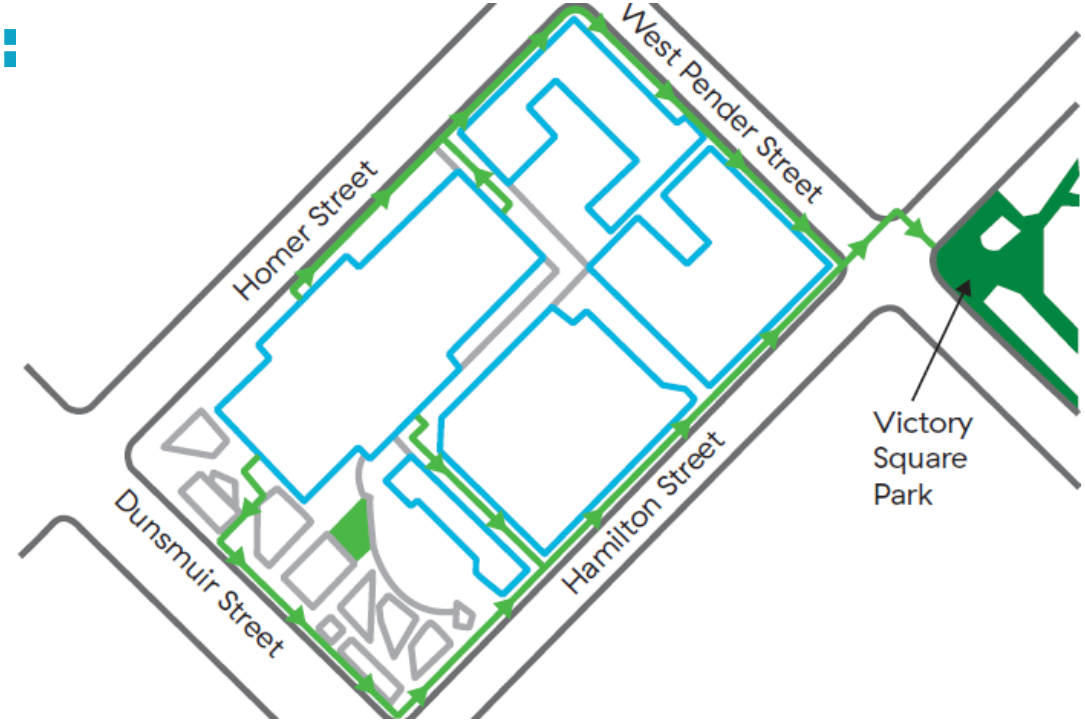
May 1, 2024

BC Hydro
Power smart

Safety –

Muster Location:

Victory Square



We are grateful to be meeting today on the unceded traditional territory of the Musqueam, Squamish and Tsleil-Waututh First Nations

Agenda

Time	Topic	Presenter
1:00 – 1:15 pm	Background and Context	Chris Sandve, Chief Regulatory Officer
1:15 – 1:45 pm	Net Metering Overview	Paul Seo, Senior Product Manager
1:45 – 2:45 pm	Net Metering Service Rate Design and Updates	Taver Bahrami, Senior Regulatory Specialist
2:45 – 3:00 pm	Wrap Up & Next Steps	Chris Sandve, Chief Regulatory Officer

Background and Context

Chris Sandve

Chief Regulatory Officer

2024 Applications

Residential Rates	Net Metering Rate	Non-Integrated Area Rates	Tariffs Terms & Conditions	Distribution Extension Policy
• Update RIB Rate • Introduce 1-2 more optional rates • Other updates	• Update Net Metering rate • Optional Net Metering TOU Rate • Other updates	• Residential rates • Commercial rates • Distribution extension charges	• Tariffs terms and conditions • Standard charges	• Update distribution extension charges • Standard connection charges

Target Filing Date: June 28, 2024

Why Consider Changes Now?

1. **Customer Feedback:** capacity limit, virtual net metering, time of delivery pricing
2. **Previous Evaluations:** potential outstanding cost recovery concern; however, concerns with underlying rate structure should be separate
3. **Rate Choices:** Are changes required so Net Metering is compatible with BC Hydro's plan to offer Residential customers multiple rates?

Net Metering Rate Engagement

	2023		2024	
	Mar	Oct – Nov	Feb – Apr	Apr – May
Customers	• Survey • Qualitative research	• Survey • Qualitative research		• Survey
Stakeholders	• Net Metering Workshop #1	• Net Metering Workshop #2	• 7 Working Group Sessions	• Net Metering Workshop #3

Target Filing Date: June 28, 2024

Our Progress Since November 2023 Workshop

1. 7 working group sessions to focusing on generation pricing (including time of delivery), capacity limits, virtual net metering
2. Incorporating ideas from working group into rate model
3. Implementation considerations

Working Group Meetings

Session	Date	Topic
1	Jan 30, 2024	Introduction
2	Feb 14, 2024	Capacity Limit, Virtual Net Metering
3	Feb 28, 2024	Capacity Limit, Virtual Net Metering
4	Mar 13, 2024	Export Compensation, Time-of-Delivery
5	Mar 27, 2024	Export Compensation, Time-of-Delivery
6	Apr 10, 2024	Illustrative Options
7	Apr 24, 2024	GHG Emissions, Net Metering in the 2021 Integrated Resource Plan, Illustrative Options Updates

Objectives for this Afternoon's Session

- Review considerations for Net Metering Service Rate
- Provide overview of potential rate design options
- Discuss next steps

Net Metering Overview

Paul Seo

Senior Product Manager

Net Metering Overview

- Net metering enables residential and commercial customers to connect a small-scale renewable electricity generating unit (up to 100 kW of capacity). Electricity generated by the customer is first used to power their home or business.
- If a customer generates more electricity than they need at any given time, the excess generation is stored as generation credits on their account to be used to offset their future bills.
- Any unused generation credits are paid out to customers annually.

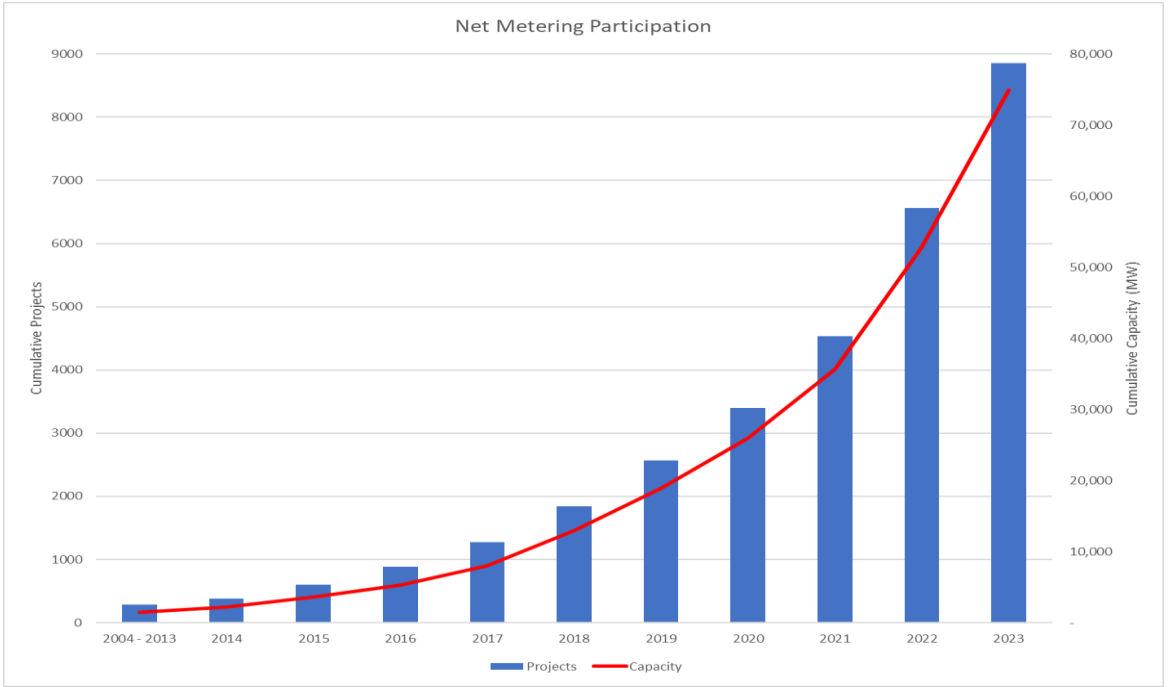
Net Metering Update

The number of net metering customers has grown significantly over the past three years

As of February 2024, there are approximately **8,800** net metering customers.

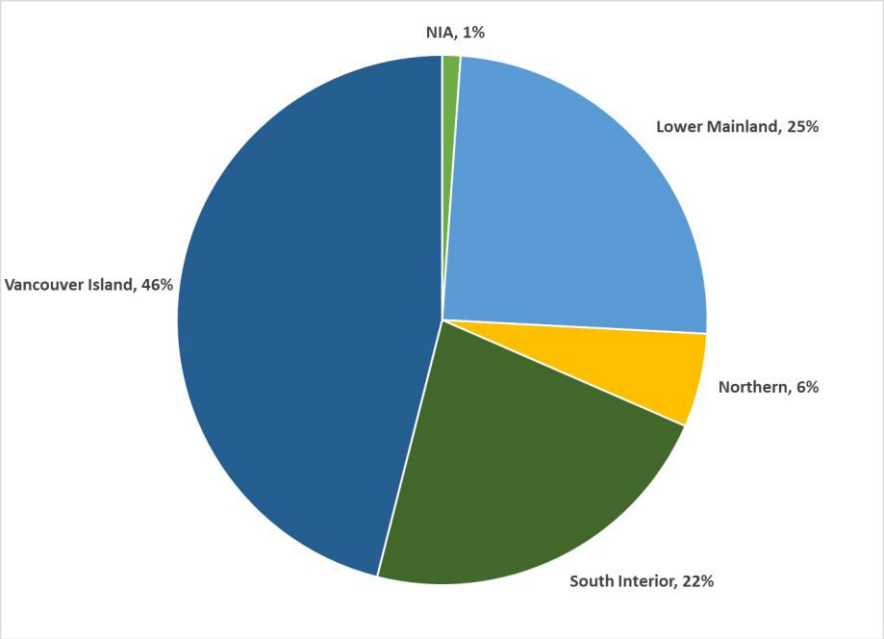
Total connected generation capacity is approximately **79.6 MW**.

Equivalent to powering ~54,000 electric vehicles using Level 1 charging

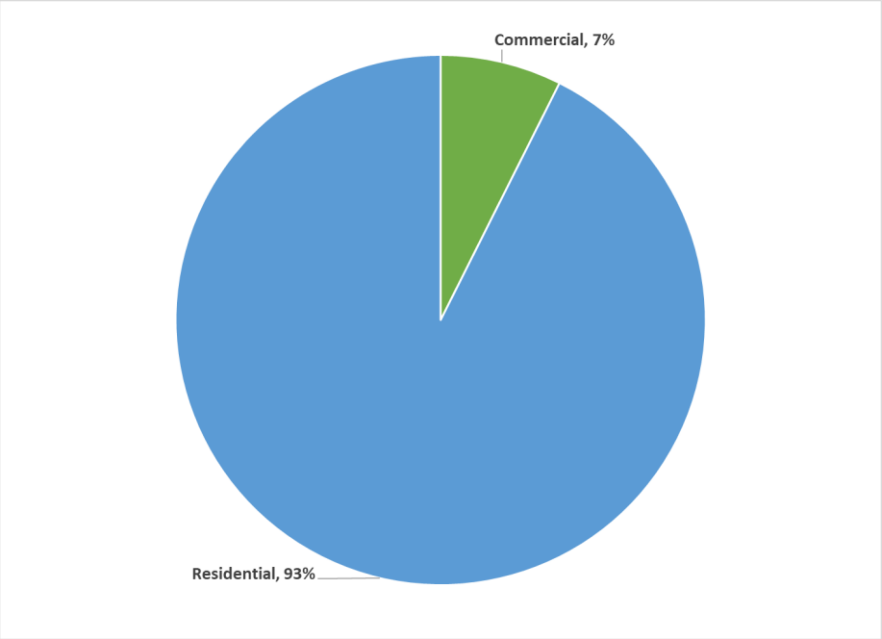


Net Metering Customers

Participation by region



Participation by sector



Net Metering Generation Technology

Generation technology	# of customers	Percent
Solar	8,800	99.5%
Hydro	20	0.2%
Wind / Solar	11	0.1%
Wind	10	0.1%
Hydro / Solar	2	0.0%
Biogas	1	0.0%
Total	8,844	100.0%

As of February 2024

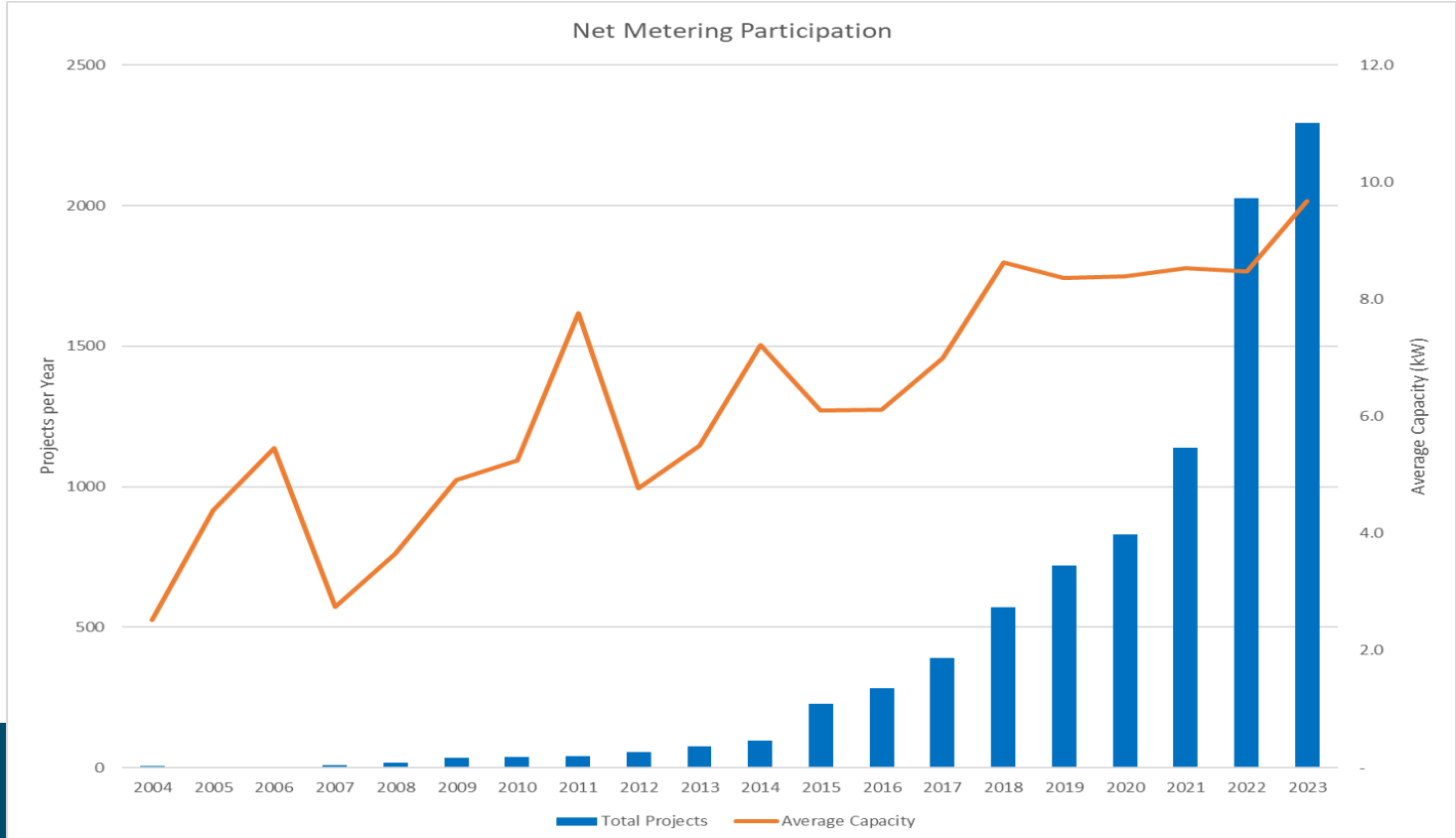
Net Metering Capacity Size

Steady increase in average size of projects

Average size of projects in the first 10 years was 4.7 kW

In 2023, average size of projects are now 9.7 kW

Average residential size project is 7.0 kW

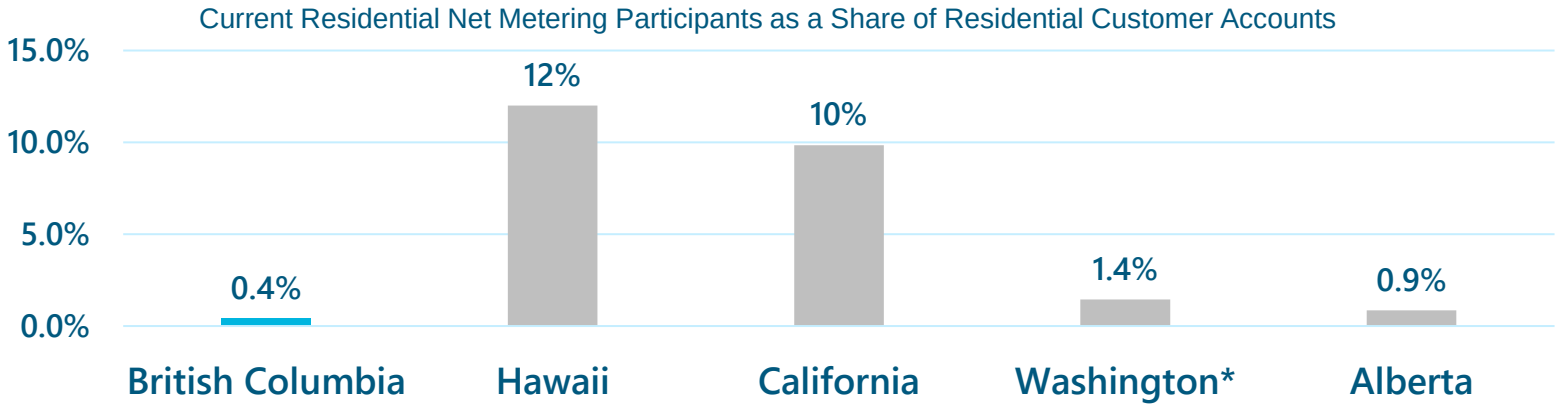


Illustrative Installation Costs

Customer Class	Average Installation Size (kW)	Average Installation Cost* ($)
Residential	7	20,000
SGS	13	37,000
MGS	34	97,000
LGS	32	91,000

* Assumes a solar installation cost of $2,845 per kW.

Jurisdictional Comparison



	British Columbia	Hawaii	California	Washington*	Alberta
Average Retail Rate** (¢/kWh)	11.62	56.54	48.18	17.57	27.78 – 29.80
Solar Intensity (kWh/kW/year)	1,004	1,620	1,625	1,093	1,276

* Includes Puget Sound Energy, Seattle City Light and Snohomish PUD.
** Average residential retail rates in CAD for major cities/regions in each jurisdiction as of April 1, 2023 (Hawaii shown as of 2022).

What We Have Heard (So Far)

- Majority of Net Metering customers and installers want to continue with Traditional Net Metering. Some interest has been expressed in Net Billing.
- Strong interest in time of delivery pricing for generation
- Strong interest in advancing Virtual Net Metering
- The current 100 kW capacity limit is seen as a barrier to participation
- Battery with solar should be pursued to enhance the value of net metering as a planning resource
- Should not segment rate by customer or generation type

Proposed Net Metering Service Rate Design

Taver Bahrami

Senior Regulatory Specialist

Issues to Consider

- **Cost recovery:** Net metering customers use generation credits (in kWhs) to offset some or all of their bills at the retail energy rate they take service under, resulting in BC Hydro not recovering some fixed demand and customer related costs.
- **Standardize compensation for customer generation:** customers receive different compensation values based on their retail rates for the energy they generate and send to BC Hydro.
- **Explore time variation in rates:** the current model does not send price signals to reward customers who deliver energy to BC Hydro at the time energy is most needed (i.e., winter late afternoon / early evening hours).
- **Respond to evolving customer needs:** some customers are requesting a higher generation capacity limit (increase the 100 kW capacity cap) and for generation credits to be shared by more than one account (virtual net metering).

Rate Design Principles

- Rate designs must not be unjust, unreasonable, unduly discriminatory or unduly preferential.
- The BCUC has found the eight Bonbright rate design criteria are consistent with the *Utilities Commission Act* test of “fair, just and not unduly discriminatory”.

  - Recovery of the revenue requirement
  - Fair appointment of costs among customers
  - Price signals that encourage efficient use and discourage inefficient use
  - Customer understanding and acceptance; practical and cost-effective to implement
  - Freedom from controversies as to proper interpretation
  - Rate stability
  - Revenue stability
  - Avoidance of undue discrimination

Net Metering Rate Design Inputs

- The economics of the net metering rate depend on the following inputs:


Underlying Base Rate and Value of Offset Consumption


Value of Generation


Costs to Serve Net Metering Customers


Other Potential Benefits

Utility Regulatory Tests

Rate designs must have either **cost of service** or **economic** justifications.

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Total Participant Cost

- Excess generation compensation
- Embedded energy, demand and customer related costs
- Administration costs
- Implementation costs

Incremental Ratepayer Costs

- Excess generation compensation
- Administration costs
- Implementation costs

Utility Regulatory Tests

Rate designs must have either **cost of service** or **economic** justifications.

1 Cost of Service Justification

Target Revenue to Cost Ratio (R/C)

Rate Class Average

Total Participant Revenue

- Billed Revenue @ retail rate
- Excess generation @ market price
- Excess generation compensation (reduction)

Total Participant Cost

- Embedded energy, demand and customer related costs
- Administration costs
- Implementation costs

or

2 Economic Justification

Target Benefit to Cost Ratio (B/C)

1

Incremental Ratepayer Benefit

- Excess generation @ avoided marginal costs

Incremental Ratepayer Costs

- Excess generation compensation
- Administration costs
- Implementation costs

Customer Needs

Rate designs should be easy to understand and be accepted by customers.

3

Pay Back Period

Target Pay Back Period

Status Quo or Shorter

Customer Investment

Customer Benefits

- Bill savings
- Compensation for excess generation
- Installation incentives

4

Other Customer Needs

- Higher Capacity Limit
- Virtual Net Metering
- Time of Delivery compensation
- Installation Incentives

Potential Options

	Status Quo	Cost-Based Payment with Incentive	Cost Plus - Based Payment with Incentive
Before the Meter	Offset Consumption at Retail Rate	Offset Consumption at Retail Rate	Offset Consumption at Retail Rate
Generation to Grid	Offset Consumption at Retail Rate Mid-C for remainder	**9.17** ¢/kWh for all (based on BC Hydro's marginal costs)	**11.00** ¢/kWh for all (based on marginal costs with adder for other benefits)
Capacity Limit	100 kW Nameplate	100 kW Net Injection	100 kW Net Injection
Time of Delivery	No	Yes - Winter Peak Adder (8.80-11.61 ¢/kWh)	Yes - Winter Peak Adder (8.80-11.61 ¢/kWh)
Virtual Net Metering	No	Yes (up to 1 MW Nameplate)	Yes (up to 1 MW Nameplate)
Installation Incentive	$0	$5,000	$5,000

Assessment of Potential Options & Combinations

Option	Status Quo (A)	Cost-Based Payment with Incentive	Cost Plus - Based Payment with Incentive	Customers Can Choose A or B (C)
1 R/C (%)				78 / 82
2 B/C (%)				68 / 93
3 Payback (Y				19 / 18
Increase Capac	X	✓	✓	✓
4 Time of Delivery	X	✓	✓	Depends what option the customer chooses
4 Virtual Net Metering	X	✓	✓	
4 Installation Incentive	X	✓	✓	

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Assessment of Potential Options & Combinations

	Option	Status Quo (A)	Cost-Based Payment with Incentive (B1)	Cost Plus - Based Payment with Incentive (B2)	Customers Can Choose A or B (C)
1	R/C (%)	73 (w/RIB: 71)	79	76	73 / 79
2	B/C (%)	68 (w/RIB: 65)	93	78	68 / 93
3	Payback (Years)	19	18	17	19 / 18
4	Increase Capacity	X	✓	✓	✓
	Time of Delivery	X	✓	✓	Depends what option the customer chooses
	Virtual Net Metering	X	✓	✓	
	Installation Incentive	X	✓	✓	

How Did BC Hydro Calculate 9.17 ¢/kWh?

Type	Utility System Impact
Generation	Energy Generation
	Capacity
	Environmental Compliance
	RPS/CES Compliance
	Market Price Effects
	Ancillary Services
Transmission	Transmission Capacity
	Transmission System Losses
Distribution	Distribution Capacity
	Distribution System Losses
	Distribution O&M
	Distribution Voltage
General	Financial Incentives
	Program Administration Costs
	Utility Performance Incentives
	Credit and Collection Costs
	Risk
	Reliability
	Resilience

Type	Host Customer Impact
Host Customer	Host portion of DER costs
	Interconnection fees
	Risk
	Reliability
	Resilience
	Tax Incentives
	Host Customer NEIs
	Low-income NEIs

Type	Societal Impact
Societal	Resilience
	GHG Emissions
	Other Environmental
	Economic and Jobs
	Public Health
	Low Income: Society
	Energy Security

How Did BC Hydro Calculate 9.17 ¢/kWh?

2021 IRP Reference Prices	Fiscal 2022	Fiscal 2025
Energy LRMC ($/MWh)	70	79.9
Distribution Line Losses at 5.95% ($/MWh)	4.4	5.05
Distribution Capacity ($/kW-Year)	35	39.9

$$79.9\frac{\$}{MWh} = \boxed{7.99\frac{¢}{kWh}}$$

$$\left(79.9\frac{\$}{MWh} \times \frac{1}{94.5\%}\right) - 79.9\frac{\$}{MWh} = \boxed{0.50\frac{¢}{kWh}}$$

$$39.9\frac{\$}{kW} \times \frac{100¢}{16\ HLH \times 365\ Days} = \boxed{0.68\frac{¢}{kWh}}$$

How Did BC Hydro Calculate Winter Peak Adder?

November to February 4 p.m. to 9 p.m.

IRP Reference Price	Fiscal 2022	Fiscal 2025	Takes Effect in Fiscal
Non-Bulk Transmission Capacity ($/kW-Year)	35	39.94	2022
Generation Capacity LRMC ($/kW-Year)	115	131.24	2031

Effective Load Carrying Capability (ELCC)

Amount by which the system's loads can increase when the resource is added to the system while maintaining the same system reliability

Sample Calculation using 50% ELCC:

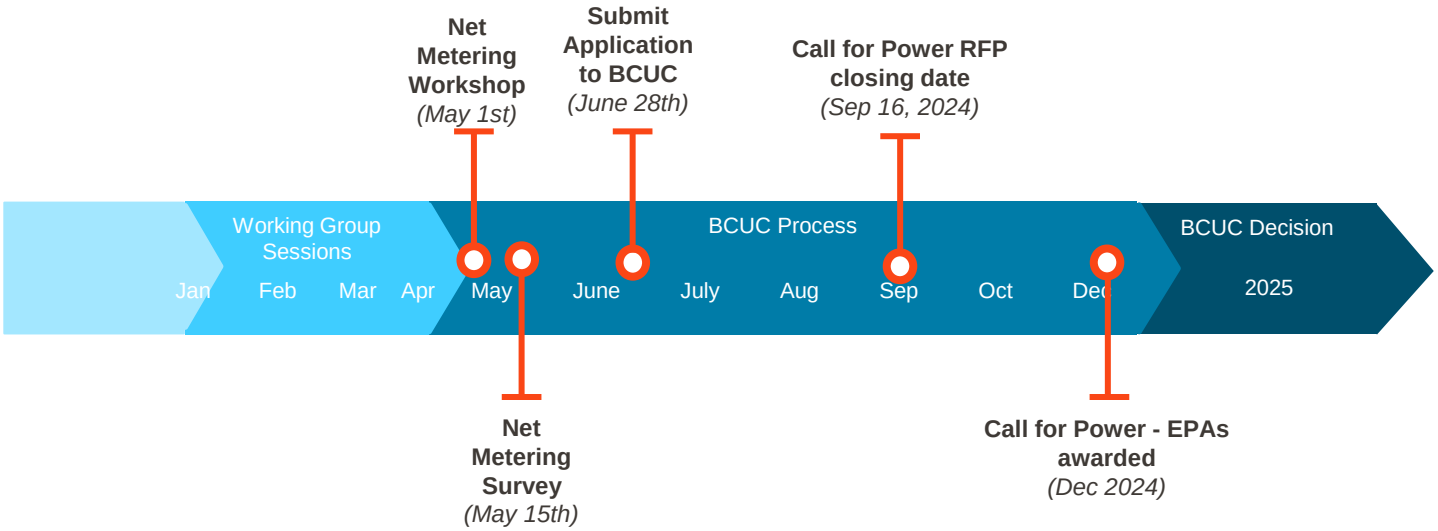
$$\frac{\frac{131.24}{2} + 39.94}{5\ hrs \times 120\ days} \times 50\% = 8.80\ \frac{¢}{kWh}$$

ELCC	Illustrative Examples
ELCC 50%	8.80 ¢ / kWh
ELCC 66%	11.61 ¢ / kWh

Value of Generation Calculation Summary

	Energy LRMC (¢/kWh)	Energy Line Loss (¢/kWh)	D. Capacity (¢/kWh)	G&T Capacity (¢/kWh)	Total (¢/kWh)
Year Round	7.99	0.50	0.68	-	9.17
Winter On-Peak	7.99	0.50	0.68	8.80 (assuming 50% ELCC)	17.97

Call for Power Could Change Value of Generation Calculations



Capacity Limit (excluding Virtual Net Metering)

	Customer Considerations	Utility Considerations
100 kW Net Injection	✔ Customers can build any size system to serve their electricity needs. ✔ Flexibility to increase injection. ✔ No system study required.	✔ Minimize impact to BC Hydro's grid. ✔ Encourages Battery.
1 MW	✔ Allows customers to export more energy to BC Hydro. ✘ System study required for > 100 kW • **$7500 to $60,000** • **1 to 6 months** ✘ Customer electrical system installation costs ✘ Subject to system improvement costs.	✘ Potential impacts to BC Hydro grid. ✘ Increases need to conduct system study.

Virtual Net Metering

Eligibility	• Multi-tenant Buildings • Non-for-profit Groups • Political Subdivisions
Rate	• Same as for Cost-Based Payment (Option B) • Introduce an administration fee
Billing Mechanism	• BC Hydro administers the distribution of generation monetary payment to other BC Hydro accounts. • BC Hydro will not be involved in the member subscription process.
Capacity Limit	• Up to 1 MW • Scalable by number and type of subscribers.
Scope	• Subscribers must be on the same substation as the generation. • Connect to Distribution System.

Wrap Up and Next Steps

Chris Sandve

Chief Regulatory Officer

Why Consider Changes Now?

1. **Customer Feedback:** capacity limit, virtual net metering, time of delivery pricing
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BC Hydro

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