

Welcome to BC Hydro's

2024 Rate Design Applications (RDA) Workshop

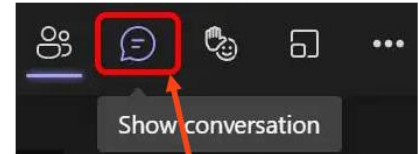
We'll be getting started shortly

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 be made available following this session

Technical issues?

- Send an email to bchydroregulatoryfeedback@bchydro.com



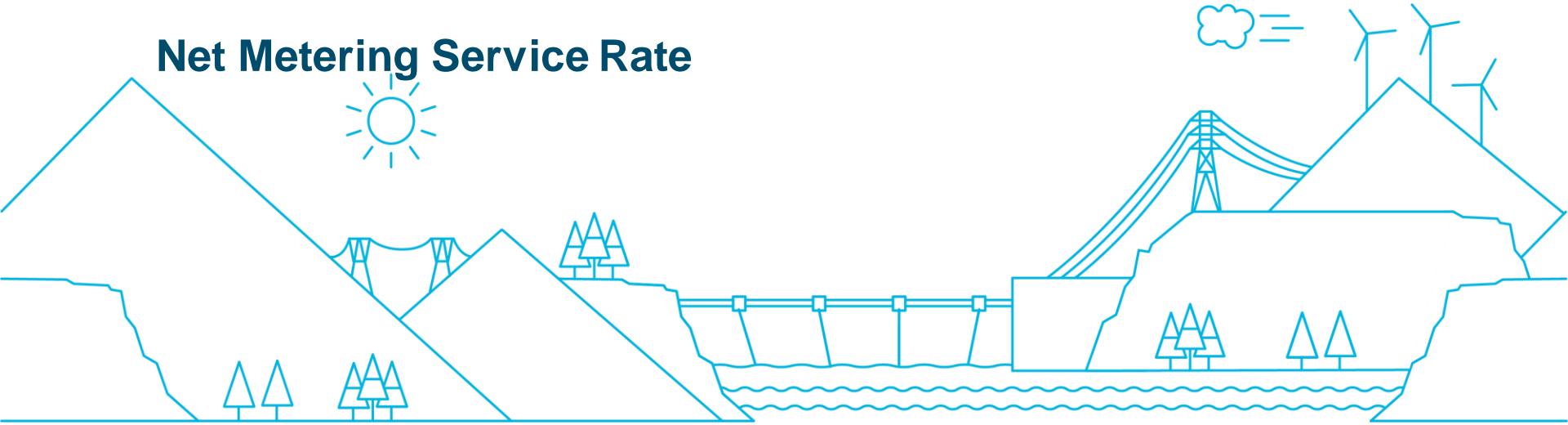
Click on this icon
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BC Hydro 2024

Rate Design Applications

Workshop 1 – Session 2

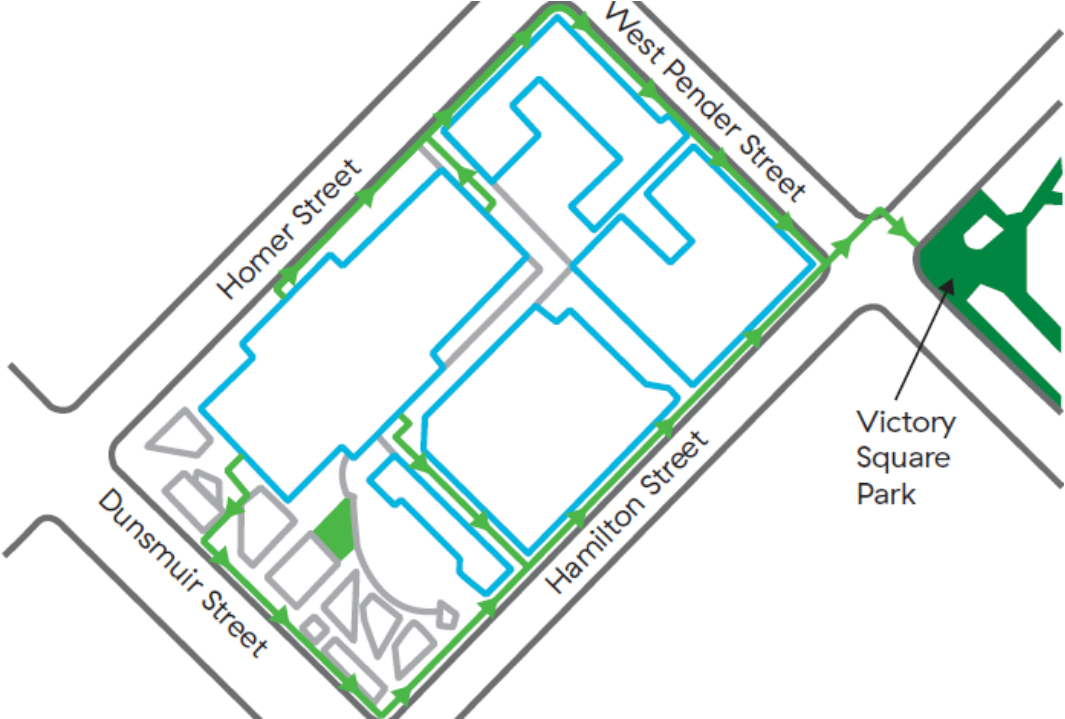
Net Metering Service Rate



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 – 2:00 pm	Net Metering Update, Engagement Feedback	Paul Seo, Senior Product Manager
2:00 – 2:45 pm	Net Metering Service Rate Design and Updates, Customer Characteristics, Rate Concepts	Taver Bahrami, Senior Regulatory Specialist – Modelling and Analysis Team Lead
2:45 – 3:00 pm	Wrap Up & Next Steps	Chris Sandve, Chief Regulatory Officer

Background and Context

Chris Sandve

Chief Regulatory Officer

Ongoing Rate Design Proceedings

	Transmission Service Rate	Optional Residential TOU Rate	Public Electric Vehicle Charging Rates
Status	<p>Update the current two-step default Transmission rate to a flat rate.</p> <p>Awaiting BCUC Decision</p>	<p>Offer Residential customers bill savings opportunities by shifting their consumption.</p> <p>Awaiting BCUC Decision</p>	<p>Update our public electric vehicle charging rates to recover our costs.</p> <p>Streamlined Review Process in December</p>
Target Launch	April 1, 2024	June 1, 2024	Early 2024

Upcoming – 2024 Applications

Residential Rates	Net Metering Rate	Non-Integrated Area Rates	Tariffs Terms & Conditions	Distribution Extension Policy
<ul style="list-style-type: none">• Update RIB Rate• Introduce 1-2 more optional rates• Other updates	<ul style="list-style-type: none">• Update Net Metering rate• Optional Net Metering TOU Rate• Other updates	<ul style="list-style-type: none">• Residential rates• Commercial rates• Distribution extension charges	<ul style="list-style-type: none">• Tariffs terms and conditions• Standard charges• Meter Choices Program charges	<ul style="list-style-type: none">• Update distribution extension charges• Standard connection charges

Target Filing Date: June 28, 2024

Stakeholder Workshop 1 – Session 1

	Day 1 November 27	Day 2 November 29
AM	Residential Service Rates Non-Integrated Areas Rates	Electric Tariff Terms & Conditions Distribution Extension Policy
PM	Net Metering Service Rate	

Objectives for this Afternoon's Session

- Provide context for our upcoming rate design activities
- Provide a summary of feedback received to date
- Review considerations for Net Metering Service Rate
- Review net metering customer characteristics and load profiles
- Discuss next steps

Net Metering Update

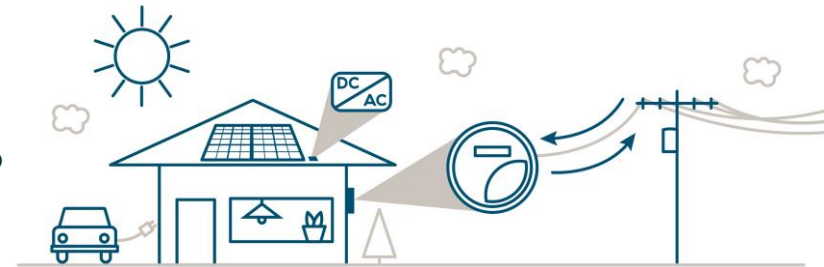
Paul Seo

Senior Product Manager

Net Metering Overview

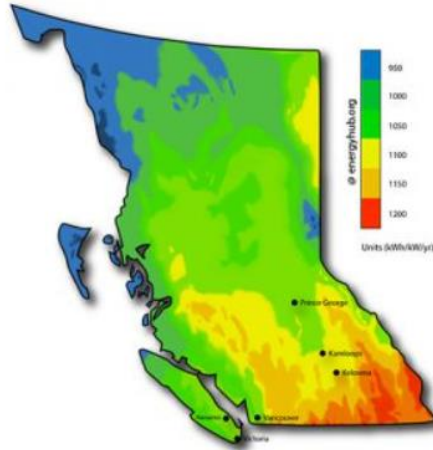
- Net metering enables residential and commercial customers to connect a renewable electricity generating unit of up to 100 kW of capacity to:
 - Power their home or business;
 - Save on their electricity bills;
 - Rely on BC Hydro's grid, when needed.
- Electricity generated by the customer is first 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

Note: Net metering applications in the non-integrated areas (NIA) are reviewed to ensure intermittent renewables only serve up to 10% of the community's annual average load to avoid power quality and reliability issues.



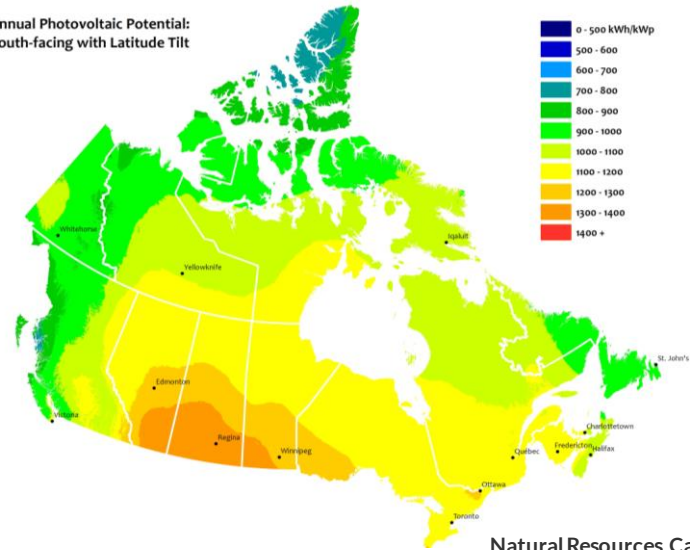
Total Solar Generation Potential

Month	kWh/kW
January	40
February	58
March	84
April	99
May	104
June	110
July	120
August	118
September	113
October	74
November	44
December	37
Annual Total	1004



Energyhub.com
Solar Energy Maps Canada (Every Province)

Annual Photovoltaic Potential:
South-facing with Latitude Tilt



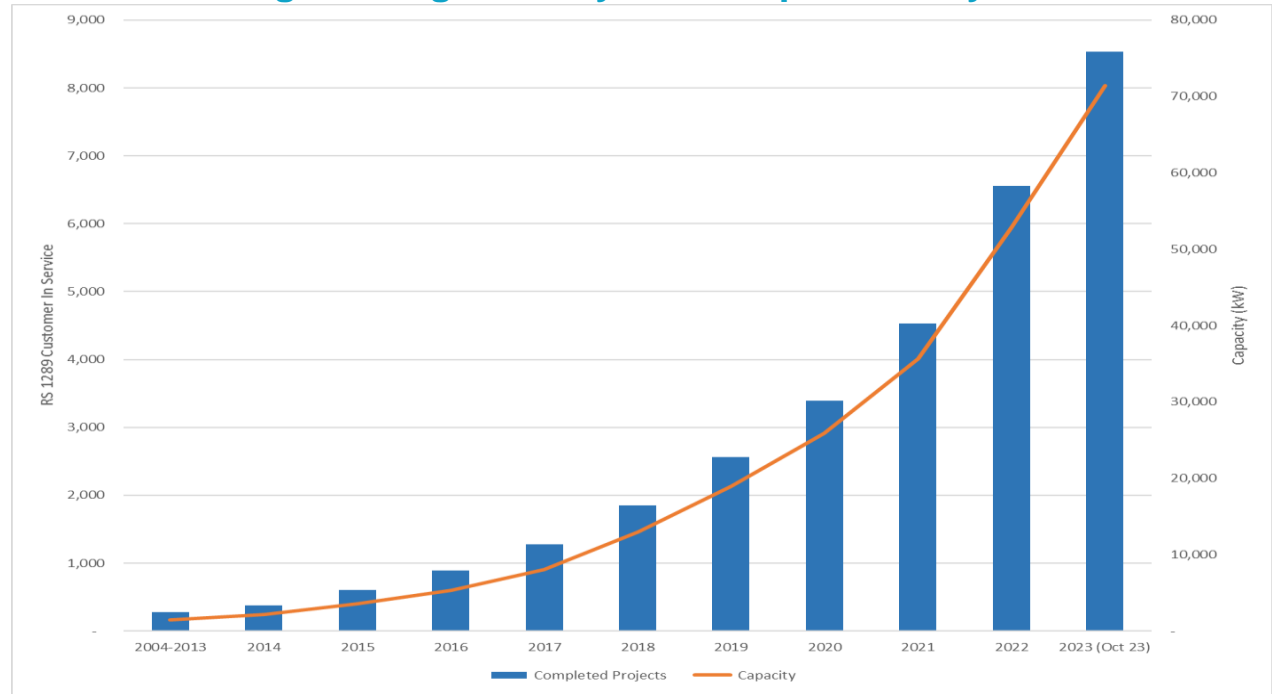
Natural Resources Canada
Photovoltaic potential and solar resource maps of Canada

Net Metering Update

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

- As of October 2023, there are approximately **8,500** net metering customers.
- Total connected generation capacity is approximately **71 MW**.

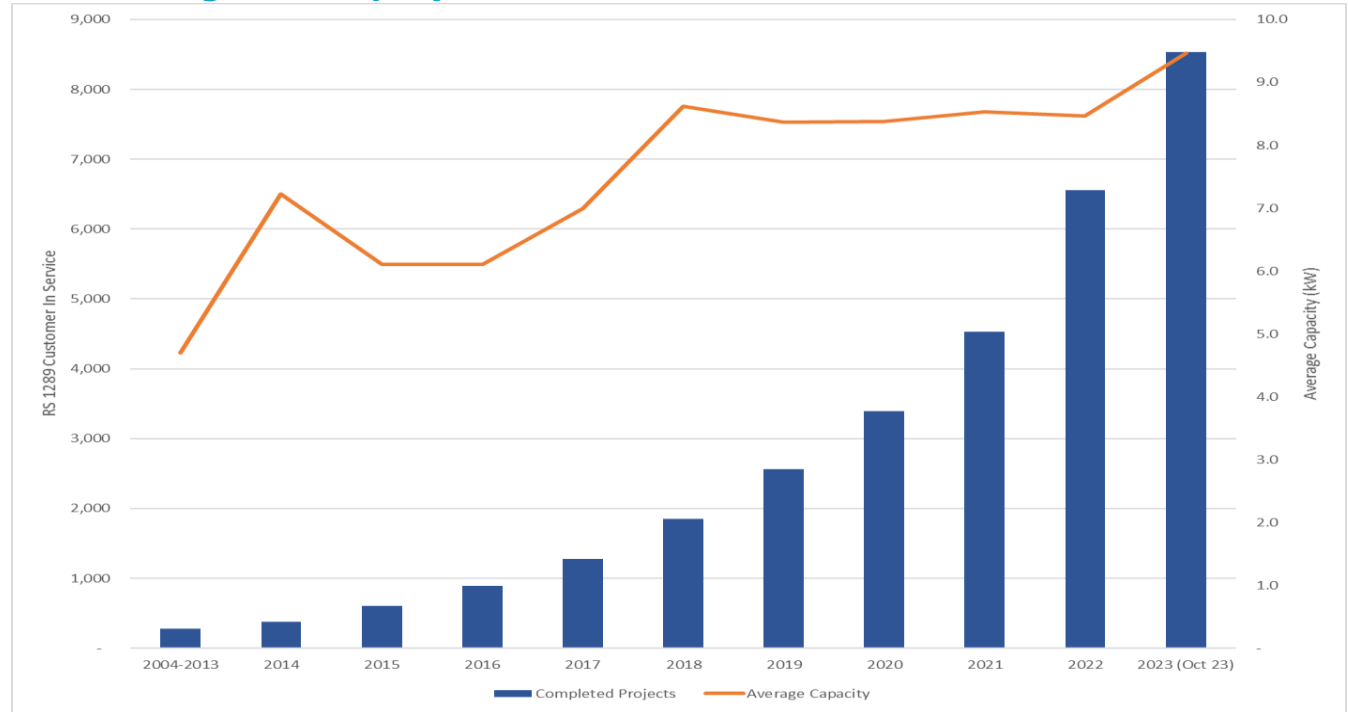
Equivalent to powering ~52,000 electric vehicles using Level 1 charging



Net Metering Update

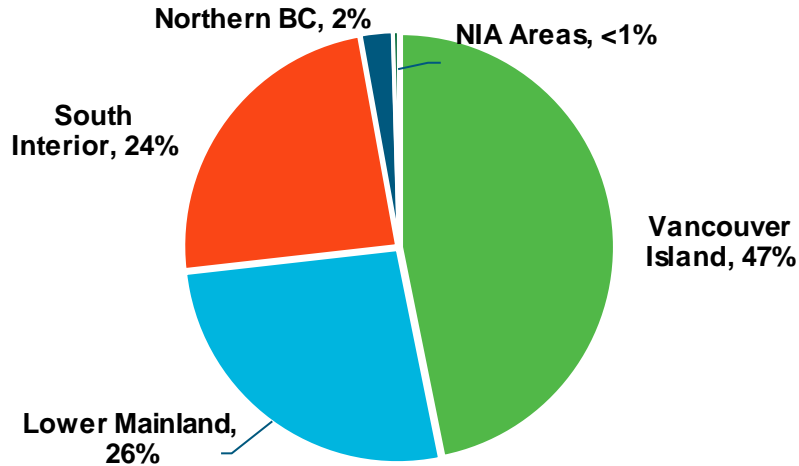
Seen a steady increase in average size of projects

- Average size of projects in the first 10 years was 4.7 kW
- In 2023, average size of projects are now 9.5 kW

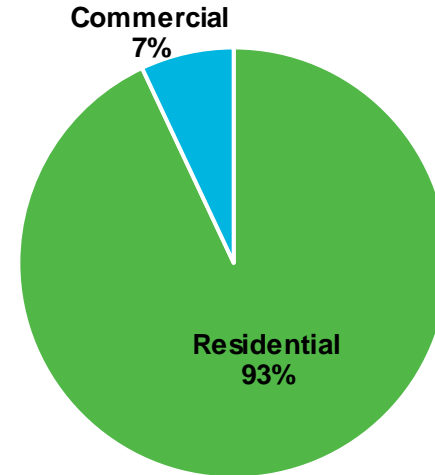


Net Metering Customers

Participation by region



Participation by sector



Net Metering Generation Technology

Generation technology	# of customers	Percent
Solar	8,489	99.5%
Hydro	19	0.2%
Wind	11	0.1%
Wind / Solar	10	0.1%
Hydro / Solar	2	0.0%
Biogas	1	0.0%
Total	8,532	100.0%

As of October 2023



Net Metering Excess Generation

	2019	2020	2021	2022
# of Net Metering Customers	2,473	3,268	4,352	6,302
# of Customers Received Payout	621	355	350	446
# of commercial customers	63	38	45	47
Excess Generation (MWh)	4,550	2,815	4,333	3,676
Transitional / Mid-C energy price (¢/kWh)	9.99	9.99 / 4.87	9.99 / 2.85	9.99 / 6.19
Total Annual Payment (\$)	\$454,588	\$280,627	\$414,384	\$345,314
% paid to commercial customers	36%	23%	48%	39%

Feedback from March 29th, 2023

Workshop

Paul Seo

Senior Product Manager

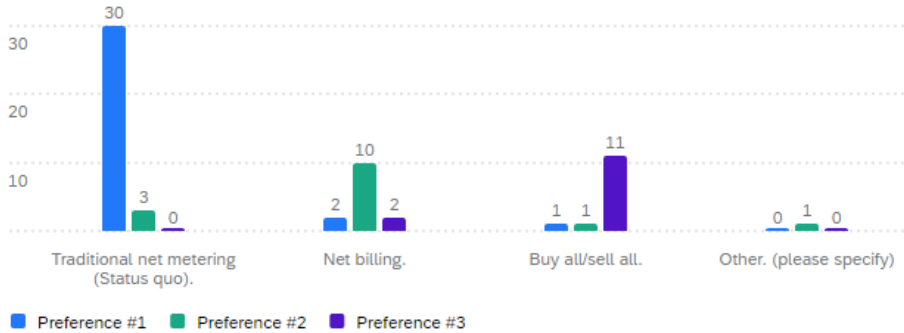
Areas of Focus

Areas of Focus	Definition
Compensation mechanisms	<ul style="list-style-type: none">• How generation is compensated
Rate design modifications	<ul style="list-style-type: none">• How costs should be recovered
Eligibility criteria	<ul style="list-style-type: none">• Who and what is eligible
Planning resource	<ul style="list-style-type: none">• Compensating for grid services; Programs for battery storage
Moving away from “one size fits all”	<ul style="list-style-type: none">• Different net metering rates for different customer groups

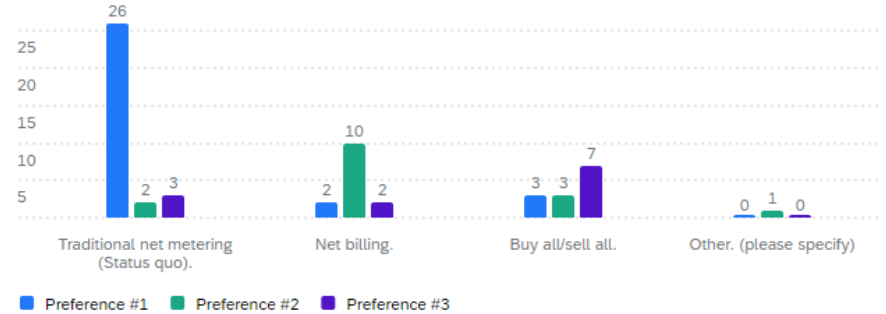
Compensation Mechanisms

Compensation Mechanism	Description
Traditional Net Metering	<ul style="list-style-type: none">Excess generation can be stored as generation credits applied to subsequent bills with an annual settlement at year end.
Net Billing	<ul style="list-style-type: none">Similar to Traditional Net Metering but excess generation is netted out on an instantaneous, hourly, or other pre-determined interval.
Buy All – Sell All	<ul style="list-style-type: none">Customers would buy all of the electricity they need from BC Hydro at the retail rate, and sell all of the electricity they generate to BC Hydro at a pre-determined price.

Phase 1 Workshop Feedback | Compensation Mechanisms



Residential



Commercial

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Phase 1 Survey Results | Compensation Mechanisms

Please rank each compensation mechanism in order of preference:

	Residential		Commercial	
	Participants	Non-Participants	Participants	Non-Participants
Net Metering	64%	19%	39%	22%
Net Billing	16%	23%	32%	28%
Buy All Sell All	3%	5%	3%	9%
No Preference	17%	52%	26%	41%

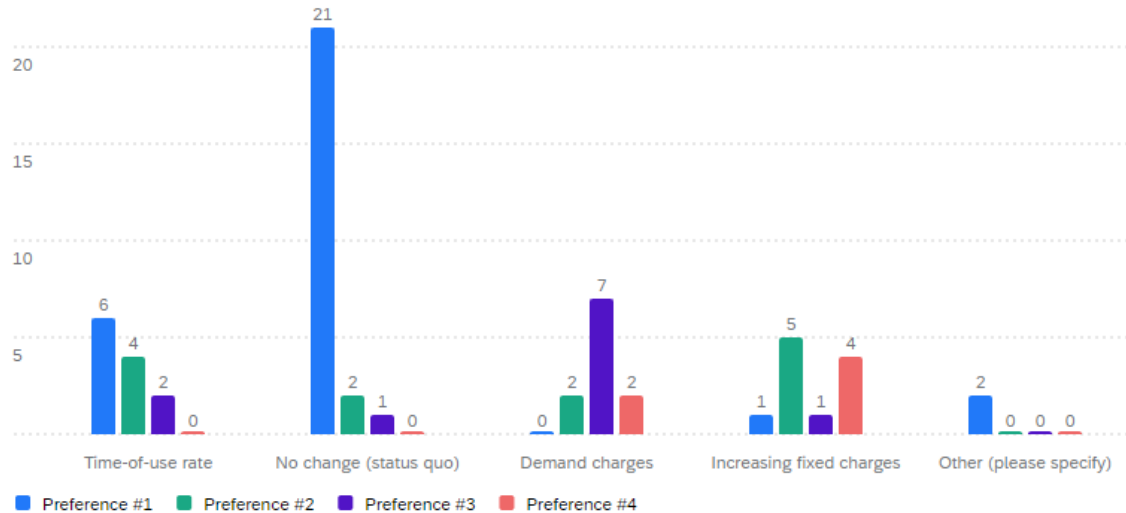
Sentis Survey (June 2023)
 1,505 Participants
 837 Non-participants

Rate Design Modifications

Rate Design Modifications	Notes
Time-of-Use (TOU)	<ul style="list-style-type: none">• The value of a kWh is based on the time of day.• Typically, between 2 to 3 pricing periods.
Increasing fixed charges	<ul style="list-style-type: none">• Fixed daily charge to recover customer costs.
Demand Charges	<ul style="list-style-type: none">• Requires a demand capable meter.
Grid Access Charges	<ul style="list-style-type: none">• Some jurisdictions assess a fee from net metering customers to reflect the costs they impose on the T&D system• Fee may be a fixed monthly fee or a per-kW installed solar fee
Grid Services Payment	<ul style="list-style-type: none">• Some jurisdictions pay NEM customers additional compensation to reflect grid services they provide or to reflect avoided T&D costs• Payment is typically per-kW of installed solar

Phase 1 Workshop Feedback | Rate Design Modifications

Please rank each rate design modification, in order of preference, that BC Hydro should consider:



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Net Metering Eligibility

Eligibility criteria	Notes
Virtual net metering	<ul style="list-style-type: none">• Some jurisdictions allow subscribers across more than one meter to receive net metering credits according to their share of the generation.
Third party ownership	<ul style="list-style-type: none">• Some jurisdictions are taking steps to enable/allow third party ownership of generation to reduce upfront costs so that more customers can afford to participate (e.g. by renting or leasing their generating equipment).
Individual customer capacity limit	<ul style="list-style-type: none">• Some jurisdictions set system capacity limits to regulate the size of individual installations.• Capacity limits can be defined either in terms of load or as a percentage of annual demand.

Phase 1 Workshop Feedback | Virtual Net Metering

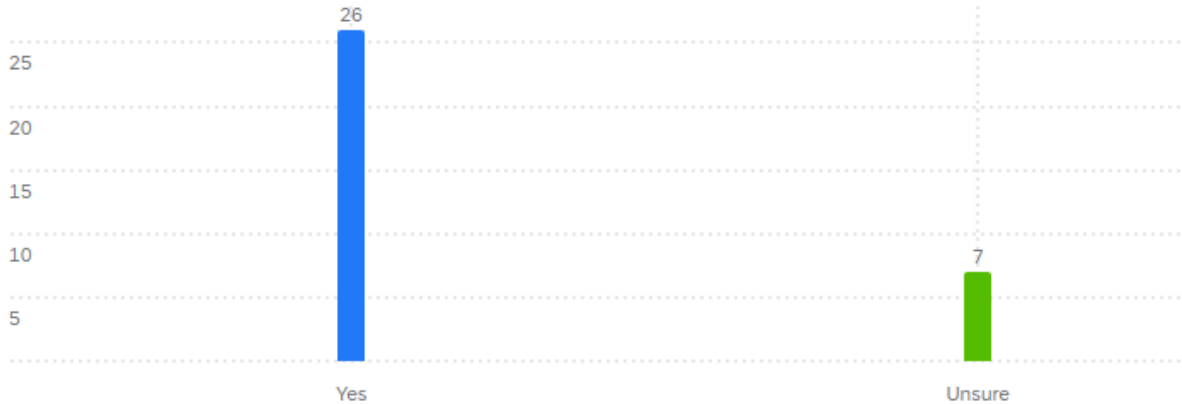
Virtual net metering facilitates the sharing of excess generation credits between different customers or different sites. Should BC Hydro consider changes to the eligibility criteria to enable virtual net metering?



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Phase 1 Workshop Feedback | Eligibility Criteria

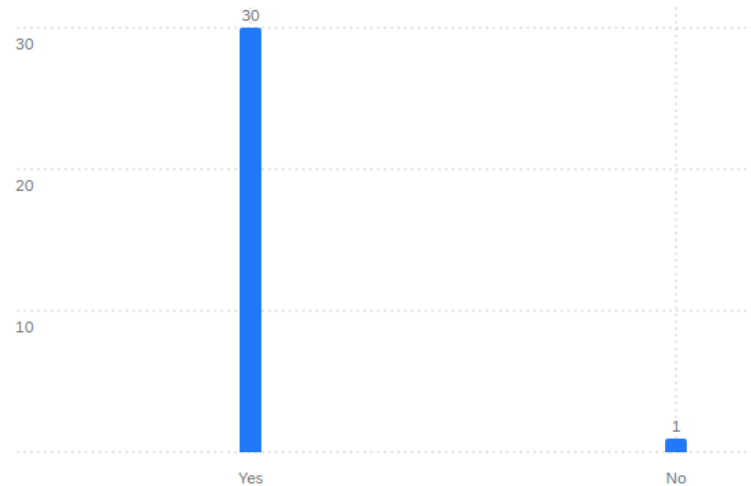
Should BC Hydro consider changes to the eligibility criteria to facilitate more renting/leasing arrangements?



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Phase 1 Workshop Feedback | Capacity Limit

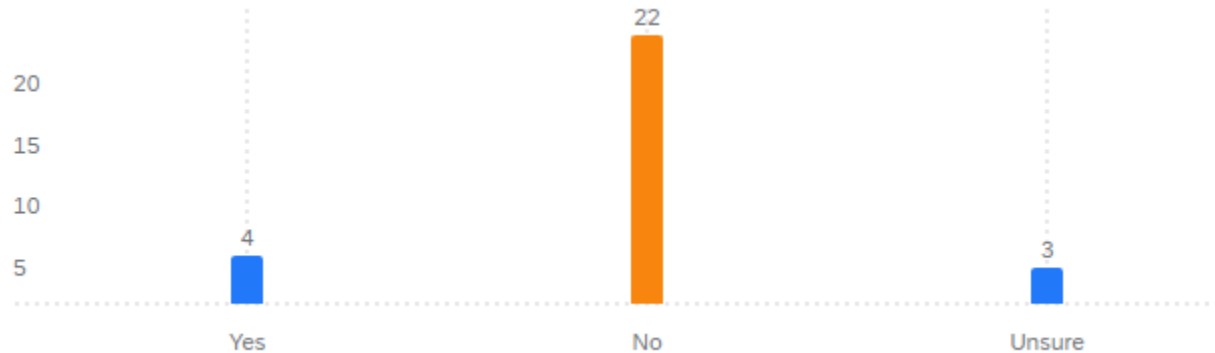
BC Hydro's net metering program currently allows the generation facility to have a nameplate capacity up to 100 kW. Should BC Hydro consider increasing the capacity limit?



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Phase 1 Workshop Feedback | Capacity Limit

An alternative approach is to define the generation capacity limit based on load or as a percentage of annual demand. Should BC Hydro consider this as an alternative approach to the generation capacity limit?



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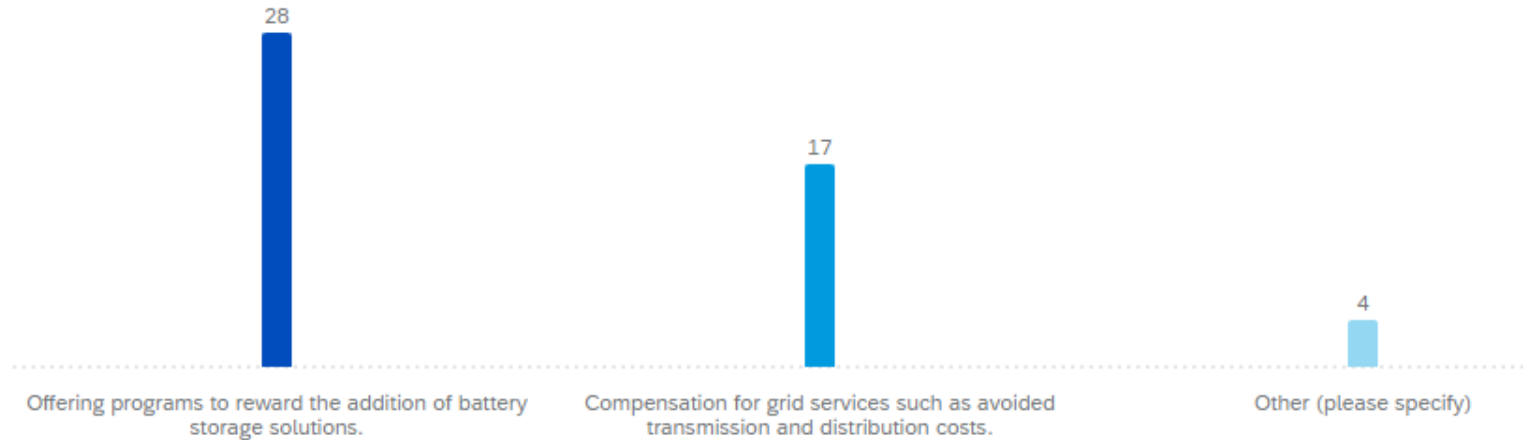
Planning Resource

Providing a suite of programs to allow net metering customers to provide grid services

- These programs are similar to Demand Response programs and reward dispatchability and peak reduction.
- They incentivize the addition of battery storage

Phase 1 Workshop Feedback | Alternatives

What options should BC Hydro consider to recognize and enhance the value of net metering as a planning resource? Select all that apply.



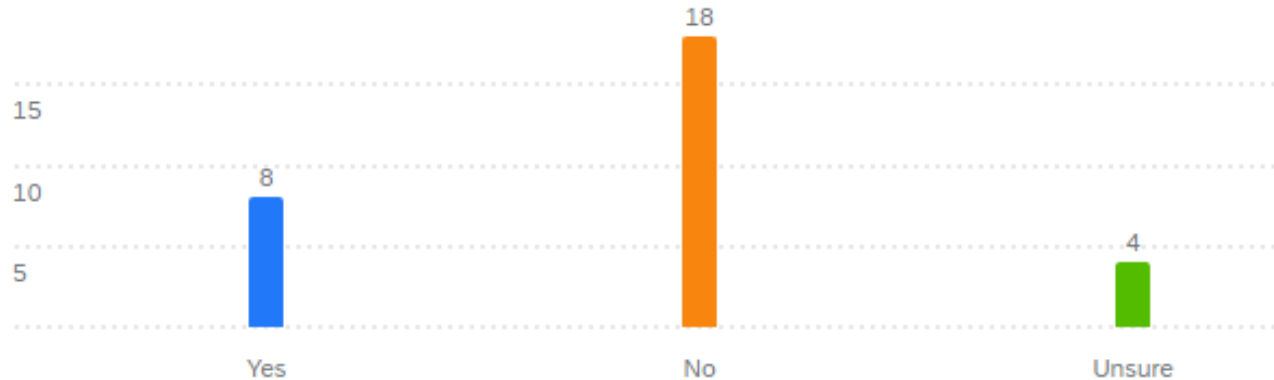
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Moving Away from Current “One Size Fits All” Approach

- BC Hydro recognizes that some of the options discussed above may work better for certain groups of customers than others.

Phase 1 Workshop Feedback | Customer Groups

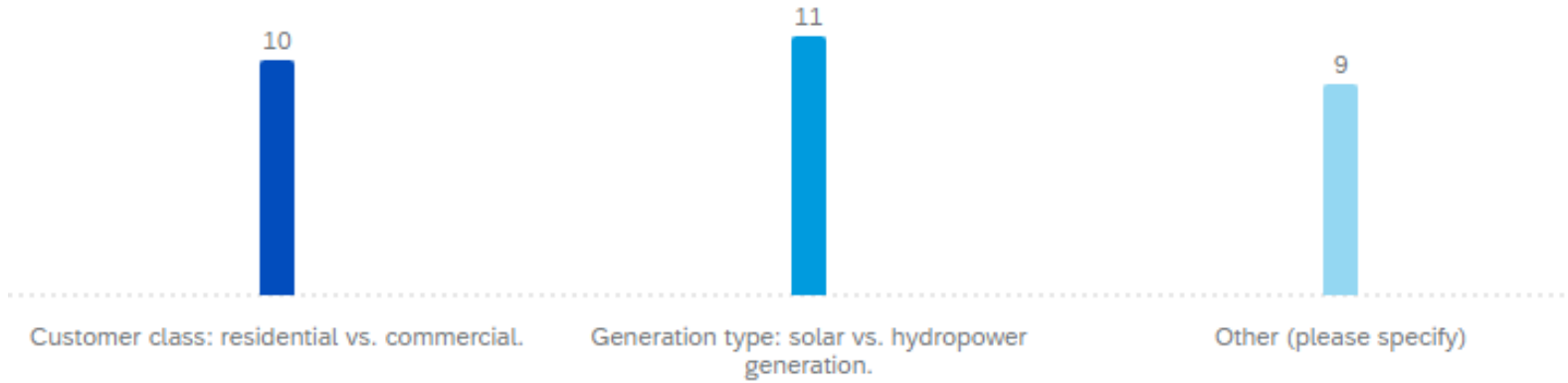
Should BC Hydro explore applying the options discussed to different customer groups?



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Phase 1 Workshop Feedback | Customer Groups

What different customer groups should BC Hydro consider? Select all that apply.



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Net Metering Service Rate Design and Updates

Taver Bahrami

Senior Regulatory Specialist – Modelling and Analysis

Team Lead

Rate Design Context

- Rate design applications to the BCUC must be justified on a cost of service and/or economic basis
- Aligning rate design with cost of service and economics (marginal costs) is important because it:
 - Provides the right price signals to customers
 - Avoids cross-subsidization between different groups of customers

Net Metering Rate Design Inputs

- The economics of the net metering rate is dependent on the following:



Underlying Base Rate and Value of Offset Consumption



Value of Generation

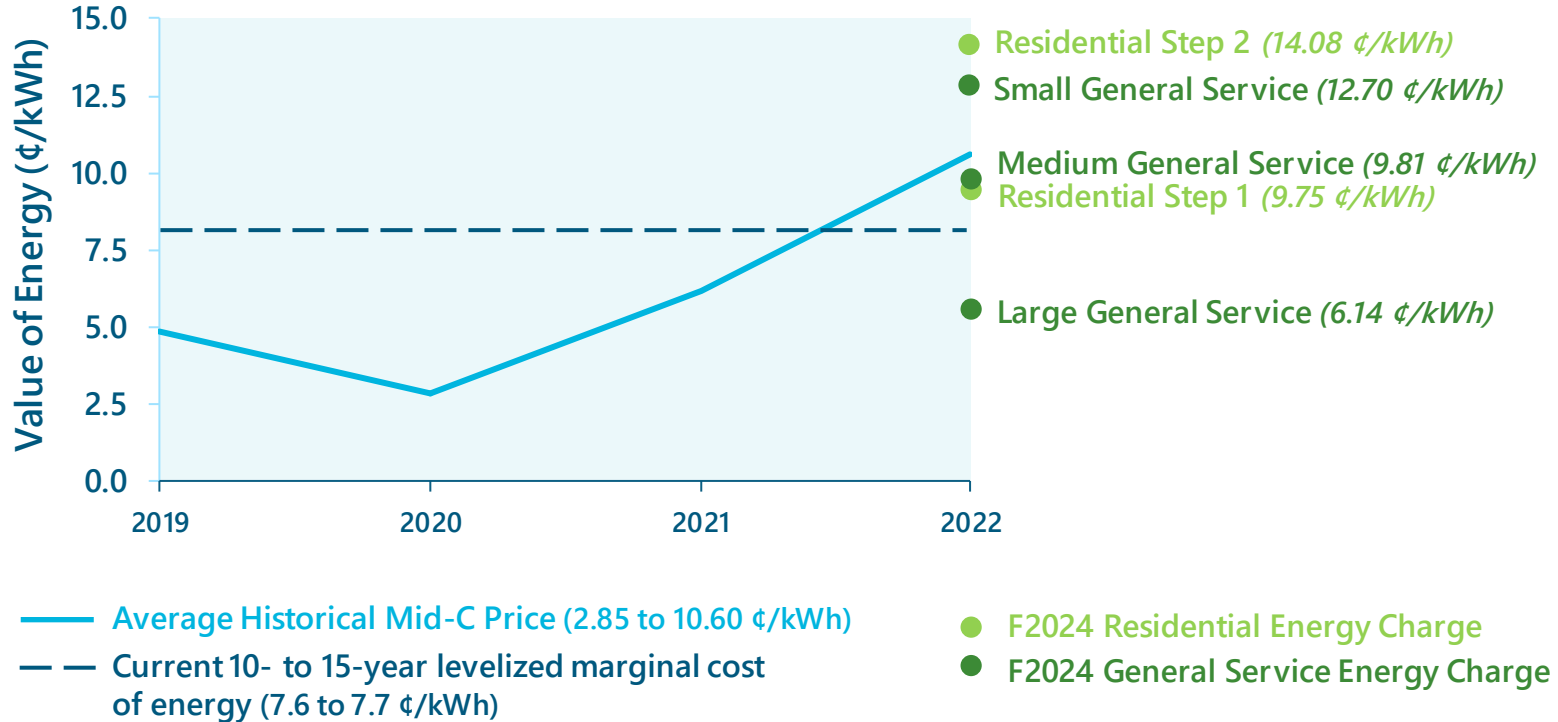


Costs to Serve Net Metering Customers



Other Potential Benefits

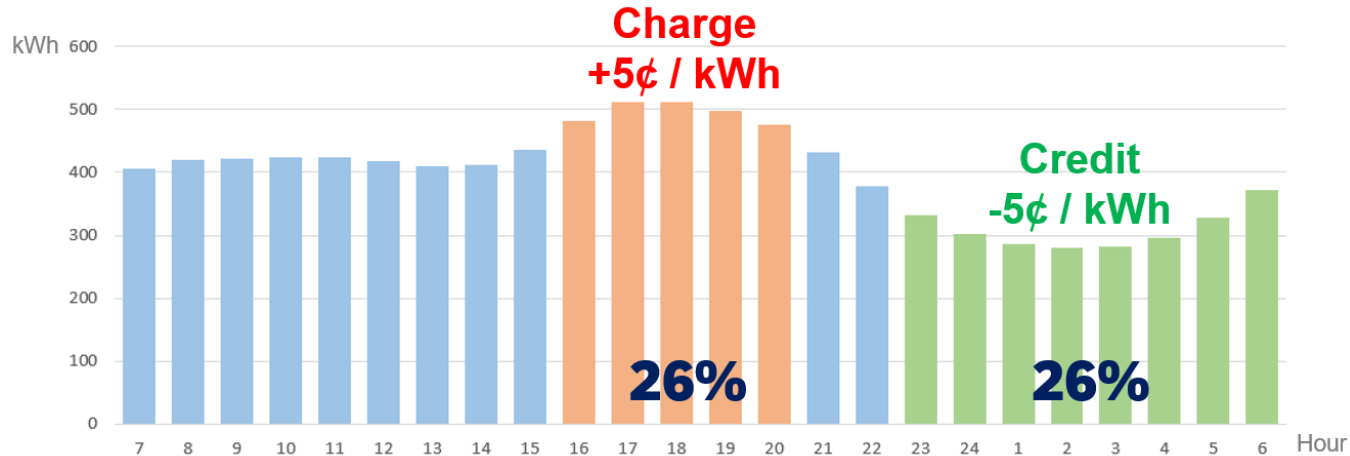
Net Metering Rate Design – Key Inputs



Proposed Optional Residential Time-of-Use (TOU)

On February 27, 2023, BC Hydro submitted an application to the BCUC for an Optional Residential Time-of-Use Rate (TOU), which would incorporate the use of a 5-cent credit/charge rate design to incentivize capacity savings from BC Hydro’s residential customers.

This rate is an “add-on” rate that could be applied on top of the current default rate.



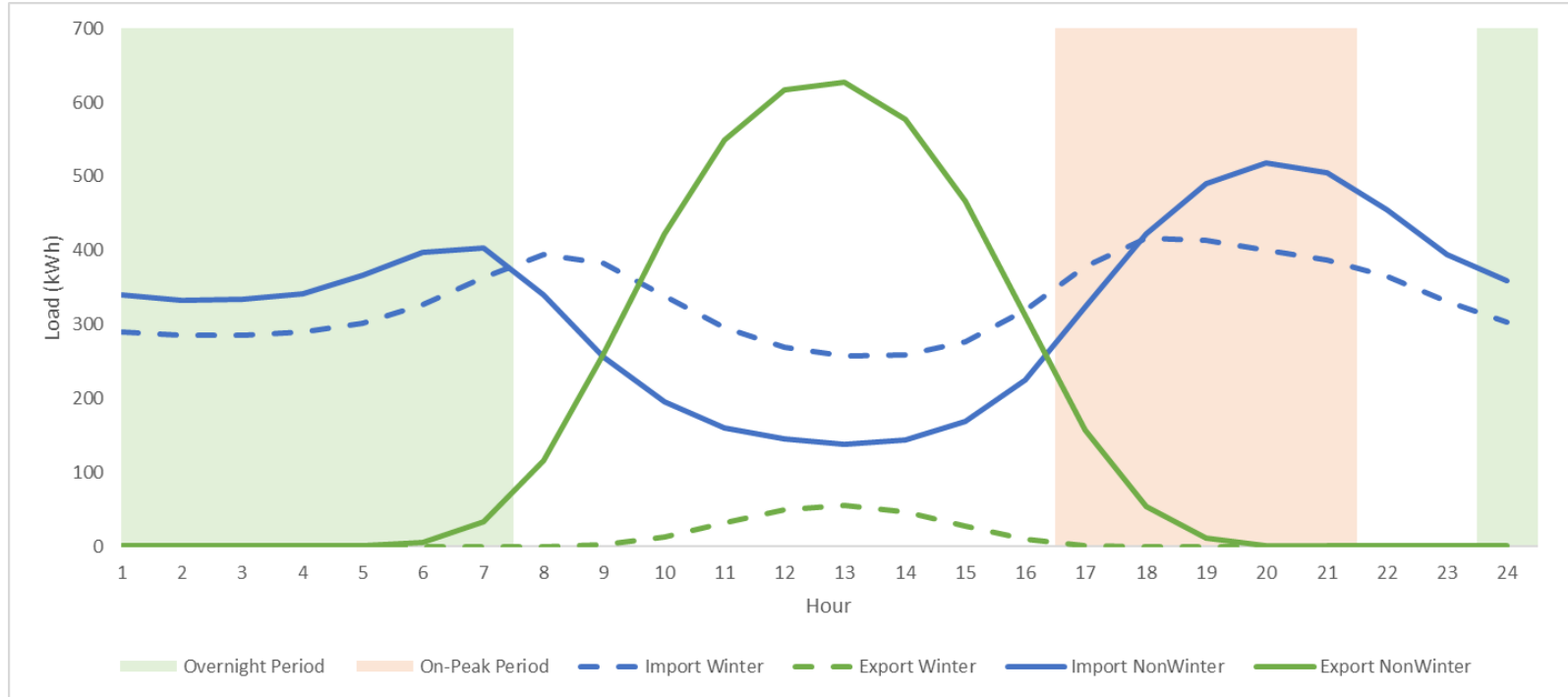
Net Metering Customer Characteristics

Taver Bahrami

Senior Regulatory Specialist – Modelling and Analysis

Team Lead

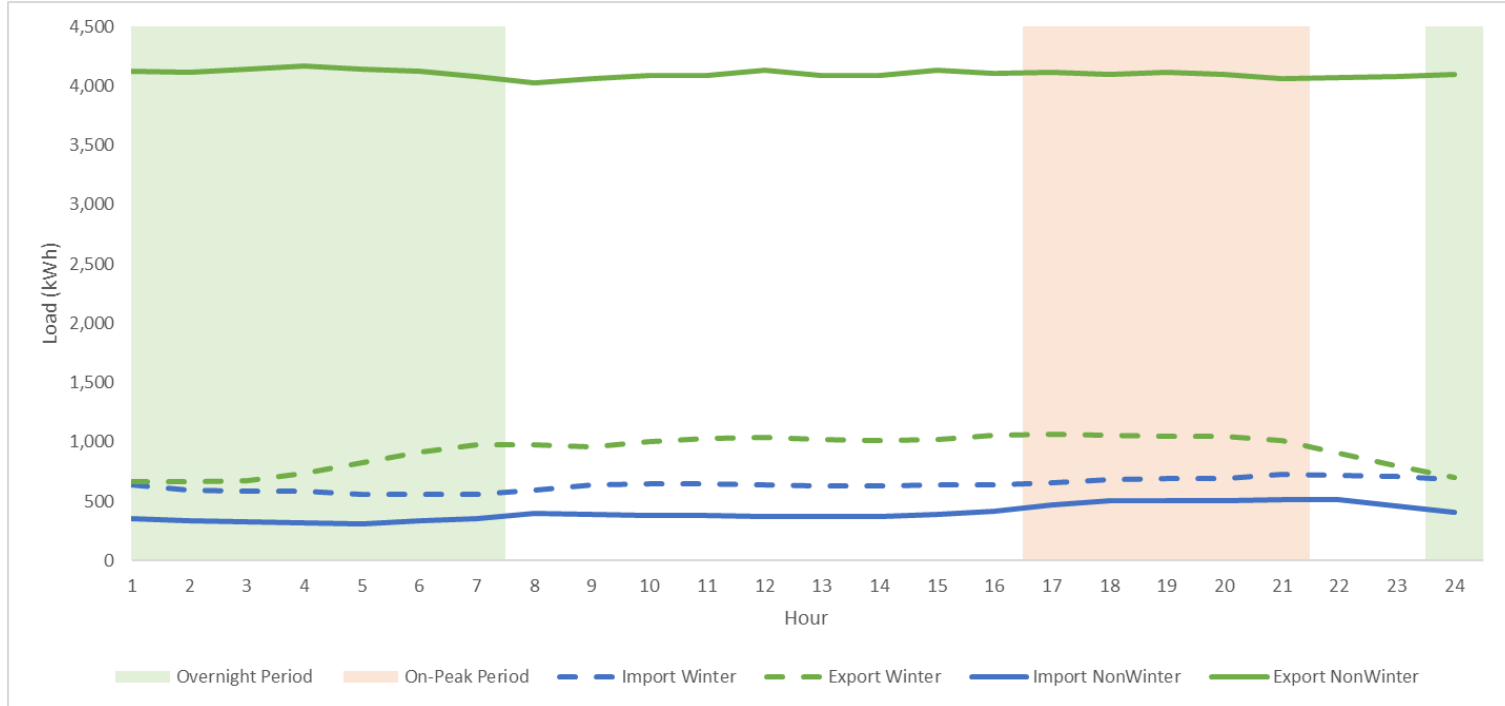
Load Shape of Residential Solar Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	15,680	4,256	6,108	5,316
Import %	100%	27%	39%	34%
Export	4,452	224	4,185	43
Export %	100%	5%	94%	1%

Average Generation Size (kW) 7

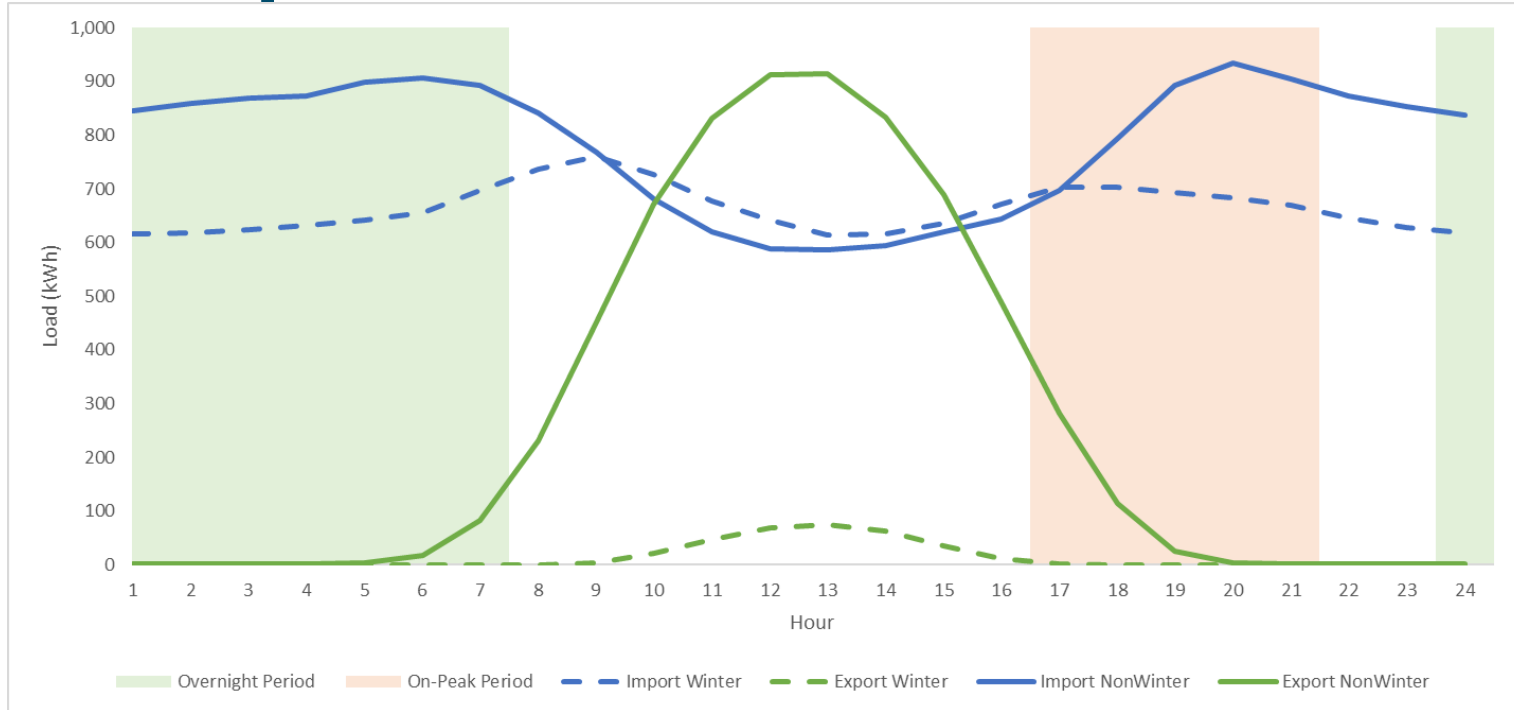
Load Shape of Residential Hydro Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	25,038	5,957	11,579	7,501
Import %	100%	24%	46%	30%
Export	120,637	25,702	55,791	39,143
Export %	100%	21%	46%	32%

Average Generation Size (kW)	44
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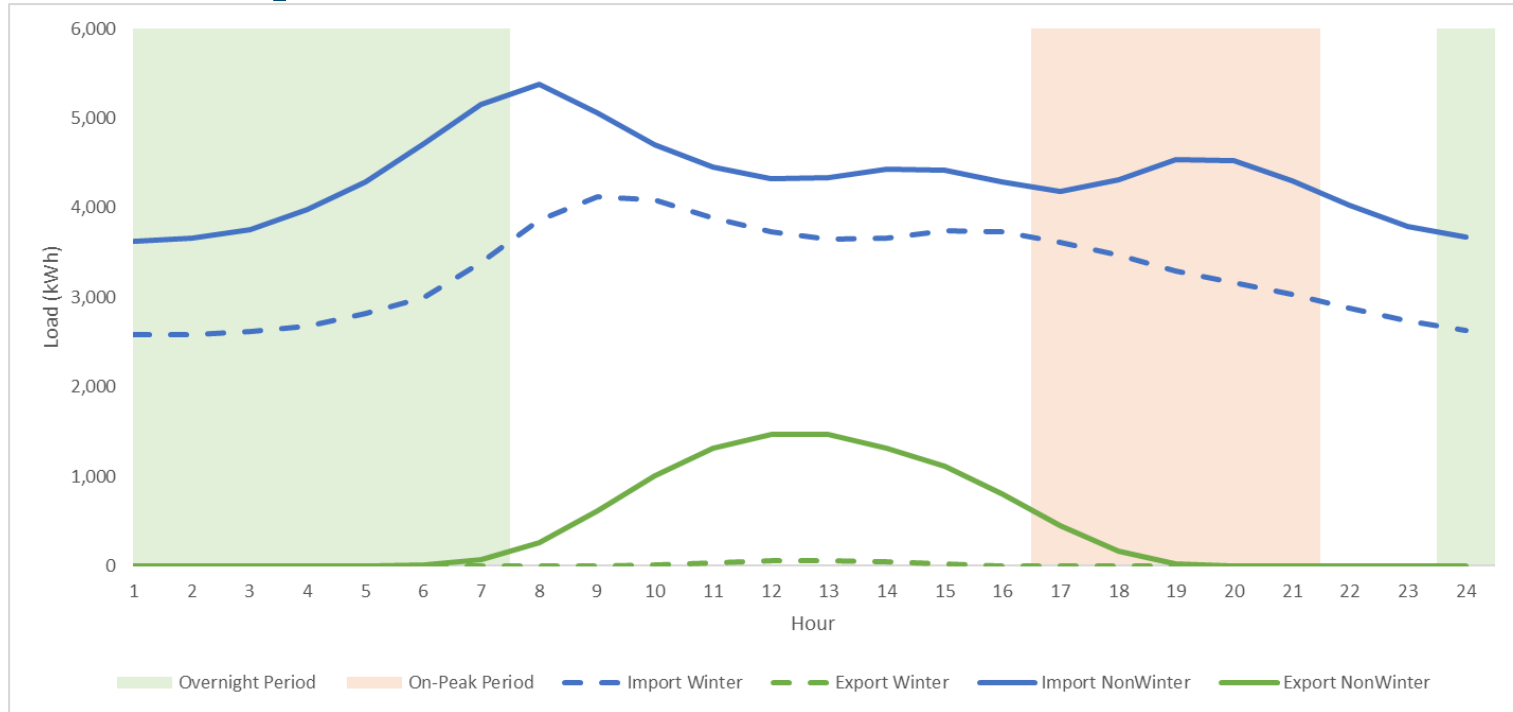
Load Shape of SGS Solar Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	34,781	7,674	15,023	12,084
Import %	100%	22%	43%	35%
Export	6,895	429	6,356	110
Export %	100%	6%	92%	2%

Average Generation Size (kW)	13
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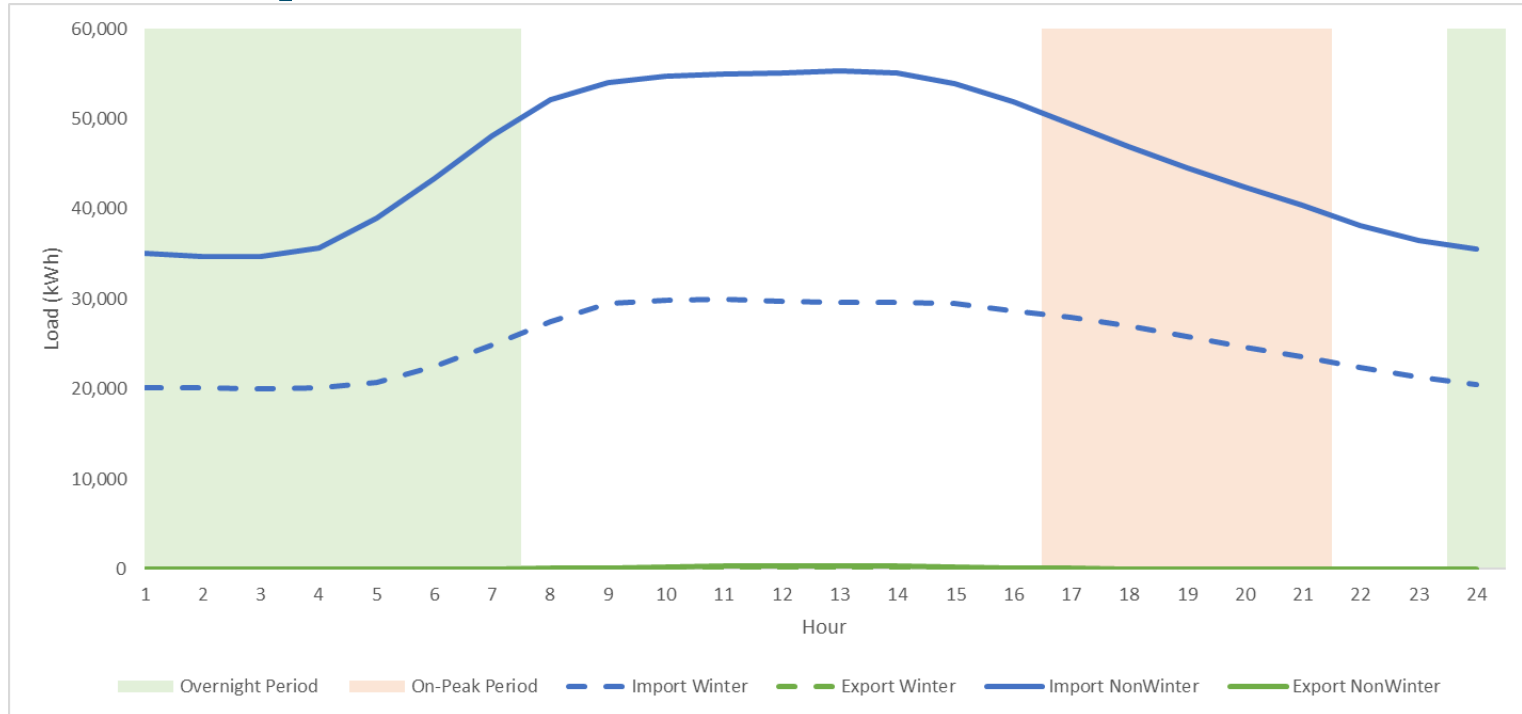
Load Shape of MGS Solar Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	182,855	38,426	89,279	55,151
Import %	100%	21%	49%	30%
Export	10,316	642	9,577	97
Export %	100%	6%	93%	1%

Average Generation Size (kW)	34
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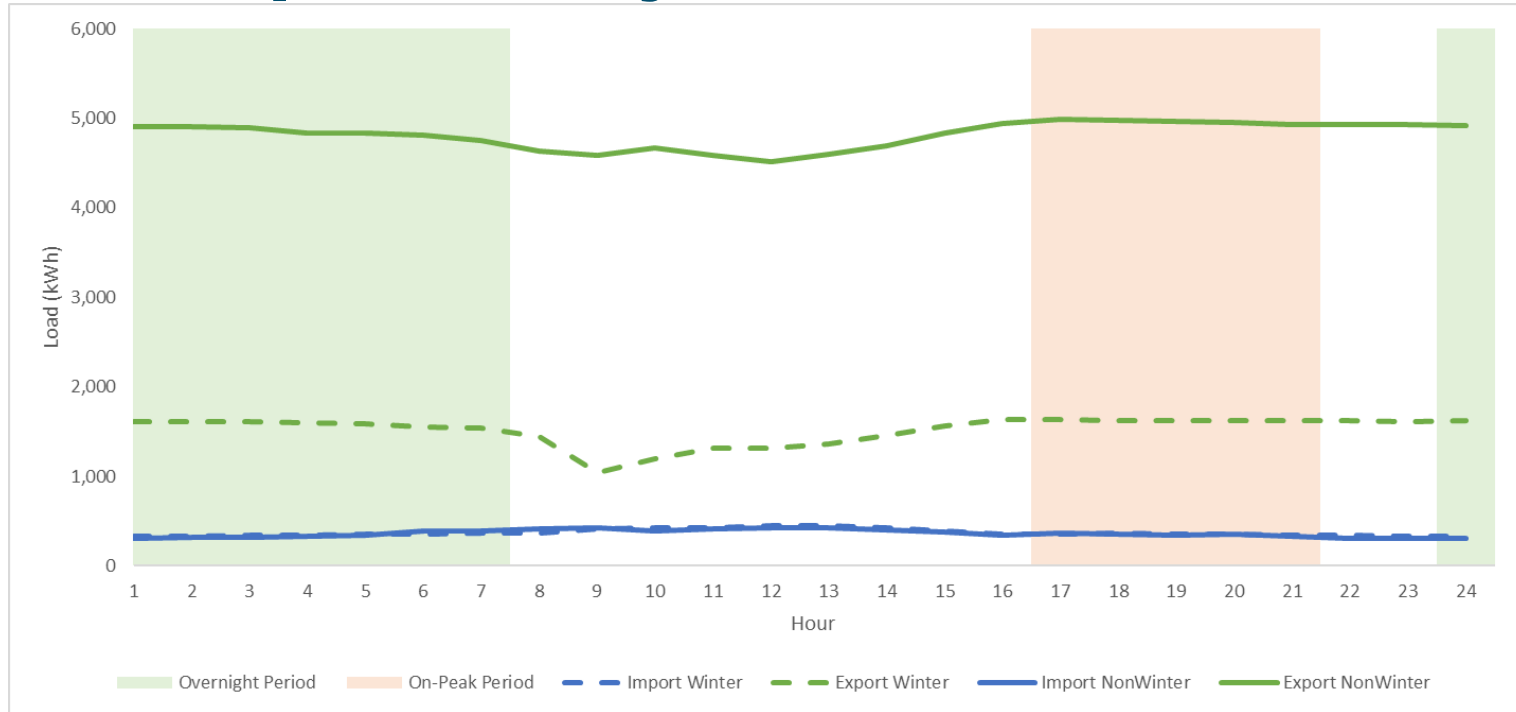
Load Shape of LGS Solar Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	1,697,212	352,618	869,374	475,220
Import %	100%	21%	51%	28%
Export	2,104	113	1,979	12
Export %	100%	5%	94%	1%

Average Generation Size (kW)	32
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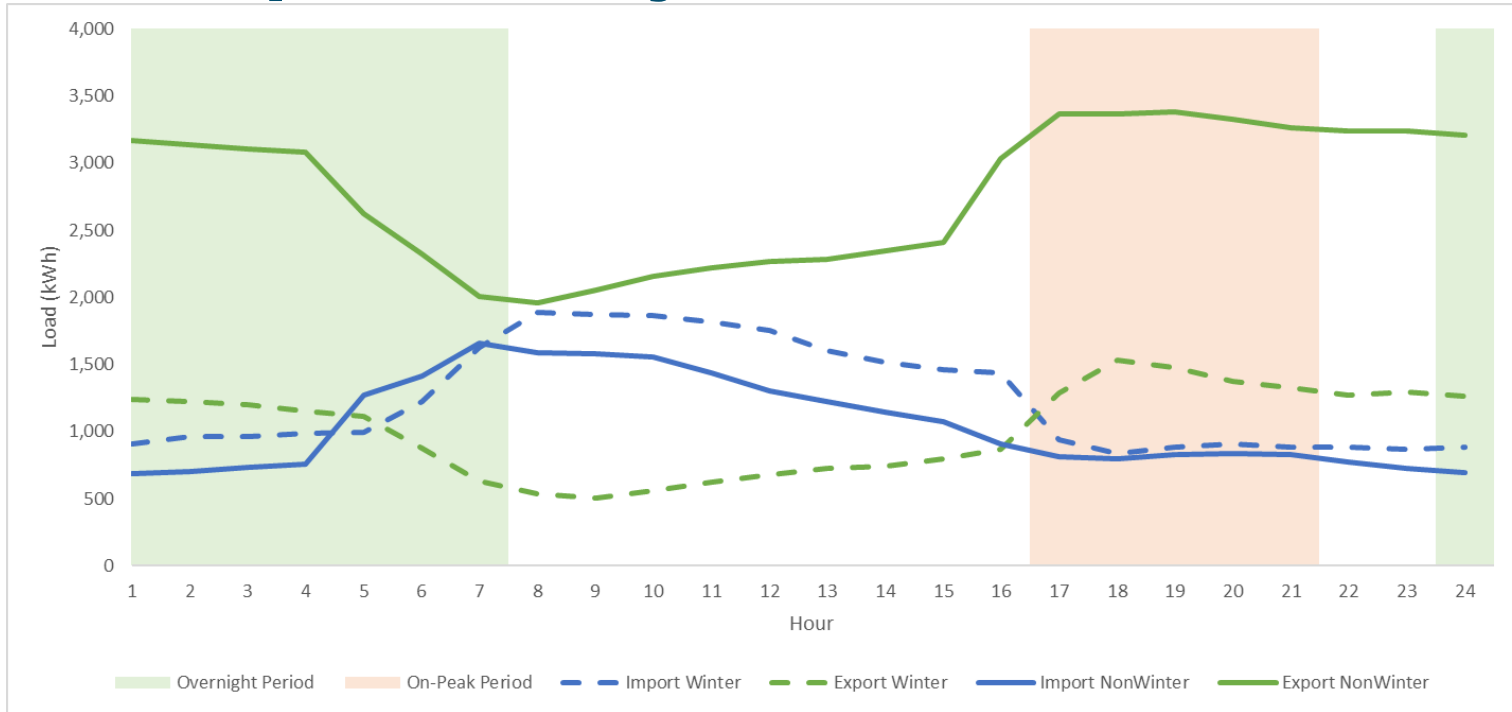
Load Shape of SGS Hydro Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	17,576	3,519	8,595	5,462
Import %	100%	20%	49%	31%
Export	151,951	32,925	67,445	51,582
Export %	100%	22%	44%	34%

Average Generation Size (kW)	36
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Load Shape of MGS Hydro Customers



Consumption	Average Annual Load (kWh)	Peak Load 4PM – 9PM	Off-Peak Load All other hours	Overnight Load 11PM – 7AM
Import	55,293	8,554	30,274	16,466
Import %	100%	15%	55%	30%
Export	90,854	23,702	35,803	31,349
Export %	100%	26%	39%	35%

Average Generation Size (kW)	64
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Load Shape of LGS Hydro Customers

No LGS Hydro Customer in this data set.

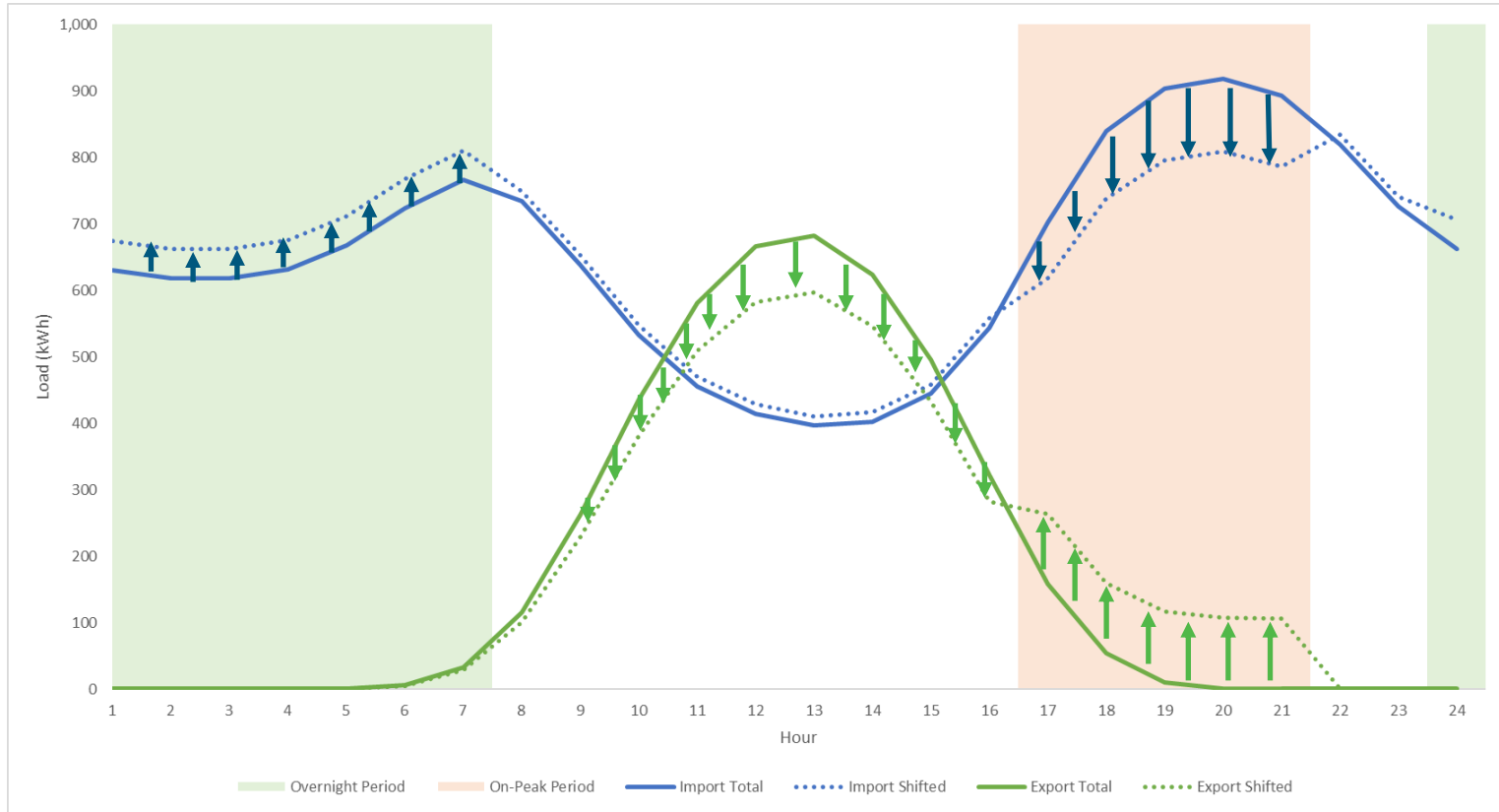
Example Rate Concepts

Taver Bahrami

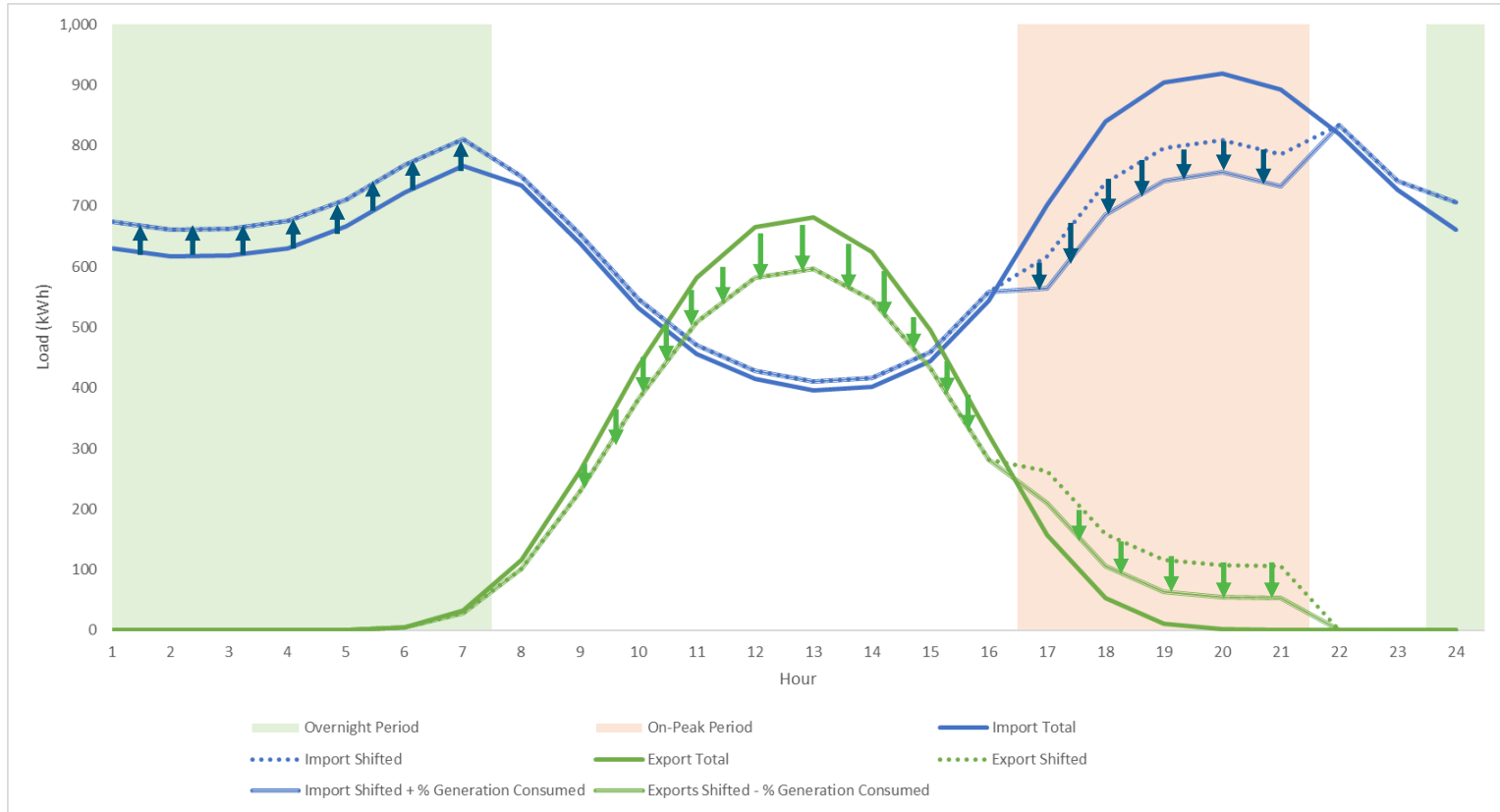
Senior Regulatory Specialist – Modelling and Analysis

Team Lead

Load Shifting of Residential Solar Customers



Load Shifting of Residential Solar Customers



Wrap Up and Next Steps

Chris Sandve

Chief Regulatory Officer

Net Metering Working Group Topics

- Virtual Net Metering - Terms and Conditions
- Time-varying price signals for Net Metering Generation
- Other Potential Benefits of Net Metering Generation
- Supporting Net Metering as Planning Resource
- Capacity Limit

Next Steps







BC Hydro

Power smart