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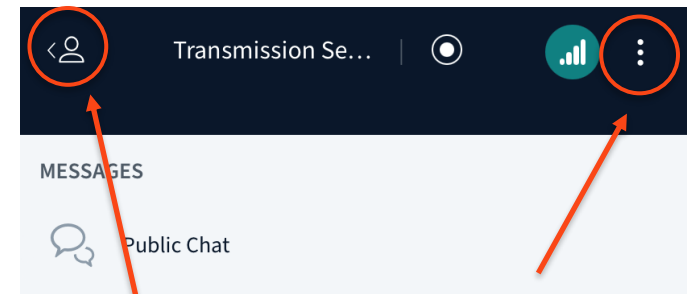
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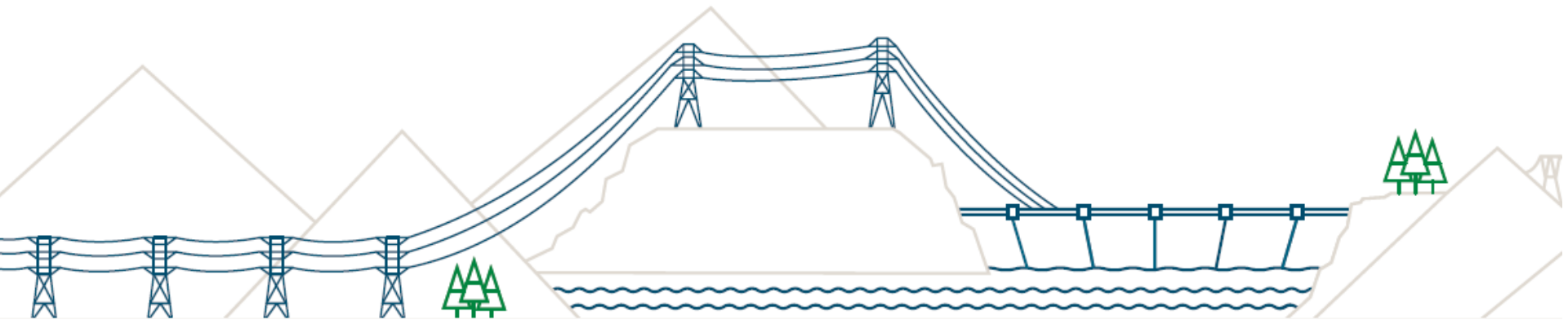


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Transmission Service Rate Schedule 1823 Rate Redesign Workshop #4

October 19, 2022



Workshop Agenda (morning)

Default Transmission Service Rate

Approximate Time	Item	Presenter
9:00 – 9:10 am	Welcome & Housekeeping	Mark Seong Moderator
9:10 – 9:20 am	Opening Remarks	Keith Anderson Vice President, Customer Service
9:20 – 9:45 am	Background and Context	Chris Sandve Chief Regulatory Officer
9:40 – 10:10 am	Stakeholder Engagement Recap and Summary of Feedback from Workshop 3	Jane Nzambu Transmission Rates Operations Manager
10:10 – 10:45 am	Proposal for Rate Schedule 1823: Default Transmission Service Rate	Allan Chung Senior Regulatory Specialist
10:45 – 10:55 am	Break	
10:55 – 11:30 am	Transition Options	Jessica Lunn Senior Regulatory Specialist
11:30 – noon	Questions and Feedback, Wrap up Morning Session	Mark Seong Moderator

Opening Remarks

Keith Anderson

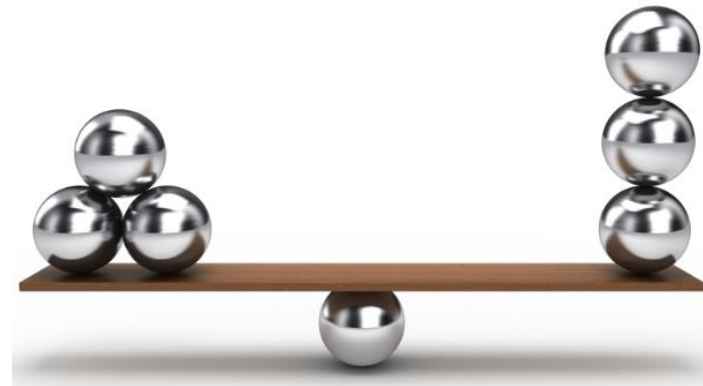
Vice President, Customer Service



Key Drivers of Rate Redesign

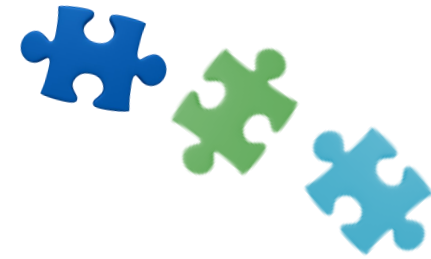


1. Support electrification
2. Support CleanBC goals
3. Affordable, fair and stable rates that improve economic efficiency
 - Legislation for stepped rate structure rescinded in 2019
 - Phase 2 Comprehensive Review of BC Hydro recommended flattening the two-tiered industrial rate

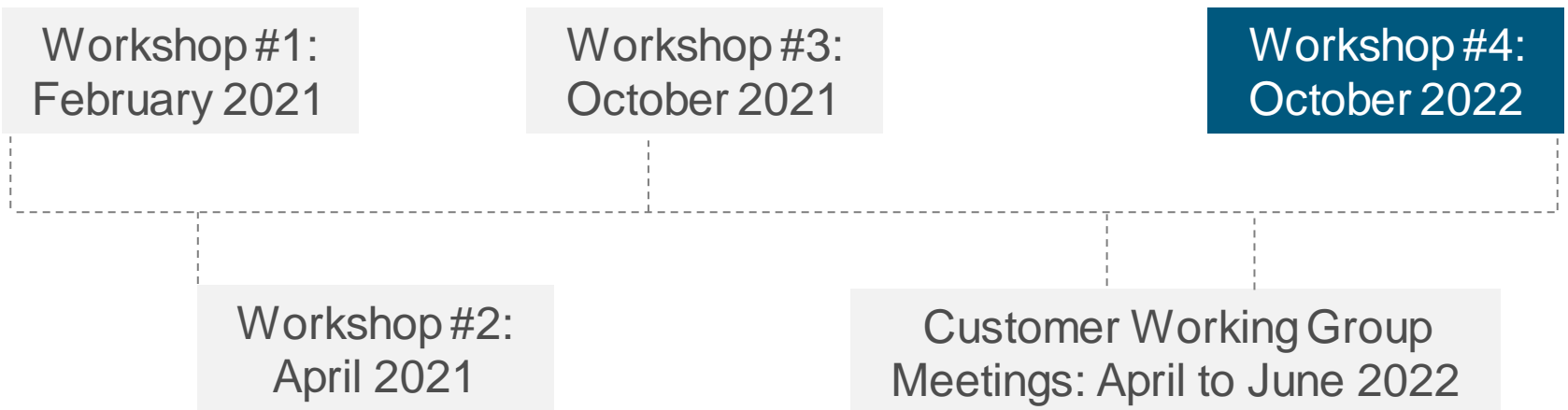


Customer Pressures

- Rate affordability
- Industrial competitiveness
- Economic recovery and growth



Customer & Stakeholder Engagement



Today's Objectives



- Describe key activities and developments informing our rate design proposals
- We recognize that customers are looking at this as a package –
 - Outline our proposal for the default transmission service rate (Rate Schedule 1823), as well as options to transition to the new rate
 - Discuss prospective changes to other rates in the transmission service portfolio
 - Discuss the continued need for conservation / DSM programs and the expectation of an industrial load curtailment program
- Gather feedback from customers and stakeholders

Background and Context

Chris Sandve

Chief Regulatory Officer



Background on our Default Transmission Rate

- Introduced in 2006, following Government's 2002 Energy Plan
- Energy Plan, Action 21: "New rate structures will provide better price signals to large electricity customers for conservation and energy efficiency."
- 150 customer sites
- Once a baseline is established for each customer site (or set of aggregated sites), customers pay a demand charge and tiered energy charge based on their consumption
- Time-limited treatment of baseline determination for customer-funded DSM
- Connected to other rate schedules and impacted by optional rates and programs

BC Hydro Rate Design Objectives

Economic efficiency

Rate design should reflect BC Hydro's short and long run marginal costs and send price signals that encourage efficient use of electricity and efficient investment decisions by customers.

Decarbonization

Rate design should support greenhouse gas (GHG) reductions through electrification where economically efficient.

Flexibility

Rate designs should incorporate flexibility to respond to changes in the economic and policy environment and anticipate the need for greater product and service differentiation in rate design.

Affordability

Rate design bill impacts to customers should be mitigated.

Economic Context

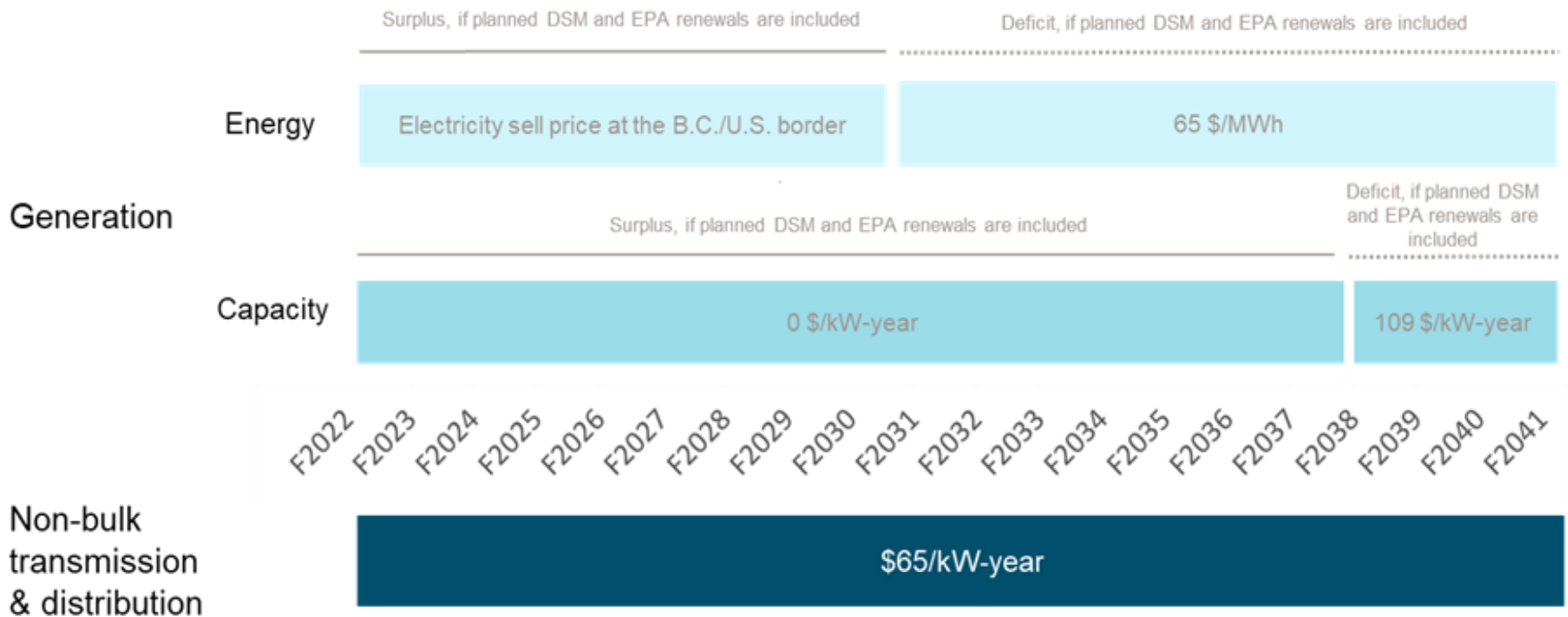
- Rate design applications to the BCUC must be justified on a cost of service and/or economic basis
- Aligning rate design with cost of service and economics (marginal costs) is important because it :
 - Provides the right price signals to customers
 - Recovers the revenue requirement while avoiding cross-subsidization
- Tier 2 energy charge no longer reflects long-run marginal cost of energy (~\$100/MWh vs. \$65/MWh)
- Current demand charge only recovers about 60% of demand-related costs

IRP Reference Prices

December 2021 IRP Reference Prices (F2022\$) with Planned DSM and Electricity Purchase Agreement Renewals

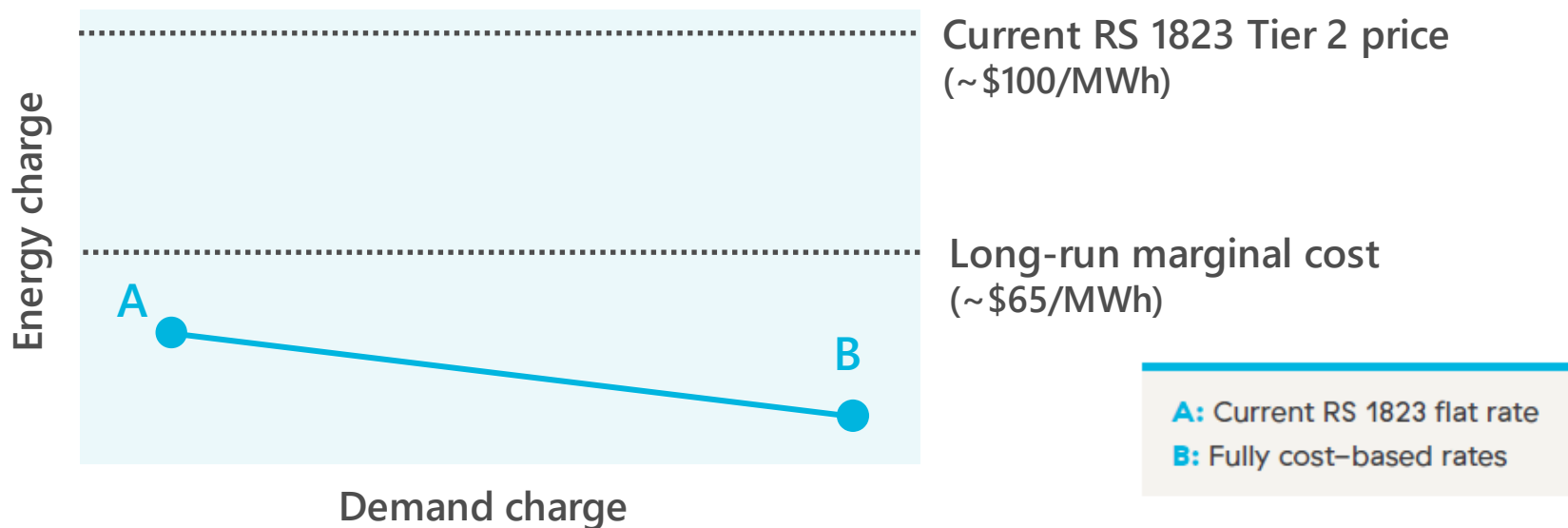
10 Year Levelized Price (F2024-F2033): \$41.48/MWh (F2024\$)

15 Year Levelized Price (F2024-F2038): \$48.50/MWh (F2024\$)



Options for Flat Rate Pricing

- The proposed flat rate we will be seeking your feedback on lies between **Point A** – the current RS 1823 flat rate that applies to new customers (prior to setting a baseline) and **Point B** – a fully cost-reflective rate



Why a flat rate?



- More cost reflective of BC Hydro's marginal cost and cost of service
- Provides greater rate stability and predictability for customers
- Greater flexibility to add optional rates to respond to changing circumstances
- Easier to understand and administer
- Supports government policy by encouraging electrification and decarbonization
- Industry standard based on jurisdictional review

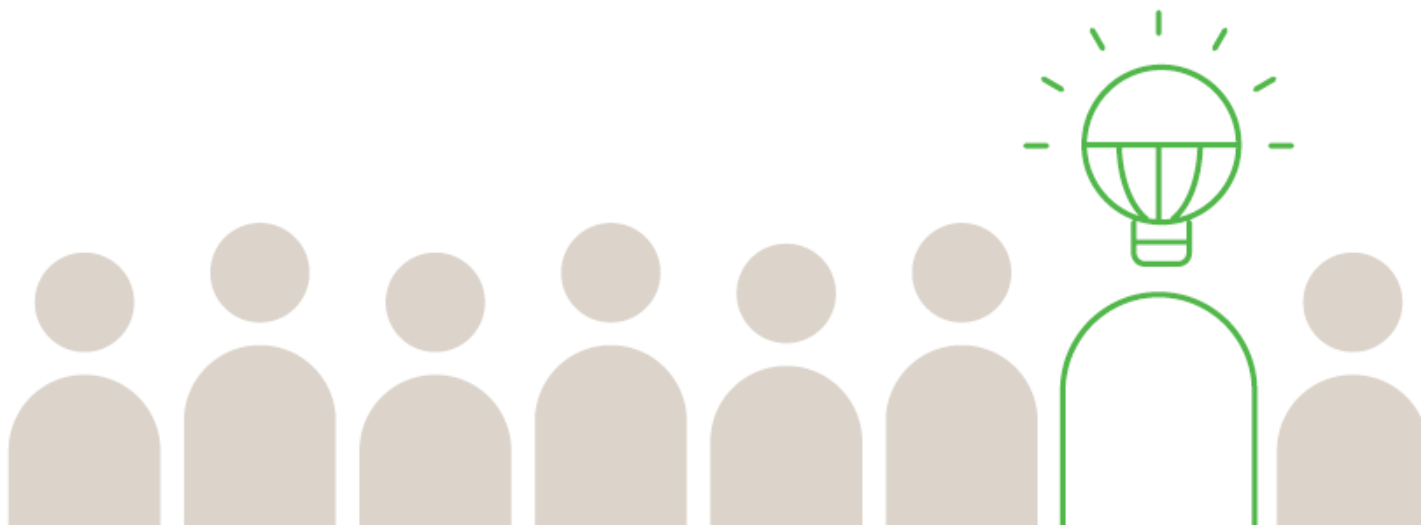
Recognizing Customer Investments in DSM

- Demand-side management (DSM) continues to be a priority for BC Hydro
- We recognize customers have made previous investments in customer-funded DSM based on the current stepped rate structure, and will be discussing transition options to recognize the value of these investments
- Going forward, we will be continuing to invest in conservation and supporting our customers with energy efficiency projects through BC Hydro funded programs

Stakeholder Engagement Recap and Summary of Feedback from Workshop 3

Jane Nzambu

Transmission Rates Operations Manager



Workshop 3 Rate Options (F2022\$)

OPTION 1

OPTION 2

OPTION 3

OPTION 4

	Status Quo	Current Tier 1 and Demand	Lower Energy and Higher Demand	Cost-based Demand, Revenue neutral Energy	Stepped Rate 2.0, Revenue neutral Demand
Flat Energy Charge (\$/MWh)	50.65	45.07	41.60	36.89	37.23
Tier 1 Energy Charge (\$/MWh)	45.07	n/a	n/a	n/a	33.48
Tier 2 Energy Charge (\$/MWh)	100.95	n/a	n/a	n/a	70.95
Demand Charge (\$/kVA)	8.64	8.64	11.00	14.23	15.15

(\$35)M

(\$20)M

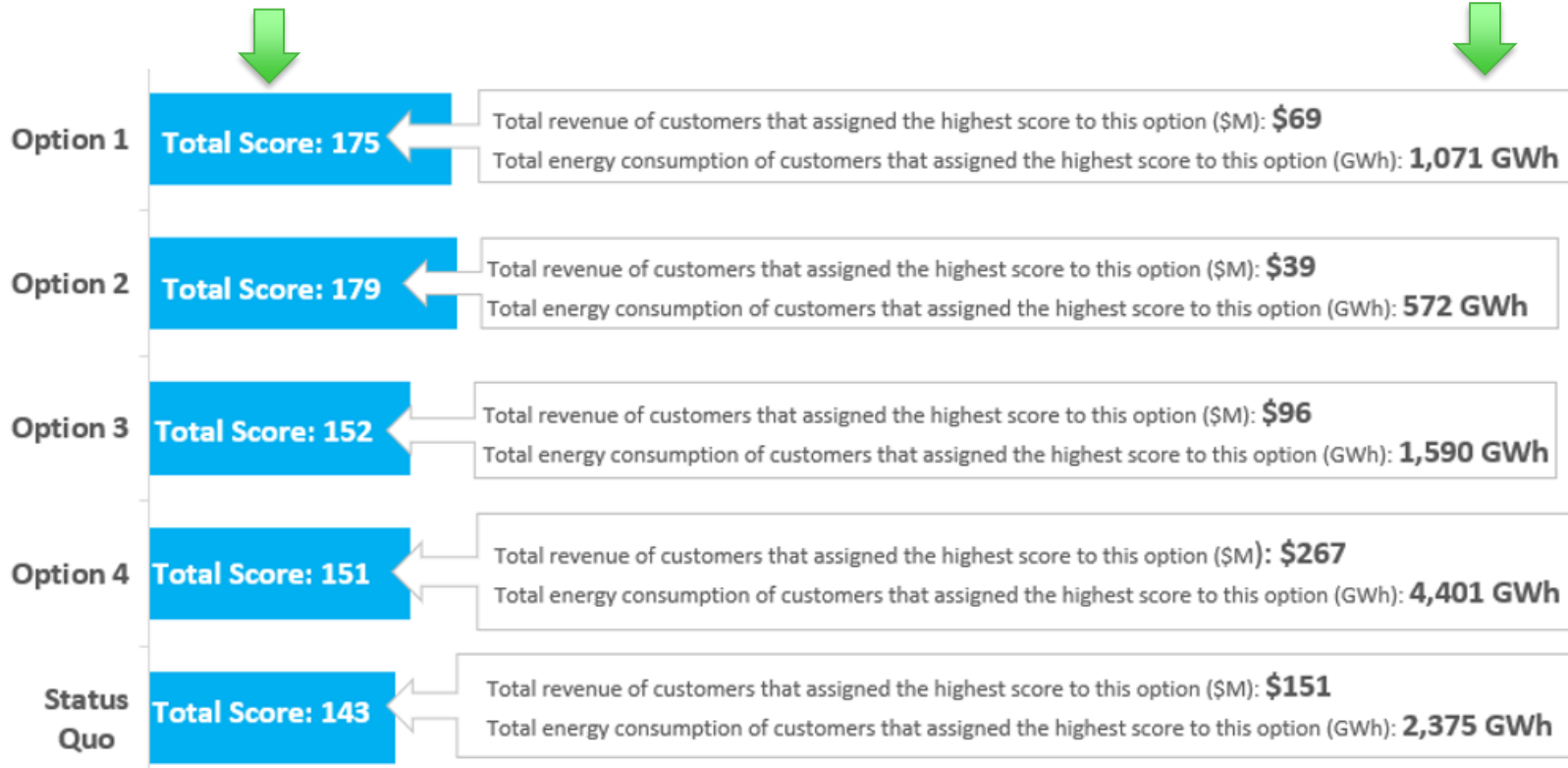
Forecast revenue
SHORTFALL

Forecast revenue
NEUTRAL

Workshop 3 Feedback

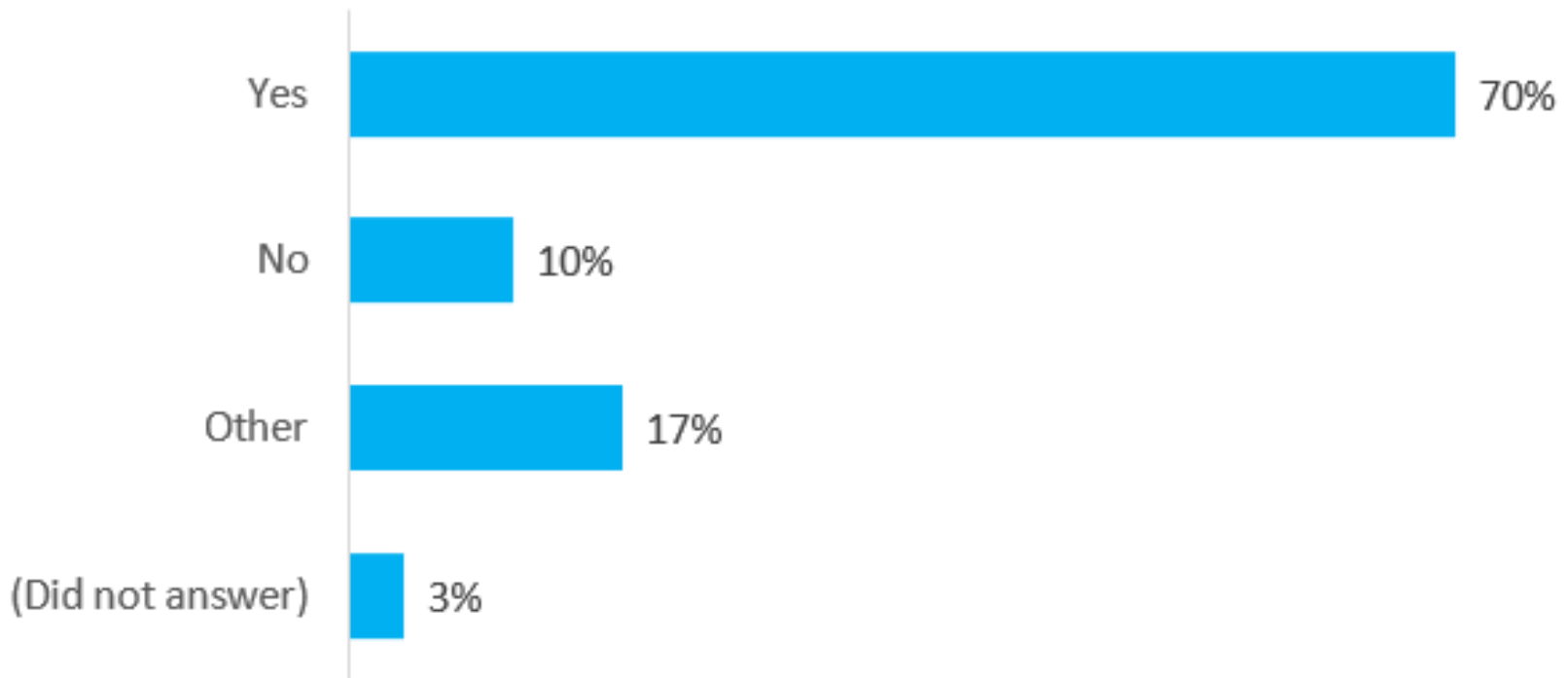
30 respondents scored each scenario out of 10 (max 300 points)

Customer load allocated to most preferred rate option



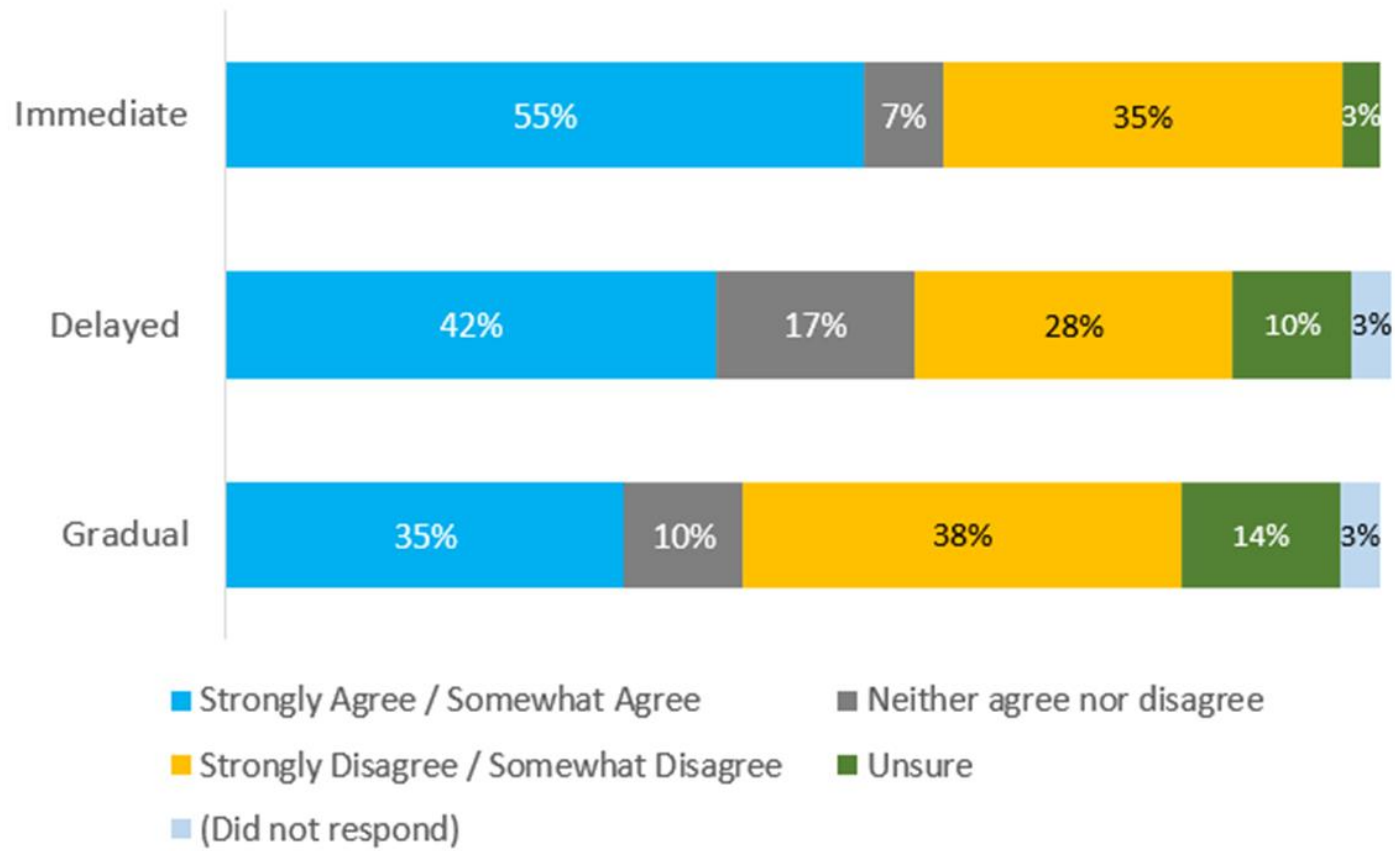
Support for TSR rate redesign

Question 1. Do you support development of a new default rate for firm transmission voltage electricity service to replace the existing Rate Schedule 1823 (Stepped Rate)?



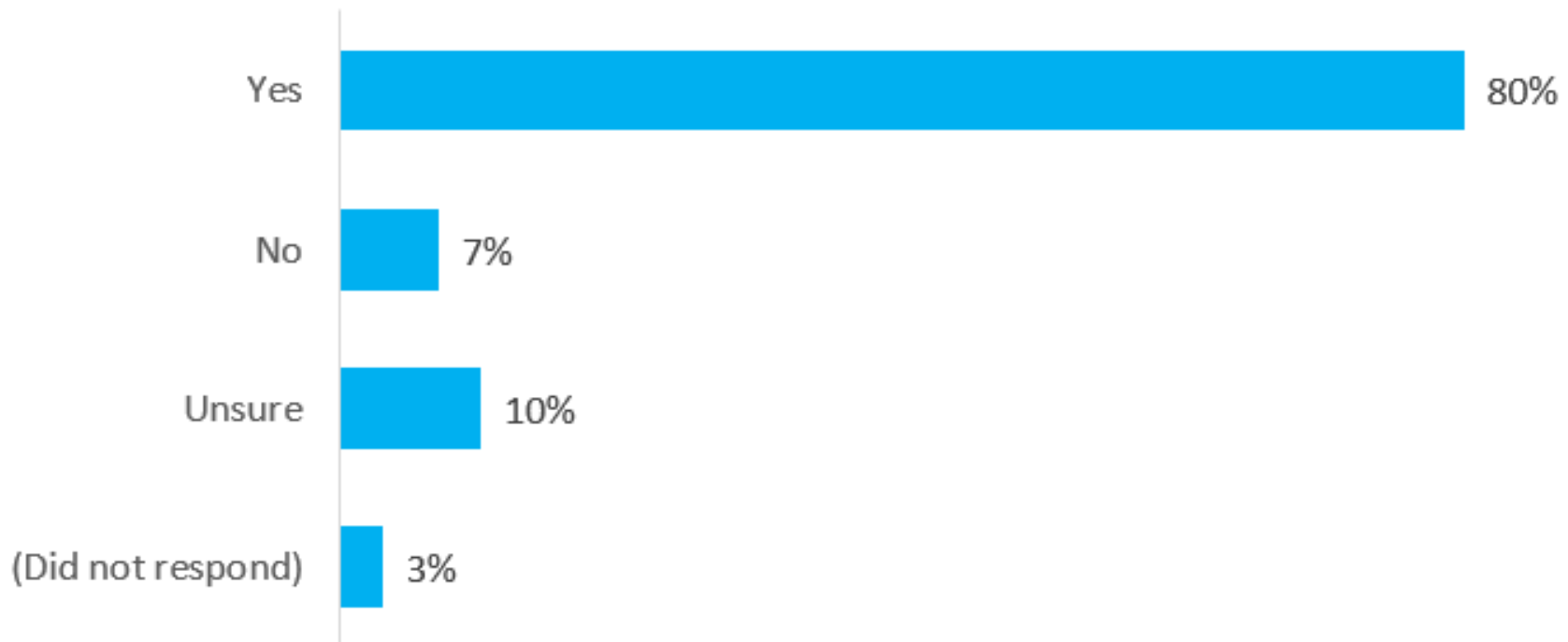
Implementation approach

Q7. Please indicate your general level of support for each of the three implementation approaches set out below.



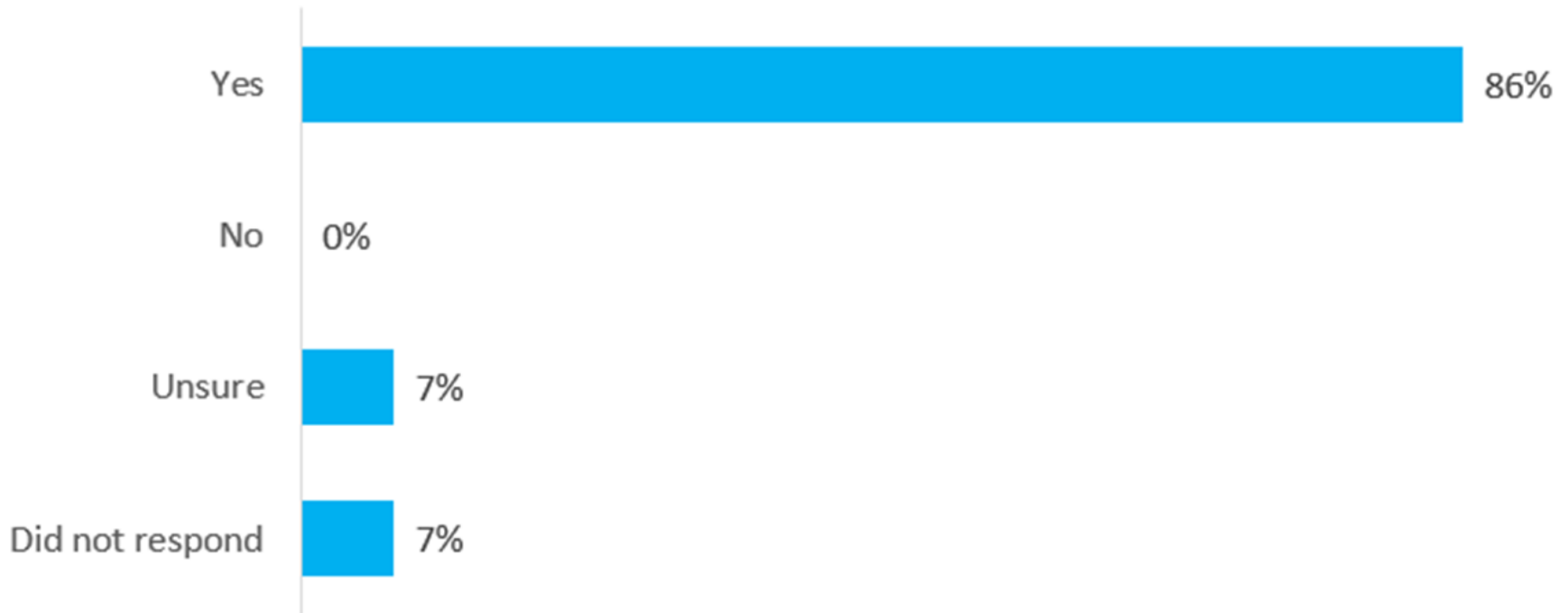
Bill impact mitigation (DSM)

Q17: Do you support the concept of a DSM credit to help recognize EXISTING customer-funded DSM investments? If so, why? If not, why not? Please explain



TSR portfolio impacts

Q23: Do you understand that replacement of the RS 1823 Stepped Rate with a flat rate alternative would require revisions to all TSR rate schedules with pricing indexed to RS 1823 tiered energy prices (such as to RS 1880 and RS 1891)?



What we heard (workshops)



- Generally strong support for TSR rate redesign, but lack of customer consensus on new rate structure
- Support for further work on segmenting RS 1823 into its own rate class to mitigate bill increases, however potential benefits achieved through segmentation are low
- Non-revenue neutral rates are not feasible
- Recognition of previous investments in DSM is an ongoing customer concern
- Demand charge cannot be set too high otherwise bill increases for some customers will exceed an acceptable level

Customer working group meetings

- Four informal meetings were held with a representative customer working group to better understand the potential impacts and opportunities from a new rate design
- Not intended to represent formal engagement on transmission service rate redesign, but helpful in gaining more detailed feedback from customers and in developing possible rate design concepts and solutions that could be supported by customers

What we heard (working group meetings)



- Customers are interested in a package of potential solutions to mitigate bill increases, such as new optional rates or programs that would provide benefits to customers and BC Hydro (e.g. load curtailment program, optional Time-of-Use rate)
- Remaining duration of energy savings from customer-funded DSM projects should be addressed as part of the rate redesign process
- Rate design should be holistic and should consider the broader suite of optional rates
- Customers would like to be able to choose from more than one rate option, while simplifying the rates that are available
- Rate design should consider the timing of benefits, as some new and existing customers would benefit from immediate implementation of the final flat rate

Proposal for Rate Schedule 1823: Default Transmission Service Rate

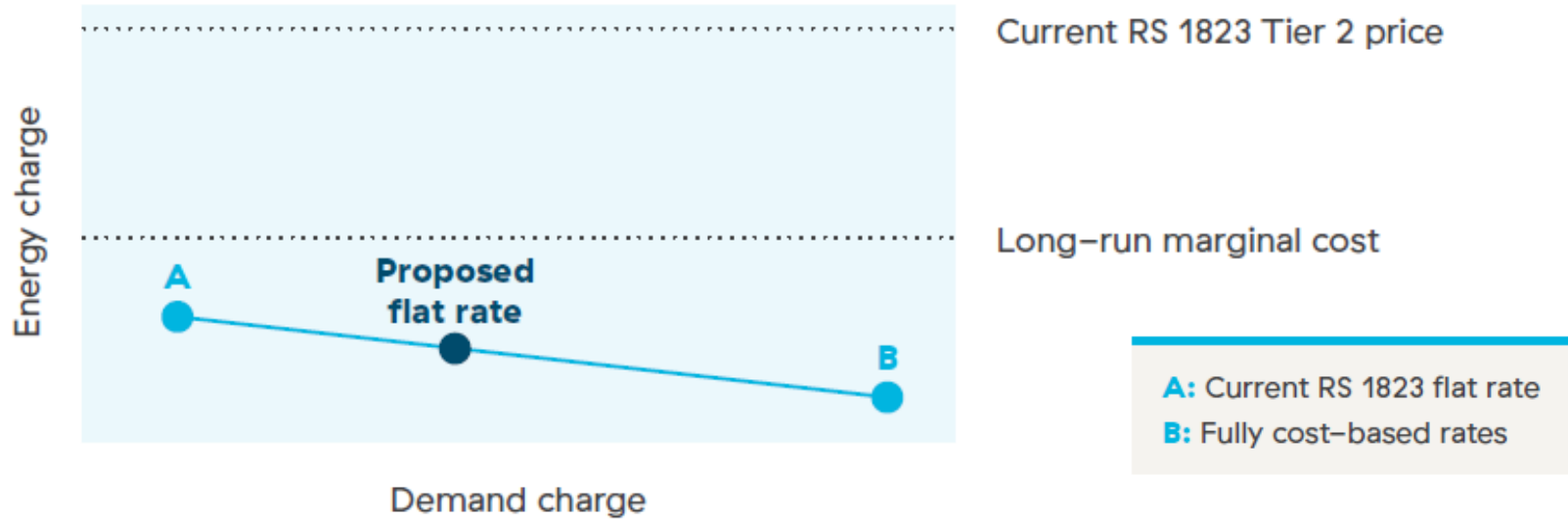
Allan Chung
Senior Regulatory Specialist



Outline

- The rationale for a flat rate structure was provided earlier
- We will review in more detail our proposed flat rate
 - Cost basis relative to cost of service and marginal cost
 - Comparison with previous flat rate options
 - Bill impacts
 - Bonbright Assessment
- On balance, we believe that our proposed flat rate achieves our rate design objectives

Choice of Flat Rate (F2024\$)



	Current RS 1823 flat rate (status quo)	Proposed flat rate
Flat energy charge (\$/MWh)	51.45	44.14
Tier 1 energy charge (\$/MWh)	45.79	-
Tier 2 energy charge (\$/MWh)	102.57	-
Demand charge (\$/kVA)	8.78	11.00

Proposed Flat Rate

Our proposed flat rate is revenue neutral based on our F2024 forecast and is priced in F2024 dollars:

Flat Energy Charge
\$44.14/MWh

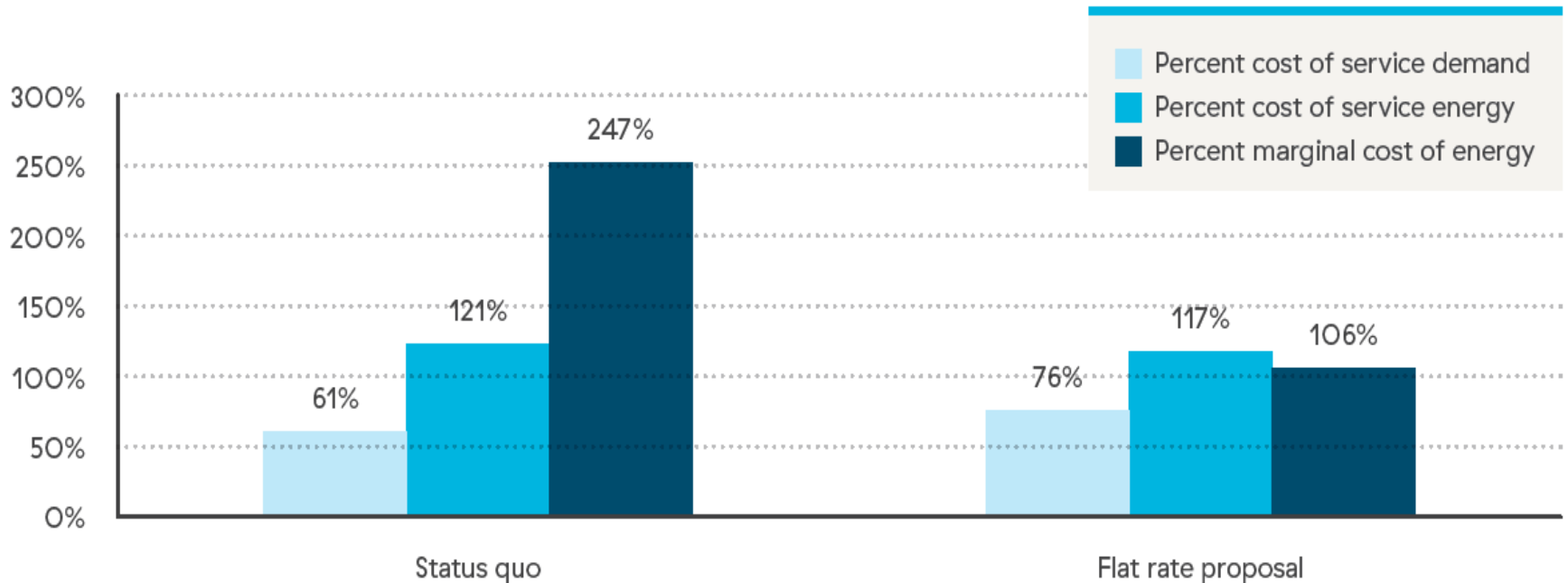
- **Lower than status quo** (\$51.45/MWh in F2024 dollars)
- **Lies between BC Hydro's 10 year and 15 year levelized cost of energy** (\$41.48/MWh and \$48.50/MWh, respectively)
- **Above BC Hydro's fully allocated cost of service** (\$37.82/MWh in F2024 dollars, escalated from F2020)

Demand Charge
\$11/kVA

- **Higher than status quo** (\$8.78/kVA)
- **Lower than BC Hydro's fully allocated cost of service** (\$14.46/kVA)
- **Identified through customer consultation as a potential upper ceiling to mitigate bill impacts**

Cost Comparison (F2024\$)

Status Quo and Flat Rate Proposal relative to Cost of Service and 10-year Levelized Marginal Cost of Energy

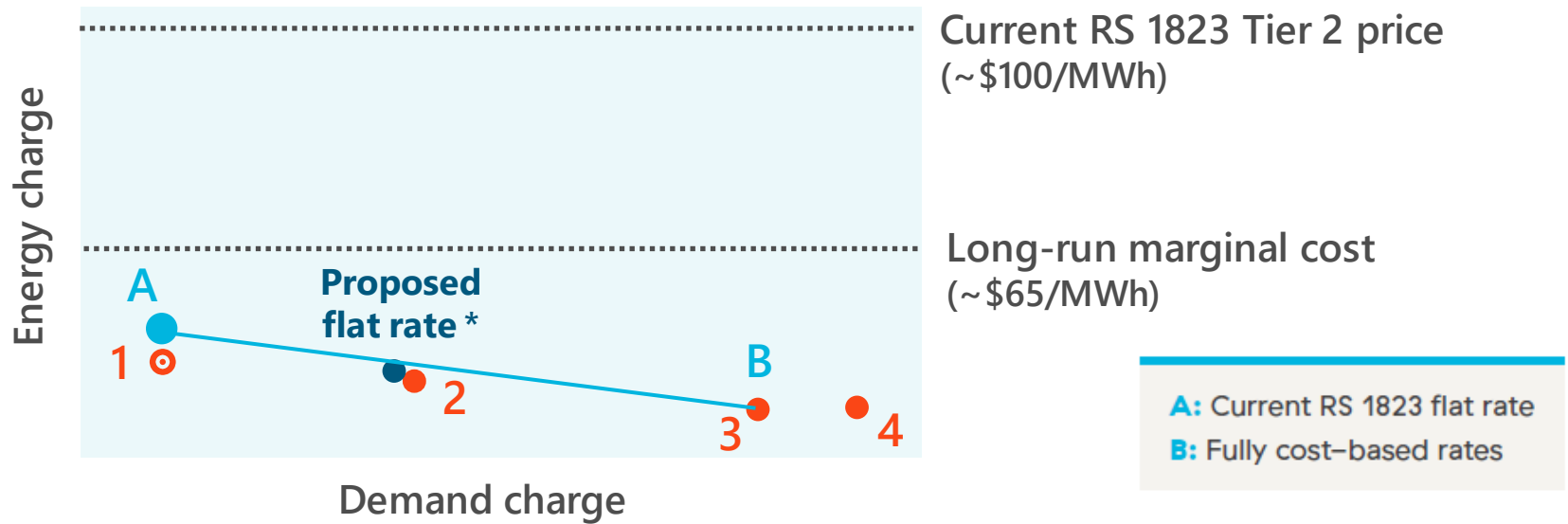


Rate option

F2O cost of service demand \$14.46/kVA
 F2O cost of service energy \$37.82/MWh
 Marginal cost of energy \$41.48/MWh

Flat Rate Considerations

How the proposed flat rate compares to the four rate options presented in Workshop 3



- 1: Flat rate option 1 (Current Tier 1 energy charge and demand charge), **not revenue neutral**
- 2: Flat rate option 2, **not revenue neutral**
- 3: Fully cost reflective rate, revenue neutral
- 4: Modified stepped rate, revenue neutral

* Proposed flat rate is a revenue neutral version of Option 2, priced in F2024 dollars

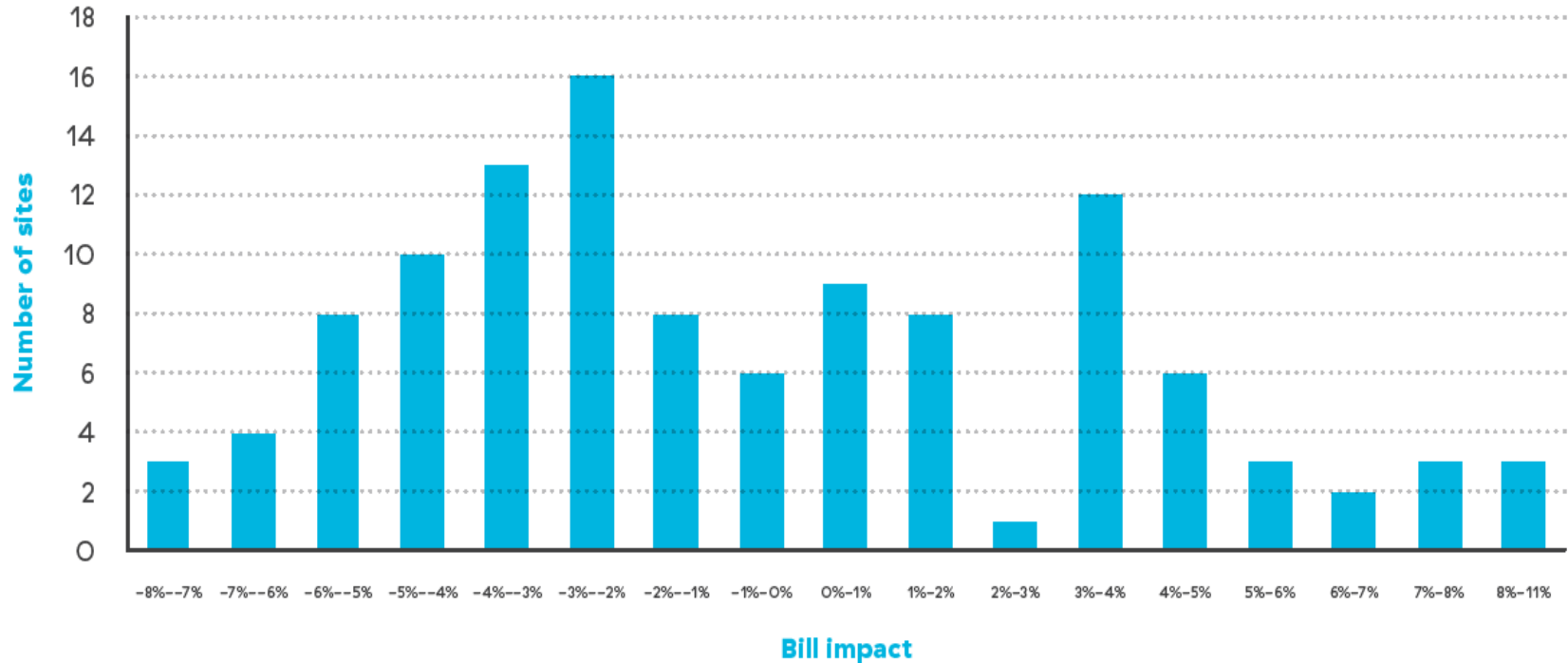
Bill Impacts of Proposed Flat Rate

By share of Tier 1 energy and load factor

	100% Tier 1 Energy Customer			95% Tier 1 energy and 5% Tier 2 energy Customer			Flat Rate RS 1823A or 90% Tier 1 energy, 10% Tier 2 energy RS 1823B		
Load factor	Step rate avg ¢/kWh	Flat rate avg ¢/kWh	Bill Impact	Step rate avg ¢/kWh	Flat rate avg ¢/kWh	Bill Impact	Step rate avg ¢/kWh	Flat rate avg ¢/kWh	Bill Impact
10%	16.01	18.73	17.0%	16.29	18.73	15.0%	16.57	18.73	13.0%
20%	10.29	11.57	12.4%	10.58	11.57	9.4%	10.86	11.57	6.6%
30%	8.39	9.19	9.5%	8.67	9.19	5.9%	8.96	9.19	2.6%
40%	7.44	7.99	7.5%	7.72	7.99	3.5%	8.00	7.99	-0.1%
50%	6.86	7.28	6.0%	7.15	7.28	1.8%	7.43	7.28	-2.1%
60%	6.48	6.80	4.9%	6.77	6.80	0.5%	7.05	6.80	-3.6%
70%	6.21	6.46	4.0%	6.50	6.46	-0.6%	6.78	6.46	-4.7%
80%	6.01	6.20	3.3%	6.29	6.20	-1.4%	6.58	6.20	-5.7%
90%	5.85	6.00	2.7%	6.13	6.00	-2.1%	6.42	6.00	-6.4%
100%	5.72	5.85	2.2%	6.01	5.85	-2.7%	6.29	5.85	-7.1%

Distribution of Bill Impacts (%)

By number of sites

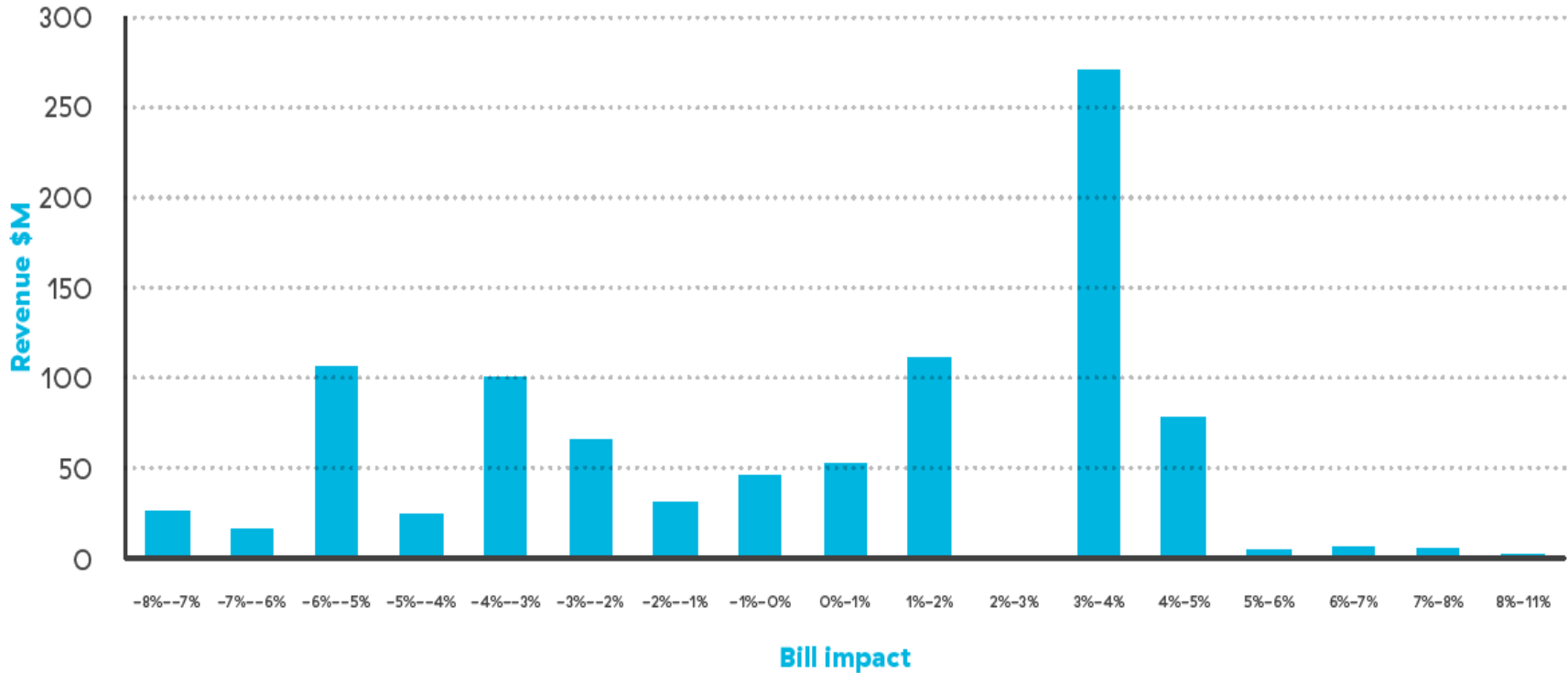


Notes

- Based on forecast F2024 consumption data
- Includes aggregated sites under TS 74 CBL Determination Guidelines

Distribution of Bill Impacts (%)

By total revenue



Notes

- Based on forecast F2024 consumption data

Average Bill Impact of Proposed Flat Rate

By sector

Industry sector	Status quo unit price of electricity (\$/MWh)	Unit price differential after rate redesign (\$/MWh)	Average bill impact (%)
Chemicals	61	2.04	3.4%
Wood manufacturing	67	1.75	2.6%
Pulp & Paper	62	1.57	2.5%
Gas Processing	60	0.01	0.0%
Mining	63	(0.37)	-0.6%
Oil	72	(0.49)	-0.7%
Port / Terminal	76	(0.71)	-0.9%
LNG / LPG	77	(0.90)	-1.2%
Cement & Manufacturing	70	(1.39)	-2.0%
Other	67	(3.05)	-4.5%

Note: Includes RS 1823 and RS 1827 customers only.

Bonbright Assessment of Proposed Flat Rate

Bonbright criteria	Remarks
Economic efficiency	
1. Price signals to encourage efficient use and discourage inefficient use	Proposed flat rate has energy charge of \$44.14/MWh which improves alignment with our marginal costs, as our 10 year levelized cost of energy is \$41.48/MWh.
Fairness	
2. Fair apportionment of costs among customers	Proposed flat rate has lower energy charge and higher demand charge which moves toward cost-based energy and demand relative to status quo.
3. Avoid undue discrimination	Proposed flat rate provides non-discriminatory pricing.
Practicality	
4. Customer understanding and acceptance; practical and cost effective to implement	Proposed flat rate improves ease of understanding and practicality of administration.
5. Freedom from controversies as to proper interpretation	There are customer acceptance issues with regard to the bill impacts that arise from moving from a stepped rate to a flat rate and whether a flat rate recognizes the remaining duration of energy savings from past customer-funded DSM projects. This is addressed by transition options which help mitigate bill impacts and provide recognition of past investments in DSM.
Stability	
6. Recovery of the revenue requirement	Proposed flat rate is revenue neutral and collects the forecast revenue requirement
7. Revenue stability	Assuming no load impacts, revenue is stable and only varies each year by changes in load and change in general rate increase.
8. Rate stability	The rate is stable and only changes with general rate increases.

Feedback Questions



We're looking for your feedback:

Do you understand how BC Hydro developed the proposed flat rate?

- Yes
- No

Do you agree that BC Hydro should transition away from the stepped rate design towards a flat rate design?

- Yes
- No
- Unsure

To what extent do you agree that the proposed flat rate strikes an appropriate balance between reflecting BC Hydro's costs to provide service and mitigating bill impacts resulting from a change to the status quo?

- Strongly Agree
- Somewhat Agree
- Neither Agree nor Disagree
- Somewhat Disagree
- Strongly Disagree

Summary

- On balance, we believe that our proposed flat rate achieves our rate design objectives
- We are proposing rate transition options to address bill impacts and customer concerns
- In addition, some of the changes in the rate portfolio which we will cover this afternoon may offer customers additional bill savings

Transition Options

Jessica Lunn

Senior Regulatory Specialist



What we heard



- While not in the context of a particular rate design, greater support for immediate implementation followed by delayed then gradual implementation



- Strong support for a DSM credit approach to recognize existing customer-funded DSM investments

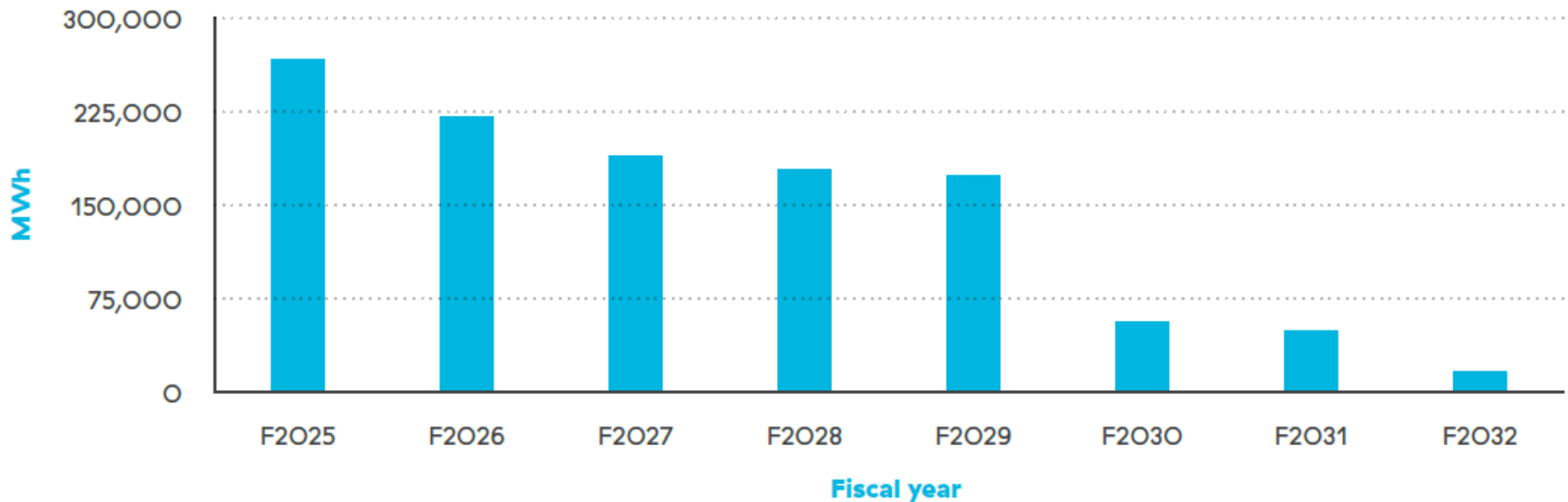


- Strong opposition by non-industrial customer groups to revenue shortfall options as part of default rate design

Leading transition options allow for immediate implementation of a flat rate, while providing benefits to customers with remaining DSM and minimizing impacts to other ratepayers

Remaining Customer-funded DSM

Adjusted Remaining Energy Savings from Customer-Funded DSM Projects as of F2020* (MWh)



* Adjusted to account for the maximum amount of energy savings that would be priced at the Tier 2 rate (i.e., maximum of 10% of F2020 energy consumption)

Transition Option 1

Revenue Neutral Segmented Flat Rates

- Stepped Rate remains in place in F2024 to allow for regulatory process and implementation, and to provide rate stability for customers
- All transmission service customers will be transitioned to a flat default rate by F2025
- Customers would be grouped into three segments based on their forecasted share of Tier 1 energy for F2024
- Each segment is assigned a revenue-neutral flat rate transition schedule from F2025 to F2028, which is designed to minimize bill impacts for individual customers (positive or negative)
- All transmission service customers transition to the same final flat rate by F2029

Transition Option 1

Customer Segments

Segment 1: Customers with a high share of Tier 1 energy

- All forecast F2024 accounts with Tier 1 energy greater or equal to 97% of total energy consumption.

Segment 2: Customers with a moderate share of Tier 1 energy

- All forecast F2024 accounts with Tier 1 energy greater or equal to 93% and less than 97% of total energy consumption.

Segment 3: Customers with a low share of Tier 1 energy or flat rate

- All forecast F2024 accounts with Tier 1 energy less than 93% of total energy and accounts on the following rate schedules: RS 1823A, RS 1827 and RS 3808.

Transition Option 1

Rates and Transition Schedule

Year	Segment 1		Segment 2		Segment 3	
	Energy Charge \$/MWh	Demand Charge \$/kVA	Energy Charge \$/MWh	Demand Charge \$/kVA	Energy Charge \$/MWh	Demand Charge \$/kVA
F2024	Existing Stepped Rate					
F2025	44.14	9.88	44.99	11.00	48.73	10.13
F2026	44.14	10.16	44.78	11.00	47.58	10.35
F2027	44.14	10.44	44.57	11.00	46.44	10.57
F2028	44.14	10.72	44.35	11.00	45.29	10.78
F2029	44.14	11.00	44.14	11.00	44.14	11.00

Note: Pricing in F2024 dollars, inclusive of revenue requirement for F2024, but exclusive of Deferral Account Rate Rider (DARR)

Total Estimated Benefit to Customers with Remaining DSM:
\$42 million in NPV (F2024 to F2032)

Transition Option 2

Staggered Implementation

- Stepped Rate remains in place in F2024 to allow for regulatory process and implementation, and to provide rate stability for customers
- RS 1823 customers with remaining customer-funded DSM project duration can choose to stay on the existing Stepped Rate for two additional years (F2025 and F2026) or move directly to the proposed flat rate starting in F2025
- RS 1827 and RS 3808 customers remain on their current rates for three years (F2024 – F2026) and then move to the proposed flat rate starting in F2027
- All other RS 1823 customers move to the proposed flat rate starting in F2025

Transition Option 2

Rates and Transition Schedule

Year	RS 1823 Customers with Remaining DSM		RS 1823 Customers without Remaining DSM		RS 1827 Customers and RS 3808 Tranche 1 energy and demand charge	
	Energy Charge \$/MWh	Demand Charge \$/kVA	Energy Charge \$/MWh	Demand Charge \$/kVA	Energy Charge \$/MWh	Demand Charge \$/kVA
F2024	Existing rates					
F2025	Existing Stepped Rate (by election)		44.14	11.00	Existing rates	
F2026	Existing Stepped Rate (by election)		44.14	11.00	Existing rates	
F2027	44.14	11.00	44.14	11.00	44.14	11.00

Note: Pricing in F2024 dollars, inclusive of revenue requirement for F2024, but exclusive of Deferral Account Rate Rider (DARR)

Total Estimated Benefit to Customers with Remaining DSM:
\$44 million in NPV (F2024 to F2032)

Alternative Transition

Gradual Implementation

- Gradual flattening of the stepped rate over a five-year transition period

Year	RS 1823 Customers				RS 1827 and RS 3808 Customers	
	Flat Energy Charge \$/MWh	Tier 1 Energy Charge	Tier 2 Energy Charge	Demand Charge \$/kVA	Energy Charge \$/MWh	Demand Charge \$/kVA
F2024	Existing rates					
F2025	49.99	45.46	90.88	9.22	49.99	9.22
F2026	48.53	45.13	79.2	9.67	48.53	9.67
F2027	47.06	44.80	67.51	10.11	47.06	10.11
F2028	45.60	44.47	55.83	10.56	45.60	10.56
F2029	44.14	n/a	n/a	11.00	44.14	11.00

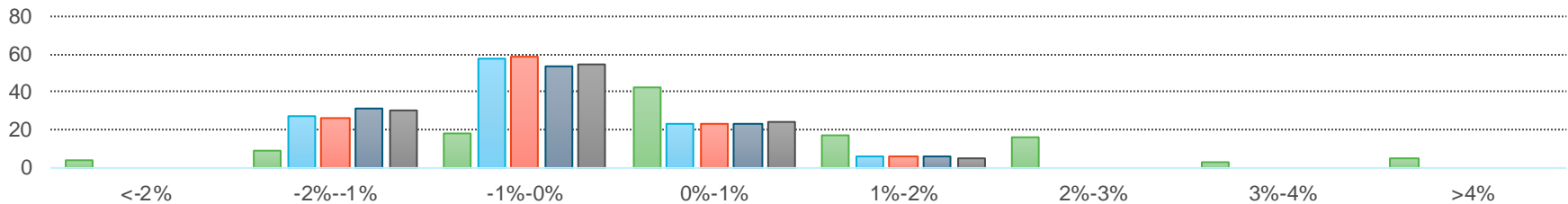
Note: Pricing in F2024 dollars, inclusive of revenue requirement for F2024, but exclusive of Deferral Account Rate Rider (DARR)

**Total Estimated Benefit to Customers with Remaining DSM:
\$37 million in NPV (F2024 to F2032)**

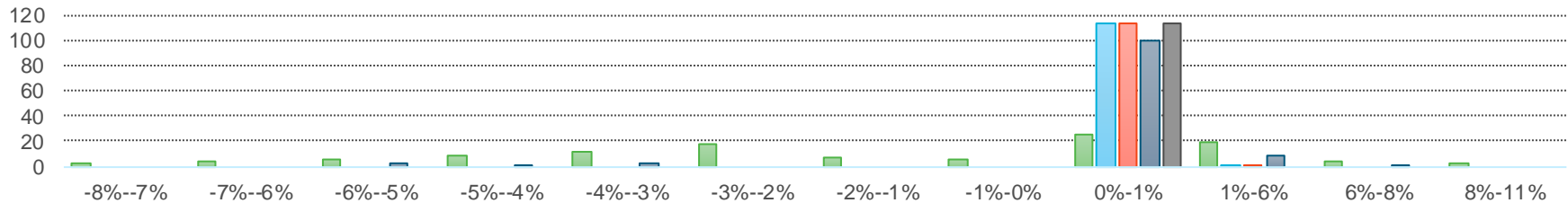
Distribution of Annual Bill Impacts (%)

By number of sites

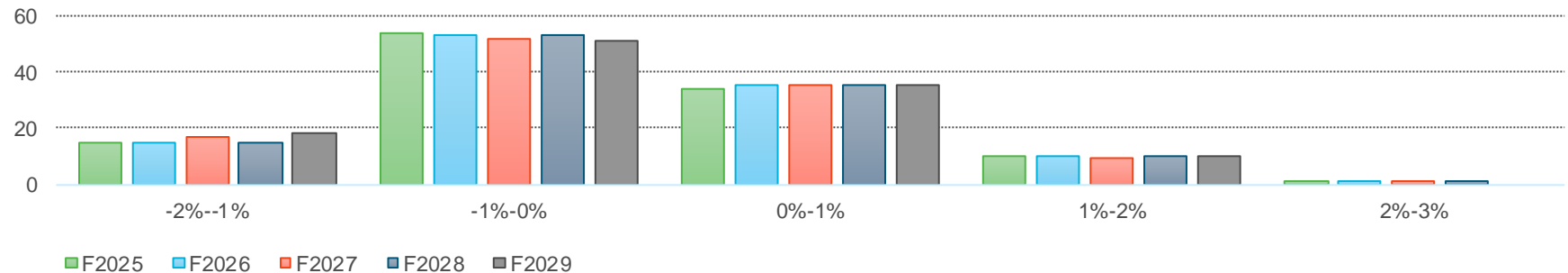
Transition Option 1: Revenue Neutral Segmented Flat Rates



Transition Option 2: Staggered Implementation



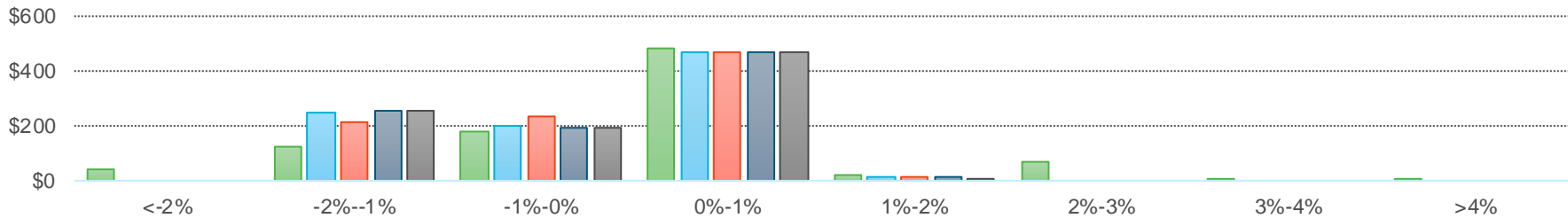
Alternative Transition: Gradual Implementation



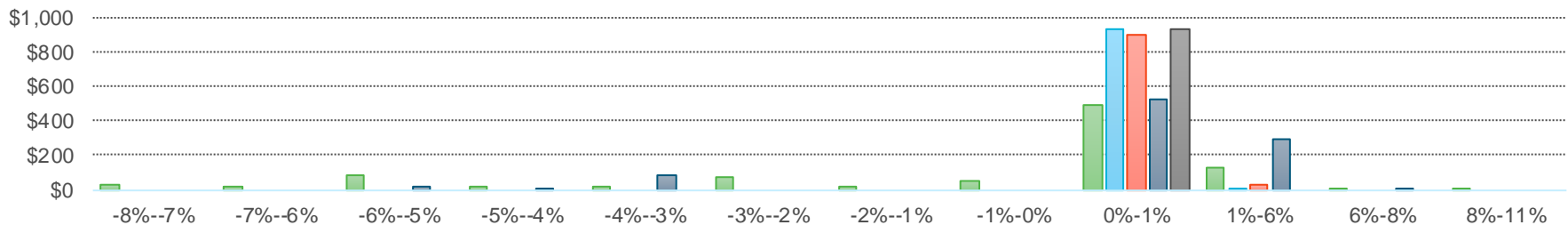
Distribution of Annual Bill Impacts (%)

By total revenue (millions)

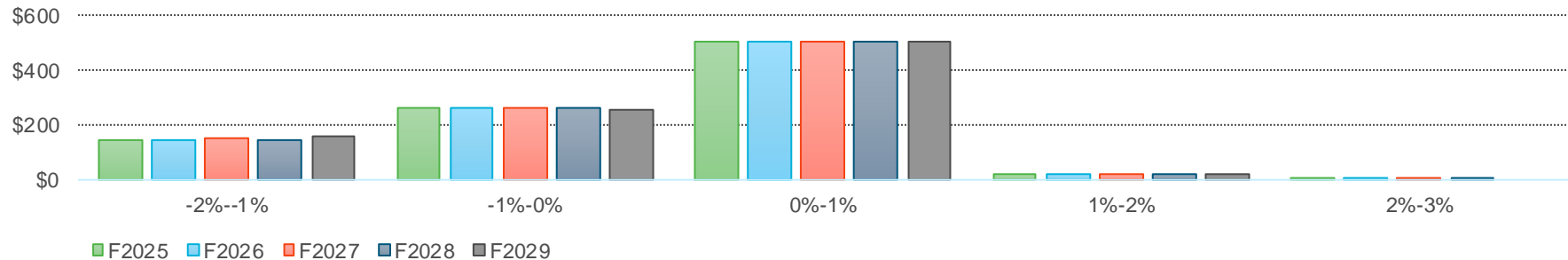
Transition Option 1: Revenue Neutral Segmented Flat Rates



Transition Option 2: Staggered Implementation



Alternative Transition: Gradual Implementation



Assessment of Transition Options

	Option 1: Revenue Neutral Segmented Rates	Option 2: Staggered Implementation	Alternative transition: Gradual Implementation
Consistent with rate objectives and current environment	All customers on a flat rate by F2025	Stepped Rate maintained for two additional years	Stepped Rate maintained for four additional years
Revenue neutral	Revenue neutral	Revenue shortfall of \$10 million over two years	Revenue neutral
Recognition of customer investments in DSM	NPV of approx. \$42M	NPV of approx. \$44M	NPV of approx. \$37M
Manage bill increases	Annual bill increases phased in over longer time frame, allows for introduction of optional rates	Full bill impacts in F2025 for customers without DSM, allows for introduction of optional rates	Minimizes range of bill impacts through gradual transition
Avoid administrative complexity	Will need to administer different flat rates for different customers	Maintains customer baseline loads for two additional years, but transition is simpler	Maintains customer baseline loads for four additional years, all customers on same rate schedule
Timing of benefits for new and some existing high load factor customers	Full benefits delayed until F2029	Full benefits starting in F2025	Full benefits delayed until F2029

Areas in green highlight where, in BC Hydro's view, one option has an advantage over the alternatives.

Feedback Questions



We're looking for your feedback:

Which statement best represents the viewpoint of your company/organization:

- All customers should immediately transition to the proposed flat rate in F2025
- BC Hydro should have a transition mechanism in place to ease bill impacts for customers impacted by the rate change

Of the two leading transition options presented, which does your company/organization prefer?

- Option 1: Revenue neutral segmented flat rates (all customers on proposed flat rate by F2029)
- Option 2: Staggered Implementation (all customers on proposed flat rate by F2027)

Please indicate your level of support for the following transition approaches:

	Strongly oppose	Somewhat oppose	Indifferent	Somewhat support	Strongly support
Transition option 1: Revenue-neutral segmented flat rates					
Transition option 2: Staggered implementation					
Transition Alternative: Gradual implementation					

Questions & Discussion

Workshop Agenda (afternoon)

Related Rate Schedules and Optional Rates

Approximate Time	Item	Presenter
1:00 – 1:05 pm	Welcome Back	Mark Seong Moderator
1:05 – 1:15 pm	Context and Background	Chris Sandve Chief Regulatory Officer
1:15 – 1:30 pm	Rate Schedule 1827: Transmission Service Rate for Exempt Customers (and RS 3808 Tranche 1)	Jessica Lunn Senior Regulatory Specialist
1:30 – 1:50 pm	Rate Schedule 1880: Standby and Maintenance and Rate Schedule 1891: Shore Power Service	Jessica Lunn Senior Regulatory Specialist
1:50 – 2:20 pm	Rate Schedule 1892: Freshet Energy and Rate Schedule 1893: Incremental Energy Rate	Amr Ayad Senior Industrial Rates Advisor
2:20 – 2:25 pm	Break	
2:25 – 2:55 pm	Time-of-Use Rate	Allan Chung Senior Regulatory Specialist
2:55 – 3:15 pm	Questions and Feedback	Mark Seong Moderator
3:15 – 3:30 pm	Next Steps	Chris Sandve Chief Regulatory Officer

Context and Background

Chris Sandve

Chief Regulatory Officer



Context

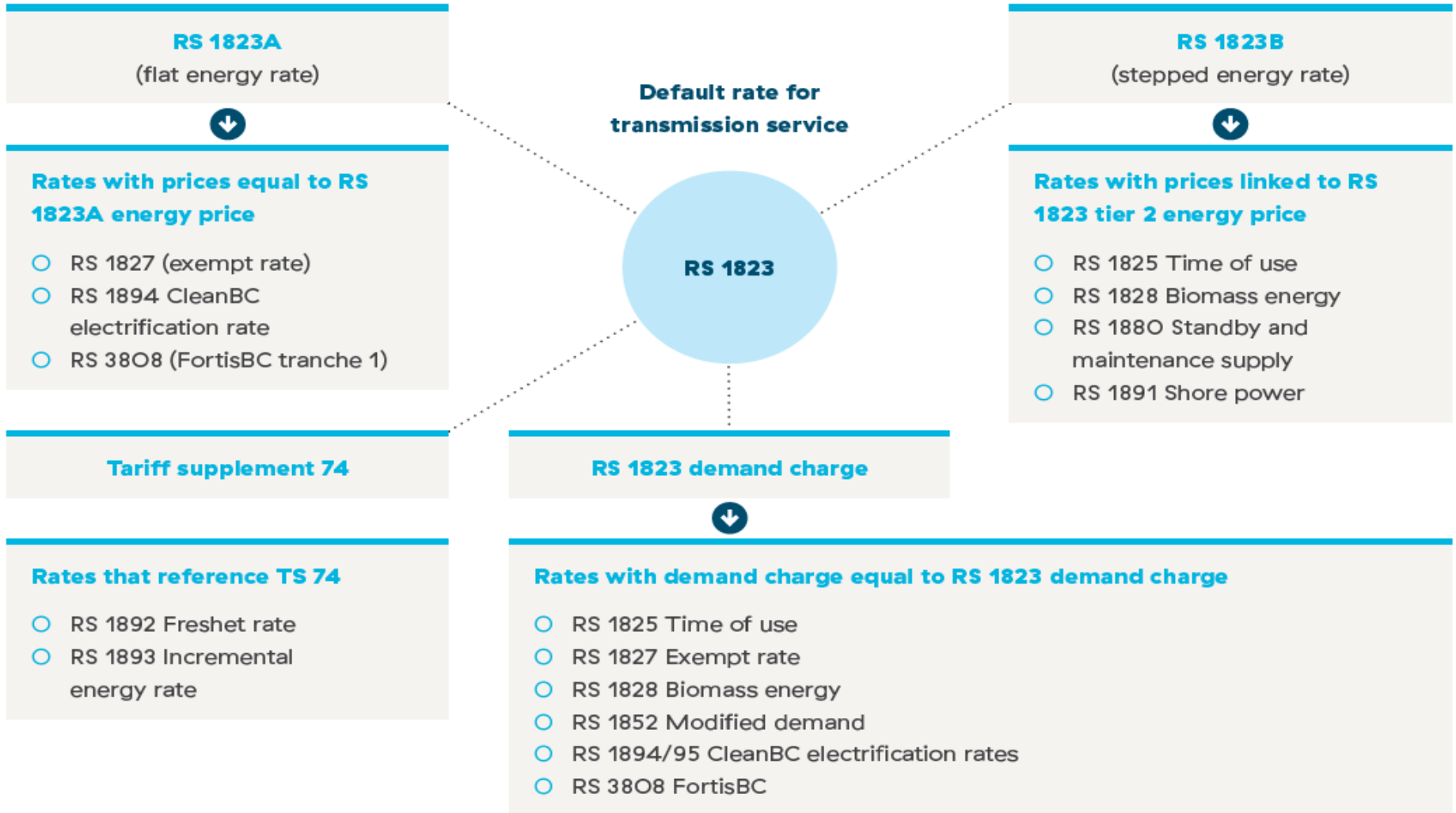
- There are several other rate schedules within the transmission service portfolio that are linked to RS 1823 pricing and/or baseline concepts
- Requires a comprehensive view of the implications of RS 1823 rate redesign on the broader suite of rates
- We will be reviewing adjustments and revisions to the broader suite of rates within the transmission service portfolio including
 - Merging customers on RS 1827 (Rate for Exempt Customers) with those currently on RS 1823
 - Repricing RS 1880 Standby and Maintenance Supply and RS 1891 Shore Power Service
 - Introducing a new optional Time-of-Use rate

BC Hydro's 2021 IRP

“Pursue voluntary time-varying rates supported by demand response programs to achieve approximately 220 MW of capacity savings at the system level by fiscal 2030, and advance the Industrial Load Curtailment Program to achieve approximately 100 MW of incremental capacity savings at the system level by no later than fiscal 2030”

- We will be separately developing load curtailment as a demand response program to meet the IRP Base Resource Plan near term actions
 - BC Hydro has substantial development and operational history from our load curtailment pilot carried out between 2015 and 2018
- A new optional Time-of-Use rate for transmission customers is included in the Base Resource Plan's suite of voluntary time-varying rates

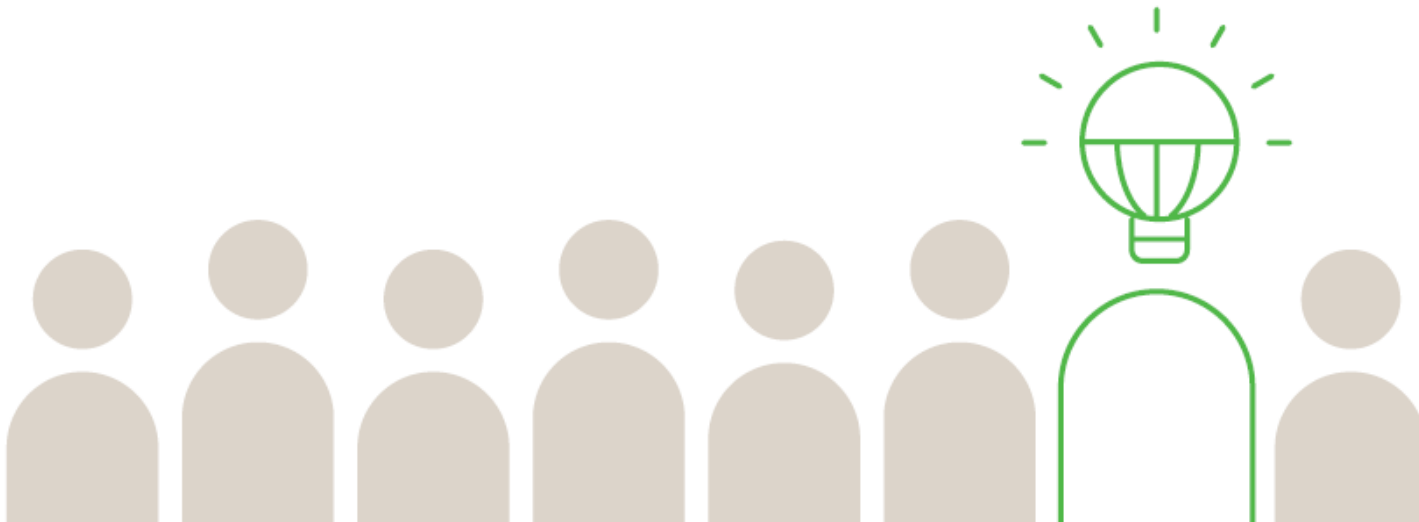
TSR Rate Portfolio



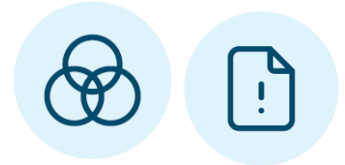
Rate Schedule 1827: Transmission Service Rate for Exempt Customers (and RS 3808 Tranche 1)

Jessica Lunn

Senior Regulatory Specialist



Updates to Other Rate Schedules



Rates that reference RS 1823 Pricing

RS 1827: Rate for Exempt Customers

- These customers have been paying flat rates under a separate rate schedule since the introduction of RS 1823 Stepped Rate back in 2006
- **Energy charge aligned to RS 1823A (flat) energy charge**

RS 3808: Rate for FortisBC

- Pricing of Tranche 1 of RS 3808 is currently tied to RS 1827
- **Energy charge aligned to RS 1823A (flat) energy charge**

- **In the absence of a default stepped rate for transmission service customers, there is no longer a need for RS 1827 customers to be exempt from the stepped rate structure**
- **BC Hydro proposes these customers take service on the new rate schedule for the proposed flat rate and to eliminate RS 1827**

Transition Schedule

Timing of the proposed changes would differ under each transition option

Transition Option 1: Revenue Neutral Segmented Flat Rates

- RS 1827 and RS 3808 (Tranche 1) would follow pricing for Segment 3
- RS 1827 customers would take service on new rate schedule starting in F2029

Transition Option 2: Staggered Implementation

- RS 1827 and RS 3808 (Tranche 1) would maintain current pricing until the end of F2026
- RS 1827 customers would take service on new rate schedule starting in F2027

Alternative Transition: Gradual Implementation

- RS 1827 and RS 3808 (Tranche 1) would gradually transition to the proposed flat rate and RS 1827 would be eliminated in F2029

Rate Schedule 1880: Standby and Maintenance and Rate Schedule 1891: Shore Power Service

Jessica Lunn

Senior Regulatory Specialist



Updates to Other Rate Schedules



Rates that reference RS 1823 Pricing

RS 1880: Standby and Maintenance Supply

- Provides standby service on “as available” basis when some, or all, of a customer’s self-generation plant is curtailed (forced or planned outages)
- **Energy charge aligned to RS 1823 Tier 2 energy charge / no demand charge**

RS 1891: Shore Power

- Shore Power Rate originally designed for Canada Place in 2008 and expanded to transmission class as part of 2015 Rate Design Application
- Pricing concept was set to be consistent with RS 1880 (i.e., for provision of shore power service when vessel self-generation is curtailed)
- **Energy charge aligned to RS 1823 Tier 2 energy charge / no demand charge**

RS 1880/1891 Re-pricing Concepts

1. Update existing reference price
2. Short-run marginal cost (Mid-C)

Current F24
\$102.57
/MWh

Re-priced
\$44.14
/MWh

RS 1853
(Mid-C, no adder)

RS 1893
(Mid-C, with adder)

Illustrative Example:

- Pulp mill with self-generation
- 2,000 MWh of standby/maintenance power on RS 1880

Impact of re-pricing 1880:
= 2000 X (102.57 - 44.14)
= 2000 X 58.43
= **\$116,860 bill reduction**

Transition Schedule

Timing of the proposed changes would differ under each transition option

Transition Option 1: Revenue Neutral Segmented Flat Rates

- RS 1880 and RS 1891 would be re-priced starting in F2025 with the elimination of Tier 2 for all RS 1823 customers

Transition Option 2: Staggered Implementation

- RS 1880 and RS 1891 would be re-priced starting in F2025 with the elimination of Tier 2 for most RS 1823 customers

Alternative Transition: Gradual Implementation

- RS 1880 and RS 1891 would remain tied to the Tier 2 price until F2029

Feedback Questions



We're looking for your feedback:

How should RS 1880 Standby and Maintenance Supply be re-priced?

- Same energy charge as that of the proposed flat rate
- Market-referenced price (e.g., Mid-C)
- Other

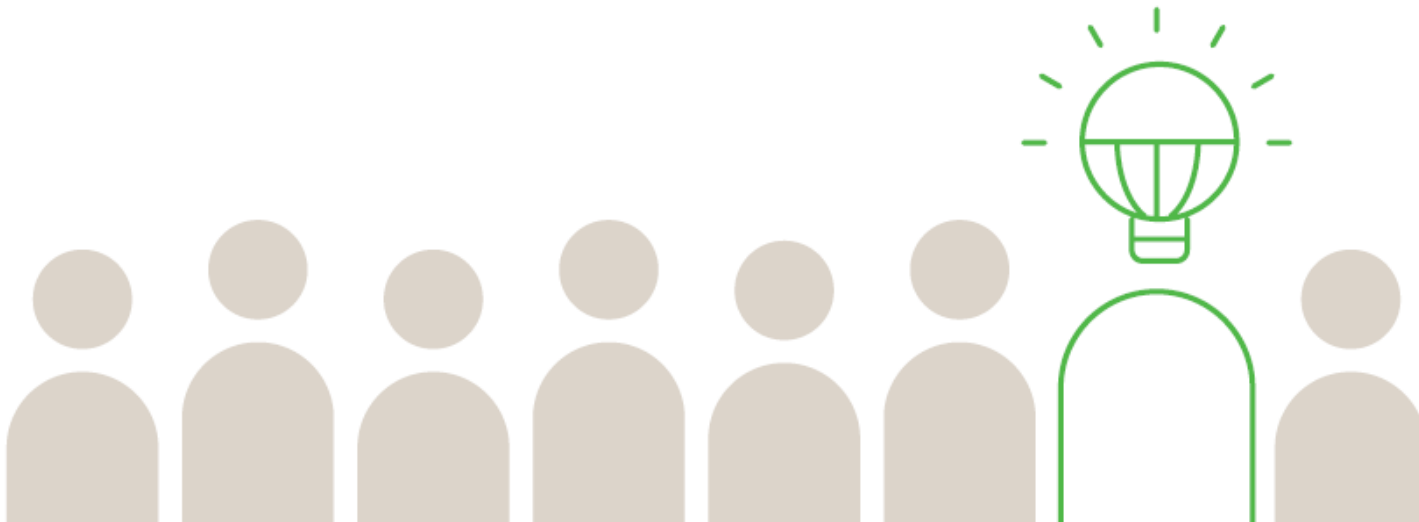
How should RS 1891 Shore Power Service be re-priced?

- Same energy charge as that of the proposed flat rate
- Market-referenced price (e.g., Mid-C)
- Other

Rate Schedule 1892: Freshet Energy and Rate Schedule 1893: Incremental Energy Rate

Amr Ayad

Senior Industrial Rates Advisor

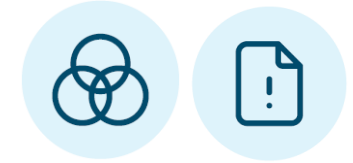


Context

- The Freshet Rate and Incremental Energy Rate are optional non-firm rates with pricing tied to day-ahead Mid-C market prices
- Firm service base load is provided under RS 1823/1828
- The non-firm rates incent incremental consumption when market prices are lower than the marginal price under RS 1823/1828
- Changing the default rate to the proposed flat rate may change the incentive under these rates for incremental consumption
- We are seeking customer feedback on whether to continue these non-firm optional rates and what changes, if any, will be needed

Background

Rates that reference TS 74



RS 1892: Freshet Rate

- Initially offered on a 4-year pilot basis, commencing in February 2016
- Rate made permanent in May 2020
- Encourage incremental energy use during May – July freshet period
- Market reference-priced energy charge (Mid-C) plus \$3/MWh adder / no demand

RS 1893: Incremental Energy Rate

- Offered on a 51-month pilot basis (January 2020 – March 31, 2024)
- Encourage incremental energy use all year round
- Market reference-priced energy charge (Mid-C) \$3/MWh adder in freshet months / \$7/MWh adder in all other months / no demand
- Evaluation report to be filed with BCUC by September 15, 2023

- **Need to assess if and how new baseline to be established for optional rates if there is a new flat default rate**
- **Opportunity to simplify**

Considerations

- There are several customers that currently receive service on either RS 1892 or RS 1893.
- Customers may operate differently on a flat rate relative to how they have historically operated on a stepped rate. Accordingly, the ability to discern “normal use” of a customer will likely be impacted.
- BC Hydro is therefore seeking feedback on whether these rates should continue with a default flat rate and if they were to continue, what an appropriate baseline would be.

Options under a Flat Rate

1. Continue to offer RS 1892 but allow RS 1893 to expire on March 31, 2024.
2. Require a period of consumption on a default flat rate prior to customers re-initiating service on RS 1892 or RS 1893 (subject to evaluation).
3. Continue to offer RS 1892 or RS 1893 (subject to evaluation) using current baselines, with a mechanism to reset/adjust a customer's baseline based on changes in consumption on a default flat rate.

Customer Baseline Determination Guidelines

- In Workshop 1, we asked whether TS 74 (CBL Determination Guidelines) should be revised or replaced so the provisions are specific to baseline determination and adjustment for RS 1892 and RS 1893 customers
- 14 of 23 respondents indicated “yes”, 8 indicated “unsure” and 1 indicated “no”
- We are seeking feedback on ways that TS 74 could be simplified for use under RS 1892 and RS 1893. For example:
 - No longer require CBL for firm service
 - Limit guidelines to adjustments to historic data used to establish CBL

Feedback Questions



We're looking for your feedback:

Should RS 1892 Freshet Energy continue to be offered if a flat default rate is implemented?

- Yes
- No
- Uncertain

Should RS 1893 Incremental Energy Rate continue to be offered if a flat default rate is implemented?

- Yes
- No
- Uncertain

If RS 1892 or RS 1893 are continued, should a new baseline (CBL) be established based on one-year of consumption on a flat rate?

- Yes
- No
- Uncertain

Should a new simplified TS 74 – CBL Determination Guidelines be developed for optional rates? If so, please suggest areas for simplification and improvement.

- Yes
- No
- Uncertain

For RS 1892 and RS 1893, what CBL reset/adjustment mechanism would your company or organization prefer?

- Reset triggered by +10%/-10% change based on prior year's consumption
- Adjust CBL by a growth adjustment factor (i.e., increase or decrease CBL over time based on prior year's actual consumption)
- Other

Time-of-Use Rate

Allan Chung

Senior Regulatory Specialist



Background

- Feedback from customer working group meetings indicated interest in a voluntary time of use rate to help mitigate bill impacts to customers from default rate redesign
- In BC Hydro's 2021 Integrated Resource Plan (currently under review with the BC Utilities Commission), our base resource plan includes the following near-term action:

Pursue voluntary time-varying rates supported by demand response programs to achieve approximately 220 MW of capacity savings at the system level by fiscal 2030

- We have developed an initial time of use (TOU) rate concept for consultation
- We will be carrying out additional analysis and consultation activities for a Phase 2 rate application

Industrial Time-of-Use Rate



Objectives

- Increase system efficiency and provide capacity savings during winter peak period
- Provide more efficient price signals e.g., through seasonal pricing
- Provide customers with more rate choice and opportunity for bill savings by responding to time of use pricing

Selected Feedback from Customer Meetings

- A higher demand charge will impact low load factor customers (such as sawmills). An alternative rate structure (such as Time of Use) could benefit these types of customers through operational changes.
- There is a desire from customers to choose from a suite of rates (i.e., optionality is preferred over a one-size fits all approach).
- Customers want price stability and certainty. Existing optional rates (RS 1892 Freshet Rate and RS 1893) are based on Mid-C wholesale price which may be volatile.

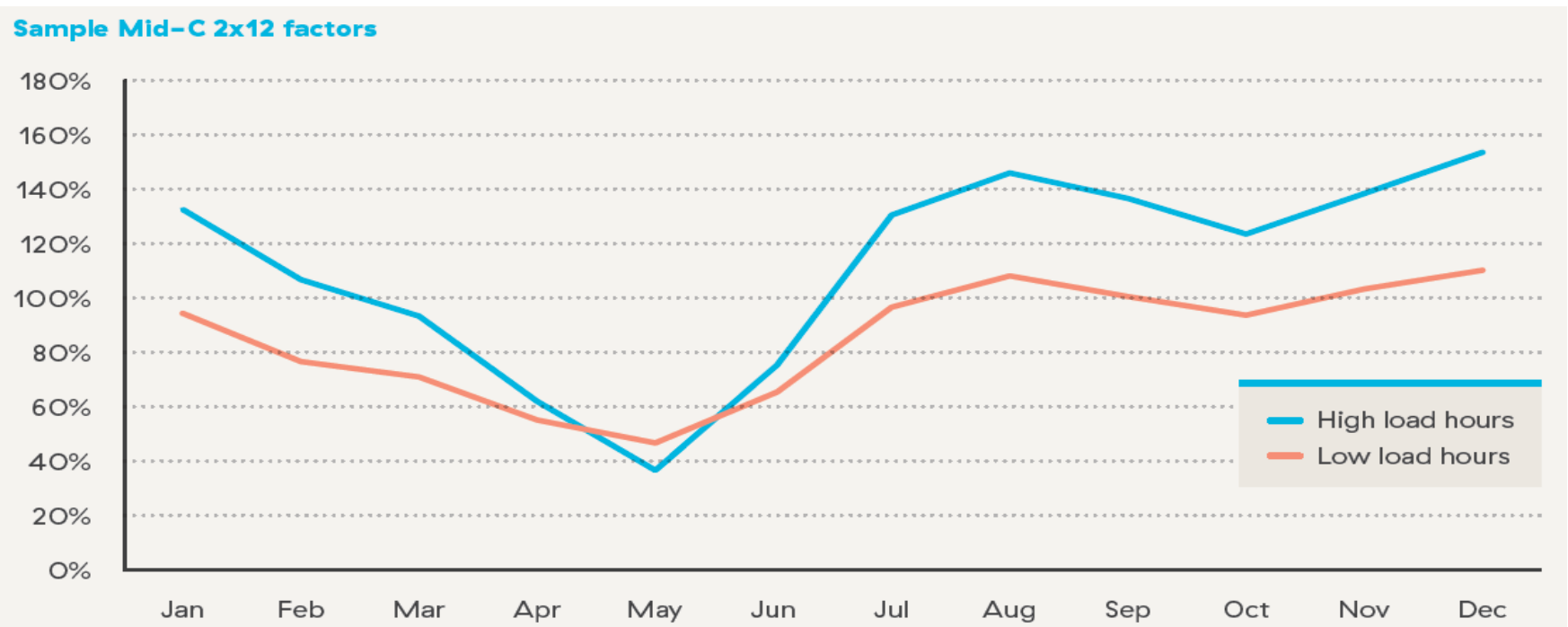
Illustrative Time-of-Use Rate Structure

Our proposed TOU rate for industrial customers would be similar to our existing optional rates that rely on a customer baseline and would be a two-part rate:

- Part 1: Fixed Charge**
- **Designed to collect customer's historic contribution to embedded cost** (i.e. calculated based on customer baseline load (CBL) priced at the default rates for energy and demand)
- Part 2: TOU Energy Charges**
- **TOU energy charges that vary by season/time-of-day for marginal consumption** (i.e., charge for incremental consumption, credit for decremental consumption based on the TOU price)
 - **Incremental energy is proposed to be firm** (e.g., up to contract demand) **and would have no demand charge**
 - **Priced to encourage load shifting from peak to off-peak periods**

Illustrative TOU Energy Pricing

For illustration purposes, we've developed TOU prices based on our embedded energy cost shaped by the forecast Mid-C price shape



Illustrative TOU Energy Pricing

Table below shows illustrative pricing based on a 3:1 peak to off-peak price ratio

		Option A	Option B	Option C
Winter (November to February)	Peak (4 to 8 p.m. weekdays)	\$127.74	\$127.74	\$127.74
	Shoulder (6 a.m. to 4 p.m. and 8 to 10 p.m. weekdays)	n/a	n/a	\$49.50
	Off-peak (remaining hours)	\$42.58	\$42.58	\$35.75
Spring (May to June)	All time periods	n/a	\$21.30	\$21.30
Remaining months	All time periods	n/a	\$38.42	\$38.42

Assessment of TOU Options

Option A: Winter only, two time periods	Option B: Three seasons, two time periods	Option C: Three seasons, three time periods
Advantages		
<ul style="list-style-type: none"> ○ With only one season and two time periods, this design would be simple to understand and administer. ○ Would target load shifting to when it is most needed by BC Hydro (i.e., shifts load away from winter peak). 	<ul style="list-style-type: none"> ○ Maintains simplicity but provides year-round benefits to participants. ○ Provides greater flexibility to customers to shift load across time periods and seasons. 	<ul style="list-style-type: none"> ○ Most aligned with BC Hydro's cost of service with prices that vary across time periods and seasons. ○ Greatest flexibility to customers to encourage load shifting.
Disadvantages		
<ul style="list-style-type: none"> ○ Provides potential bill savings to customers in winter period only, which may discourage participation. ○ Does not reflect seasonal variations in energy costs at other times of the year. 	<ul style="list-style-type: none"> ○ Less targeted offering and greater complexity. 	<ul style="list-style-type: none"> ○ Less targeted offering and greater complexity.

Illustrative Bill Savings: Load Shifting

Illustrative bill savings (potential customer benefit) for a customer shifting 50% of its on-peak load to off-peak during the winter period

Part 1: Fixed Charge

$$\begin{aligned} &= (\text{CBL Energy} \times \text{Default Energy Rate}) + (\text{CBL Demand} \times \text{Default Demand Charge}) \\ &= (94,728 \text{ MWh} \times \$44.14/\text{MWh}) + (15,763 \text{ kVA} \times 12 \times \$11/\text{kVA}) \\ &= \$4.18 \text{ million} + \$2.08 \text{ million} \\ &= \mathbf{\$6.26 \text{ million}} \end{aligned}$$

Part 2: TOU Energy Charges

$$\begin{aligned} &= (\text{Reduction in Energy during Winter Peak} \times \text{Winter Peak TOU Rate}) + (\text{Increase in Energy during Winter Off-Peak} \times \text{Winter Off-Peak Rate}) \\ &= (-2,155 \text{ MWh} \times \$127.74/\text{MWh}) + (2,155 \text{ MWh} \times \$42.58/\text{MWh}) \\ &= -\$275,280 + \$91,760 \\ &= \mathbf{-\$183,520} \end{aligned}$$

Bill adjustment results in total annual savings of **2.9%**

Note: Customer load assumes 70% load factor and 98% power factor

Next Steps

- Integrate feedback and refine TOU rate
- Undertake additional consultation on TOU rate
- Finalize TOU rate for Phase 2 rate filing in 2023

Feedback Questions



We're looking for your feedback:

Would your company or organization likely be interested in participating in a Time-of-Use (TOU) rate?

- Yes
- No
- Unsure

Which rate design would your company or organization likely prefer?

- Option A: Winter only, two time periods
- Option B: Three seasons, two time periods
- Option C: Three seasons, three time periods
- Unsure/Other

Please rank which winter peak to off-peak TOU price ratio your company would likely prefer (with 1 being the highest and 3 the lowest):

- 4:1 _____
- 3:1 _____
- 2:1 _____

Feedback Questions

Please rank which TOU peak winter period your company would likely prefer (with 1 being the highest and 4 the lowest):

- 4 p.m. to 9 p.m. _____
- 4 p.m. to 8 p.m. _____
- 3 p.m. to 7 p.m. _____
- 5 p.m. to 9 p.m. _____

What actions or measures would your company or organization likely undertake in response to a TOU rate?

- Schedule equipment maintenance/downtime during peak periods
- Shift operations from peak periods to off-peak periods
- Shift timing of self-generation
- Invest in battery storage technology
- Other

Would your company or organization likely be interested in a TOU option with more frequent updating of TOU prices (e.g., annually or quarterly) and tied to shorter term market prices?

- Yes
- No
- Unsure

Questions and Feedback

Next Steps

- Your feedback will help inform our transmission service rate redesign application, which will be filed with the BCUC in early 2023
- We encourage you to share your comments and concerns via a feedback form that be circulated to attendees following the session

THANK YOU

For further information, please contact:

BC Hydro Regulatory Group

BCHydroRegulatoryGroup@bchydro.com





BC Hydro

Power smart