Balisage et analyse de la proposition du Distributeur par The Brattle Group

Hydro Québec Large Residential Tariff

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Executive Summary

Purpose of Review

Hydro-Québec Distribution ("Hydro-Québec") is in the process of developing a new electricity tariff proposal for large residential consumers and retained The Brattle Group ("Brattle") to prepare an independent expert report to research and benchmark the proposed tariff against similar tariff structures, assess the proposed tariff against rate design criteria, and provide expert opinion on the proposed tariff design.

To complete this mandate, Brattle:

- Benchmarked tariff structures applicable to large residential customers, including eligibility criteria, pricing mechanisms, targeted price signals, and stated policy objectives
  - We reviewed comparable utilities in Canada, the United States and selected Nordic jurisdictions with a focus in cold weather climates;
- Assessed how large residential customers are defined, whether exemptions apply, and what implementation challenges or constraints have been identified;
- Evaluated observed impacts of such tariffs, changes in consumption levels or patterns, and revenue considerations where relevant;
- Assessed the proposed tariff against cost causation, economic efficiency, and recent regulatory expectations; and
- Identified key risks, gaps, and priority improvements to strengthen the proposed design.

Key Findings

- Our assessment shows that Hydro Québec's three-tier inclining block structure scores well against rate design criteria and is consistent with, 1) how peer utilities price *New Loads;* and 2) rely on rate design as a primary price signal for *Existing Customers* to reduce their energy use
- Notably, we find that the large residential rate proposal can be expected to enhance system efficiency through:
  1. Clearer and **more accurate price signals** that prompt customers to modify usage; and
  2. Moving high-use customers who maintain their consumption onto **higher rates better aligned with marginal system costs** and the actual cost to serve them
- While large residential rate structures are rarely treated as a formal subclass, it is appropriate to use a volumetric approach in Québec when the objective is to deliver a strong conservation signal and ensure new consumption is priced in line with the system cost of serving it
- We found that price ratio across the proposed third tier to the first tier, which reaches ~2.6 by 2031, is at the higher end, albeit still within the range of 1.02 – 3.03 observed across jurisdictions surveyed
  - However, HQ's embedded cost of generation has historically been much lower than the marginal cost, which the proposed third tier is attempting to converge to over five years and, in our opinion, a higher ratio is reasonable in the Québec context
- Customers who choose to remain above the threshold and pay the higher rate will help the residential class cover a larger share of total system costs.

Key Findings – Potential Risks

1. ***Weak price signal leading to little to no change in consumption***
   - This is unlikely as approximately 45% of affected customers sit in the 35,000 to 40,000 kWh range subject to a materially higher rate, so the new rate offers a meaningful and realistic price signal to adjust consumption behaviour
   - The proposed rate also discourages customers currently below the threshold from raising their usage without pairing it with conservation or energy efficiency measures
2. ***The proposed rate may inadvertently capture low-use residential customers and low-income households***
   - Hydro Québec is proactively including measures to protect sub-groups of customers that may be adversely affected. Specifically, Hydro Québec will identify and exclude multi-unit residential buildings and low-income households wherever possible
   - Customers will also have the opportunity to self-declare if they believe they should not be included in the new rate
   - In the unlikely event that a large number of customers are excluded from the new rate, it may result in a reduction to HQ's target of 5% (or 200,000) of customers, which in turn may risk reducing additional revenues from the proposed third tier
3. ***A key design risk is that annual consumption only loosely reflects peak contribution, meaning the rate may not effectively reduce usage during the most critical peak hours***
   - This issue is less pronounced in Québec, where system peaks coincide with home heating demand during winter, and an optional flex rate with a critical peak pricing (CPP) feature can address it by offering customers able to cut usage during peak hours a rate that rewards them for doing so.

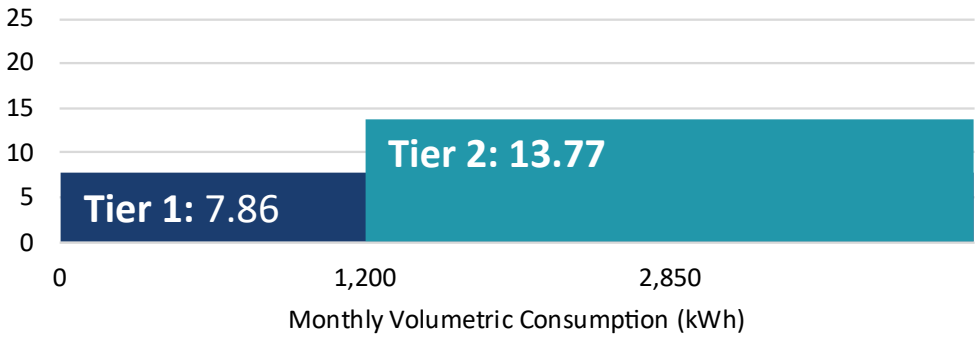
Hydro Québec's Proposed Large Residential Rate

Key Details on the New Rate

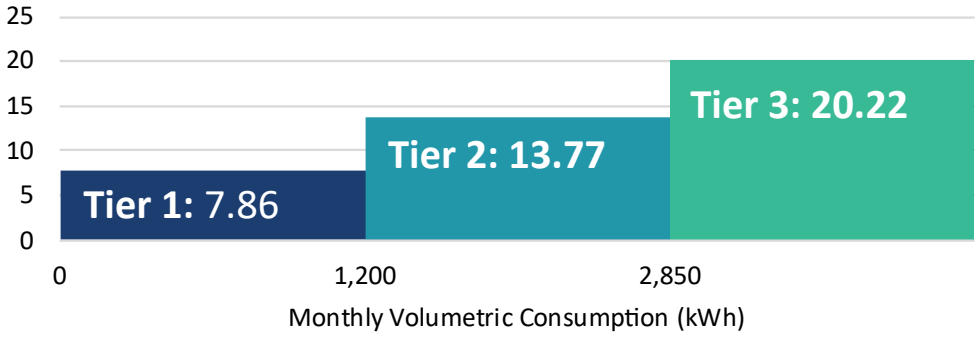
Hydro Québec is proposing a new rate that will be identical to the existing residential rate for Tier 1 and Tier 2 and adds a third tier of consumption for usage beyond 35 MWh per year (i.e., 2,850 kWh per month).

- After a five-year transition period, the third-tier rate will align closely with marginal costs to serve
- The proposal also includes an optional “flex DG” rate which is a Critical Peak Pricing (CPP) program with high costs during peak load events but lower costs otherwise.
  - This mirrors the existing “flex D” CPP optional rate
  - The optional CPP rate will be attractive to customers who are better able to manage their consumption during system peak periods

Existing Two-Tier Rate 2030 (cents/kWh)



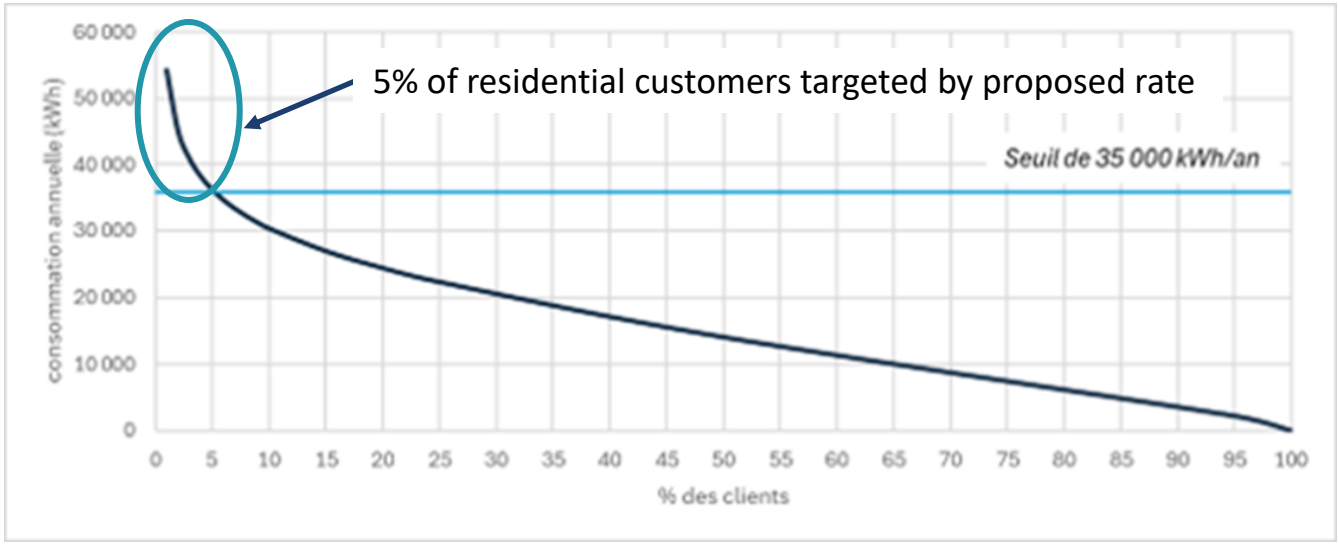
Proposed Large Residential Rate 2030 (cents/kWh)



Target Customers

Section 161 of Bill 69, Chapter 24 (Law 24) provides the context that governs Hydro Québec's proposed rate design. Specifically, Hydro Québec Distribution is presenting an option to Régie to approve a rate applicable to domestic customers in a manner that promotes a reduction in electricity consumption during peak periods, as well as a rate that varies based on energy intensity.

Breakdown of Hydro Québec residential customer base by consumption



Hydro Québec proposed rate would target the largest 5% of residential consumers

- The proposed consumption threshold is equivalent to annual consumption of 35,000 kWh or more which is more than twice the average consumption of the customer base
- As a result, nearly 200,000 customers would be subject to the new rate if approved

Proposed Rate Design Components

Rate type	Proposed	Comments
Rate Design: Number of Tiers	The rate will have a third additional tier of usage.	This is within the observed range of 2 to 4 tiers of usage within our jurisdictional scan.
Rate Design: Tier Threshold	Customers who use more than 35 MWh annually (i.e., 2,850 kWh/month) will be moved onto the proposed rate. This targets the top 5% of residential customers	The tier threshold is higher than any observed within the jurisdictional scan; However, Hydro Québec is a uniquely winter-peaking system with high levels of resistance heating driving average annual consumption higher than other jurisdictions.
Rate Design: Pricing Ratios	By 2031, the price ratio between Tier 1 and Tier 3 will be 2.6	This is on the upper end of price ratios observed. We observe that utilities with lower Tier 1 rates like Hydro Quebec's proposed rate tend to have high price ratios around 2. Additionally, Hydro Quebec's rate design under-recovers revenue from the first tier which would further increase the final pricing ratio observed.
Marginal Cost Pricing	After the 5-year ramp period, pricing for the final tier of consumption will align closely with marginal costs	Allocating costs using marginal cost promotes economic efficiency by aligning the price customer's pay with the system's costs to generate (NARUC). This is particularly true for the marginal consumption bucket.
Ramp Period	Rates will transition upwards over a 5-year ramp period	Easing the transition between rates can help reduce sudden swings in customer energy bills and is common across utilities. Generally, these range from three to five years.

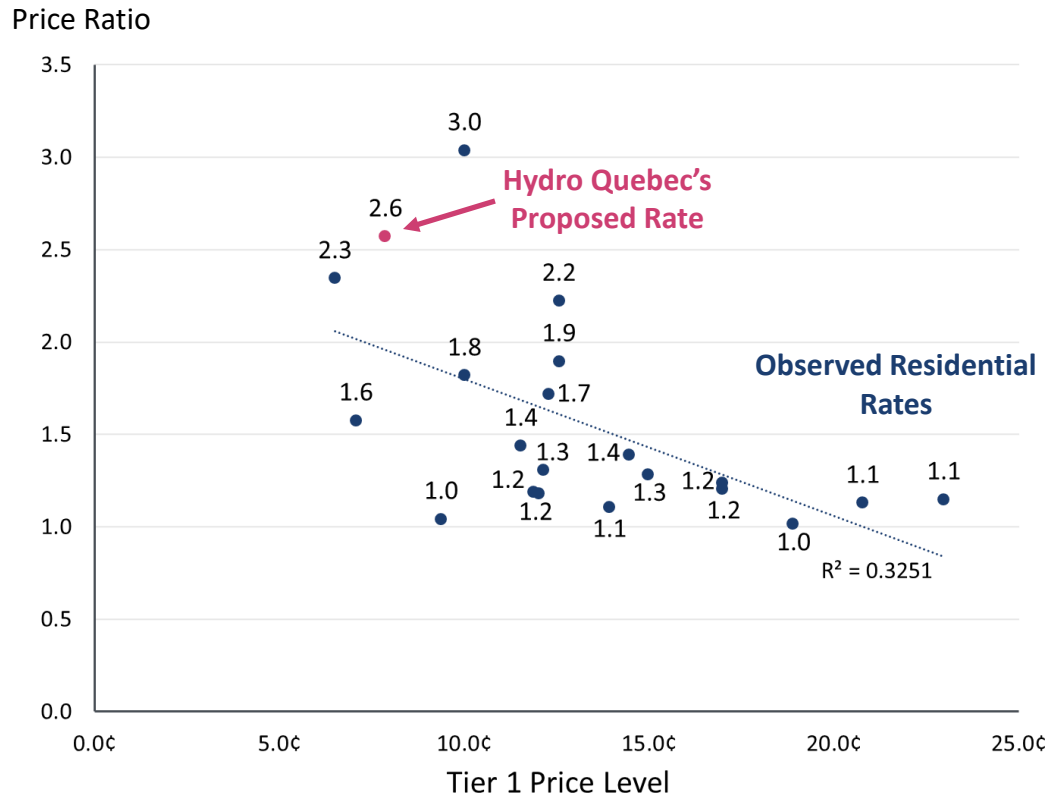
Inclining Block Rate Pricing Ratios

Hydro Quebec's proposed rate has a pricing ratio that falls on the higher end of the observed range, but this is expected given its lower initial tier pricing level

Lower Tier 1 prices are associated with steeper inclining block rate structures and higher price ratios between the final and first tier

- This pattern is consistent with rate designs that preserve affordability for low-consumption customers while placing more of the price signal on higher levels of consumption
- Mechanically, a low Tier 1 price will also result in an elevated price ratio

Relationship Between Tier 1 Price Levels and Price Ratios between Tier 1 and the Final Tier



Note: All prices are converted into CAD using the current 2026 exchange rate of 1.4. Price ratio for the proposed rate reflect pricing levels after the five-year ramp period

The Proposed Rate Scores Well Across Rate Design Criteria

Criteria	Description	Proposed Large Residential Rate
Bill Stability	Minimize large, sudden increases in customer bills	The five-year transition will mitigate large bill shocks
Cost Reflective	The extent to which a rate design aligns with the structure and nature of costs it is intended to collect i.e., whether customers pay their "fair share"	While not accounting for time-varying nature of costs, the third tier of consumption will be billed at rates designed to reflect rising marginal system cost. This will reduce any inter-class cost shifts, but could raise affordability concerns for some high-use-low-income households.
Valuable Price Response	A rate should provide price signals to customers to adjust their usage pattern in response to system conditions (e.g., reduce usage when the cost of generating and delivering electricity is highest).	The rate provides a clear and strong price signal to reduce consumption below 35 MWh annually. The optional CPP "flex DG" rate will also provide strong price signals to reduce consumption during peak system events in the winter.
Simple and Transparent	The rate options should be simple and straightforward for customers to understand.	The proposed rate is simple and aligns with existing rate structures that customers are familiar with.

Key Features of the Proposed Rate

- **Energy consumption reductions:** Currently Hydro Québec residential customers pay only around 81% of the costs they impose on the system. This means that residential customers may overuse electricity, from a societal perspective, because the price they pay is not aligned with the costs to serve
  - The new third tier rate will, over time, align with marginal cost aligning the price with the cost to serve
  - Around two-thirds of Hydro Québec residential customers use electric resistance heating. High volumetric price signals will encourage customers to shift towards more efficient heat pump heating which will reduce energy consumption and, in a winter peaking system, could reduce load during peak system hours; however, this will depend on equipment performance, sizing, and backup options.
- **Customer applicability**: How the customer threshold criteria is defined impacts who is placed on the new rate
  - The 35 MWh annual consumption threshold is based on a threshold of 95 kWh per day or 2,850 kWh per month
  - Low-income households, agricultural customers, and multifamily buildings behind single meters are excluded
  - The annual threshold could result in a customer on the existing rate paying less than another customer on the new proposed rate who uses less energy in a given month

Hydro Québec Table 8

Considerations

- **Low price elasticity**: Customers may not significantly reduce their consumption particularly if they are wealthy and more price inelastic
  - Pair proposed rate implementation with customer education and targeted programs to facilitate transition to more efficient use of electricity such as heat pumps
- **Weak peak-period signal**: No temporal or demand-based price signal may weaken benefits to peak system hours.
  - Maintain and promote the optional Flex DG rate to expose customers to price signals during critical system peak load events
- **Bill shock:** Customers may be frustrated at the bill increases
  - Provide advance notice aligned with the gradual phase-in
- **Revenue uncertainty**: The new rate may result in greater revenue variability in cold-winter vs mild-winter years since more revenue will be generated from high-consumption usage

Residential Rate Offerings by Other Utilities

Utilities Explored

Cold-Climate Utility Sample Default Rates: Canada	
Hydro Québec	Inclining Block Rate
BC Hydro	Inclining Block Rate or Flat
Manitoba Hydro	Flat Volumetric
NB Power	Flat Volumetric
Newfoundland & Labrador Hydro	Flat Volumetric
Toronto Hydro	TOU or ULO or Inclining Block Rate
Cold-Climate Utility Sample Default Rates: United States	
Eversource	Flat Volumetric
National Grid	Flat Volumetric
PSEG Long Island	Time of Day
Puget Sound Energy	Inclining Block Rate
Seattle City Light	Time of Use or Flat
Xcel Energy – Minnesota	Seasonal Flat Volumetric
Cold-Climate Utility Sample Default Rates: Nordic Countries	
Denmark - Radius Elnet	TOU/Seasonal Volumetric Network Tariff
Finland - Caruna Oy	Flat Network Tariff
Norway - Elvia	Capacity and TOU Network Tariff

Inclining Block Rate Sample

Utility	Thresholds (kWh/month)	Price Ratio*
Hydro Québec	1200, 1200+	1.58
BC Hydro	675, 675+	1.19
Toronto Hydro	600, 600+	Summer: 1.18
Alabama Power Co	1000, 1000+	Summer: 1.02
Austin Energy	300, 900, 2000, 2000+	2.35
Avista Corp	800, 1500, 1500+	1.39
Cleco Power LLC	1000, 1500, 1500+	Summer: 1.44
Consolidated Edison Co-NY Inc	250, 250+	Summer: 1.15
Georgia Power	650, 1000, 1000+	Summer: 1.72
Hawaiian Electric Co Inc	350, 1200, 1200+	1.28
Idaho Power Co.	800, 2000, 2000+	Summer 1.21 Non-Summer: 1.11
LADWP	350, 1050, 1050+	High Season: 3.04 Low Season: 1.82
Maui Electric Co Ltd	350, 1200, 1200+	1.24
Public Service Co of NM	450, 900, 900+	Summer 2.22 Non-Summer: 1.89
Puget Sound Energy	600, 600+	1.13
Tucson Electric Power and Co	500, 1000, 1000+	1.31
Virginia Electric & Power Co	800, 800+	Summer: 1.04

*Price ratio means the ratio of the final tier price compared to the first tier price.

Residential Rate Alternatives

We explore residential rate offerings across the U.S., Canada, and Nordic countries to identify prevalent rate designs. Identified rates can have volumetric, temporal, and demand-based components

Rate type	Primary price signal	Best use of the rate	Prevalence
Flat volumetric	Volumetric consumption	Rate simplicity	**Very Common**: Most residential rates use flat volumetric design. Some have seasonal differentiation
Inclining block (IBR)	Higher total usage is charged at increasing rates	Energy conservation because customers are exposed to higher costs as usage increases	**Common:** Around 10 - 15% of residential rates explored have some IBR component
Time-of-Use (TOU)	Time of use typically with higher prices during high system cost hours	Shifting load away from predictable system peaks reducing T&D investment needs	**Common:** Some jurisdictions like California have default TOU, but TOU tends to be more common as an optional rate
CPP / dynamic pricing	Can be layered on other rate designs. Applies high prices during critical system hours	Peak reduction during unexpected system peaks typically driven by weather	**Less Common** particularly as part of a default residential rate
Demand charge	Customer peak kW	Reduce peak consumption reducing T&D investment needs	**Not as common** in residential rate offerings but very prevalent in commercial rates
Low/high-use residential	Annual/monthly usage	Targeted treatment of low-use or high-use customers if rate goals or customer profiles are meaningfully different	**Not common:** Only a few examples of residential customers split by size

High-Use Residential Rates

High-use residential rates are relatively uncommon, although we observe that they can be used to differentiate high-consumption customers.

- Rates typically include higher customer charges or demand-based charges

Takeaway for Hydro Québec: Most utilities address high residential consumption indirectly through other rate structures, such as inclining block rates, TOU rates, EV or electric-heating rates, or higher fixed/facility charges for larger residential service rather than explicitly defining an alternative high-use residential rate.

EXAMPLES OF HIGH-USE RESIDENTIAL RATES

Utility	Customer Threshold	Rate Type	Compared to Standard Rate
LADWP	Large single-family residential service with an on-site transformer	TOU or Seasonal Flat Standard: IBR	Lower energy charge Adds a facility charge
NV Energy	Residential customers having three-phase service to a separately-metered, permanent, single-family dwelling.	Flat Standard: Flat	Lower energy charge Higher fixed charge

Inclining Block Rates

Inclining block rates have a tiered pricing structure where the marginal cost of each additional unit of energy consumed is higher than the last. This design:

- Encourages high-consumption customers to reduce overall usage*
- Makes small volumes of usage affordable for low-consumption customers
- Tiers and price increases can vary across utility rate offerings with the highest observed final tier reaching 2,000 kWh/month

Key takeaway for Hydro Québec: IBRs differentiate high and low consumption customers implicitly within the same rate allowing utilities to treat them different based on the price levels and usage tier thresholds set.

*Austin Energy specifically notes that its high tier design was intended to encourage energy conservation

EXAMPLES OF INCLINING BLOCK RATES

Utility	Threshold (kWh/month)	Price Ratio
Hydro Québec	1200, 1200+	1.58
BC Hydro	675, 675+	1.19
Idaho Power Co.	800, 2000, 2000+	Summer 1.21 Non-Summer: 1.11
Austin Energy	300, 900, 2000, 2000+	2.35
Avista Corp	800, 1500, 1500+	1.39

Note: Examples are the three inclining block rate designs with the highest final tier thresholds and two identified Canadian IBRs. Price ratio means the ratio of the final tier price compared to the first tier price.

Inclining Block Rates Design Details

We find that inclining block rates are not as common as flat volumetric rate structures but exist in many jurisdictions

- IBRs are default rates in 12 of the 52 U.S. IOU utilities surveyed, 3 of the 6 Canadian utilities, and none of the 4 Nordic countries surveyed. We additionally include 2 other non-IOU U.S. utilities with IBRs to capture a wide range of design choices

IBRs vary widely within the tariffs identified, but generally:

- Have between **2 and 4 tiers** of usage
- Tier thresholds vary widely, ranging from **250 to 1,200 kWh/month for the end of the first tier**. For tariffs with more than one tier, the final tier starts between **900 and 2,000 kWh/month**
- Price ratios, i.e., the ratio of final tier rates to first tier rates, **are on average 1.5** but can range from 1.02, which means there is very little price differentiation, to 3.04, which results in higher marginal electricity costs for customers.

Low-Use Residential Rates

Low-use residential rates generally try to make energy more affordable for low-income customers whose consumption tends to be lower

- Rates have lower fixed charges
- Energy charges can be higher or lower depending on the rate

Takeaway for Hydro Québec: In contrast to low-use residential rates, large residential rates can prioritize cost-reflective pricing to discourage additional consumption

EXAMPLES OF LOW-USE RESIDENTIAL RATES

Utility	Threshold	Rate Type	Compared to Standard Rate
SMUD	Panel size <125 amps	TOU Standard: Same	Higher energy charge Lower fixed charge
Dominion SC	<400kWh/ month	Flat Standard: DBR Winter, IBR Summer	Lower energy charge Lower fixed charge
Vector (NZ)	Not specified	TOU and flat Standard: Same	Higher on-peak energy charge, lower off-peak energy charge Lower fixed charge
SDG&E	Customers qualify for CA Alternate Rates for Energy Program	TOU Standard: Same	Same energy charge Lower fixed charge

How Utilities Treat Heating Customers

Some utilities have optional rate offerings for electric heating customers. Often these rates have **lower volumetric energy charges** to keep electric consumption affordable and reflects the flatter consumption profile of electric heating customers.

- Some utilities like Ontario don't have different rate tariffs, but recognize electric heating needs through their default rate design built with an overnight low-TOU period

Takeaway for Hydro Quebec: Optional heating rates are not typically designed with conservation in mind instead reflecting average prices to serve for a different customer type rather than charging marginal costs to induce consumption changes.

EXAMPLES OF RATES FOR HEATING CUSTOMERS

Utility	Rate Type	Compared to Standard Rate
Xcel Energy – Minnesota	Space Heating: Same as standard Standard: Seasonal Flat Volumetric	Same fixed charge and summer energy charge Lower non-summer energy charge
Eversource	Space Heating: Same as standard Standard: Flat Volumetric	Same fixed charge Lower volumetric charge
PSEG Long Island	Home Heating: Summer IBR, winter declining block rate Standard: TOD	Tiered pricing instead of TOD Generally lower than TOD peak pricing
National Grid	Optional Heat Pump: Seasonal Flat Volumetric Standard: Flat Volumetric	Same fixed charge and same summer delivery charge. Lower winter delivery charge
Alaska Electric Light and Power	Heat Pump: Seasonal Flat Volumetric and Demand Standard: Seasonal Flat Volumetric	Lower seasonal energy charge Higher fixed charge Adds demand charge
Minnesota Power	Dual fuel interruptible: Controlled-load Volumetric Standard: Flat Volumetric	For residential customers with a non-electric backup source Lower energy charge than standard residential, but load can be interrupted

Optional EV Customer Rates

Utility optional EV rate options generally have time-varying rates with very low overnight prices to incentivize consumption during hours where the cost to generate energy is low.

- Rates can be designed around separately metered EV loads or apply more generally to the whole house load

Takeaway for Hydro Quebec: Optional EV rates are not directly comparable to rates focusing on energy conservation, but they do provide examples where varying price signals are designed to change customer behavior and better reflect marginal system costs

EXAMPLES OF OPTIONAL EV RATES

Utility	Rate Type	Compared to Standard Rate
Alaska Electric Light and Power	EV: Same as standard Standard: Seasonal Flat Volumetric	Lower seasonal EV energy charge Residential EV rate follows same seasonal structure Separate EV equipment monthly charge available
Minnesota Power	EV: TOU Standard: Flat Volumetric	Lower off-peak EV charging charge and higher on-peak charge EV load must be separately served and metered.
SDG&E	EV: TOU Standard: IBR	Lower super off-peak EV charging charge Higher on-peak EV charging charge Only tracks EV charging, not whole-home usage
Baltimore Gas & Electric	EV: Whole-home TOU Standard: Flat Volumetric	Same customer charge and delivery service charge Whole-home TOU schedule for customers with plug-in EVs Requires smart meter and EV charging at primary residence