

ONTARIO ENERGY BOARD

Report to the Minister of Energy

Defining Ontario's Typical Electricity Residential Customer 2023 Update

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**Ontario
Energy
Board**

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ACRONYMS

COVID-19:	Coronavirus Disease 2019
DER:	Distributed Energy Resource
GTA:	Greater Toronto Area
GW:	Gigawatts, 1 Billion Watts
IESO:	Independent Electricity System Operator
kWh:	Kilowatt Hours
LDC:	Local Distribution Company
MW:	Megawatts, 1 Million Watts
OEB:	Ontario Energy Board
PV:	Photovoltaic
TOU:	Time-of-Use
ULO:	Ultra-low Overnight

1 DEFINING ONTARIO'S TYPICAL ELECTRICITY RESIDENTIAL CUSTOMER

1.1 Summary

Since 2016, the Ontario Energy Board (OEB) has been using 750 kilowatt hours (kWh) as the standard when reporting and/or defining the monthly electricity consumption of a typical residential customer. This standard consumption value is widely used by distributors and the OEB to measure and illustrate how changes in electricity rates and charges will impact electricity customers.

In recognition of an evolving electricity sector, the OEB determined it would be valuable to revisit the standard consumption definition.

This update reaffirms the consumption for a typical residential customer is 750 kWh per month. The monthly electricity consumption value for a typical residential customer will be re-evaluated in three years.

1.2 Context

The OEB is Ontario's independent regulator of the electricity (and natural gas) sector(s). Focused on protecting consumers and making decisions that serve the public interest, its goal is to promote a sustainable and efficient energy sector that contributes to Ontario's economic, social and environmental development.

In support of its mandate, a customer-centric regulatory framework enables innovation, readies the energy sector for the transition that is now before us, and empowers energy customers by providing them with greater opportunities to influence policy and participate in decision-making. The framework strives to engage with customers in such a way as to provide them with information that will help them make informed decisions about their energy use and an understanding of how those decisions can and will impact their monthly bills.

To support this educational effort, the OEB has a variety of tools that help put costs into perspective for a variety of stakeholders, including customers. Rate changes are regularly communicated through official notices, informing potentially affected groups of initiated hearings. These communications often include an estimate of the anticipated monthly cost change for a typical customer. Furthermore, policy papers and decisions strive to set out the cost consequences of its determinations when possible.

The basis of these impacts relies on defining the typical residential electricity consumption and consistently applying that value to report bill impacts and other cost changes. The consistent application of this standard also supports the OEB's performance-based approach to rate-setting since it acts as a benchmark that allows comparisons between distributors.

To ensure that the bill impacts the OEB reports are broadly relevant, the OEB has defined a typical residential customer's monthly electricity consumption by using data provided by electricity distributors. This data includes the annual amount of electricity consumption reported by residential users and the total number of residential customers each year.

2 SECTORAL CHANGES DRIVING CHANGES IN RESIDENTIAL USE

Since 2016, the OEB has defined the typical residential customer as a household that consumed 750 kWh of electricity per month. This definition was reduced from the 800 kWh standard established in 2009. Prior to that, the OEB standard was 1,000 kWh per month¹.

Considering the impact of COVID-19, the growing adoption of electric vehicles (EVs), government energy saving programs, and advancements in technology since the last residential standard consumption was defined, the OEB has determined it would be valuable to reexamine this threshold.

Considerations from COVID-19

According to Statistics Canada², the share of total hours worked from home increased from 4.9% in 2018 to 31.3% in February 2021, with a peak of 42.6% in April 2020. As a result of remote work, residential consumption increased between the hours of 9:00 a.m. and 7:00 p.m.³. As the economy recovers from the COVID-19 pandemic, an increasing number of individuals are resuming work at their offices. Through the Smart Metering Entity, the IESO's consumption data shows that Ontario's 2022 summer residential consumption peaks are consistent with those seen in 2018 and 2019, indicating a possible return to pre-pandemic consumption levels⁴.

¹ Report of the Ontario Energy Board - Defining Ontario's Typical Electricity Customer, OEB, 2016

² Working from home after the COVID-19 pandemic: An estimate of worker preferences, Statistics Canada, 2021, catalogue no. 36-28-0001 ISSN 2563-8955

³ Market Snapshot: Ontario consumes less electricity since the beginning of the COVID-19 pandemic, Canada Energy Regulator, 2020

⁴ Electricity consumption across Ontario, Independent Electricity System Operator, 2022

Considerations due to electric vehicles

In Ontario and across Canada, the sales of Electric vehicle (EV) are increasing. In Canada, EV registrations have steadily increased from 19,696 in 2017, to 56,165 in 2019, and further to 86,032 in 2021. This represents 1.0%, 2.9% and 5.3% of total vehicle registrations in each respective year⁵. In Ontario, 71,000 Light Duty Electric Vehicles (LDEVs) had been registered as of the end of 2021/ This constitutes 1% of all automobiles registered⁶. Given that the average energy consumption of an electric vehicle battery is 0.22 kWh per kilometer, a residential consumer could see their monthly electricity consumption increase by an additional 275-367 kWh, with annual kilometers of 15,000 to 20,000 driven⁷. The influence of this additional consumption from EV home charging on the typical residential electricity consumption definition will increase with the number of homeowners making the transition to EVs.

Consideration of energy technologies

Global capacity of heat pumps is expected to reach nearly 2,600 GW by 2030, up from the 1,000 GW in 2021, as estimated by the International Energy Agency⁸. In Ontario, the provincial government's Clean Home Heating Initiative⁹ is providing homeowners with monetary incentives to install electric heat pumps¹⁰. However, as this initiative was launched in 2022, towards the end of the current study period, the full impact of this initiative on residential electricity consumption will only be observed and realized in the coming years. In addition to heat pumps, Distributed Energy Resources (DERs) can also impact the amount of electricity drawn from the local distributor's system. For reference, distributed photovoltaic (PV) installations totaled 167 GW globally between 2019 and 2021¹¹.

Summary

Influences such as the impact of COVID-19 on remote work, the growing adoption of electric vehicles, and other factors discussed above can impact Ontario's residential electricity consumption in offsetting ways. These changing dynamics prompt considerations to review and update the typical residential electricity consumption threshold on a three-year review cycle.

⁵ Market Snapshot: Record-high electric vehicle sales in Canada, Canada Energy Regulator, 2022

⁶ Annual Planning Outlook Ontario's electricity system needs: 2024-2043, IESO, 2021

⁷ Fuel consumption ratings - Battery-electric vehicles 2012-2023, Government of Canada, Open Government Datasets, updated October 5, 2023

⁸ The Future of Heat Pumps, International Energy Agency, 2022

⁹ Ontario Launches Clean Home Heating Initiative, Government of Ontario, 2022

¹⁰ Ontario Expanding Clean Home Heating Initiative to Whitby, Ajax and Pickering, Government of Ontario, 2023

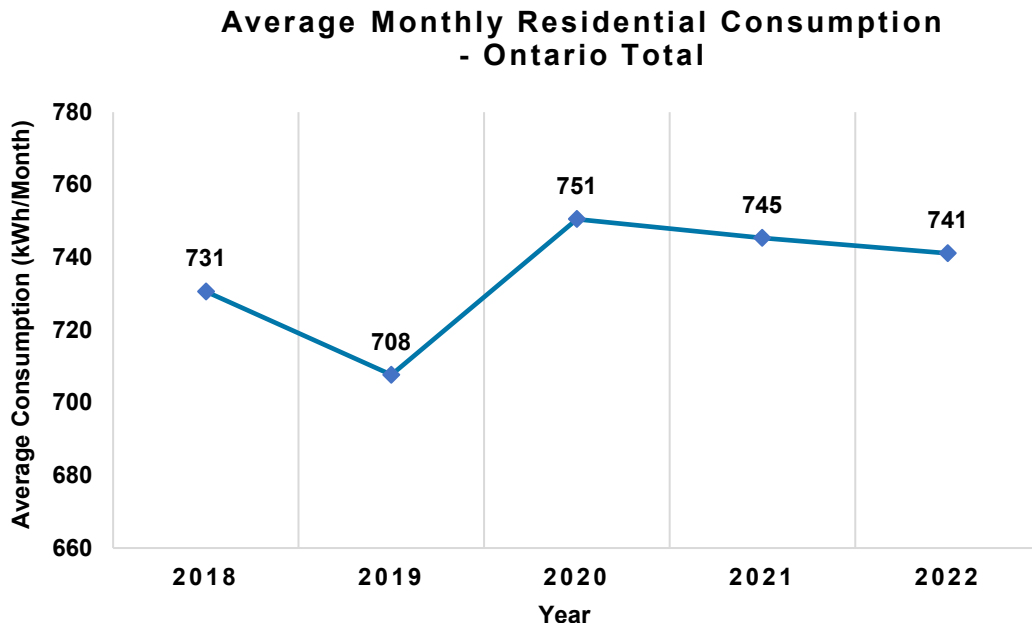
¹¹ Unlocking the Potential of Distributed Energy Resources, International Energy Agency, 2022

2.1 Analysis and Results

To assess the typical residential consumption for a given month, the OEB analyzed the data provided by distributors through the Reporting and Record keeping Requirements (RRR). The OEB looked at data for various time periods, such as three years and five years, and different groupings of distributors. This approach helped to control both for variations in the weather in any given year and for geographic factors.

The data from all of Ontario's reporting distributors in the last 5 years¹² (from 2018 to 2022) was considered. The average monthly residential electricity consumption for all of Ontario from 2018 to 2022 is shown in Figure 1 below.

Figure 1



The decrease in the average monthly residential consumption in 2019 may have been attributed to a combination of factors, such as energy efficiency measures, milder climate conditions, economic factors, and/or changes in consumer behavior. The climate conditions, as evidenced by a reduction in Degree Days¹³, likely played a role in influencing the observed decline. The increase in 2020 may be attributed to various factors, with the reshaping of consumer patterns due to COVID-19 being a significant one. Since 2020, the average monthly residential electricity consumption has been declining.

¹² Focus on the last 5 years of data enables the most recent conditions to be captured and studied.

¹³ A degree day is one day (24 hrs) with which the temperature is above or below a fixed reference temperature of 18 °C.

The OEB tested four different sets of LDCs to compile a weighted average for each set. The OEB constructed a sample based on data provided by Ontario's electricity distributors in the Greater Toronto Area (GTA)¹⁴, where nearly half of all customers reside.

The analysis also tested the effects of including and excluding Hydro One's 1.44 million customers, many of which receive service in low density, rural areas where reliance on electricity for home heating is more common. The OEB also tested the results using all Ontario residential customers and only Hydro One's most populous residential class, known as R1.

The results of the OEB's analysis are shown in Table 1 below.

Table 1

Average Monthly Residential Class Consumption, 2018-2022 (kWh)				
	GTA	Ontario Total	Ontario less Hydro One	Ontario with Only Hydro One R1
2022 Average	680	741	680	708
3 Year Average	688	746	688	715
5 Year Average	676	735	678	704
2018 Average	674	731	677	701

OEB analysis identified the following:

- In all cases, the annual average was lower in 2018 than 2022.
- Three-year averages were always higher than five-year averages, independent of the population sampled.
- The GTA average residential consumption is generally comparable to the Ontario average consumption Ontario excluding Hydro One.

The overall Ontario three-year average residential monthly consumption is 746 kWh.

In line with existing practices, the standard definition of a typical residential

¹⁴ GTA distributors included: Alectra Utilities Corporation, Oshawa PUC Networks Inc., Elexicon Energy Inc., Toronto Hydro-Electric System Limited, Newmarket-Tay Power Distribution Ltd., Oakville Hydro Electricity Distribution Inc., Milton Hydro Distribution Inc., Burlington Hydro Inc., and Grimsby Power Incorporated.

customer's monthly consumption will remain at 750 kWh.

The choice of 750 kWh as a standard will have varying impacts on the OEB's calculation of the cost impacts of decisions and rate-setting activities.

To provide an indication of a typical residential customer's bill under the standard, Table 2 compares detailed costs for 750 kWh of monthly consumption under different electricity price plan scenarios. The results reflect the updated Regulated Price Plan (RPP) prices – the Time-of-Use (TOU) and Tiered prices were effective as of November 1, 2022, and Ultra-low Overnight (ULO) prices that were first set for May 1, 2023.

Table 2

Typical Residential Costs at 750 kWh per month, as of November 1, 2023, RPP Rates				
	TIME-OF-USE ¹⁵	ULTRA-LOW OVERNIGHT ¹⁶	TIERED - SUMMER	TIERED - WINTER
Electricity	83.52	89.16	80.55	77.25
Distribution	38.01	38.01	38.01	38.01
Transmission	12.78	12.78	12.78	12.78
Line Losses	4.35	4.35	4.35	4.35
Regulatory	3.61	3.61	3.61	3.61
Total Electricity Charges¹⁷	\$142.27	\$147.91	\$139.30	\$136.00
HST	\$14.93	\$15.52	\$14.61	\$14.27
Ontario Electricity Rebate	\$(27.46)	\$(28.55)	\$(26.88)	\$(26.25)
Total Amount	\$129.74	\$134.88	\$127.03	\$124.02

¹⁵ As per OEB Online Bill Calculator, 19.00% of the electricity consumption is On-Peak, 18.00% is Mid-Peak, and 63.00% is Off-Peak.

¹⁶ As per OEB Online Bill Calculator, 17.90% of the electricity consumption is On-peak, 33.10% is Mid - Peak, 23% is Weekend Off Peak, and 26.00% is Ultra-Low Overnight.

¹⁷ Distribution, Transmission, Line Losses, and Regulatory charges represent the average values across all reporting LDCs.

3 CONSIDERATIONS

Geographic variation will always be a factor in a province as large as Ontario. Some distributors, particularly those in the north, and those whose customers do not have access to natural gas and use electricity for heating, will not find this standard to be representative of their customers. Their typical customers would consume more electricity than those elsewhere in Ontario.

To ensure that representative bill impacts can always be assessed for specific populations and customer groups, when necessary, distributors will continue to be responsible for defining their own typical consumption levels, in addition to reporting changes in cost at the 750 kWh consumption standard. The OEB's online bill calculator will continue to enable customers to select specific consumption levels to estimate their costs and compare costs across distributors and supply options.

4 CONCLUSION AND NEXT STEPS

In line with existing policy, the standard definition of a typical residential customer's monthly consumption will remain at 750 kWh. Given the evolving landscape in Ontario's electricity sector, the OEB has committed to reevaluating its standard definition of typical residential consumption every three years.