Canadian Renewable Energy Association | Association canadienne de l'énergie renouvelable

EB-2022-0074: Stakeholder Meeting on the Design of an "Optional Enhanced" Time of Use (TOU) Rate

Overview

Thank you for the opportunity to provide comment on the proposed alternative, optional Time of Use (TOU) price design that is being developed in response to the Minister of Energy's request to the OEB.

The Canadian Renewable Energy Association (CanREA) supports this proposal. We generally concur with the analysis of the OEB with respect to the potential for this "Optional Enhanced" TOU rate will encourage electricity usage behaviour among participants that will benefit the electricity system under anticipated increased electrification. We generally concur with the view that the proposed TOU rate option strikes an appropriate balance between the provision of value for participating customers with consideration for overall ratepayer impacts.

As noted in the OEB staff presentation, this proposed rate will provide a meaningful incentive for participating customers to adopt measures including overnight EV charging, electric storage heating and overnight pre-cooling in summer, in addition to shifting energy-intensive activities such as laundry to off-peak hours. It is possible that this rate option would also incent some use of behind-the-meter (BTM) battery residential battery storage in some circumstances where a consumer already owns a battery for other purposes (i.e. back-up power).

These measures collectively have the effect of smoothing load, thereby making more efficient use of existing generation, transmission and distribution infrastructure and potentially avoiding or deferring some infrastructure reinforcement or expansion.

In terms of improving the price design proposal, CanREA's primary concern is with respect to the notion that the On-peak price would be uniformly applied between 4pm to 9pm on weekdays throughout the year. While the simplicity of this design may be desirable, a truly cost-reflective time-varying rate would more effectively incentivize significant and sustained peak reduction by driving investment in and greater use of BTM solar PV and battery storage during actual peak periods.

CanREA recommends that:

- Further consideration be given to the design of seasonally varying critical peak rates as opposed to the proposed year-long uniform evening peak rate

- Net metering customers be guaranteed eligibility for this rate option, and that OEB staff work with the IESO Smart Metering Entity and Ministry of Energy staff to support an upgrade to the Meter Data Management and Repository (MDM/R) system, to enable province-wide time-of-use settlement for all customers, including net-metered customers, and an amendment the net metering regulation to require that LDCs make use of the updated MDM/R system for billing net-metered customers.

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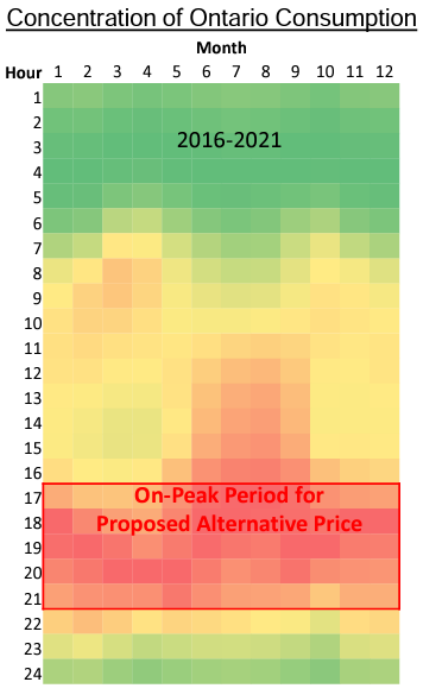
Seasonal variability in peak demand

The claim presented in the February 17 stakeholder meeting that “Ontario peak demand typically occurs 4pm to 9pm in all seasons” is an oversimplification that fails to account for significant seasonal variability in demand, as well as the non-negligible impact of behind-the-meter solar PV in reducing demand during what would otherwise be the actual peak demand hours over the course of the year.

OEB staff presented the following illustration of the “Concentration of Ontario Consumption” for the years 2016 to 2021, which shows average hourly demand normalized for each month (i.e. each hour is shown in comparison to the other hours within a given month, as opposed to the whole year):



Comparing average hourly demand for 2016-21 over the course of the year, as CanREA has done below, produces a very different picture, showing significant seasonal variability in the timing and intensity of peak demand:

2016-21

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	14956.53	14903.52	13768.80	12413.25	11961.17	12901.59	14224.64	14119.91	12628.14	12029.33	13420.54	14401.47
2	14496.38	14476.61	13460.92	12167.53	11631.19	12415.56	13599.43	13540.38	12235.17	11734.41	13009.03	13909.48
3	14245.75	14239.89	13319.77	12063.78	11477.32	12142.91	13201.49	13173.93	12016.37	11594.55	12775.25	13642.13
4	14141.61	14161.67	13339.23	12126.23	11480.77	12036.01	13023.63	13033.72	11969.66	11620.58	12681.86	13534.55
5	14203.41	14240.90	13638.20	12515.87	11762.99	12173.04	13151.60	13235.01	12230.03	11980.15	12802.43	13598.27
6	14601.24	14667.46	14398.09	13352.38	12419.42	12772.65	13657.89	13782.30	13037.56	12917.96	13305.71	13992.44
7	15516.91	15610.43	15366.50	14184.76	13318.38	13795.16	14691.12	14629.42	13964.76	14082.38	14357.90	14859.06
8	16628.49	16611.35	15913.99	14500.69	13800.91	14522.05	15703.63	15548.85	14544.37	14596.15	15382.79	15918.73
9	17074.58	16960.58	15977.88	14531.42	13996.29	15059.04	16504.30	16316.78	14912.21	14750.08	15766.89	16461.85
10	17238.85	17033.54	15827.67	14455.25	14093.91	15459.24	17152.16	16965.33	15194.93	14786.57	15841.54	16703.48
11	17289.53	16971.25	15664.09	14387.97	14164.84	15756.06	17669.38	17504.98	15430.98	14776.60	15801.12	16797.26
12	17265.91	16855.66	15530.62	14319.02	14199.48	15972.36	18056.16	17917.30	15620.87	14723.73	15740.13	16803.40
13	17196.43	16709.97	15380.44	14207.57	14226.25	16181.76	18330.01	18238.92	15803.70	14694.99	15683.47	16727.87
14	17157.52	16588.24	15234.00	14045.76	14183.33	16282.13	18506.25	18415.54	15903.23	14638.80	15672.18	16700.41
15	17138.54	16510.45	15180.21	14010.92	14208.88	16406.86	18695.08	18589.08	16059.04	14706.96	15746.57	16728.78
16	17317.45	16649.95	15392.40	14277.02	14479.37	16732.76	19013.58	18892.11	16431.46	15075.37	16061.54	16956.44
17	17929.07	17179.63	15880.68	14700.23	14878.87	17118.54	19399.08	19256.65	16850.17	15569.39	16770.51	17661.42
18	18817.38	17976.95	16381.11	14951.24	15074.54	17292.30	19492.52	19306.62	16969.59	15938.13	17572.83	18470.50
19	18943.90	18552.61	16995.14	15258.76	15222.40	17315.79	19325.90	19069.97	17053.64	16110.02	17461.63	18346.48
20	18682.30	18453.08	17215.53	15651.99	15389.80	17125.49	18941.90	18869.82	16957.76	15789.56	17117.01	18022.07
21	18288.94	18079.57	16811.51	15346.06	15298.06	16900.92	18643.51	18456.19	16285.52	15173.77	16699.12	17655.12
22	17657.95	17457.28	16033.99	14510.33	14472.94	16065.03	17724.87	17398.81	15244.42	14297.94	16059.13	17088.61
23	16727.92	16545.45	15093.60	13563.41	13408.97	14827.77	16358.06	16093.62	14121.90	13310.95	15116.43	16197.49
24	15710.44	15582.81	14264.95	12825.74	12530.38	13728.95	15099.76	14929.75	13188.49	12517.07	14148.40	15182.25

- Average peak demand during the hours of 4pm to 9pm was **nearly 1,000 MW higher** in the months of July and August than in December and January (the next highest-demand months),
- Average peak demand during the hours of 4pm to 9pm was **over 4,000 MW higher** in the months of July and August than in the lowest-demand months of April and May
- Demand at **9am in August** was higher than at **any hour** in the months of April, May or October

Given that the electricity system is built to accommodate peak demand over the course of the whole year as opposed to within a given month, it is clear that demand reduction during the highest-demand hours of the year is inherently more valuable than demand reduction during the highest-demand hours of an overall low-demand month.

Access to a higher peak rate targeting summer daytime hours would in CanREA's view be a more accurate reflection of true system costs, and a more economically efficient mechanism for achieving desired demand reduction outcomes.

While we recognize the OEB's desire for clarity and simplicity in this rate design, given that this enhanced TOU rate would be optional and therefore taken up by a self-selecting subset of consumers willing to actively manage their energy consumption, seasonal variability in the on- vs. off-peak rate amounts and differentials would probably be welcomed by prospective participants, many of whom would be able to make use of automatic "smart" EV charging and "smart home" technology to manage space heating and cooling loads.

In light of Ontario's electricity demand profile, BTM solar PV and battery storage are ideally suited to providing significant and sustained reduction in summer daytime demand peaks. The more than 2,200 MW of distributed solar and hundreds of MWs of batteries participating in the ICI program already makes an extremely significant impact in terms of reducing transmission system demand during these critical hours.

In the case of residential battery storage, we can assume that a residential-sized unit would cost approximately $18,000 installed. Cycling the battery every weekday to take advantage of the 10:1 on-

peak/off-peak price differential would yield a savings of approximately $500 per year, or approximately $5000 over the warrantied life of the battery. Thus, it is not possible that utilization of this rate would be a meaningful incentive for a customer to invest in a battery storage system, although if the customer already owned a battery for other purposes (i.e. UPS) it is possible that they would choose to use the battery in this way.

CanREA recently commissioned analysis of the whole-system impact of additional Behind-the-Meter solar in Ontario[1]. This research found that BTM solar can provide significant whole-system savings by lowering HOEP during peak demand hours in the summer, reducing the need to procure additional capacity through IESO's Capacity Auction (or other future procurements) and mitigating costs related to carbon prices and gas-fired generation. BTM solar can also mitigate the need for transmission infrastructure in response to load growth and the forthcoming retirement of the Pickering NGS. A copy of this research is appended to this submission.

Every additional megawatt (MW) of net-metered rooftop solar PV installed in Ontario will generate approximately $2 million in direct private-sector investment[2]; Dozens of full time-equivalent job-years of employment for Ontario workers (including in manufacturing, system design/engineering, installation, and maintenance)[3]; and reduced GHG emissions through avoided dispatching of costly and polluting natural gas peaking capacity during summer periods of high demand.

Eligibility of net metering customers to participate in this rate option

CanREA strongly recommends that the OEB take steps to ensure that net metering customers are able to opt into this enhanced TOU rate option.

At present, net metered solar PV in Ontario is not fairly compensated for surplus generation exported to the grid.

The net metering regulation (O. Reg. 541/05) stipulates that settlement for exported surplus generation be "calculated on the same basis as the eligible generator's consumption of electricity", without specifying the methodology that the distributor must use to calculate the net metering customer's electricity bill. While this would seemingly imply that net metering customers would be settled on the default TOU rate, it is CanREA's understanding that LDCs switch customers over from the default TOU to a tiered rate immediately prior to connecting the net metering generation.

Thus, when these customers export surplus solar electricity to the grid during summer peak demand periods, they are credited for that generation at a rate that does not correspond to the true whole-system value of the generation – For example, on weekends and holidays, net metering customers are significantly over-compensated for exported generation, and under-compensated during weekday peak periods.

[1] Impact of Behind-the-Meter Solar in Ontario" – Power Advisory LLC, August 10 2021 – Available from: https://renewablesassociation.ca/wp-content/uploads/2021/08/CanREA-study-Impact-of-BTM-Solar-in-Ontario-2021.pdf

[2] IEA PV Power Systems: "National Survey Report of PV Power Applications in Canada 2019" – Natural Resources Canada and the Canadian Renewable Energy Association – Available from: https://iea-pvps.org/wp-content/uploads/2021/03/NSR_Canada_2019.pdf

[3] "Nova Scotia Residential Solar Market Outlook and Labour Force Study – Final Report April 2019" – Dunsky Energy Consulting – Available from: https://www.cansia.ca/uploads/7/2/5/1/72513707/cansia_nova_scotia_residential_solar_market_outlook_and_labor_force_study_-_final_report__2019-04-09_.pdf

While the Enhanced TOU rate option would potentially enhance the cost-benefit of BTM solar, a higher summer peak rate would more accurately reflect system needs and the contribution of solar PV to meeting them.

CanREA therefor recommends that the net metering regulation should require that all customers that opt for net metering shall be settled in accordance with the rate option of their choice – Tiered, standard RPP TOU, or Enhanced TOU.

Recommendations

CanREA applauds the OEB for taking this important step toward enhanced consumer choice to support the investment case for low-carbon technologies including EVs. We look forward to further engagement on this important topic as the design process unfolds.

Energy pricing schemes with a high correlation between price and total grid load have a proven track record in Ontario of incenting consumers to invest in demand reduction, peak shifting, and BTM generation technologies. Technologies that lower peak grid demand and increase local generation reduce line losses, long-term transmission costs, and related infrastructure investments, enabling a more efficient and lower-cost electricity system for the benefit of all Ontario ratepayers

Net-metered solar PV and BTM battery storage are optimally suited to reducing electricity demand during mid-day peak periods, and would avoid any disruption or inconvenience to residential consumers. Access to a cost-reflective Time-of-Use rate option would thus greatly improve the economic incentive for these consumers to adopt these technologies, thereby providing significant whole-system savings.

CanREA recommends that:

- Further consideration be given to the design of seasonally varying critical peak rates as opposed to the proposed year-long uniform evening peak rate

- Net metering customers be guaranteed eligibility for this rate option, and that OEB staff work with the IESO Smart Metering Entity and Ministry of Energy staff to support an upgrade to the Meter Data Management and Repository (MDM/R) system, to enable province-wide time-of-use settlement for all customers, including net-metered customers, and an amendment the net metering regulation to require that LDCs make use of the updated MDM/R system for billing net-metered customers.

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