

PWU Submission on the Joint IESO/OEB Consultation on Pricing, Programs & Procurements – Dec 2022

At the jointly sponsored November 23, 2022 webinar, the Independent Electricity System Operator (IESO) and the Ontario Energy Board (OEB) proposed to cooperatively examine the roles of pricing, programs, and procurement (3 P's) in order to optimize the adoption of DERs in Ontario. As noted in the webinar materials, the DER Potential Study identified that: "... these findings shed light on circumstances where wholesale price signals and retail price signals neither align with each other nor with the economic value of DERs."

The Power Workers' Union (PWU) supports the IESO and OEB objectives regarding the optimization of the financial incentives for DERs to: produce more economically efficient outcomes; enable greater access to the right incentives; enable a more complete set of incentives; and ensure incentives do not work at cross purposes.¹ The IESO has asked for feedback on the value of this research, the objectives, additional research questions and insights on the incentive options.

Context

The PWU agrees with the IESO/OEB statement that "investment in and operation of DERs can be incentivized by pricing (e.g., coincident peak pricing, dynamic rates), programs (e.g., Save on Energy) and procurements (e.g., RFP, auctions, markets)." However, the PWU continues to advocate for rate plans that create relevant pricing signals for DER adoption e.g., variations on Time of Use (TOU) regulated rates as they potentially represent a superior low-cost approach to incenting productive DER adoption compared to the electricity market-based procurement solutions e.g., IESO Administered Markets (IAMs).²

In fact, as noted in the webinar materials, the OEB is progressing with the implementation of an Ultra-Low Overnight Price Plan and dynamic pricing pilots for the non-RPP Class B consumer, which may also include variations on TOU plans.³ Furthermore, the Ministry of Energy is seeking advice on an Interruptible Rate Pilot.

Recommendations

1. Focus on Behind the Meter (BTM) Demand Side Management (DSM) solutions;
2. Consider the net integrated benefits of the existing and planned rate plans, including the Ministry of Energy's ICI and Net Metering programs and assess the degree to which these rate plan designs can achieve system needs;
3. Use the rate plan assessment findings to consider additional rate plan approaches, including extending the terms to encompass distribution and transmission cost benefits;
4. Ensure integrated regional planning informs the desired benefits of DER adoption (e.g., MW peak reduction and reliability contributions) within a region in the context of bulk system plans, such as the IESO's current procurement programs; and,
5. Size the remaining need for further DER adoption not achieved by rate plans and programs and conduct a benefit cost analysis of any further IESO Administered Market (IAM) related incentives.

¹ Derived from initiative objectives, OEB-IESO Joint Engagement on DER Integration Webinar, Nov 23, 2022, pg., 11

² PWU submission to the IESO on the DER Potential Study, October 2022.

³ Ontario Energy Board, OEB Non-RPP Class B Pilot Program – Statement of Interest, Oct, 2022

Recommendation #1 - Focus on Behind the Meter (BTM) Demand Side Management (DSM) solutions;

The DER Potential Study identified that in all cases, BTM residential and commercial demand side management of HVAC (cooling and heating), water heating, EV charging, lighting and some other load flexibility options should be economically viable. The PWU's own sponsored analysis concurs that Behind the Meter (BTM) and Demand Side Management (DSM) solutions offer substantial potential under reasonably foreseeable conditions.⁴

In particular, the potential for EVs to support long-term DSM service to smooth demand variability is significant. As adoption increases, analysis show that only 10 GWh of storage may be sufficient to optimize 2030 electricity system costs and that this could be supplied by only 13% of projected EVs on the road being managed BTM in vehicle to-building (V2B) applications.⁵ This 13% participation projection is well within the expected bounds of customer adoption.⁶

It is important for the proposed joint study to acknowledge that the IESO's significant underway planned procurements undermine the findings from the DER Potential Study for both BTM and FTM storage and solar resources. As a result, the PWU believes that the outcomes of this study as they relate to solar and market conditions should be disregarded.⁷ Furthermore, storage and solar only demonstrated material relevance to DER potential in the Accelerated scenario, which included unreasonable assumptions about carbon pricing and capacity constraints that would drive the hourly energy price.

Since the BTM DSM options are well understood and given the uncertainty regarding the potential for residential and commercial solar and storage, the assessment of pricing plans versus market incentives should first focus on these items. As the IESO has demonstrated, storage and generation capacity is being addressed by their new long-term procurements. Studies have shown that after reasonable DSM practices have been implemented, the system may only need an additional 3000 MW of storage by 2050 to mitigate system peaks in a Net Zero scenario.⁸ The IESO is already pursuing the procurement of 2500 MW of storage.

Recommendation #2 - Consider the net integrated benefits of the existing and planned rate plans, including the Ministry of Energy's ICI and Net Metering programs and assess the degree to which these rate plan designs can achieve system needs;

The OEB Framework for Energy Innovation Working Group (FEIWG) and its Benefit Cost Analysis (BCA) subgroup recognized that "resources can be regulated by the OEB, contracts, and market rules or respond to rate incentives depending on the resource's technology, size, and location within the

⁴ Strategic Policy Economics, Electrification Pathways for Ontario, 2021.

⁵ Strategic Policy Economics presentation to the FEIWG, "DER Integration – A Customer Perspective", Jan 2022; Strategic Policy Economics, Electrification Pathways for Ontario, 2021.

⁶ Strategic Policy Economics, EV Batteries Value Proposition for Ontario's Electricity Grid and EV owners, July 2020.

⁷ PWU submission to the IESO on the DER Potential Study, October, 2022.

⁸ Strategic Policy Economics, Electrification Pathways for Ontario, 2021. Background analysis

electricity system.”⁹ The PWU has been advocating for rate price plans, such as the Regulated Pricing Plan (RPP) TOU framework that can achieve most of the DER incentive objectives.¹⁰

As mentioned earlier, the IESO materials summarized several relevant rate plans with two additional plans being especially relevant to the DER adoption question: the Industrial Conservation Initiative (ICI) and Net Metering (NM). It has been clearly established that DER adoption to date has been driven by these plans which while beneficial for DER investors, come with high cost for ratepayers. While these types of rate plans encourage DER adoption, these examples show that their design warrants a transparent assessment of the benefits and costs.

The new rate plans being considered may also offer specific benefits to DER adopters:

- The ultralow, overnight rate targets future EV owners, encouraging them to charge their vehicles in the off-peak hours during the night. Studies have shown that incenting EV charging behaviors with TOU plans can provide material system value.¹¹
- The dynamic pricing pilot could, or arguably should, involve outcomes that extend Time of Use incentives to the remainder of Class B consumers, which would cover over 82% of the global adjustment costs.¹²
- The Interruptible rate is being advocated as an incentive to promote hydrogen and create a demand response capability at a very low cost to the electricity system.
 - a. It is worth noting that the IESO’s DER Potential Study did not include the implications of the hydrogen economy in their analysis. Studies have shown that the potential for distributed hydrogen electrolysis coupled with residential and commercial BTM DSM could meet all of Ontario’s future peak demand needs.¹³
 - b. As a proxy for a Demand Response (DR) service, this plan may compete with the IESO’s capacity auction for DR resources.
 - c. It is arguable that this new rate may offer advantages to current ICI participants that may cause them to switch, since the value of the ICI declines with mid-2020 retirement of the Pickering Nuclear Generating Station. The IESO’s 2021 APO assumes that the ICI provides 1.3 GW of system peak mitigation. There may be approximately 2.5 GW of installed ICI.¹⁴ A new interruptible rate may unlock that full value and account for the ~700 MW assumed by the DER Potential Study.¹⁵

Rate plans offer several benefits for potential DER investors, particularly small businesses and potential aggregators of such services:

- Rate programs are low cost, predictable, stable and simple to understand and administer thereby requiring no sophisticated action to benefit from them.

⁹ OEB FEIWG BCA subgroup Final Report, June 2022.

¹⁰ PWU submission to the IESO on the DER Potential Study, October, 2022; PWU Feedback on the FEIWG and subgroup reports – EB-2021-0118, August 29, 2022, page 7; Strategic Policy Economics presentation to the FEIWG, “DER Integration – A Customer Perspective”, Jan 2022.

¹¹ Strategic Policy Economics, EV Batteries Value Proposition for Ontario’s Electricity Grid and EV owners, July 2020.

¹² Regulated Price Plan Price Report November 1, 2022, to October 31, 2023.

¹³ Strategic Policy Economics, Electrification Pathways for Ontario, 2021.

¹⁴ Strategic Policy Economics presentation to the FEIWG, “DER Integration – A Customer Perspective”, Jan 2022.

¹⁵ The economic potential of industrial DR programs in the DER Potential Study was estimated by proxy to residential and commercial outcomes with no additional substantiating analysis. The Study recommended it be further examined.

- Studies have shown that a TOU rate approach is an effective mechanism for influencing consumer behaviors and that TOU based incentives can achieve 70% of the theoretical market-based benefits.¹⁶
- Rate programs can capture the value of consumer preferences in ways that market-based solutions cannot.
 - A “convenience” premium could be included in rate programs. Rate plans could offer premiums that exceed hundreds of dollars per MWh.¹⁷ If designed to fully recover costs from the targeted ratepayer group, e.g., the RPP design, the implementation could be for very little cost.
 - In contrast, IAM energy costs are not related to consumer behaviors, nor visible to them, and are driven by the variable cost of natural gas. When Pickering retires and significant gas production is on the margin for all hours of the day, the price difference available for arbitrage will be smaller than it is today. Even now, where energy market off-peak pricing is driven by surplus baseload and other non-emitting supplies, the price gap is much less than the difference in TOU rates.
 - When considering consumer incentives, the magnitude of the variation between on-peak and off-peak billed electricity costs is far greater from time of use (TOU) (e.g. ~\$220/MWh for the ultra-low overnight plan) and is available for every day of the year, compared to the HOEP which spikes for only a few hours a year.

The successful track record of rate plans, the future breadth of their applicability to ratepayers of all classes, and the degree to which they may interact with each other, should be fully understood and assessed against the need for Ontario to further incent DERs.

Recommendation #3 - Use the rate plan assessment findings to consider additional rate plan approaches, including extending the terms to encompass distribution and transmission cost benefits.

Rate programs are designed to shift and “smooth” demand away from peaks by managing consumer behavior. Three considerations may help improve BTM DSM DER adoption to optimize system reliability:

1) Tiered TOU rates that target incremental demand

Current TOU rates vary according to system demand – they are cheapest when demand is the lowest, in the late evenings, on weekends and on holidays. Ontario’s TOU rates include off-peak (nearly two thirds of electricity use), mid-peak (during the day-time) and on-peak. Targeting the incremental demand within the on-peak hours represents an opportunity to better match the associated incentives with the desired system cost savings. For example, in the building sector, a TOU based on the incremental demand in the on-peak hours, i.e., above the average demand for the building, would focus the costs and benefits on a more narrow and specific set of consumption

¹⁶ MIT Center for Energy and Environmental Policy Research (CEEPR), Electricity Retail Rate Design in a Decarbonizing Economy: An Analysis of Time-of-Use and Critical Peak Pricing, Oct 2022.

¹⁷ Difference between TOU off peak and on peak is currently \$7.7/MWh and proposed to be \$22.8/MWh for the Ultra-Low Overnight Price Plan

patterns. Higher premium benefits could be offered to reduce that increment and thus further encourage the desired behavior to shift demand from peaks.

2) Extending principles of incremental demand charges to Class B distribution and transmission rates

Incremental tiered TOU electricity rate plans could help maximize consumption behavior by extending the principle of incremental demand charges for the distribution and transmission costs. Since these Dx and Tx costs represent 40% of an average electricity bill, using such a TOU incentive could help reduce these costs for all ratepayers more effectively than with other IAM based approaches.

3) Address the potential for dual fuel heat pumps in buildings to optimize costs across the electricity and natural gas supply.

Dual fuel heat pumps were not considered by the DER potential study. However, dual fuel heat pumps are on the rise globally¹⁸ and figure prominently in several electrification pathway reports for Ontario and are being advocated for by Enbridge Gas.¹⁹

While Ontario has a summer peaking electricity system, climate change is impacting the winter peaking requirements of utilities across the continent. As Ontario's winter peaking requirements change, managing the heat load will have a significant impact on the province's current summer air conditioning driven capacity needs of the province. Dual fuel heat pumps can help mitigate this transition. This kind of TOU rate could provide a sufficient signal for switching home heating systems between electricity and gas inputs for the heat pumps, particularly as the carbon price escalates to \$170/t and potentially beyond. However, such dual fuel heat pump programs should include an examination of the potential for synergy between rate programs for natural gas and electricity. This could include lowering the cost of natural gas during peak electricity demand times.

Integrating electricity and natural gas rate incentives is also not viable with current IAM solutions.

Recommendation #4 - Ensure integrated regional planning informs the desired benefits of DER adoption (e.g., MW peak reduction and reliability contributions) within a region in the context of bulk system plans, such as the IESO's current procurement programs.

The FEIWG identified the need for better integrated planning across the regional interface between distribution companies and the IESO.²⁰ Rate programs and their expected outcomes can be made sufficiently deterministic such that they are reflected in the IESO's regional planning, resource adequacy assessments, and ultimately in its procurement practices. Integrated planning is of paramount importance as the underlying premise of a DER benefit cost analysis is the DER's ability to help reduce system capacity costs. This offset is only possible when bulk system investment decisions explicitly depend upon the DER benefits and lead to not procuring capacity through other mechanisms. For

¹⁸ <https://www.iea.org/news/the-global-energy-crisis-is-driving-a-surge-in-heat-pumps-bringing-energy-security-and-climate-benefits>.

¹⁹ Guidehouse, Pathways To Net Zero Emissions For Ontario, June 2022; Strategic Policy Economics, Electrification Pathways for Ontario, 2021.

²⁰ FEIWG Final Report, June 2022, pages 15-19.

example, the IESO's recent procurement plans undermine the cost benefit approach assumed in the DER Potential Study thereby rendering many of its findings irrelevant. The IESO's new commitments to increased capacity will decrease the potential capacity benefits of the identified DER options as the system costs will no longer be avoided.

A better process is required to clearly inform the regional planning efforts with rate program and other DER incentive expectations such that both the distributors and the IESO can transparently plan for the impacts of DERs on their operations and systems.

Recommendation #5 - Size the remaining need for further DER adoption not achieved by rate plans and programs and conduct a benefit cost analysis of any further IESO Administered Market (IAM) related incentives

The anticipated effectiveness of potential DER incentive programs should be quantitatively established within the forecast of system needs. This approach would enable and facilitate a gap analysis that would assess the material benefits of any additional IAM innovations to incent DER adoption. The FEIWG BCA subgroup has established that undertaking this kind of benefit cost analyses involves multiple, complex factors.

Given the substantial cost of new IAM infrastructure and the findings of the FEIWG BCA subgroup, a comprehensive benefit cost analysis of potential IESO incentives for DER in its administrated markets should be completed before any further investment commitments are made.

Closing

The PWU is supportive of the OEB and IESO efforts to evaluate the role DER could play in the future of Ontario's electricity system. However, as reflected in the aforementioned comments and recommendations, the PWU supports investment decisions that minimize electricity costs for all ratepayers.

The PWU has a successful track record of working with others in collaborative partnerships. We look forward to continuing to work with the IESO, OEB and other energy stakeholders to advance innovation across Ontario's electricity system. The PWU is committed to the following principles: Create opportunities for sustainable, high-pay, high-skill jobs; ensure reliable, affordable electricity; build economic growth for Ontario's communities; and promote intelligent reform of Ontario's energy policy.

We believe these recommendations are consistent with, and supportive of, the objectives for supplying low-cost and reliable electricity in Ontario. The PWU looks forward to discussing these comments in greater detail at the OEB's and IESO's convenience and is willing to provide more in-depth presentations on these findings should you be interested.