CanSIA

CANADIAN SOLAR INDUSTRIES ASSOCIATION | L'ASSOCIATION DES INDUSTRIES SOLAIRES DU CANADA

Submission to the Government of Ontario: Consultation on Industrial Electricity Pricing

June 11, 2019

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Introduction

The Canadian Solar Industries Association (CanSIA) is a national trade association that represents the solar energy industry throughout Canada. Solar electricity is a mainstream energy source and an integral part of Canada's diversified electricity mix. CanSIA offers feedback to the consultation on industrial electricity pricing as an organization with members who actively provide services to support customers in reducing their electricity costs and provide value to the electricity grid. Specifically, CanSIA's members work with Ontario's commercial and industrial customers to provide a suite of services including behind-the-meter solar generation (including net metering[1]) and energy storage. CanSIA had an opportunity to participate in-person during the consultation session in Peterborough on May 17, 2019; this submission is consistent with the remarks and commentary provided during that session.

Large volume electricity consumers that participate in the Industrial Conservation Initiative (ICI), referred to as Class A customers, pay Global Adjustment (GA)[2] determined on an annual basis by their percentage share of coincident province wide peak demand which in turn determines their share of total GA costs. All other consumers in Ontario pay a share of GA; what is referred as Class B treatment and includes Regulated Price Plan (RPP) customers as well as small and medium sized commercial and industrial customers. Customers participating in the ICI deploy a variety of strategies to reduce their contribution to coincident peak demand through demand response (DR), on-site generation, and discharging battery storage facilities.

CanSIA as an organization does not wish to comment on areas of provincial economic development policy as such matters are outside of our members areas of expertise – and we know the government is consulting with experts in this area.

Many of our members actively engage with Ontario's industrial sector to develop cost-saving measures through the deployment of solar technology in conjunction with their participation in the ICI. As this submission will demonstrate, **CanSIA supports the continuation of the ICI for these Class A customers, with an expansion for additional optionality provided to both Class A and Class B customers**.

Moving in this direction will ensure that Ontario's largest employers continue to benefit from low electricity costs, but also reflects the fact that a one-size-fits-all model does not serve the best interests of Ontario's diverse array of employers.

Our feedback is structured in the following manner and specific areas of input:

1. CanSIA's principles developed by members to inform our recommendation and approach
2. Discussion of context for the review of Ontario's industrial electricity prices
3. Review of approaches from other jurisdictions
4. An analysis of options from the customers perspective
5. CanSIA's recommendations for Ontario's review of industrial electricity prices (responses to select consultation questions)

[1] Please refer to Appendix A for a discussion on the value of net metering.

[2] The cost of electrical energy is the sum of the market clearing price plus the Global Adjustment (GA). The market clearing price is a real-time dispatch price for determining which generation resources will operate but does not reflect all-in generator costs. The GA represents the difference between the market clearing price and amount received by the generator through contracts or rate-regulated assets.

CanSIA's Principles

In consideration of this consultation, CanSIA endorses the following principles to ensure industrial electricity pricing is fair and reasonable. In no particular order, these principles are:

1. **Greater customer choice**
   Customers should be offered a range of pricing options, from simple to complex. Each customer has unique operating characteristics, load profiles, risk tolerances and impact on broader electricity system costs. Providing electricity to customers with a range of well-designed pricing options allows them to take control of their electricity bill by recognizing their individual preferences.

2. **Understandable and addressable**
   Industrial customers need electricity pricing options that are understandable and transparent so that strategies can be developed to manage electricity costs and improve productivity. Industrial customers are more sophisticated compared to residential and small-commercial customers and therefore require clearly defined price signals so that they can optimize their investment decisions.

3. **Affordable**
   Affordability is of utmost importance to electricity consumers. In particular, total costs for electricity should be affordable to enable economic investment, rather than focusing on individual line-items or rates. Electricity pricing should be predictable and provide stability to ensure customers are able to plan for the future. Affordability will allow Ontario business to remain competitive with their global counterparts.

4. **Economically efficient**
   Pricing should be a disincentive to wasteful electricity consumption and offer savings for actions that reduce electricity consumption and peak demand, to the benefit of all customers. Energy conservation and peak demand reduction strategies help to ensure that electricity prices remain low for all consumers.

Context for the Review of Industrial Electricity Pricing

Ontario's consultation on industrial electricity pricing must recognize the broader context of Ontario's electricity system that will impact customers, including:

1. **Recognition of past investments**
   While CanSIA supports the continuation of the ICI, if changes are made, it is important to recognize the investments made by customers across Ontario in good faith and in compliance with the regulations. The consultation on electricity pricing should recognize actions already taken by customers to manage their electricity costs. CanSIA urges decision-makers to give consideration for prior investments made by customers in response to the current framework for cost allocation.

2. **Supply needs**
   Electricity pricing must consider the system needs and impacts on all customers in the short and medium terms. Specifically, Ontario is quickly moving from a period of oversupply to a period of supply need as existing generating units are retired.

As shown in Figure 1, the Independent Electricity System Operator (IESO) has stated that Ontario will need new capacity as early as 2023 (i.e., starting in 2023, approximately 1400 MW of capacity may be required to meet summer peaks). The need for new capacity to meet summer peaks could also increase if operating resources (i.e., "Existing resources with expired contracts") are retired and do not continue to supply electricity into the Ontario market.

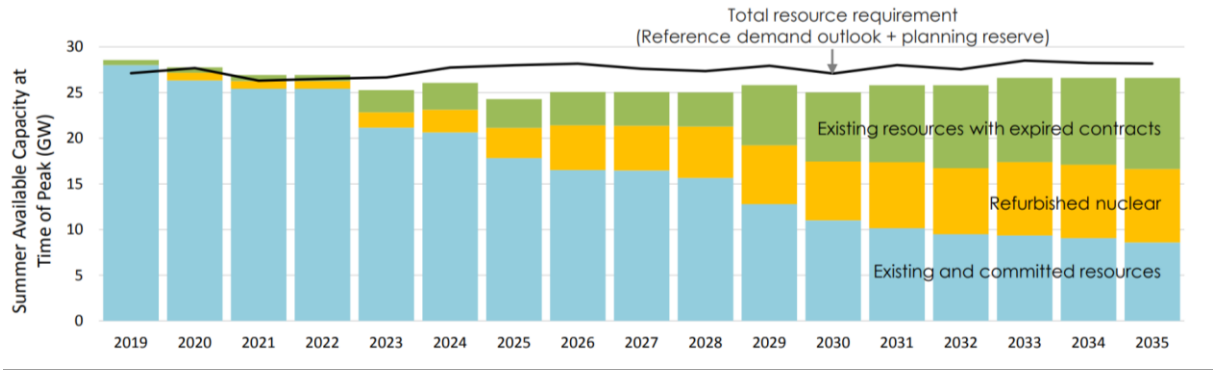


FIGURE 1. AVAILABLE CAPACITY COMPARED TO TOTAL RESOURCE REQUIREMENT (SOURCE: IESO)

While this consultation is considering the future of the ICI, it must be acknowledged that in 2018 ICI participants contributed to a reduction in system peak by approximately 1450 MW, as reported by the IESO[3]. Therefore, customer-driven investments in behind-the-meter storage is reducing central procurement needs today and helps to avoid unnecessary capital investments in the future, which has the benefit of shifting investment and capital risk away from non-participating customers.

3. Parallel consultations

Going forward, CanSIA also urges the Ontario Government to consider how the implementation and changes to industrial electricity pricing is related to other initiatives underway that have a direct impact on consumers, including:

- IESO's Market Renewal Program, which proposes locational marginal prices for market participants and a cost allocation methodology for new capacity charges resulting from incremental capacity auctions;
- Ontario Energy Board's (OEB) rate design for commercial and industrial customers (EB-2015-0043), with respect to distribution charges; and
- OEB's staff research paper with respect to Class B customer GA pricing.

CanSIA further encourages the Ministry of Energy, Northern Development and Mines, together with OEB staff, to consider the impacts of electricity pricing and rates in context of newly announced consultations with respect to Responding to Distributed Energy Resources (DERs) (EB-2018-0287) and Utility Remuneration (EB-2018-0288). As demonstrated by the preceding discussion, investments in customer driven DERs are primarily motivated by expectations for electricity savings and policy stability is conducive to private sector investment.

[3] Independent Electricity System Operator. Ontario Demand Forecast, Pg. 41. Published December 17, 2018. Retrieved from: http://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/reliability-outlook/2018Q4OntarioDemandForecast.pdf?la=en

All these discussions interrelate and require careful coordination to drive best program design and value.

Review of Select Jurisdictions Relevant to Ontario

There are a few basic options for pricing, including:

1. **Flat volumetric rates which are the same energy price in all hours**
   Every kWh used is charged the same price (average price), regardless of how much it cost to generate.

2. **Demand charges based on customer monthly peak usage only**
   Price per kW for consumption is based on 'peak demand', however no charges per kWh consumed[4].

3. **Time-of-use (TOU) or varying prices which differ across time periods (e.g., on- & off-peak pricing)**
   Recognizes that generation during peaks period are more expensive than off-peak periods. Variable pricing can be augmented by Critical Peak Pricing (CPP) mechanisms that apply a predetermined price to a limited number of peak days each year, finalized a few hours to a day in advance.

The following provides an overview of different price and rate design methodologies used in other North American regions. As demonstrated by the scan, the jurisdictions pull from a few basic options (e.g., fixed fees, flat rates, demand charges, TOU, etc.) Some jurisdictions apply a mixture of different rate design elements (i.e., flat rate plus demand charges). Also, it is not uncommon for regions to provide options to consumers. This review is intended to demonstrate that many markets offer consumers a variety of rate options that fairly allocate costs to customers and offer discounts in exchange for services that benefit the grid.

Cambridge Core

A survey of 204 US utilities by Cambridge Core in February 2018[5] found that there are TOU programs for industrial customers distributed among 44 states. Of these 44 states surveyed, 34 had demand charges with the median price of $10.83/kW and maximum $25.47/kW.

Take-away: Acceptance of TOU rates, and ability to apply both TOU rates and demand charges.

Xcel Energy

Xcel Energy in Michigan offers industrial customers on-peak and off-peak rates, with load control discounts. Large industrial service customers can opt-in to peak control services, thereby reducing rates for that level of their demand under operator control. Similar rate structures are offered by DTE, also in Michigan.

[4] For the purposes of this discussion, we have not provided a definition of "peak demand". However, as an example, the ICI defines peak demand based on the consumption of a customer during the 5 hours of the year with the greatest electricity consumption by all users.

[5] Al-Hallaj, S., Wilk, G., Crabtree, G., and Eberhard, M. (2018). Overview of distributed energy storage for demand charge reduction. Cambridge Core. Retrieved from: https://www.cambridge.org/core/journals/mrs-energy-and-sustainability/article/overview-of-distributed-energy-storage-for-demand-charge-reduction/776D4900BD12B965B8AEBC6DC0C237A1/core-reader

Large industrial service continued	
Supply energy charge	
On-peak secondary voltage	$0.0768/kWh
Off-peak secondary voltage	$0.0477/kWh

Take-away: Acceptance of TOU rates and the ability for customers to select lower rates through program participation.

Fortis BC

Fortis BC commercial electricity rates are shown below:

- Demand Charge of $8.60 per kW of billing demand above 40 kW
- First 8000 kWh are billed @ 8.663¢ per kWh.
- Balance of kWh are billed @ 7.191¢ per kWh.

For example, a 300 kW commercial customer with a 40% load factor would pay approximately $9000 per month, with 30% of that cost for demand and 70% for energy charges.

Take-away: Ability to use a mixture of different rate structures to incentivize consumer behaviour.

PJM

The PJM (Pennsylvania, New Jersey, Maryland) regional transmission operator runs a DR program that allows customers to save money on their electricity bills by curtailing consumption when the system demands are highest. Participants have been called on to curtail between 1 to 2 times per year on average over the past decade.

About PJM's Emergency Load Response Program (ELRP)

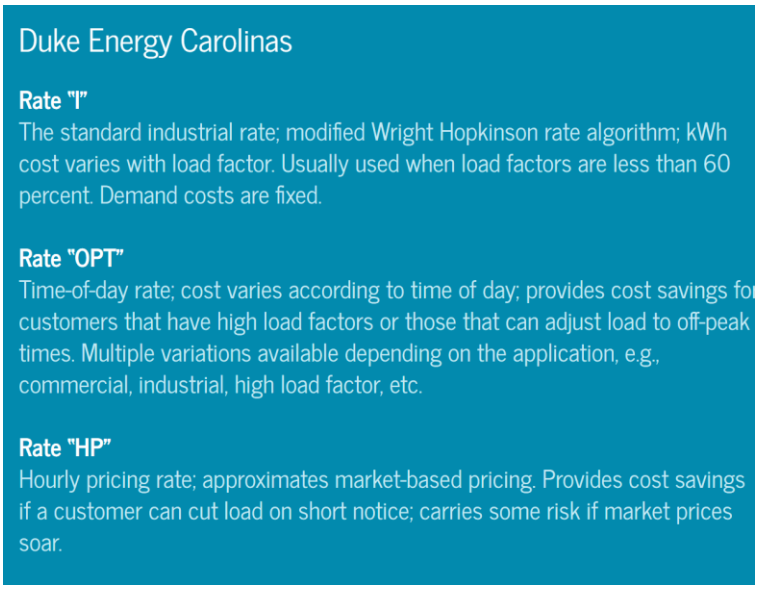
	Base Capacity (BC)	Capacity Performance (CP)
Months	June — September	June — May
Availability	DY 2018/19 & 2019/20 only	DY 2018/19 onward
Hours	10 a.m. — 10 p.m. EPT	June — October and following May, 10 a.m. — 10 p.m. & November — April, 6 a.m. — 9 p.m. EPT
Dispatch Duration	10 hours maximum (3 — 4 hours on average)	Unlimited
Dispatch Notification	30 minutes (PJM may allow for 60– or 120–minute exemptions in special circumstances)	
Payments	Capacity (for being on stand–by) & Energy (for event performance)	

Duke Energy

Utilities in many jurisdictions offer consumer's choice. For example, Duke Energy in the Carolinas offers customers a choice of

1) standard industrial rates (consisting of a mix of energy and demand charges),
2) time-of-day rates, and
3) Real time-prices.

Take-away: Consumers are offered choice.



Duke Energy Carolinas

Rate "I"
The standard industrial rate; modified Wright Hopkinson rate algorithm; kWh cost varies with load factor. Usually used when load factors are less than 60 percent. Demand costs are fixed.

Rate "OPT"
Time-of-day rate; cost varies according to time of day; provides cost savings for customers that have high load factors or those that can adjust load to off-peak times. Multiple variations available depending on the application, e.g., commercial, industrial, high load factor, etc.

Rate "HP"
Hourly pricing rate; approximates market-based pricing. Provides cost savings if a customer can cut load on short notice; carries some risk if market prices soar.

SaskPower

Saskatchewan's SaskPower has a variety of rate structures, including the structure below which is applicable to large commercial, farms and industrial loads served through customer-owned transformation. The rate structure includes a basic monthly fixed charge, a demand charge as well as on- and off- peak rates (On-peak is 7:00-22:00).

Rate Codes* Effective October 1, 2018	**E82**	**E83**	**E84**
Supply voltage	25kV	72kV	100kV & Above
Basic monthly charge	$6,188.90	$7,093.95	$7,615.80
Demand Charge			
Per kVA of billing demand each month	$10.906	$8.405	$8.284
Energy Charge			
On-peak energy charge (¢/kWh)	7.475¢	6.800¢	6.682¢
Off-peak energy charge (¢/kWh)	6.475¢	5.800¢	5.682¢

Take-away: Acceptance of TOU rates and mixture of demand-charges.

AESO

The Alberta Electricity System Operator (AESO) recovers the demand-related costs of the bulk transmission system based on the monthly coincident system peaks of the Alberta interconnected electric system (frequently referred to as a "12 coincident peak" or "12CP" approach). Coincident metered demand currently is charged at $10,524.00/MW/month.

Take-away: Use of demand charge to recover fixed-costs.

What can Ontario learn from other jurisdictions?

First, there is no one-size-fits all approach. Depending on the electricity sector structure, resource mix and wholesale market, each jurisdiction has created a pricing and rate design framework tailored for their own needs. We find a mixture, from fixed rates, TOU rates, and demand charges. We also find that some jurisdictions offer consumers a choice of rate options.

Ontario's framework must acknowledge that the GA functions as a fixed cost in the system. While rate-design cannot chip away at the fixed amount, Ontario should be mindful about creating additional costs going forward.

Ontario must design a framework that works best for Ontario residents and businesses. Given the characteristics of Ontario's manufacturing base (e.g., generally consistent consumption and energy needs) and peaks driven by residential/commercial customers (e.g., fluctuating consumption throughout the day based on needs for cooking, temperature control, laundry/dishes, etc.), we believe the best approach for Ontario is to provide consumers with choice. In other words, there is a rationale for the continuation of the ICI, while giving options to others who do not participate.

Analysis of Options

CanSIA recognizes that there are a range of options that can be considered with respect to pricing structures for the GA. Each option has inherent strengths and weaknesses. To summarize these trade-offs, we have prepared the following high-level assessment leveraging the core components of our pricing principals shared above.

Pricing structure	Easy to understand	Discourages wasteful use of energy	Promotes reduction in peak usage
Flat Prices	++	+	--
TOU	o	++	+
TOU+ CPP (or TOU with peak demand charges)	-	++	++
Full Demand Charge	+	--	++
Partial Demand Charge (e.g., mix of flat rate and demand charge)	o	-	++

Legend: ++ yes; + somewhat yes; o neutral; - somewhat no; -- no.

As illustrated above, flat rate structures are very easy for customers to understand and will encourage energy efficiency since every kWh not used results in savings for the customer. However, there is no price signal provided to customers

to shift consumption to lower-cost off-peak periods reducing costs on the grid. The net effect will be increased demand and potentially required new supply rather than optimizing the existing resources.

TOU rates are neutral for customers with respect to complexity. Consumers should be aware of the schedule, and since the schedule is fixed and prescribed in advance, it is not overly burdensome. Furthermore, technology, such as smart thermostats, can automate TOU alignment for residential, commercial and industrial customers. TOU rates promote energy conservation and shifting to off peak periods. If TOU rates are combined with a CPP, we note a slight increase in complexity for customers because they must monitor for super-peak hours, however this would lead to increased incentive to avoid peak periods reducing system costs.

Demand charges are easily understandable for customers since they are based solely on the customer peak draw from the grid. As a result, there is a strong incentive to reduce peak consumption to lower costs. That said, wasteful energy consumption is not necessarily restricted since every kWh consumed does not contribute to the customers total bill, provided the consumption is below the peak. If there is a priority to reduce total energy consumption, demand charges can be combined with other volumetric charges such that a customer has a partial demand charge (e.g., setting peaks from 7am-11pm).

From the perspective of the customer, the preferred rate structure depends on the customers load profile and ability to shift consumption, as described in the table below.

Pricing structure	Customers who benefit	Customers who do not benefit
Flat prices	Consumers who have "peaky" electricity usage (e.g., draw a significant amount of power over narrow periods); *these consumers avoid paying costs associated with using expensive peaking generation*	Consumers who do not have "peaky" electricity usage; t*hese consumers subsidize the electricity cost of consumers who have "peaky" electricity consumption because the average cost of electricity generation is driven up for all users due to high on-peak consumption*
Demand Charges	Consumers who have relatively consistent (i.e., flat, baseload) electricity consumption throughout the day	Consumers who have "peaky" electricity usage; *these consumers would be incentivized to reduce peak consumption*
TOU	Consumers who have a relatively consistent draw should be neutral; *those consumers who could move some consumption to off-peak periods would have greater benefit*	Consumers who have "peaky" electricity usage; *these consumers would pay for electricity at prices that more accurately reflect the cost of generation*

Take-away: If rates are flat, consumers who have high consumption during system peak periods are subsidized by those that do not have high consumption during system peak periods.

From the perspective of customers who are considering installing solar or storage to help mitigate their costs:

1. Solar PV generation production curves are only moderately well suited for Ontario's coincidental peak hours (i.e., late afternoon in summer & early evening for winter)
2. Energy-only cost allocation for GA (i.e., flat rates and TOU rates) are detrimental for storage due to higher charging costs, limiting the ability for customers to take greater control over their electricity usage and contribute to the reduction of on-peak usage.

No cost allocation framework works well for both solar and storage. However, arguably the same can be said for different load customer types. No single price design is perfect for all customer types. Therefore, an appropriate approach for GA cost allocation would be to provide options to customers so they can select their preferred cost allocation methodology, as is offered in other jurisdictions.

Options can be provided to customers in a variety of ways:

- Ability to opt-in to the ICI and Class A treatment (status quo)
- Ability for a Class B customer to pay GA on a flat per kWh rate (status quo)
- Creation of a new GA rate for Class B customers on the basis of a TOU rate
- Creation of a new CPP rate that offers discounted GA in non-CPP hours
- Ability to select from a range of pricing options provided by the customer's local distribution company or retailer
- Ability to work with a solar or storage provider for rate mitigation strategies

CanSIA recognizes that the biggest hurdle to reforming Ontario's electricity rate structure is the GA. Essentially, the GA is a fixed cost in the system, so costs cannot be shifted or avoided indefinitely. Ontario's policy must balance paying down the GA fairly, while providing customers the appropriate tools to manage their costs and avoid the creation of additional cost burdens in the future.

CanSIA's Recommendations

CanSIA supports the continuation of the ICI, with additional options provided to Class A and Class B customers. Many Class A and Class B customers have made significant investments to avoid peak periods[6], which both help the customer reduce their electricity costs while contributing to an overall reduction in peak electricity supply requirements. On the other hand, some customers have been challenged by the ICI or have been restricted from participation and would benefit from options.

Consistent with the principles outlined in this submission, CanSIA supports providing customers with options recognizing that individuals have different needs, risk tolerances and ability to shift consumption. Any options provided should be reflective of cost-causality and should not enable cross-subsidization. In other words, customers who avoid on-peak periods should be rewarded through the pricing design structure.

While this submission has not addressed economic factors per se (i.e., eligibility requirements for certain pricing options based on economic attributes), we would emphasize that any additional administrative hurdle could add complexity and "red-tape" to future rate design programs.

[6] For example, many Class A customers have invested in behind-the-meter storage, while many Class B customers have invested in solar net-metered systems.

Conclusion and Summary of Recommendations

The following are CanSIA's responses to select consultation questions:

What impact has the Industrial Conservation Initiative (ICI) had on your operations and business competitiveness? How easy or difficult is it for you to lower consumption in potential peak hours in order to reduce Global Adjustment (GA) charges? What changes, if any, could be made to ICI to improve fairness, industrial competitiveness or reduce red tape?

Customers who participate in the ICI often work with an energy service provider to simplify their participation. An energy service provider can support the customer by offering options for financing, analytics, back-stops and operations support. In Ontario, there is also strong competition and a range of service providers who have developed expertise in this field. As such, customers not only have options for how they want to participate but can choose from a range of energy service providers to work with.

Given the choice, would you prefer a more dynamic pricing structure which allows for lower rates in return for responding to price signals or a flat rate structure that potentially costs more, but is more stable and predictable?

CanSIA suggests that this question should not be framed as a preference but that both options should be made available to consumers. The pricing framework should provide options to customers. CanSIA urges the government not to consider a one-size-fits-all approach and, instead, recognize that each customer has specific needs and should be provided a range of acceptable pricing alternatives.

While customer choice is important, it should also be noted that dynamic pricing can encourage customers to adopt energy efficiency measures (including net-metered solar) to realize cost savings beyond flat rate structures. If given the choice, many customers choose dynamic pricing.

Electricity retailers currently have a limited role in Ontario's electricity market. If the option were available, would your company consider entering into an all-in commodity contract with a retailer, even if it involved a risk premium?

CanSIA is supportive of creating an energy market that would enable bi-lateral contracting of supply resources. Further, the net metering regime in Ontario creates a bilateral retailing relationship between the customer and the solar project owner/operator. CanSIA is supportive of this option being available to customers and there are many US markets that extend this option to consumer choice and retail aggregation.

Similarly, customers are being approached by third party owners of battery energy storage systems and such bilateral relationships should be encouraged as they stimulate private market investment to deliver energy solutions and reduce the need for centralized IESO procurement.

What are your views regarding the proposed updates to the electricity market or procurement mechanisms being proposed by the Independent Electricity System Operator?

The IESO's Market Renewal Program proposes a cost allocation methodology for new capacity charges resulting from incremental capacity auctions and locational marginal prices for market participants. CanSIA supports the move toward enabling more resources to participate in the wholesale power market, customers with solar and/or storage facilities that can offer valuable services to the grid. While the IESO has indicated how the proposed changes would impact IESO

market participants, the OEB has not yet provided an indication with respect to how these changes would be passed through to non-IESO market participants via distribution level electricity pricing or rates.

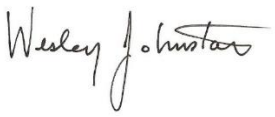
Are there any other thoughts that you would like to provide with respect to industrial electricity price mitigation?

Electricity pricing design is crucial to incent consumer behaviour. If electricity is subsidized, it can lead to inefficient behaviour, leading to wasteful consumption, and drives up overall system costs. As Ontario moves from a period of oversupply to a period of supply need, it is particularly important to consider the impacts of pricing on consumer behaviour and consumption. Energy pricing also sends price signals to customers who now have options to manage their costs through the use of technology such as solar and storage. Given the fact that consumers make investment decisions based on predicted electricity costs, it is not only important to provide affordable pricing options for customers, but there is a need to ensure overall stability in pricing to create an investment-friendly climate.

Overall, CanSIA recommends that customers should be provided with more choice. Pricing should not be a one-size fits all approach since customers have unique characteristics, and investment options for customers can also vary. Ontario should offer greater customer choice by providing simple to complex pricing options for customers to evaluate and opt-in to at their discretion.

CanSIA recommends the continuation of the ICI in a similar form but consider additional options for both Class A and Class B customers. This acknowledges that market designs that provide price signals to customers to reduce demand during peak periods benefit everyone by reducing the need to secure new supply resources and lower electricity costs overall. Customers want investment certainty, both for managing their own operation, but also with respect to predictable electricity costs into the future. Overall, we recommend that the ICI remain an annual, opt-in program, and that the government create additional investment certainty by clarifying review dates and decision-making procedures with respect to industrial electricity pricing.

Sincerely,



Wes Johnston
President and CEO, CanSIA

Appendix A: Background on Net Metering

Net metering results in reduced electricity bills for customers based on the provincial Net Metering Regulation O Reg. 541/05[7]. Net metering allows customers with renewable generation to reduce their electricity usage (when generation is less than consumption) and creates credits against future consumption (when generation is greater than consumption) as demonstrated in Figure 2 below.

Net-metered solar assets are considered "load modifiers" and reduce the Ontario demand for electricity, particularly during summer peaks. In other words, net-metered solar effectively acts as an energy conservation and demand management measure, reducing the amount of new resources that would need to be secured to meet the capacity gap emerging as early as 2023. Similar to an investment in energy efficiency, net metered systems lead to a reduction in energy costs from individual consumers and the solar system is 'paid for' based on savings accrued to the host consumer.

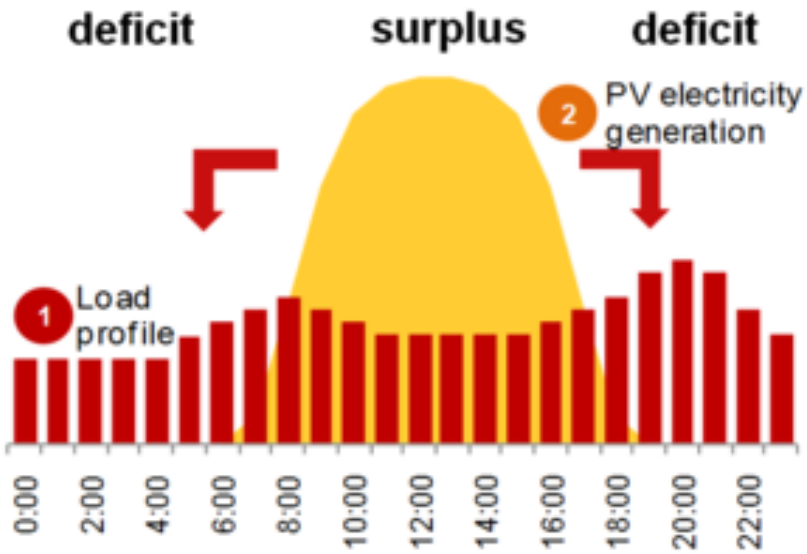


FIGURE 2. SOLAR NET METERING

[7]Net Metering Regulation O Reg. 541/05, Retrieved from: https://www.ontario.ca/laws/regulation/050541