Rate Design Options for IESO Interruptible Rate Pilot

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Background

A voluntary DR program, the**Industrial Conservation Initiative (ICI)** was designed to primarily reduce Commercial & Industrial customers' consumption during top 5 coincident peak (CP) hours

- Participants pay their Global Adjustment (GA) charge based on their share of consumption during those hours; therefore have an incentive to reduce their usage during these hours
- There are no formalized penalties for non-performance
- Customers do not know in advance when the 5 CP hours will occur; so they "chase" these peak hours

There are some limitations associated with the ICI program:

- Load curtailment may not coincide with the 5 CP peak hours
- Voluntary and therefore unpredictable demand reduction
- Due to the nature of the Global Adjustment payment, it may lead to some cost shifting between customer classes
- Program structure and incentive may not be straightforward for the average participant

In 2021, the Ministry of Energy proposed todevelop an **Interruptible Rate Pilot**

Key Drivers of the Pilot

The interruptible rate pilot is intended to have the following benefits when compared to the current ICI program:

- Reduce transaction costs and risk normally associated with the ICI participation
  - Pilot participants will no longer have to chase the 5 CP hours
- To the extent that participants reduce their load (to their contracted demand level) when events are called, they will help with system planning, reduce system peak demand, and limit future capacity costs (for the system as a whole)
- Take steps towards a more economically efficient rate that aligns the customer value of interruptions with the system value of interruptions

Global Adjustment Costs

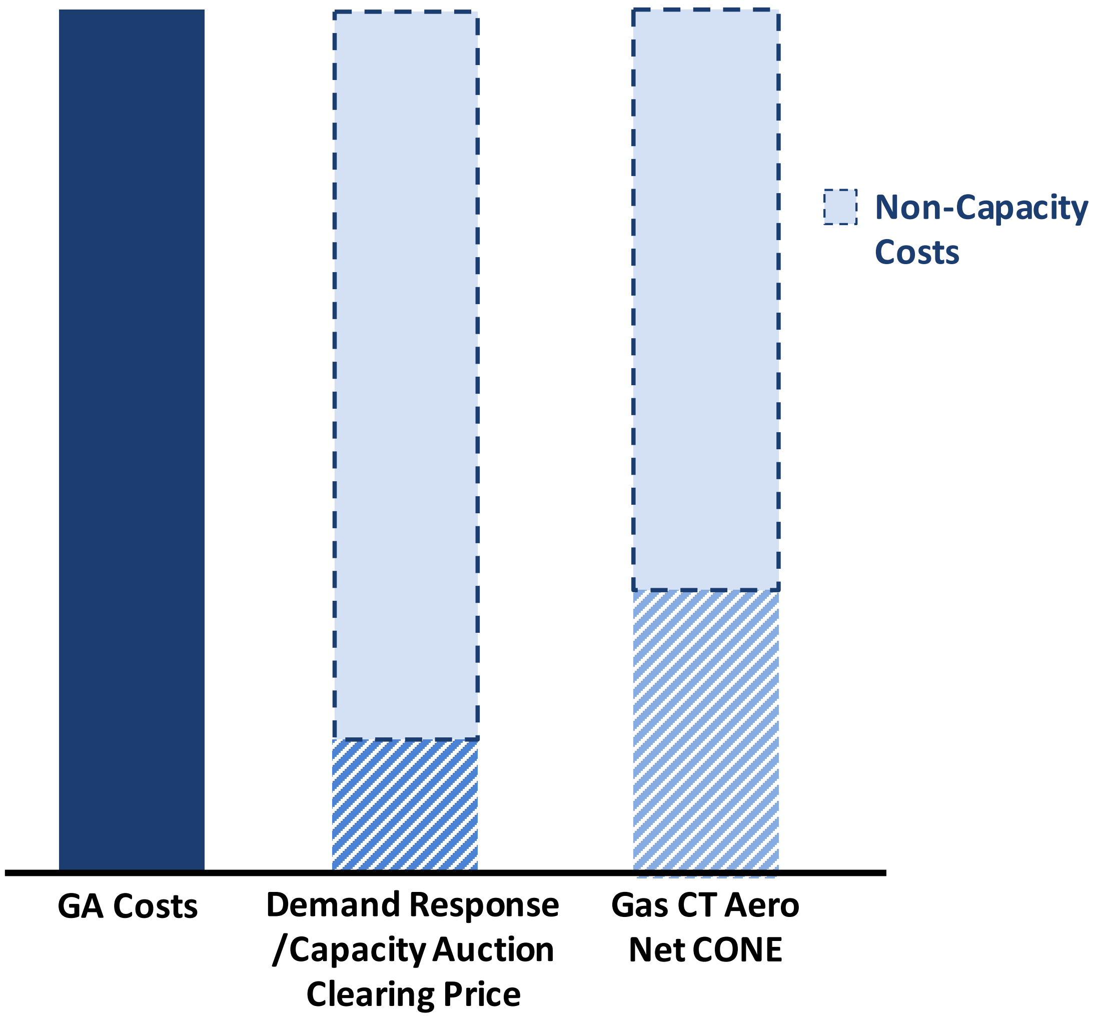
Global Adjustment covers costs of building new electricity infrastructure, maintaining and refurbishing existing generation resources and conservation programs, and other electricity system costs

- GA cost: ~$340,000/MW-year-$610,000/MW-year (2017-2021 historical)
- Net CONE*: $144,000/MW-year (Gas CT+ Frame) to $209,000/MW-year (Gas CT Aero)
- Demand Response/Capacity Auction: ~$34,000-$93,000/MW-year (2016-2021 historical annualized clearing prices)

Ideally, the difference between the GA costs and the capacity cost would be recovered through fixed charges. Short of that, any second-best option should minimize distortion to efficient price setting

* CONE – Cost of new entry
\+ CT – Combustion turbine

GA COSTS AND CAPACITY COSTS



Note: Figure based on highest values in historical range

Pilot Design and Considerations

IESO will run the interruptible rate pilot for three years. Specific design elements are under progress

- Interested parties submit an application will be selected based on a number of criteria, including price bid
- Participants commit to a certain level of "firm contract demand": When an event is called, participants are to reduce their load to the contracted demand level
- Pre-defined system stress conditions when the IESO can trigger activations
- IESO can call up to a certain number of hours per year
- There will be a non-performance rate/charge for non-performance

In designing the pilot, IESO has to contend with a number of factors

- Take into account design elements requested by the Ministry of Energy
- Design a pilot that is consistent with a potential full-scale, durable program
- Consider best practices and lessons learned from previous experiences (both in Ontario and in other jurisdictions)
- Make it worth the customer's while to enroll and participate

Next slide provides several options that develop alternative ways to recover GA costs with different implications for pricing efficiency. The IESO expects to implement one of these rate design options in the pilot.

Overview of Alternative Rate Designs

Rate Option	Description
HOEP + Demand	• IESO to set a **minimum price bid** for **demand charge** that better reflects capacity portion of GA costs • Participant provides a price bid and pays bid price if accepted
HOEP + Demand + Volumetric	• IESO to set a demand charge that better reflects capacity portion of GA costs, and a **minimum price bid** for **volumetric charge** based on the balance of GA costs (i.e. non-capacity costs) • Participant provides a price bid for the volumetric charge. If accepted, participant pays their volumetric bid price + demand charge
All-In Volumetric (HOEP + volumetric)	• IESO to set a **minimum HOEP + GA-based price bid** for **volumetric charge** • Participant provides a price bid and pays their bid price if accepted
HOEP + Fixed + Demand	• IESO to set a fixed charge that better reflects non-capacity portion of GA costs and a **minimum price bid** for **demand charge** based on the balance of GA costs • Participant provides a price bid for the demand charge. If accepted, participant pays their bid price for demand charge + fixed charge
HOEP + Two-Part Demand	• Similar to HOEP + Demand, but demand charge consists of a year-round base demand charge and a critical peak demand charge that applies on the event days • IESO to set a **price bid** for **critical peak demand charge** that better reflects capacity portion of GA costs

Rate Design Criteria

We will evaluate the rate options based on four primary criteria

Cost-reflectivity: The rate structure should reflect the cost structure

- The demand charge should be designed to recover demand-related (capacity) costs
- The energy charge should reflect the electricity consumption (energy) costs
- The fixed charge should reflect costs unrelated to electricity demand or consumption

Economic Efficiency: Charges should reflect the market costs of providing electric services to customers

- For the energy charge, this is the Hourly Ontario Energy Price (HOEP)
- For the demand charge, this is the net CONE (cost of new entry)

Proper Valuation of Demand Interruption: Customers should be paid the fair value for the reducing their load when an event is called

Simplicity: The rate structure is straightforward for customers to understand and act on

HOEP + Demand

IESO to set a minimum price for the demand charge based on forecasted (or actual) GA costs and consumption (MW) of Class A

As part of the pilot application, participant to provide a price bid for the demand charge. Bid must be greater than the minimum price

- If accepted, the participant pays their bid price (e.g. $/kW-month) for the duration of the pilot period (consistent with how IESO calculate the minimum bid price)
- As an alternative construct, the price bid can be incremental to a demand charge that is based on the monthly GA throughout the pilot duration

Advantages

- Preserves HOEP price signal
- More explicit price signal to reduce peak compared to current construct
- Familiarity: rate is similar to the current ICI

Disadvantages

- Does not improve cost-reflectivity: demand charge still recovers material non-capacity costs

“Floating versus Fixed” Pilot Rate Mechanics Options

The demand charge and volumetric charge (if applicable) can be implemented in two ways:

- A “fixed” pilot rate is applied to the contract demand and energy consumption (if applicable) throughout the pilot term, giving pilot participants greater price certainty
  - However, this price certainty would also come with risks for both IESO and participants (e.g., if GA ends up higher/lower than pilot rate during the three year period)
  - This could be addressed using true-up mechanisms (e.g., annual)
- A “floating” pilot rate that is pegged to the monthly GA as published by the IESO throughout the pilot term
  - This provides the pilot participants greater certainty given the known contract demand that the “floating” pilot rate will be applied to
  - This reduces risk on all parties

HOEP + Demand + Volumetric

IESO to set a demand charge and a minimum price bid for the volumetric charge

- The demand charge is designed to be directionally more reflective of the capacity portion of the GA costs for class A
- The minimum volumetric charge is based on the balance of the GA costs for class A
- The volumetric charge can be shaped based on the time-varying nature of energy prices or other demand- and supply-related drivers

Participant provides a price bid for the volumetric charge and pays their bid price + demand charge if accepted

Advantages

- More cost-reflective (rate designed to recover capacity costs)
- More efficient demand price signal
- Addresses overvaluation of demand interruption, especially if demand charge reflects net CONE

Disadvantages

- All-in energy price signal not reflective of system marginal energy cost (lead to under consumption)
- Customers may not reduce peak as much as they do under current construct
- Customers may find it confusing to bid their own rate, and may be deterred by the risks

All-In Volumetric (HOEP + volumetric GA)

IESO to set a minimum price bid for the volumetric charge based on forecasted HOEP, GA prices, and a risk premium.

- This volumetric price can be shaped based on the time varying nature of the energy prices & other demand- and supply- related drivers
- The risk premium reflects a cost associated with the risk of a setting a constant all-in price based on forecasted GA and HOEP.
- One minimum bid can be calculated for all participants (based the forecasted average Class A volumetric consumption). However, such method does not capture the benefits of the individual's commitment to reduce to contract demand during events.
- Alternatively, each participant receives a volumetric rate based on individual GA costs and consumption. However, this method is onerous and may lead to selection bias (e.g. customers who have managed costs well would receive more favorable rates)

Advantages	Disadvantages
• Simple; similar to how Class B customers currently pay for electricity	• Not cost-reflective • All-in energy price signal not reflective of system marginal energy cost • No straightforward method to determine the price bid for participants • Inconsistent with the objective of creating an efficient, sustainable successor/complement to the ICI construct

HOEP + Fixed + Demand

IESO to set the same fixed charge ($/customer) for all customers and a minimum price bid for the demand charge

- The demand charge is designed be directionally more reflective of Class A's GA capacity cost
- Fixed charge reflects the balance of the GA costs for class A and the number of Class A customers

Participant provides a price bid for the demand charge and pays their bid price + fixed charge if accepted

Advantages

- Most cost-reflective: provides efficient demand price signal and preserves HOEP
- Can mitigate the potential of overvaluing demand interruption
- Reduce potential cost-shifting within class and between classes

Disadvantages

- Fixed charge concept is new to Class A customers
- May promote higher risk of grid defection

HOEP + Two-Part Demand

Similar to HOEP + Demand, but the demand charge consists of two components:

- A year-round $/MW-month "base demand charge" to recover the non-capacity related GA charges. The monthly billing demand is measured during the system peak window (set by IESO)
- IESO to set a price bid for the "critical peak event demand charge" applied during event hours, and the charge is designed to be directionally more reflective of the capacity portion of the GA costs for class A. Participant provides a price bid and pays bid price if accepted

Advantages

- Preserves HOEP price signal
- Can mitigate the potential of overvaluing demand interruption
- More opportunities to save on the demand charge by reducing their load during event hours
- Reduces the extent of cost shifting to Class B customers

Disadvantages

- Participants may find it too burdensome to manage their peak year-round

Summary of Rate Options

Rate Option	Cost-Reflectivity	Economic Efficiency	Proper Valuation of Demand Interruption	Simplicity
HOEP + Demand	🙁	😐	😐	😍
HOEP + Demand + Volumetric	😐	😍	😍	😐
All-in Volumetric	🙁	🙁	🙁	😍
HOEP + Fixed + Demand	😍	😍	😍	😐
HOEP + Two-Part Demand	😐	😍	😍	🙁