

Capacity Market Pricing and Cost Allocation



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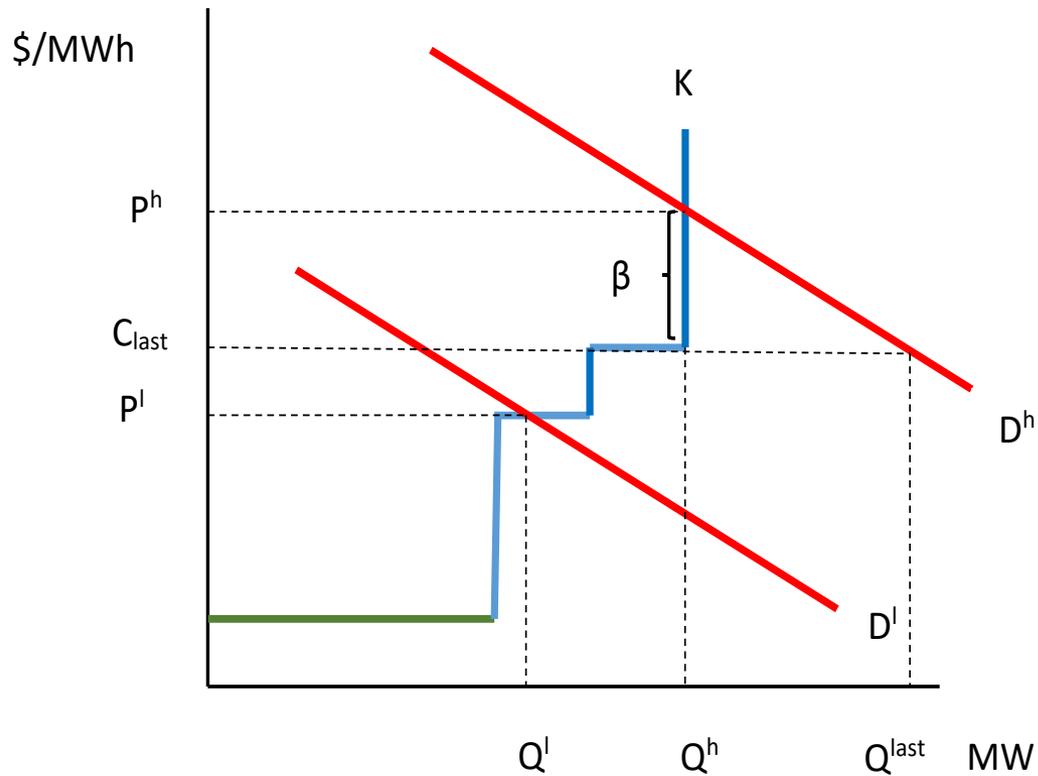
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Discussion Topics

- Efficient Pricing in an Energy-only Market
- Why Capacity Markets?
- Capacity Market Cost Allocation
- Allocation of Ontario's Global Adjustment

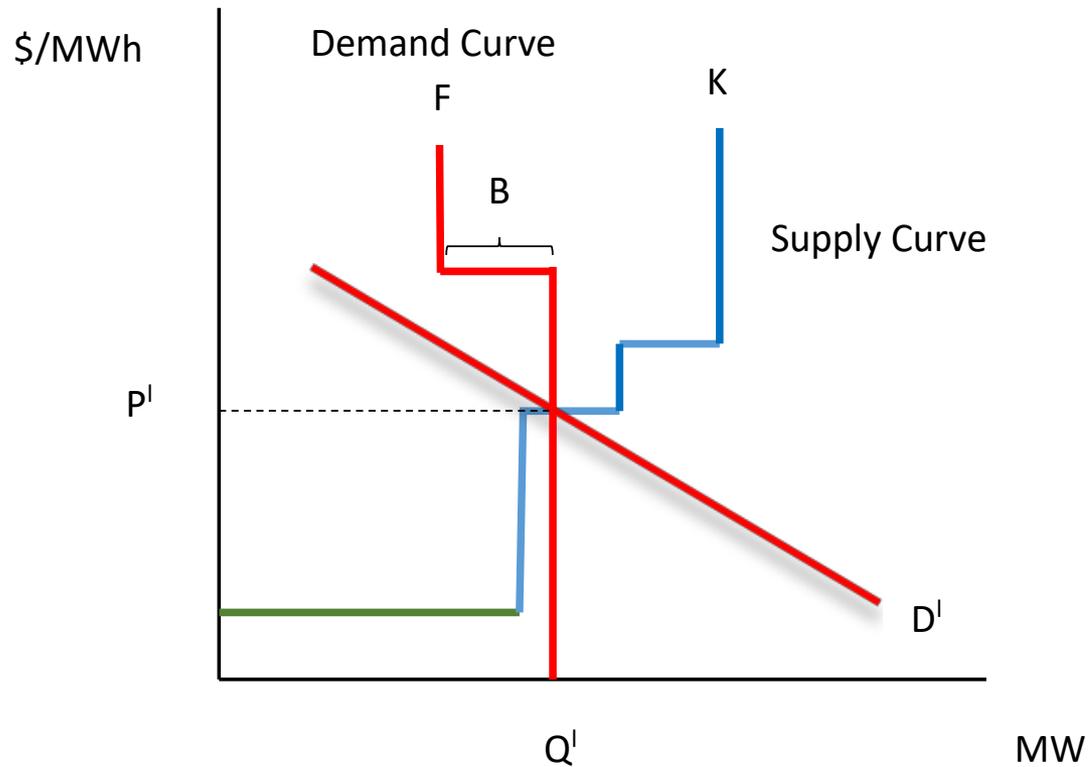
Efficient Pricing

Peak-load Pricing



Efficient Pricing in an E-O-M

Wholesale Energy Market Auction

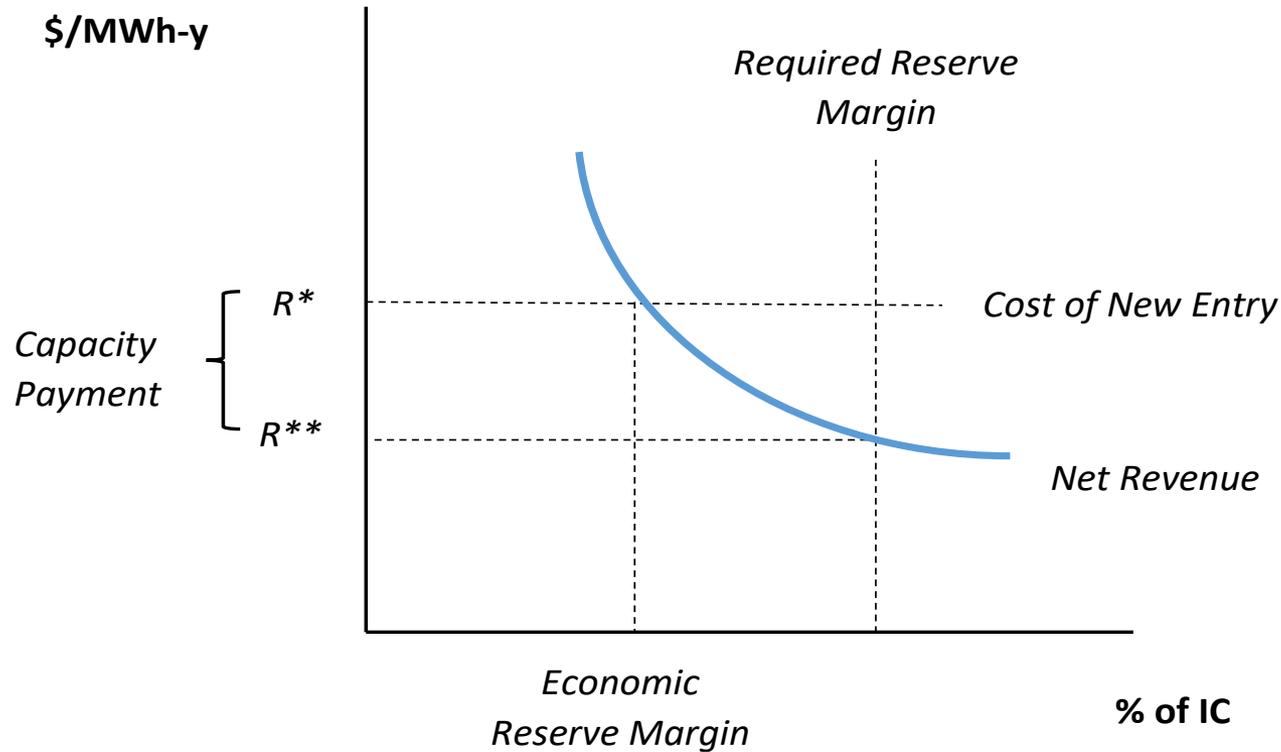


Why Capacity Markets?

- Resource Adequacy or Missing Money Problem
- The missing money problem arises when the expected net revenues from sales of energy and ancillary services earned at market prices provide inadequate incentives for merchant generating capacity investors or equivalent demand-side resources to invest in sufficient capacity to meet the resource adequacy standard
- Two general causes:
 - Gap between economic reserve margins and required reserve margins
 - Market imperfections/flaws that suppress energy prices

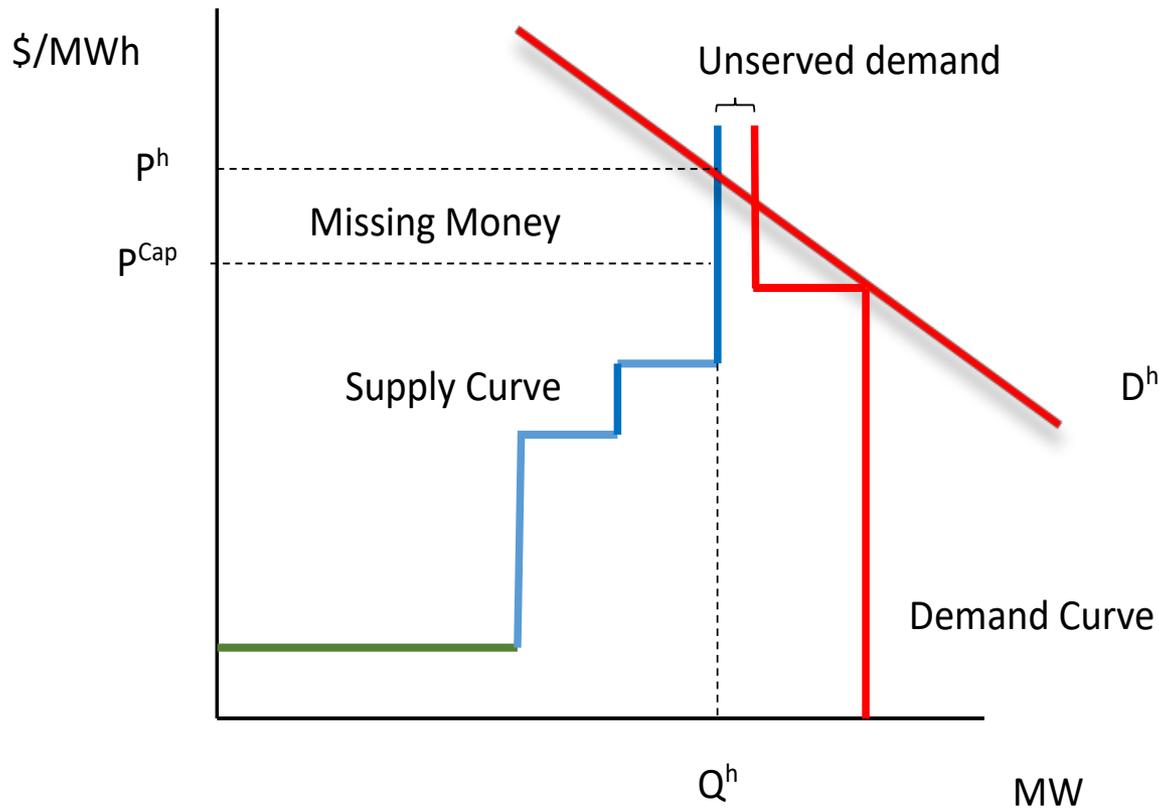
Why Capacity Markets?

Gap between Economic Reserve Margins and Required Reserve Margins



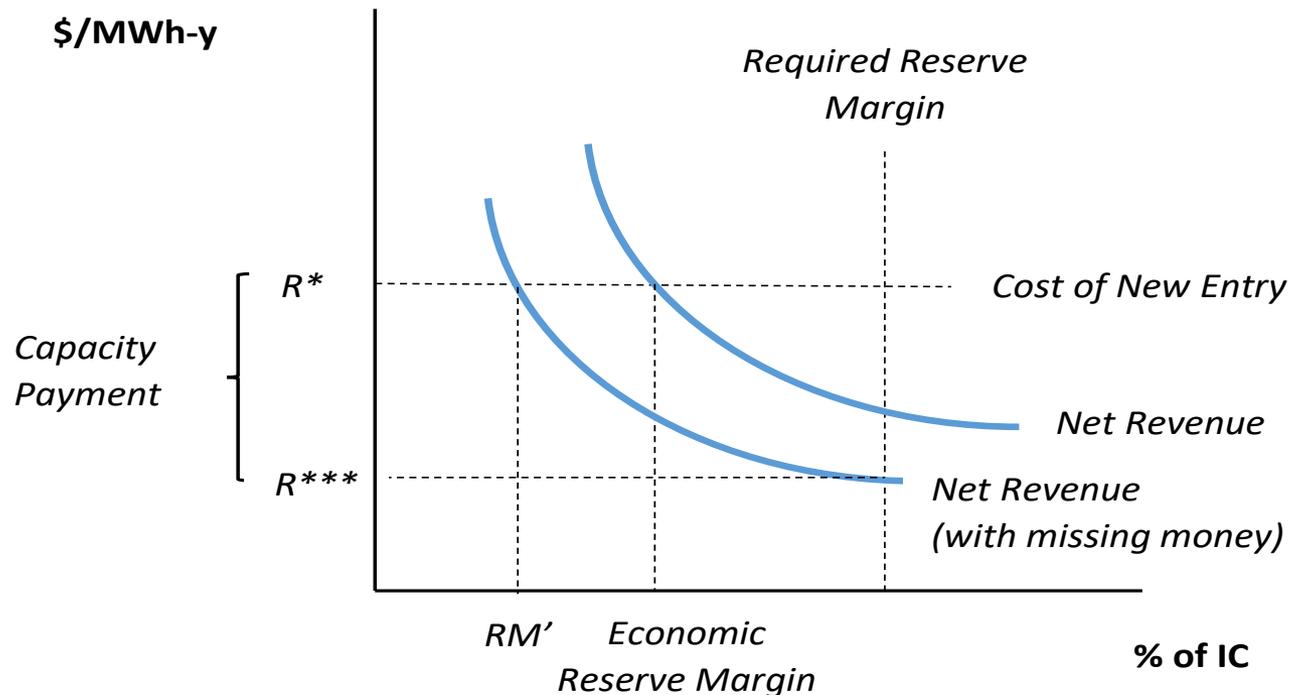
Why Capacity Markets?

Wholesale Energy Market – High Demand Period



Why Capacity Markets?

Missing Money and Need for Capacity Payment



Future of E-O-M

- Why Alberta and Ontario?
- Will technology change the need for resource adequacy?
- Will carbon policies market the end?
- Stay tuned

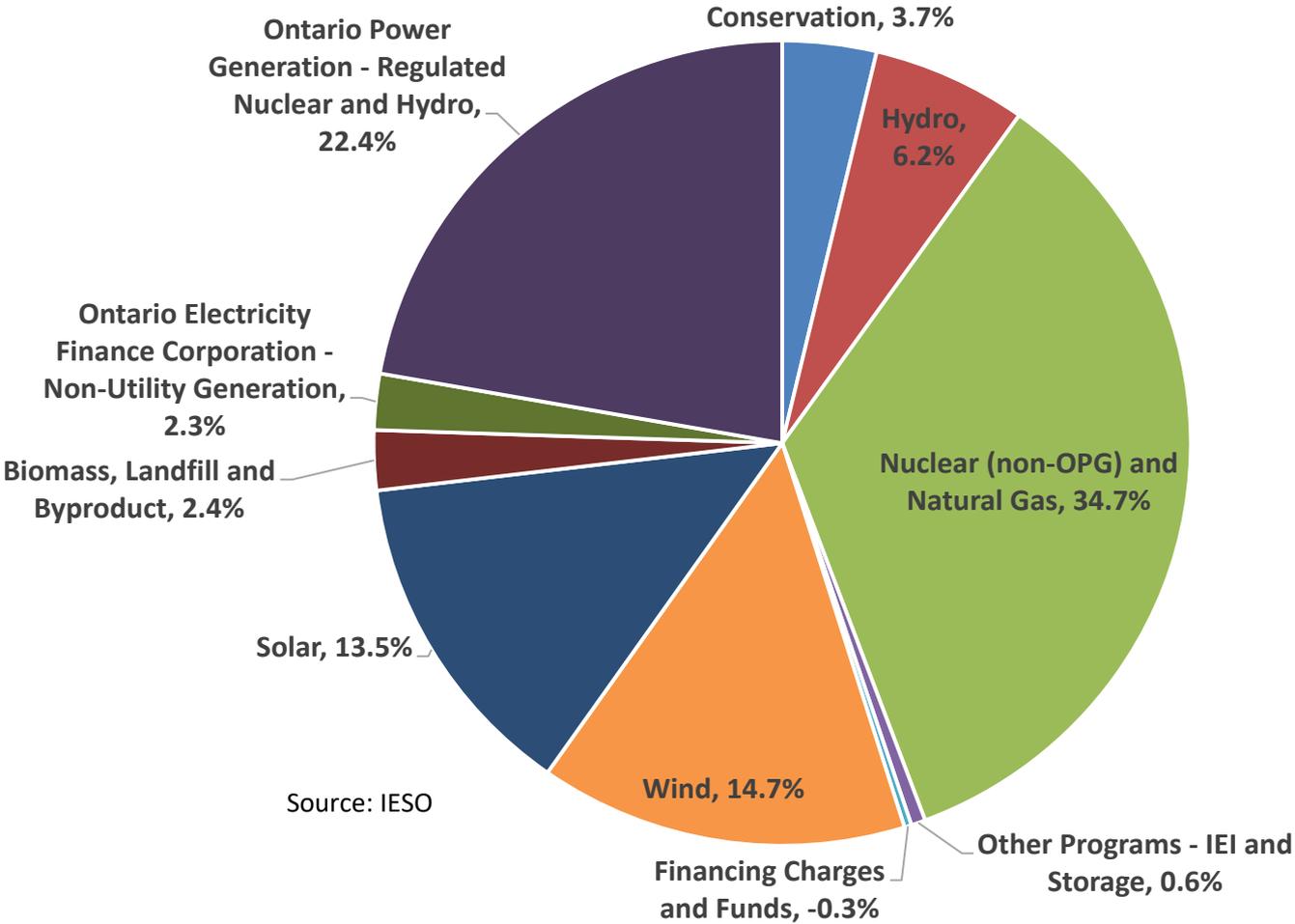
Capacity Market Cost Allocation

- Capacity market costs are a system-wide, fixed, and sunk cost
- Requires a cost allocation methodology
 - Efficiency vs. Equity
- Options:
 - Average-cost pricing (volumetric charges)
 - Ramsey Pricing
 - Fixed Charges
 - Coincident-Peak Pricing
 - Weighted-energy method

Ontario's Global Adjustment

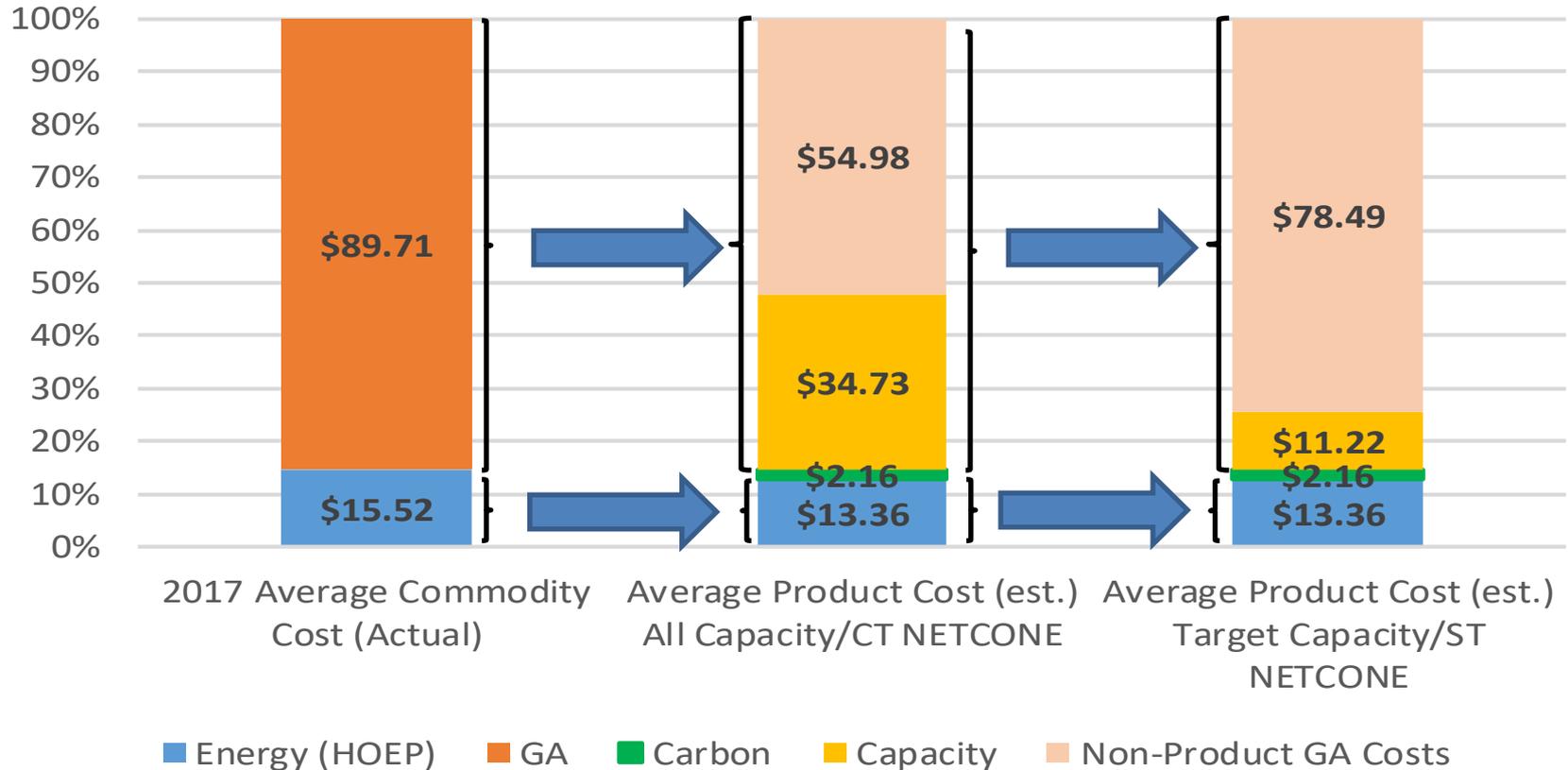
- Global Adjustment (GA) is:
 - the difference between the wholesale market price for electricity and the fixed cost recovery guaranteed to certain contracted or regulated facilities; and
 - the cost of delivering conservation programs
- Inverse relationship between energy market price (HOEP) and GA
- Introduced in 2005 as Provincial Benefit
 - Rebate of revenues earned by OPG above prescribed rates – energy price hedge
 - Charge when GA used to provide fixed cost recovery for new investment and conservation

GA Components (% of Total) 2017



Commodity Cost Components By Product (2017)

\$/MWh



Source: IESO and Presenter Calculations

GA Cost Allocation

- *Industrial Conservation Initiative* introduced in 2010 to provide competitive rates to energy intensive consumers and promote conservation
- Two classes of consumers
 - Class A
 - Customers with peak demand greater than 1 MW and customers with peak demand greater than 500kW and less than 1 MW in certain manufacturing and industrial sectors
 - GA allocation based on percentage contribution to the top five peak Ontario demand hours over a 12-month
 - Class B
 - Largely residential and small business customers
 - Billed by an LDC using time-of-use (TOU) rates set by Ontario Energy Board that have GA costs embedded within

Efficiency and Equity Considerations

- Class A
 - Avoided cost for consumer reducing 1 MW in each 5CP equal to \$551,000 in 2017
 - If VOLL of \$4,000/MWh then value of not consuming 1 MW roughly \$20,000 if only reduce in 5 hours and \$120,000 if reduce in 30 hours
 - Estimated cost of new entry between \$215,000 for CC generator and \$115,000 for SC generator
 - **Represents an extreme** price signal that can distort incentive to invest in behind-the meter generation, storage technology etc (by-pass)
 - In all other hours, face energy price which approximates marginal cost
 - Spawned a market for consulting services to predict 5CP (wasteful expenditure?)
 - Broad concern that large consumers avoid GA costs and do not pay fair share and harms commercial consumers or other vulnerable consumers that cannot avoid peak hour consumption (Equity)
- Class B
 - In all hours face a mark-up above marginal energy price
 - Class B do not have same opportunity to avoid GA and bare disproportionate share of costs (Equity)

Policy Consideration

- IESO Market Renewal, including incremental capacity auction (ICA) provides opportunity to revisit approach to GA cost allocation
- Objective of Market Renewal is efficient pricing of electricity products, which include energy, A/S, capacity
 - ICA provides signal of price of capacity that can be used to separate capacity related costs embedded GA
 - Allows appropriate cost allocation method for capacity related costs
 - Remaining cost attributable to other factors or objectives
 - Sunk costs
 - OEB regulatory review
 - Taxes?
- Carbon Price?