



# **Ontario Capacity Auction: Analysis of Feasibility and Criteria for Design Elements**

**Mindfirst Lunch Seminar**

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# Topics

- What is Resource Adequacy?
- Ontario's Future Capacity Needs to Ensure Resource Adequacy
- Objectives of Capacity Markets and Experience Throughout North America
- Uniqueness of Ontario and Commentary on IESO's Proposed Capacity Auction



# What is Resource Adequacy?

# Resource Adequacy

- To maintain reliability, power systems must maintain sufficient capacity resources to meet peak demand requirements plus reserve margins (together referred to as a Resource Adequacy Requirement (RAR))
  
- Resource Adequacy needs based on
  - ✓ Demand Forecasts
  - ✓ Loss of Load Expectation (LOLE)/Loss of Load Probability (LOLP)
  - ✓ Reserve Margins
    - More debate needed to define meaning within a market context, increasing customer choice
  
- RAR met by resources (e.g., generation, demand-response, imports, etc.) calibrated for
  - ✓ Capacity Factors
  - ✓ Forced Outage Rates
  - ✓ Energy Production and Performance
    - Definition of “capacity” being debated, especially considering energy production during peak periods or times of need

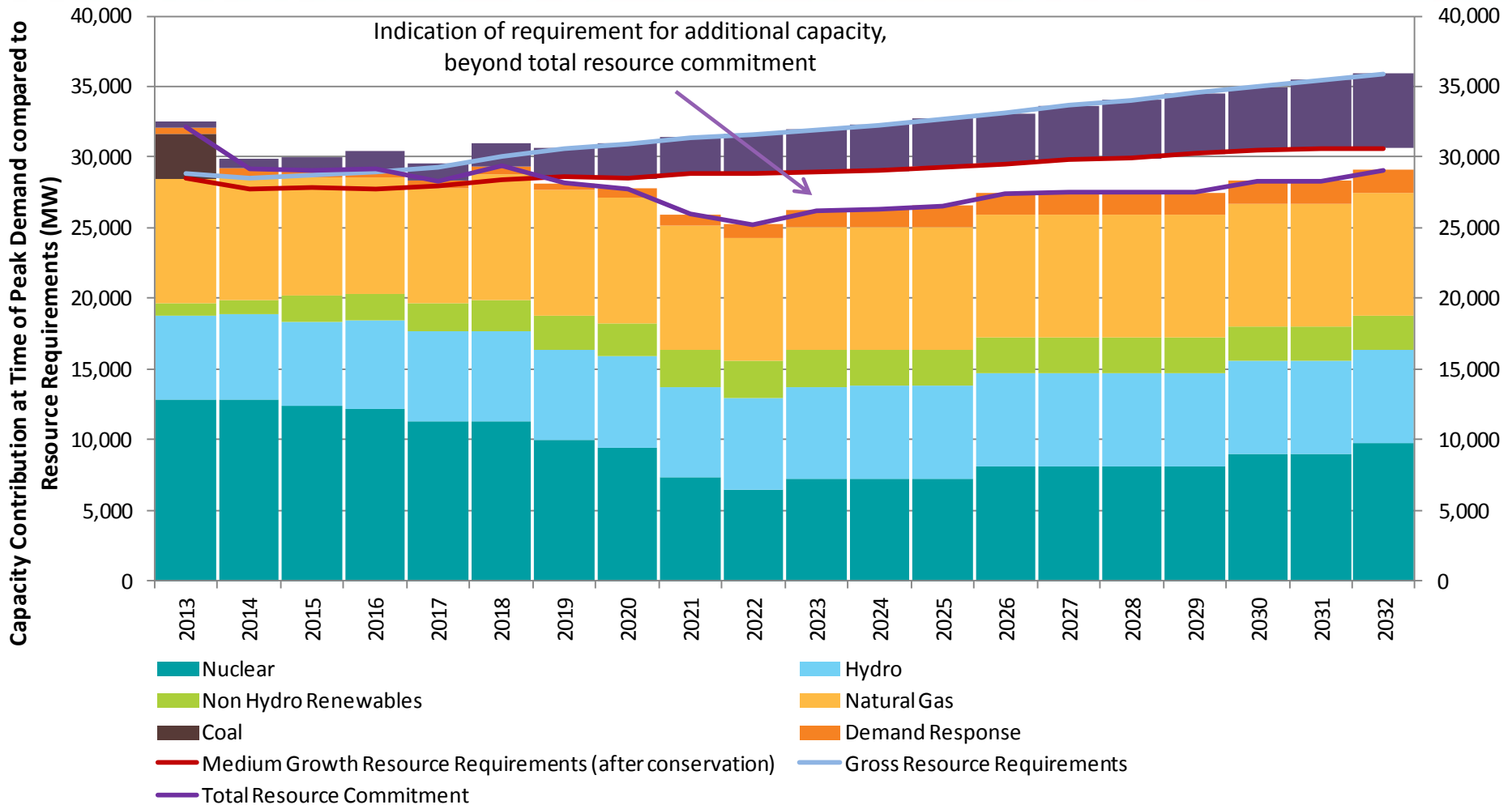
# How does Ontario Ensure Capacity to Meet its RAR?

- Since Ontario is a member of the Northeast Power Coordinating Council (NPCC) and NPCC is a member of the North American Electric Reliability Corporation (NERC), Ontario must meet reliability standards set by NERC
  - ✓ Power systems must maintain sufficient capacity resources to meet peak demand requirements plus reserve margins (reserve margins typically around 120% of peak demand)
  
- Ontario does not have an explicit mechanism to meet its RAR
  - ✓ Ontario meets its RAR through a mixture of existing resources (i.e., rate regulated, contracted, etc.) and Government policies (e.g., Long-Term Energy Plan) driving procurement/contracting activities (e.g., Request for Proposals, etc.) supplemented by forecasts (e.g., IESO 18-month forecasts)
  - ✓ IESO's proposed Capacity Auction (i.e., Capacity Market) may one day be an explicit mechanism to meet Ontario's RAR



# Ontario's Future Capacity Needs to Ensure Resource Adequacy

# Long-Term Energy Plan (2013): Outlook of Resources to Meet Ontario's Requirements



➤ Capacity needs could be greater if delays result in refurbishing nuclear generating units, or if decisions are made to not refurbish all units



# **Objectives of Capacity Markets and Experience Throughout North America**



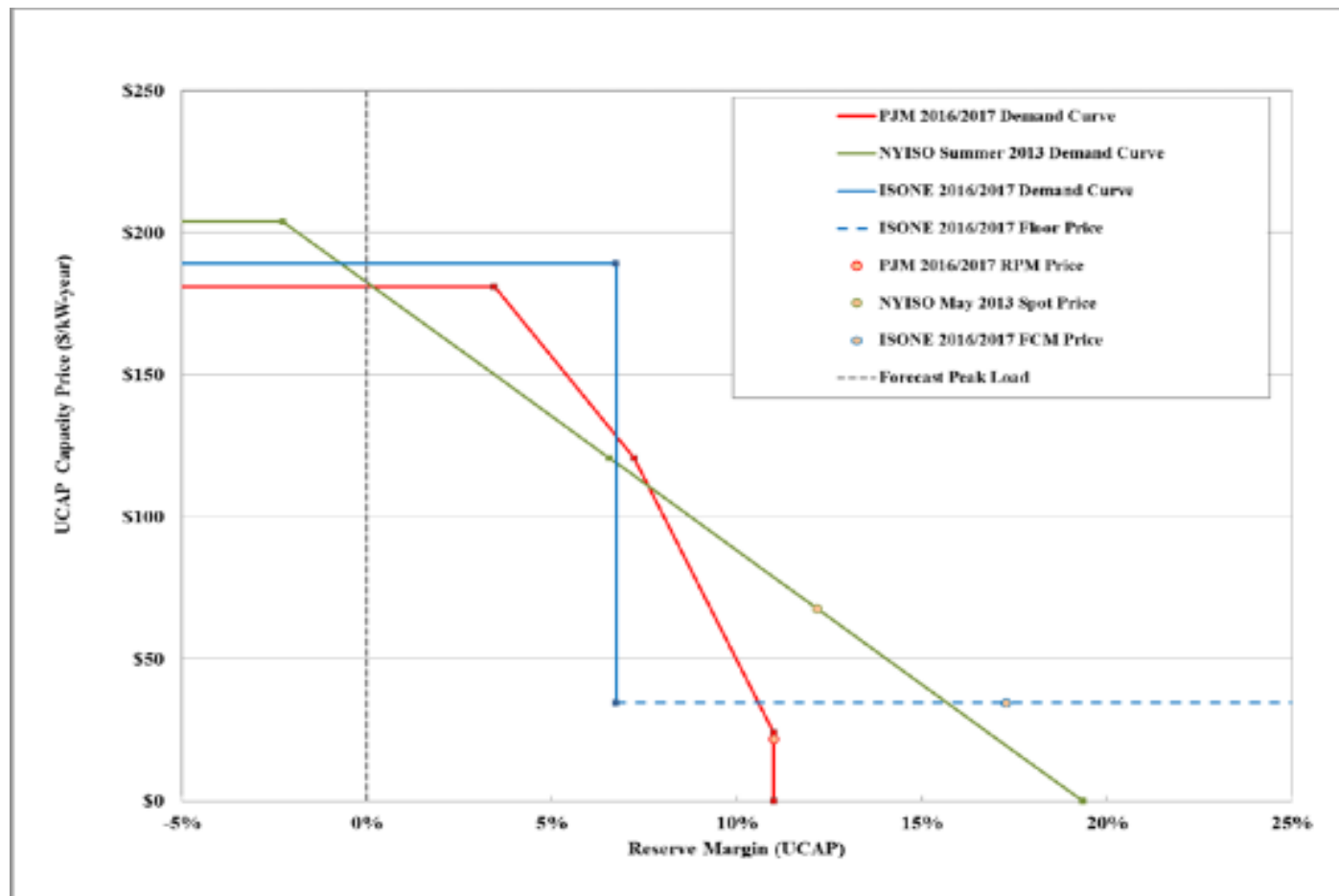
# Objectives of Capacity Markets and Experience in North America

- Under traditional U.S. utility regulation, RARs are met by Load-Serving Entities (LSEs) by holding portfolios of resources (i.e., own, bilateral contracts, etc.) to meet their power system's reliability needs
- Supplementing LSE obligations, Capacity Markets are mainly a U.S. electricity market restructuring construct administered by northeastern ISOs (NYISO, ISO NE, PJM), where these markets are auctions to provide participants with signals and commitments to maintain their resources and afford more lead-time and certainty for development/investment in new resources with the primary goal of meeting applicable RARs at just and reasonable prices while not unduly discriminating or preferentially selecting specific resources

# Basic Capacity Market Framework

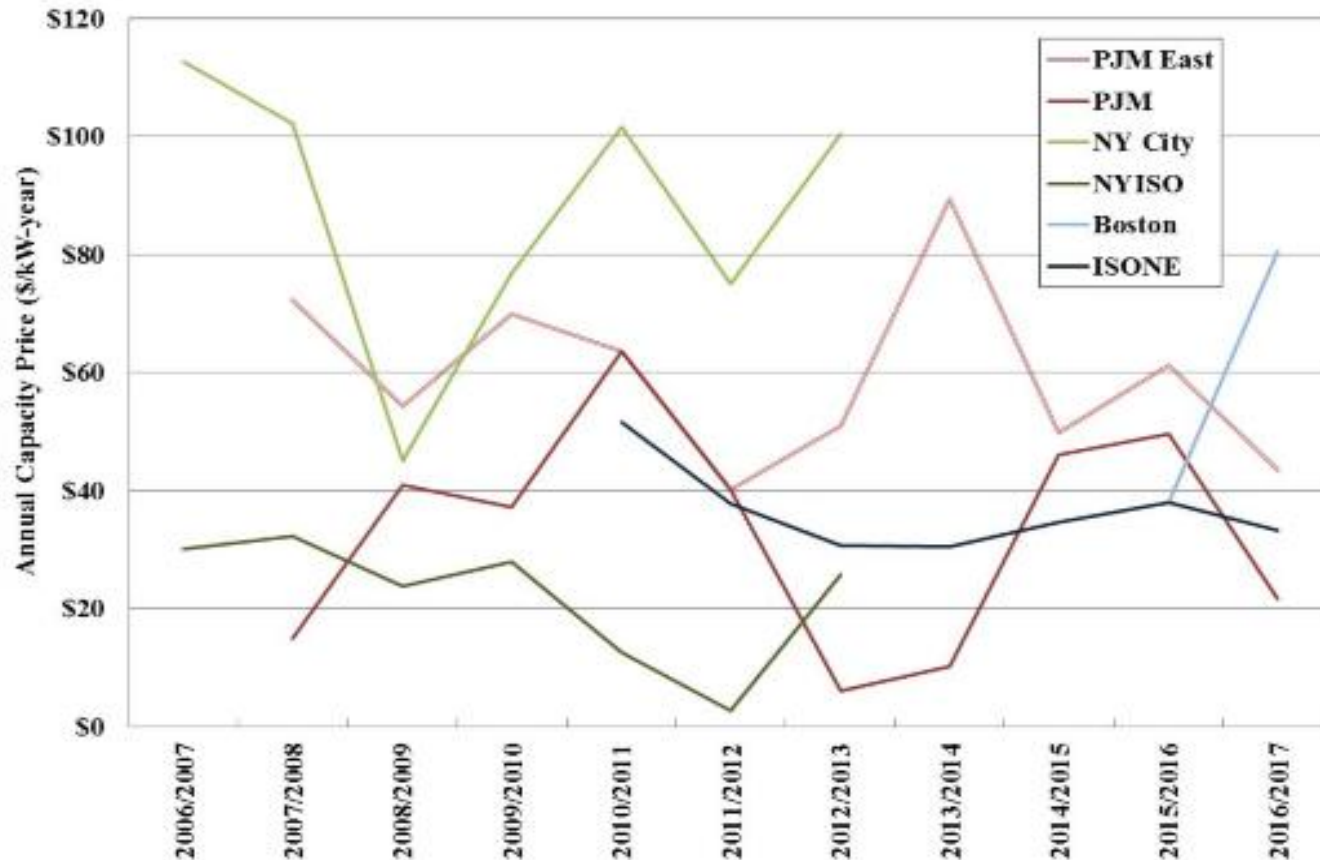
- ISO sets RAR (i.e., target level of capacity), including locational RARs as applicable to address local reliability needs (e.g., New York City)
- LSEs meet obligations to serve their customers by securing capacity and ISO centrally secures capacity not secured by LSEs, ensuring Control Area reliability will be met
- Qualified resources (e.g., generation, demand-response, imports, etc.) bid prices and quantities to provide rated capacity through auctions
- Clearing prices are set based on supply of bid capacity resources and demand (i.e., RAR), where administratively set Demand Curves used
- Capacity resources ‘must-bid’ into Day-Ahead Markets (DAMs) based on applicable Forward and Commitment Periods, to get paid
  - ✓ Forward and Commitment Periods evolving to multi-years (e.g., 3-years forward and 3-years of payments)

# Examples of Demand Curves and Administrative Capacity Price Ceilings



- Demand Curves administratively set capacity prices based on bid capacity supply and shape of Demand Curve

# Capacity Prices for Different Commitment Periods (2006 to 2017)



- Clearing capacity prices have been volatile, therefore can impact investment decisions

# Characteristics of Successful Capacity Markets

- Capacity Markets generally require the following to be successful
  1. Well-defined resource adequacy needs and drivers of that need
  2. Clear understanding why energy/ancillary services market design alone will not achieve resource adequacy targets without a capacity construct/mechanism
  3. Clearly-defined capacity products, consistent with needs
  4. Well-defined obligations, auctions, verifications and monitoring
  5. Efficient spot markets for energy/ancillary services, with liquid bilateral contracting
  6. Addressing applicable locational reliability challenges
  7. Participation from all resource types
  8. Carefully-designed forward obligations and commitment periods
  9. Staying power to reduce regulatory risk while improving designs and addressing deficiencies
  10. Capitalizing and building on experience from other markets
  
- In Power Advisory's opinion, Ontario's market structure and market design will provide challenges to meeting above requirements



# Uniqueness of Ontario and Commentary on IESO's Proposed Capacity Auction

# Ontario's Market Structure and Market Design – Challenges to Develop a Workable Capacity Auction

- In Power Advisory's opinion, differences with Ontario's market structure and design compared to NYISO, ISO NE and PJM, relating to how Capacity Markets require specific conditions in an attempt to work effectively, will create significant challenges to develop a workable Capacity Auction
  
- These characteristics from NYISO, ISO NE and PJM are necessary links and foundational bases to their Capacity Markets
  - ✓ Locational energy pricing helps define locational capacity needs and requirements
  - ✓ LSEs with explicit obligations to secure capacity resources to meet their load requirements
  - ✓ Very competitive energy markets with many buyers and sellers that facilitate liquid bilateral contracting on a forward basis

# Issues to be Considered and Discussed Going Forward for Ontario

- Will a Capacity Auction result in new and timely investment to meet Ontario's power system needs and policy objectives (i.e., existing and new resources)? What happens if Capacity Auction(s) do not meet needs and objectives? Roll for multi-year contracting?
- Considering that many resources in Ontario are under multi-year contracts or rate-regulated, can a Capacity Auction effectively value and price capacity? How can/should contracted and rate-regulated resources be effectively integrated into a Capacity Auction?
- Can a Capacity Auction effectively meet policy objectives (e.g., renewable generation, technology like energy storage, etc.)?



# IESO Stakeholder Engagement – Capacity Markets Controversy

Date	Item	Comments
1998-1999	ON Government Market Design Committee	Previous initiative to explore development of a Capacity Market, among other markets (e.g., energy, ancillary services, etc.) – Capacity Reserve Market not developed but placeholder rules contained within Market Rules (deleted few years ago)
2003-2005	IESO Market Evolution Program	Previous IESO initiative to explore development of a Capacity Market, among other markets (e.g. DAM, etc.) – Detailed Design developed but initiative abandoned, generators supportive but load/customers were not (e.g., AMPCO left working group)
April 8, 2014	IESO Information Session	Open session, provided overview of principles for a Capacity Auction and perspectives from select other jurisdictions
August 13, 2014	IESO Information Session	Open session, introduced formal stakeholder engagement scope and timelines
October 1, 2014	IESO Information Session	Open session, introduced draft Stakeholder Engagement Plan and proposed high-level design elements
December 2014	IESO Information Session	Finalization of Stakeholder Engagement Plan and response to stakeholder comments on high-level design elements – very few stakeholders have declared clear support
2015 and beyond	???	???

# Scorecard: Capacity Auctions/Markets vs. Ontario Contracting Framework

	Capacity Market	ON Contracting Framework
Reliability: day-to-day and multi-year	√√	√
Explicit RAR Mechanism	√√	√
Administrative Pricing	√	√
Capacity Valuation/Price Signals	√√	√
Ability to Secure Resources	√	√√
Cost Effectiveness/Ratepayer Impact	√√	√
Diversity of Resources	√	√√
Supports Specific Government Policies (e.g., renewables)	√	√√
Financing New Investments	√	√√
Summary	13	13



**Thank You**