

INCREMENTAL CAPACITY AUCTION

Stakeholder Engagement Phase 1 – Fundamentals

Meeting #2

June 15, 2017

Today's Objective

- By the end of this session participants should:
 - Be clear on the problem the ICA is trying to solve
 - Understand the assumptions that underpin the proposed design elements
 - Have clarity on how participation in the ICA will work
 - Have a general understanding of auction mechanics and timelines

Agenda

- Recap of May 18th meeting
- Defining the Problem Statement
- What is Capacity?
- Foundational Assumptions (1 – 3)
Break
- Foundational Assumptions (4 – 5)
Break for Lunch
- Auction Mechanics
- Auction Participation & Timelines
- Next steps & Discussion

Time has been allocated to ensure ample opportunities
for questions and comments

Recap from May 18th Meeting

Summary of Key Messages from May 18th

- Communicated that, as part of the broader Market Renewal Program, the ICA will utilize an enhanced stakeholder engagement process to design a made-in-Ontario capacity auction
 - MRWG, CEO Roundtable, expanded scope of SE
- Explained phases, roles and timelines for establishing a HLD
 - Fundamentals, Options, Final Decisions
- Highlighted challenges with current approach to securing capacity to ensure resource adequacy and benefits of switching to an auction based mechanism
 - Increased competition, greater flexibility
- Introduced design elements and key auction concepts
 - Proposed list of 19 design elements

ICA Design Elements

Pre Auction		10	Target Capacity
1	Resource Eligibility	11	Min/Max Capacity Limits
2	Participation Requirements	12	Net Cost of New Entry
3	Qualified Capacity	13	Max Auction Clearing Price
4	Market Power Mitigation	Forward Period	
Auction Parameters		14	Rebalancing Auctions
5	Length of Forward Period	15	Resource Obligations (within forward period)
6	Commitment Period(s)	16	Non-performance Implications (within forward period)
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9	Slope of Demand Curve	19	Cost Recovery

Defining and Solving the Problem

Defining the Problem Statement

- Before establishing the goal and objectives for the ICA Project, it is important to first reach agreement on “**what**” is the problem that needs to be solved and “**how**” should that problem be solved
- Recap of the challenges with the status quo:
 - Uncertainty for developers – “one-off” directive-based procurements, uncertain future post contract, etc.
 - Resource specific procurements do not maximize competition or foster innovation
 - Lack of flexibility to respond to evolving needs (locks in specific resource types & incentive mechanisms)
 - Price of capacity commingled with other value drivers
 - Contractual incentives not always aligned with system needs

Defining the Problem Statement *(cont'd)*

- Given this context, the IESO is proposing the following problem statement:

Ontario does not have a stable, transparent, and competitive mechanism to ensure resource adequacy is maintained at the lowest cost in the long run.

- How should the problem be solved? Could leverage some or all of the following:
 - Ensure sufficient flexibility to meet evolving system needs?
 - Provide a stable and predictable procurement mechanism?
 - Provide a transparent price signal for the value of capacity?
 - Maximize competition both between and among resource types?
 - Facilitate innovation?
 - Other?

QUESTIONS & COMMENTS



What is Capacity?

What is Capacity?

- An auction establishes a market-based approach to maintaining resource adequacy through the procurement of *capacity*
- Energy and Capacity are distinct products
 - Capacity resources can also provide energy and other products (e.g. blackstart, OR, etc.)

Capacity

(in MW) is the *ability to provide energy or reduce load when called upon*

Energy

(in MWh) is the *actual electricity injected into/withdrawn from the grid*

Resource Adequacy

- ISO/RTO's participating within the Northeast Power Coordinating Council (NPCC) are required to adhere to the resource adequacy criterion (Loss of Load Expectation (LOLE) of 0.1 days per year)
- The reliability requirement is met by ensuring sufficient capacity will be available in the future, regardless of the mechanism used to procure capacity
- Under an ICA, the reliability requirement is reflected in the amount of capacity that is required to be procured in the auction, reflected in the *target capacity requirement*



Defining the Capacity Product

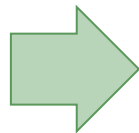
- A qualification process will determine the maximum quantity that eligible resources can offer into the capacity auction
- The capacity product is defined by the performance obligations that are placed on cleared resources
- The capacity product provided will be consistent for all cleared resources, although the performance obligations placed on specific resource types may differ

1 MW of capacity should provide the same marginal contribution to system-wide reliability (improved LOLE value) regardless of the type of resource providing it

Qualified Capacity

- Determining the qualified MW will require a consistent and transparent process that will be performed ahead of each auction
 - A unique process may be required for each resource type
- A “qualified MW” is distinct from the “installed capacity” of a generation resource or maximum load capability
 - Ensures sufficient capacity is procured to meet the resource adequacy requirement
- *Seasonal* considerations impact the amount of capacity eligible resources can offer into the auction
 - Resource availability and peak demand levels can vary across the year

Qualified MW



Expected ability to provide capacity during periods of peak demand

Resource Performance Obligations

- Most jurisdictions with capacity markets place an energy (and/or ancillary services) “must-offer” obligation on cleared resources
- Must-offer obligations may apply to day-ahead and/or real-time and provide an obligation on resources to submit energy offers or bids
 - Must-offer indicates availability to generate or reduce consumption
- Capacity resources may incur financial implications if unable to meet their capacity obligations

Foundational Assumptions

ICA – Foundational Assumptions

- Certain assumptions have been made by the IESO in the process of establishing the design elements
 - To narrow the universe of possible options to a manageable scope
 - For each assumption we will also highlight the Design Element implications

“Context Assumptions” *to Frame the Auction*

Secure only the incremental capacity required to maintain resource adequacy beyond that already secured via contract or rate regulation

Mechanism to incentivize capacity only

“Mechanical Assumptions” *to Reflect Best Practices*

Implemented through existing Market Rules and Manuals processes

Solve for a uniform clearing price
[Brattle]

Utilize a forward period (i.e. not a spot auction)
[Brattle]

*Assumption #1 –
Incremental Needs Only*

Impacted Design Elements

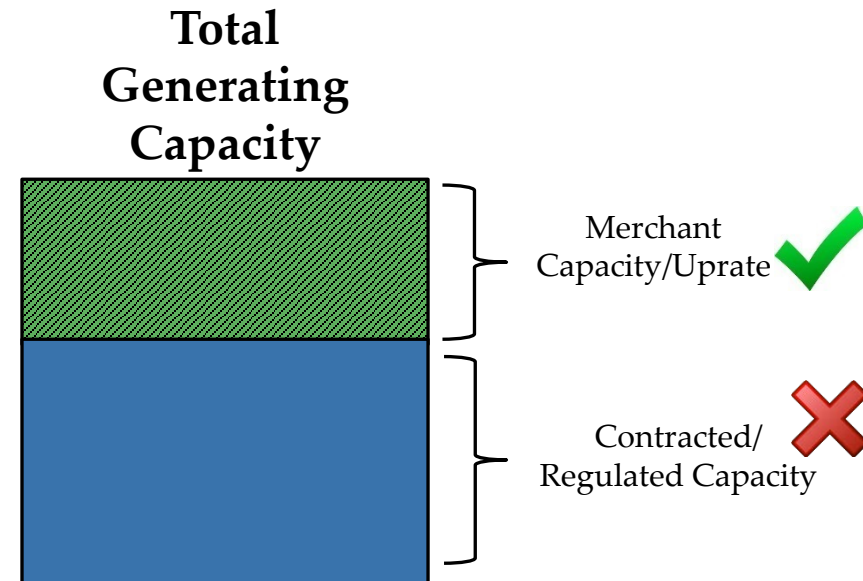
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Why an Incremental Auction?

- Regions with centralized capacity markets generally require all resources to participate
- In Ontario however, a majority of capacity is contracted / rate regulated (i.e., suppliers receive capacity-related payments through contract settlement or “true-ups” to regulated rates)
 - The capacity from these facilities is already relied upon to ensure system adequacy, and as such the capacity from these facilities will not (with certain exceptions) be eligible to participate
- The auction will therefore seek to procure capacity that is incremental to what is already under contract/rate regulation
 - Avoids administrative complexity that would be required in order to ensure that contracted/rate regulated resources are not being compensated more than once for the same MW of capacity

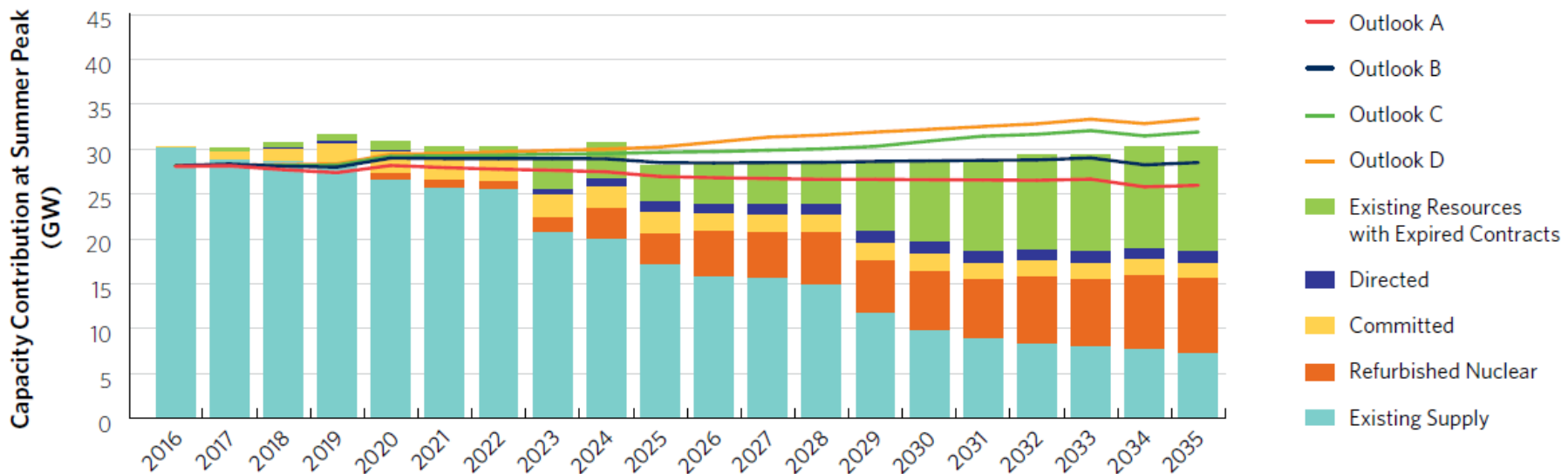
“Incremental” Capacity – Contracts Context

- Incremental capacity will come from “merchant capacity”, which can arise from either:
 - a) Resources that are not under a contract for any portion of their capacity
 - b) Resources that have the ability to generate capacity in excess of what has been contracted
- Merchant capacity (existing or uprated) from contracted resources is expected to be able to participate in the ICA; provided that it can be demonstrated that ***both*** contracted and merchant capacity are available to the system simultaneously
 - This may be verified through a mechanism such as a capacity check test



Scope of the “Incremental” Need

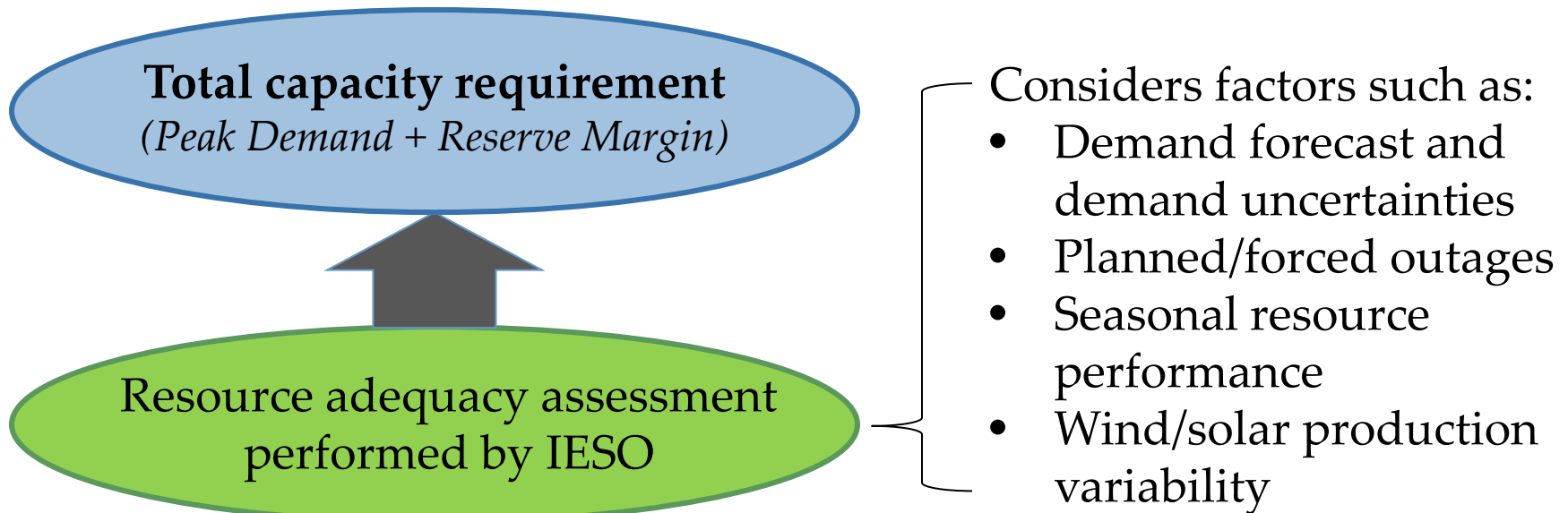
- The size of the incremental need will rise as contracts expire
 - Summer capacity contribution from expired resources will reach ~9 GW by 2030 and almost 12 GW by 2035
 - These facilities will have an opportunity to compete in the ICA



IESO Ontario Planning Outlook (2016), Figure 16 (pg. 10)

Establishing the “Incremental” Need

- The first step in establishing the incremental need that will be secured through the auction is to determine how much capacity in total is required to maintain resource adequacy in Ontario



Establishing the “Incremental” Need *(cont’d)*

- Once the total capacity requirement is determined, the incremental need is calculated by deducting the capacity that is available from contracted or rate regulated facilities

Total Capacity Requirement
(Peak Demand + Reserve Margin)

LESS:

**MW contribution from
contracted/regulated facilities**

=

Incremental MW Capacity Need

*Note: process will have
to establish an
incremental need for
each commitment
period & zone*

*Assumption #2 –
ICA Will Only
Address Capacity Needs*

Impacted Design Elements

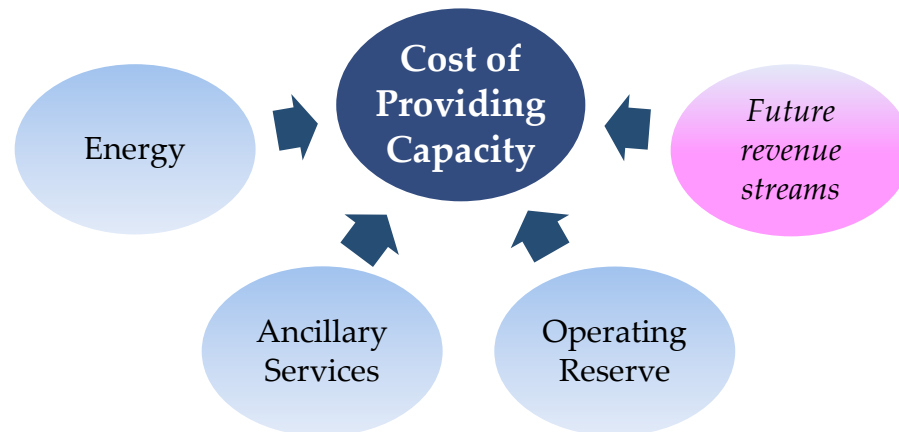
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ICA to Focus on Resource Adequacy

- Some ISO/RTOs are considering changes to their capacity market to facilitate changes to their supply mix
- It is important to remember for Ontario that all market mechanisms taken together should facilitate a diversified supply mix
 - It is therefore important the ICA focuses on maintaining resource adequacy
- Any approach that focuses on more than maintaining resource adequacy would reduce the expected benefits of the auction:
 - Would not send clear price signals for the value of capacity
 - Requires some degree of centralized/administrative decision making that would reduce the ability of the private sector to find innovative solutions to meet system needs

ICA to Focus on Resource Adequacy *(cont'd)*

- The ICA should send a clear price signal for the value of capacity, other products and services required to meet system needs should also have clear, but distinct, price signals
 - These price signals will then inform the private sector's investment decisions in the type and location of resources that can capture these revenue opportunities most efficiently



- Resources that can optimize between maximizing their revenue opportunities in other markets, while minimizing their cost of supplying capacity, would be expected to be most competitive in the auction

*Assumption #3 –
Implemented via Market
Rules & Manuals*

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Implementation via Market Rules/Manuals

- Currently resource adequacy is primarily maintained via procurements enabled by directives from government
 - Utilize a combination of RFPs, program rules and contracts
 - Duration of opportunities were often either time limited or uncertain
- Transitioning to the ICA will deliver the advantages outlined in the Benefits Case, and implementing via the Market Rules will help to maximize those advantages by:
 - Increasing stakeholder confidence in the mechanism (i.e. ensures a rigorous process, that involves stakeholders, is followed before changes are made)
 - Reducing uncertainty that the opportunity to earn capacity payments will not be available over the useful life of capacity resources (thereby reducing risk premiums)
- Options for the Design Elements will be proposed on the basis that they will be facilitated through the Market Rule process

*Assumption #4 –
Uniform Clearing Price*

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Brattle Slides – Uniform Price Auctions

*Assumption #5 –
Forward, Not a Spot, Auction*

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Brattle Slides – Forward vs. Spot Auction

QUESTIONS & COMMENTS



Auction Mechanics

Establishing Capacity Auction Demand Curve

- The Demand Curve is a representation of the quantity of capacity that the market is willing to buy and the price it is willing to pay
- Demand curve parameters impact the slope and positioning of the curve, and the price and quantity that clears the auction
 - sloped curve is based on both *financial* and *reliability* parameters

Capacity Auction Demand Curve *(cont'd)*

- Important elements in deriving a downward sloping demand curve:

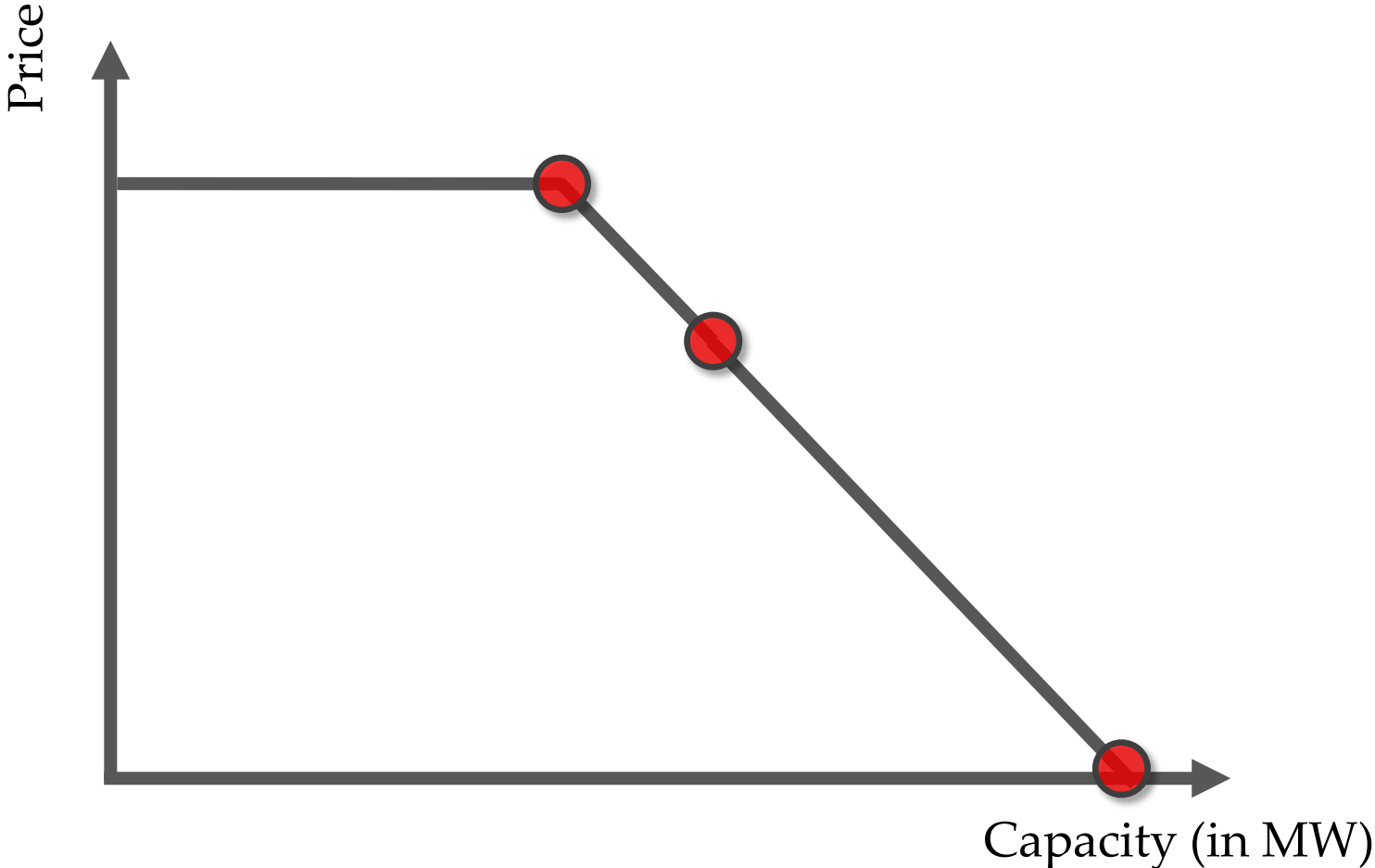
Target Capacity Requirement

Net Cost of New Entry (Net CONE)

Min/Max Capacity Limits

Maximum Auction Clearing Price

Illustrative ICA Demand Curve



Target Capacity

- Target Capacity represents the amount of capacity required to be procured in the auction to ensure resource adequacy requirement (LOLE of 0.1 days per year) will be met
- Requirement set ahead of need date based on the length of the forward period
 - Approximately three years ahead in U.S forward capacity markets

Net Cost of New Entry (Net CONE)

$$\text{Net CONE} = \text{Gross CONE} - \text{Energy \& Other Revenue Stream Offset}$$

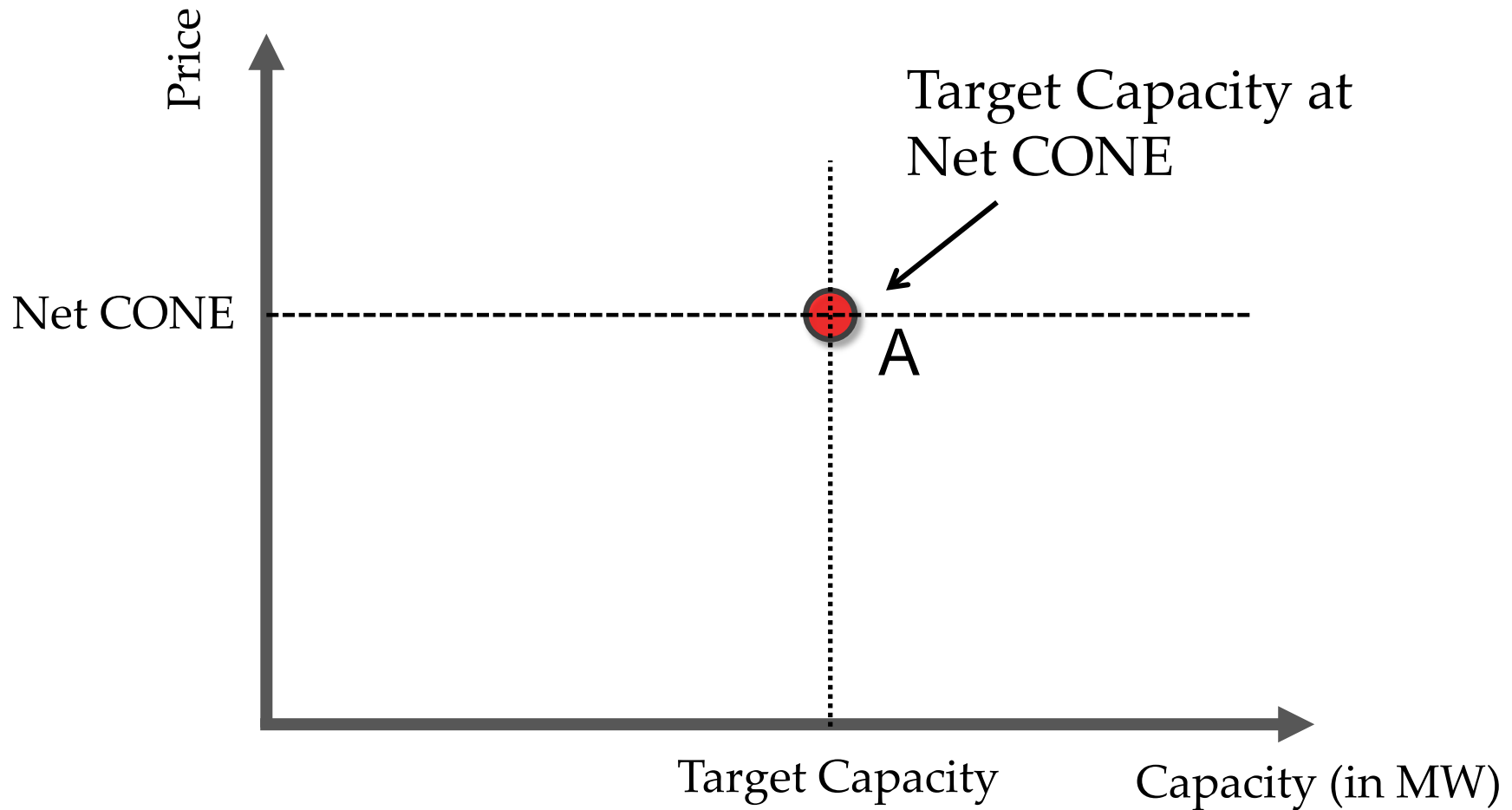
Gross Cost of New Entry (CONE)

- Revenues a new generator needs to earn to enter the market and recover its capital investment and annual fixed costs
- Requires a choice of reference technology and includes capital, O&M, property taxes, financing, regulatory costs etc.

Energy & Other Revenue Streams Offset

- The net revenues the reference unit would be expected to earn during the commitment period(s)

Demand Curve Parameters



Maximum Auction Clearing Price at Minimum Capacity

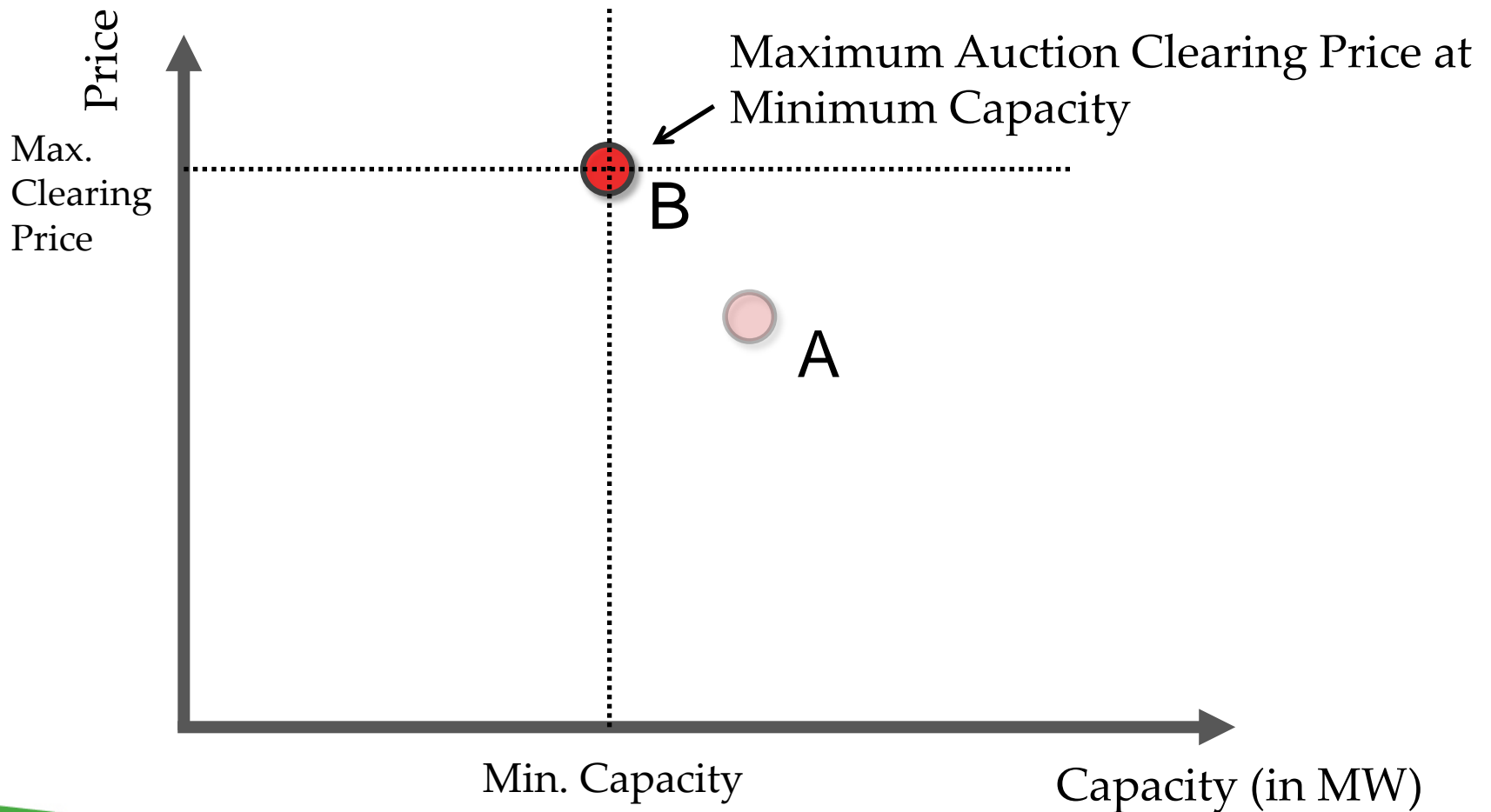
Maximum Auction Clearing Price

- The highest price that a capacity auction can clear
- In other jurisdictions, the maximum price is set as a multiple of Net or Gross CONE

Minimum Capacity

- The amount of capacity below the target capacity requirement that can be purchased through the auction

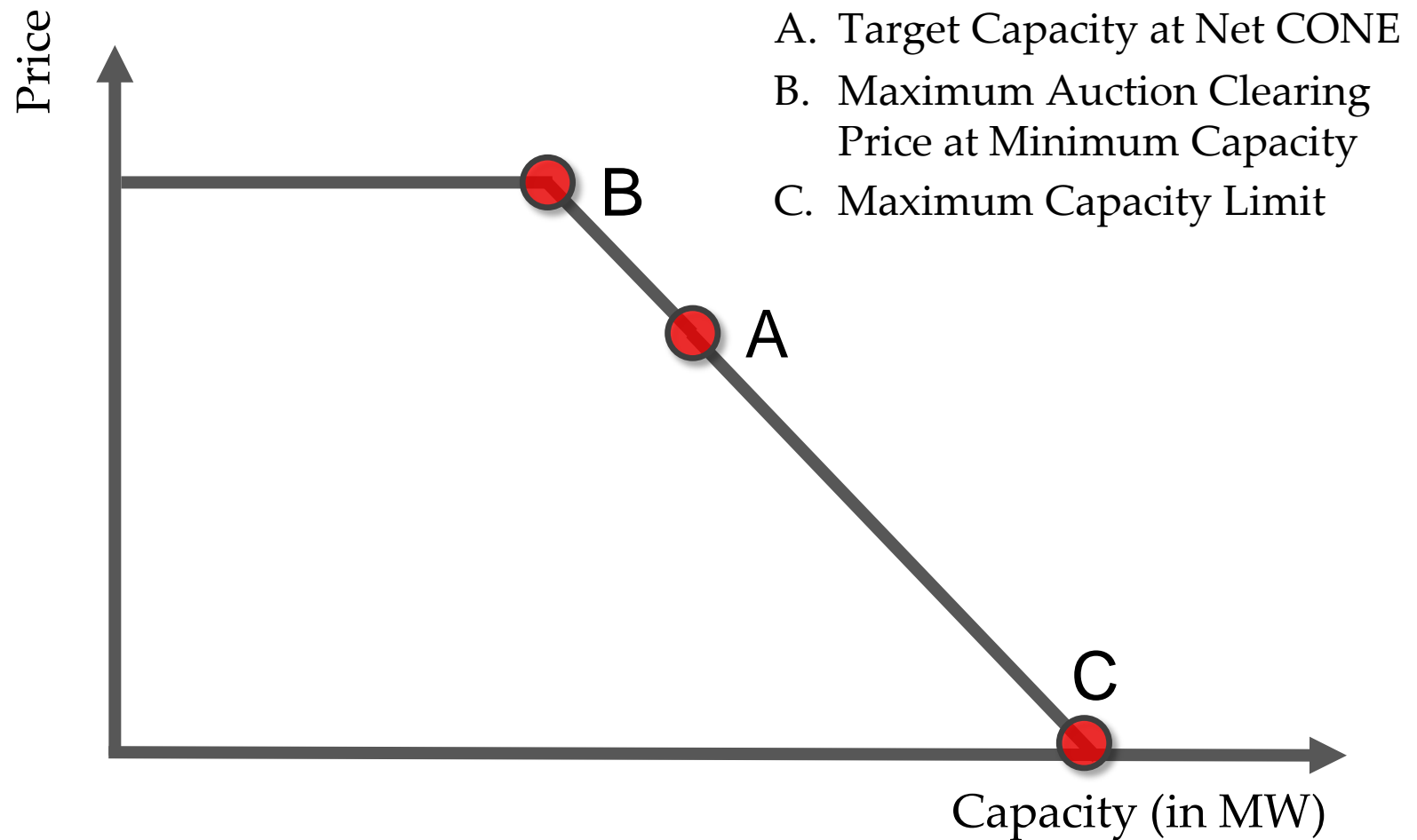
Maximum Auction Clearing Price at Minimum Capacity *(cont`d)*



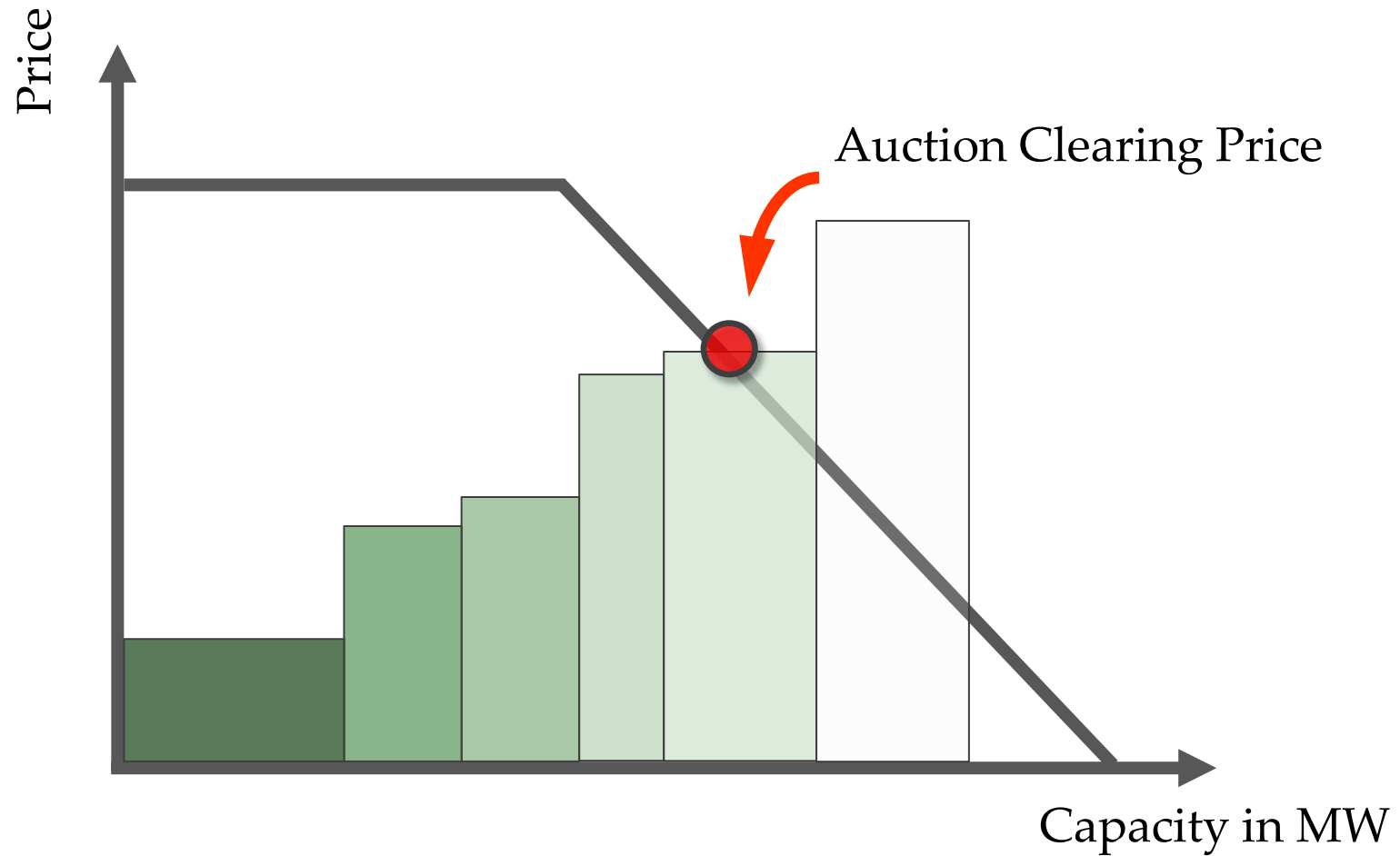
Maximum Capacity Limit

- The amount of capacity above the target capacity requirement that can be purchased through the auction
- This limit is set to reflect the quantity at which customers are no longer willing to pay for increased reliability (improved LOLE)
- Limit can result in a straight, concave or convex shaped demand curve

Illustrative ICA Demand Curve

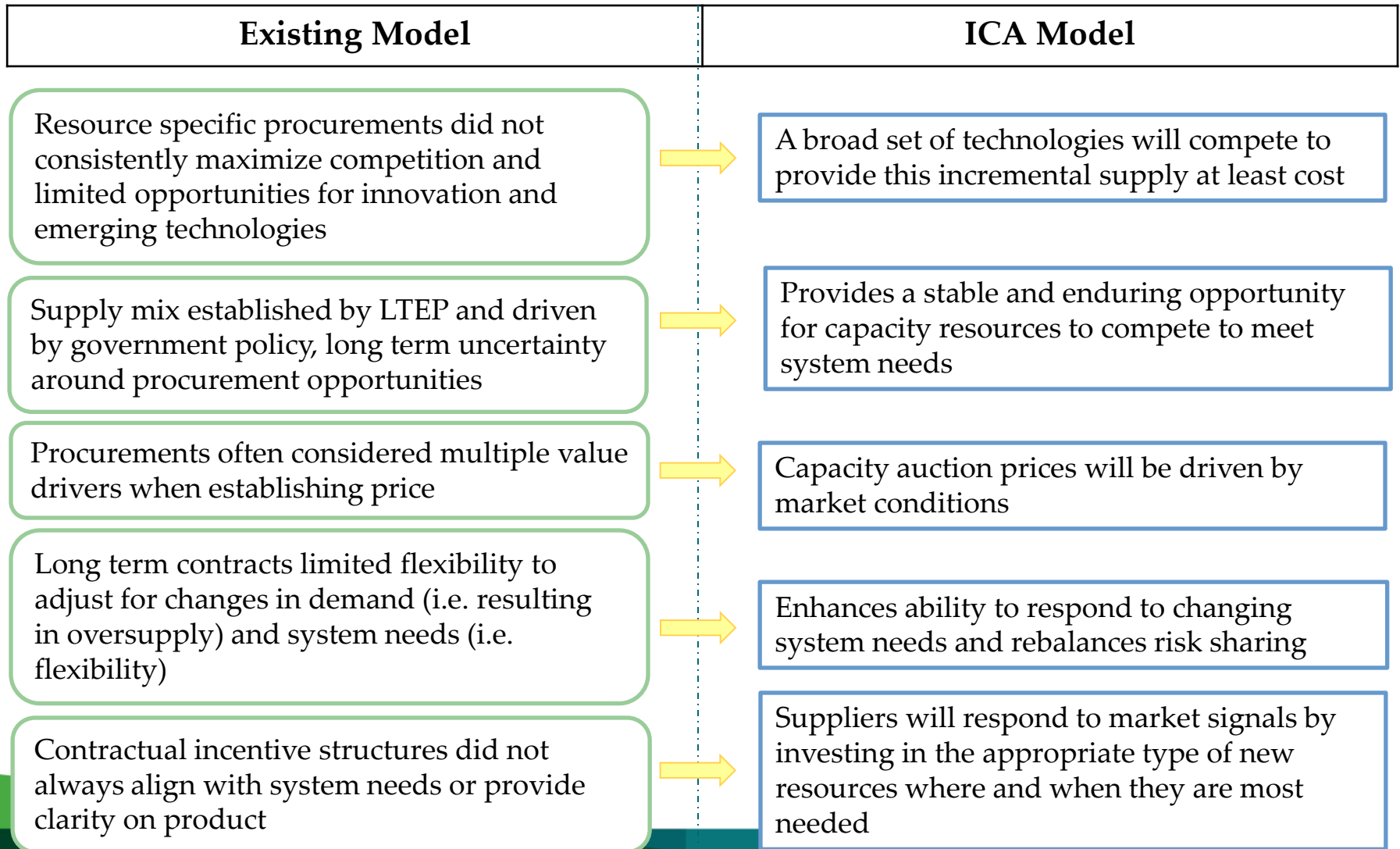


Illustrative Auction Clearing

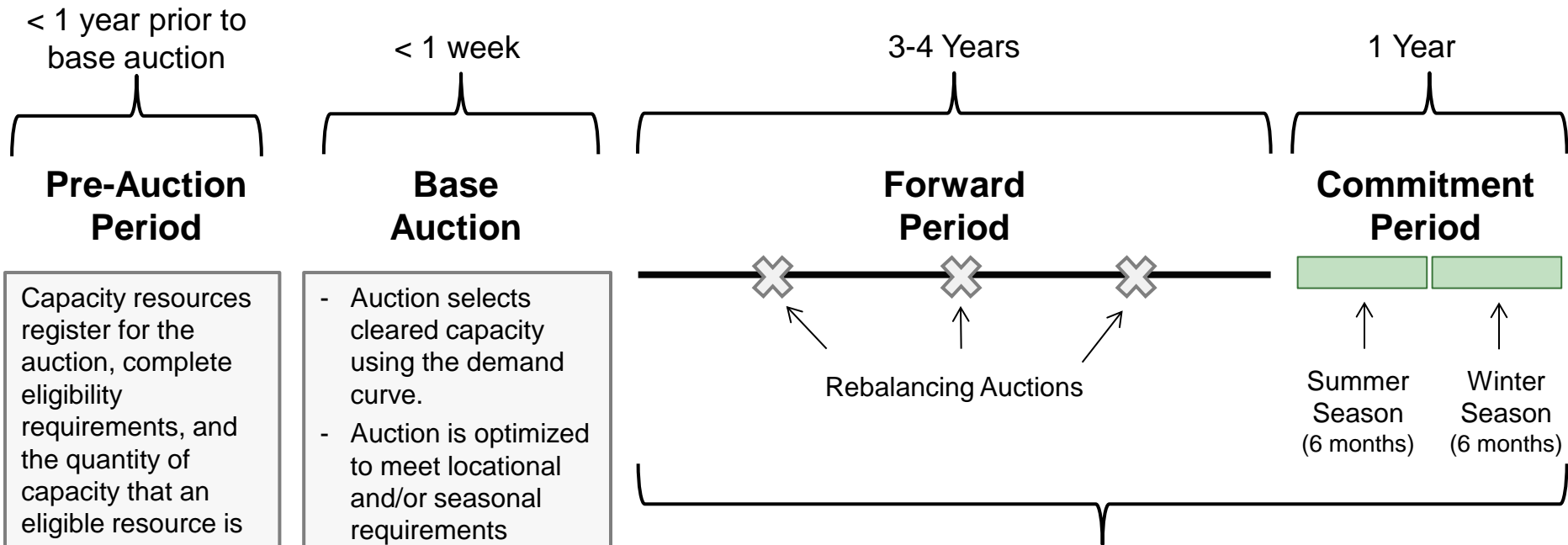


Auction Participation & Timelines

Evolving Participation Model



Incremental Capacity Auction Timelines



Capacity resources register for the auction, complete eligibility requirements, and the quantity of capacity that an eligible resource is able to offer into the auction is determined.

- Auction selects cleared capacity using the demand curve.
- Auction is optimized to meet locational and/or seasonal requirements

- Length of Forward Period is to be determined. PJM & ISO-NE have set it to approx. 3 years
- The frequency and timing of Re-balancing Auctions is to be determined. PJM holds 3 re-balancing auctions (20 months, 10 months, & 3 months in advance of the Commitment Period)
- Capacity is delivered and payments are made in the commitment period.
- Measurement and verification processes assess resources' success in meeting their obligations.
- Non-performance implications when obligations are not met

Illustration of Auction Process



QUESTIONS & COMMENTS



Next Steps

- Stakeholders are invited to provide any questions or feedback by July 12, 2017 to engagement@ieso.ca . IESO is especially interested in hearing your thoughts on the following:
 - Problem statement and how best to solve it
 - Feedback on the assumptions discussed today
- Upcoming Fundamentals meeting on July 20th will explore the design elements in more detail and highlight linkages and dependencies
- First Options phase meeting on August 16th