Installed Capacity (ICAP) Market

E-Learning Module

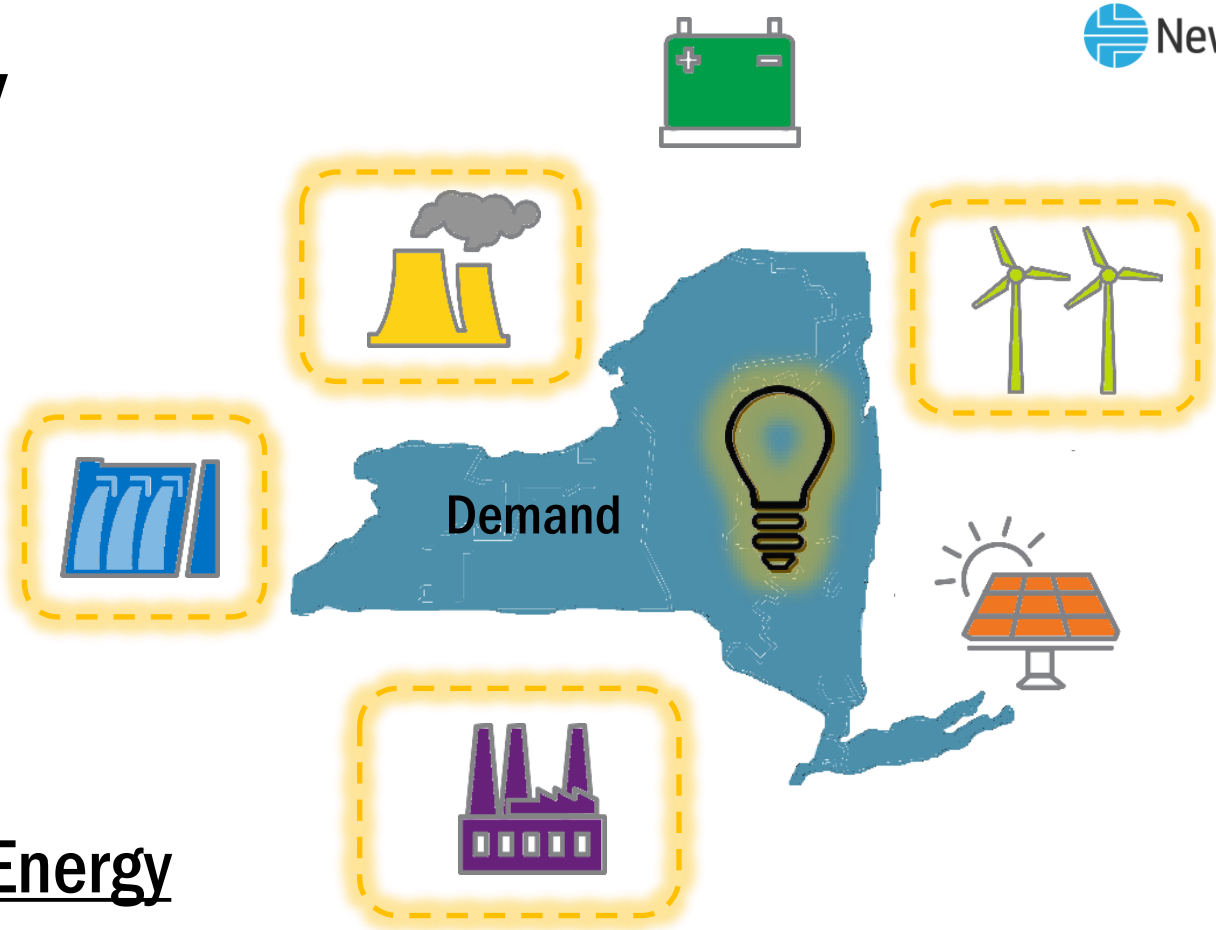
Installed Capacity Market

- **MODULE OBJECTIVES:**
  - Name three benefits of the NYISO Capacity Market
  - Describe the difference between Installed Capacity and Unforced Capacity
  - List the basic processes and activities associated with conducting NYISO's Capacity Market

Capacity vs. Energy

Capacity

- Actual or potential ability to perform
  - Refers to the electric power output for which a generating system, plant, or unit is rated
- Capacity required to meet expected maximum load + margin
- Capacity sold/purchased through NYISO's Installed Capacity Market



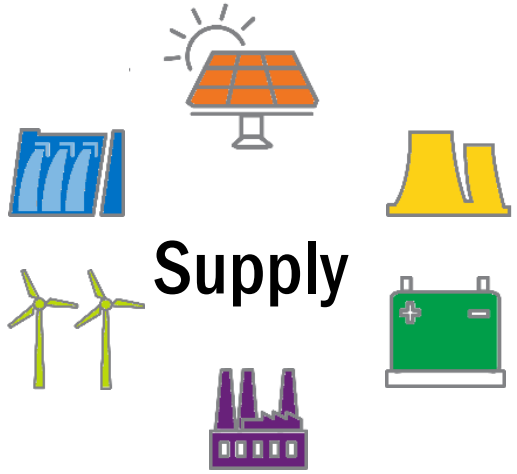
Energy

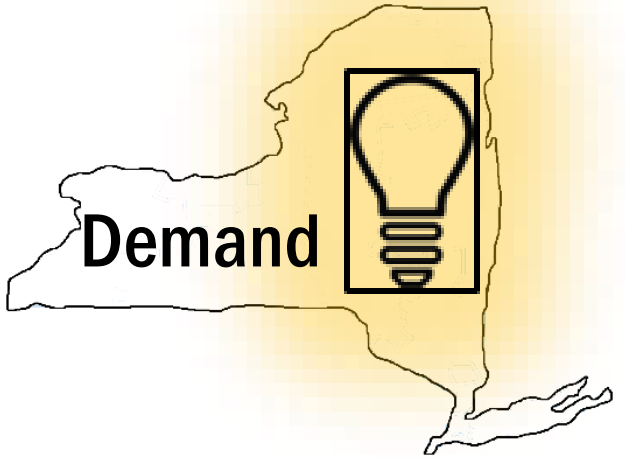
- Amount of actual energy produced over time
- Energy required to meet actual consumption or demand
- Energy sold /purchased through NYISO's Energy Markets

ICAP Market Benefits

Benefits of the ICAP Market

- Ensures resource adequacy
  - Do we have enough?
    - Supply is sufficient to meet load
    - Adhere to reliability standards





Benefits of the ICAP Market

- Recover portion of fixed costs

Variable Costs vs. Fixed Costs

Energy Market

(Market Clearing Prices - LBMPs)

Portion from ICAP Market

(Auction Clearing Prices)

Benefits of the ICAP Market

- Market signal for investment
  - Potential Investors:
    - Is it worth building a new plant?
    - Where should I build a new plant?
    - Do I have the technology to build a plant that is competitive?

ICAP Market Mechanics

ICAP vs. UCAP

- ICAP:

  - Installed Capacity describes the market as opposed to the product that is sold/purchased

- UCAP:

  - Unforced Capacity describes the measure by which
    - ICAP suppliers will be rated for the capacity that they are qualified to sell
    - LSEs procure capacity to satisfy their obligation

  in accordance with formulae set forth in NYISO procedures

ICAP Market – Capability Year and Capability Periods

- Capability Year: May 1st through April 30th
  - Summer Capability Period: May 1st to October 31st of each year
  - Winter Capability Period: November 1st of each year to April 30th of the following year

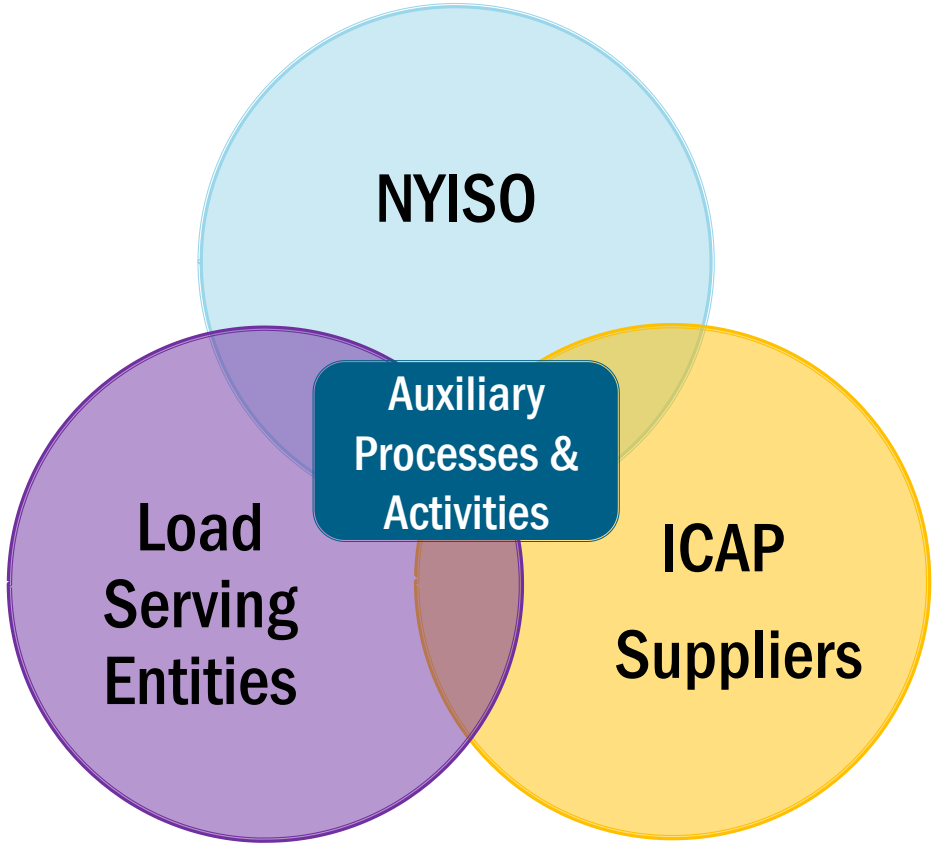
Winter Capability Period						Summer Capability Period					
Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct

Buying and Selling Capacity in NY

- Buying/selling capacity:
  - NYISO Auctions
  - Bilateral transactions
- Installed Capacity Suppliers (ICAP Suppliers):
  - Internal to NYCA
    - Generators
    - Special Case Resources (Demand Side Resource)
  - External suppliers in neighboring Control Areas

ICAP Market Mechanics

- How does it work?
  - Suppliers offer their capacity
  - Loads bid to procure capacity
  - NYISO runs auctions to match bids and offers to determine a clearing price
  - Auxiliary processes and activities



ICAP Market Mechanics

Auxiliary Processes and Activities

1) Determining the amount of capacity required

2) Determining the amount of capacity available

3) Determining the amount of capacity suppliers are qualified to offer

4) Determining the amount of capacity obligation to be procured

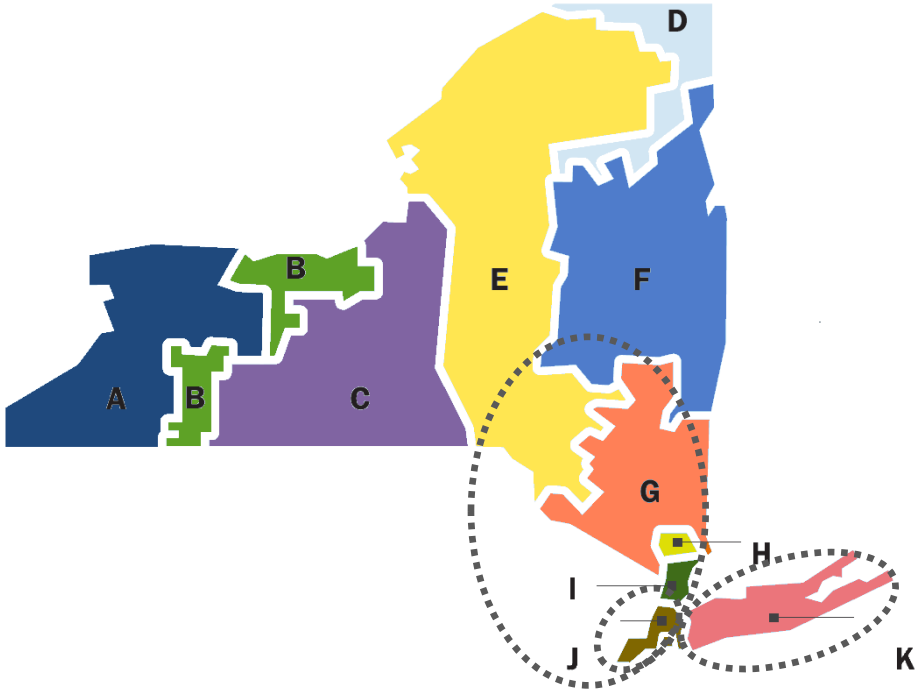
Auxiliary Processes and Activities

- Determining the amount of capacity required – How much do we need?
  - Calculated as the Minimum Installed Capacity Requirement each Capability year
  - NYCA Minimum Installed Capacity Requirement based on:
    - Peak Load Forecast
    - Reliability Standards
    - Installed Reserve Margin (IRM)

NYCA Minimum ICAP Requirement = Forecasted NYCA Peak Load x (1 + IRM)

Auxiliary Processes and Activities

- Minimum Locational Installed Capacity Requirements also calculated for the following localities:
  - Zone G-J
  - Zone J
  - Zone K



Auxiliary Processes and Activities

- Determining the amount of capacity available – How much do we have?
  - Installed Capacity (ICAP)
    - Suppliers provide data to support their capability to produce a certain number of MWs
    - Seasonal effects taken into consideration

ICAP

Auxiliary Processes and Activities

- Resource Capability determined by one of the following, depending on the type of unit
  - DMNC / DMGC Test
  - Performance Test
  - Resource Nameplate
  - Actual Production Data

ICAP

Auxiliary Processes and Activities

- Determining the amount of capacity suppliers are qualified to offer – How much can be sold?
  - Unforced Capacity (UCAP)
    - Components that determine UCAP for resources are
      - Maximum Demonstrated Output
      - Deliverability Limit
      - Duration Adjustment factor
      - Historical Availability

UCAP

Auxiliary Processes and Activities

UCAP for Resources:

A generator may sell Capacity equal to its maximum demonstrated output adjusted for the deliverability limit, duration adjustment factor and by its historical availability

UCAP = Adjusted ICAP * (1 – Derating Factor)

Adjusted ICAP = ICAP * Duration Adjustment Factor

ICAP = Min (CRIS, DMNC)

UCAP

*This formula is for Internal Generators that are not BTM:NG

Auxiliary Processes and Activities

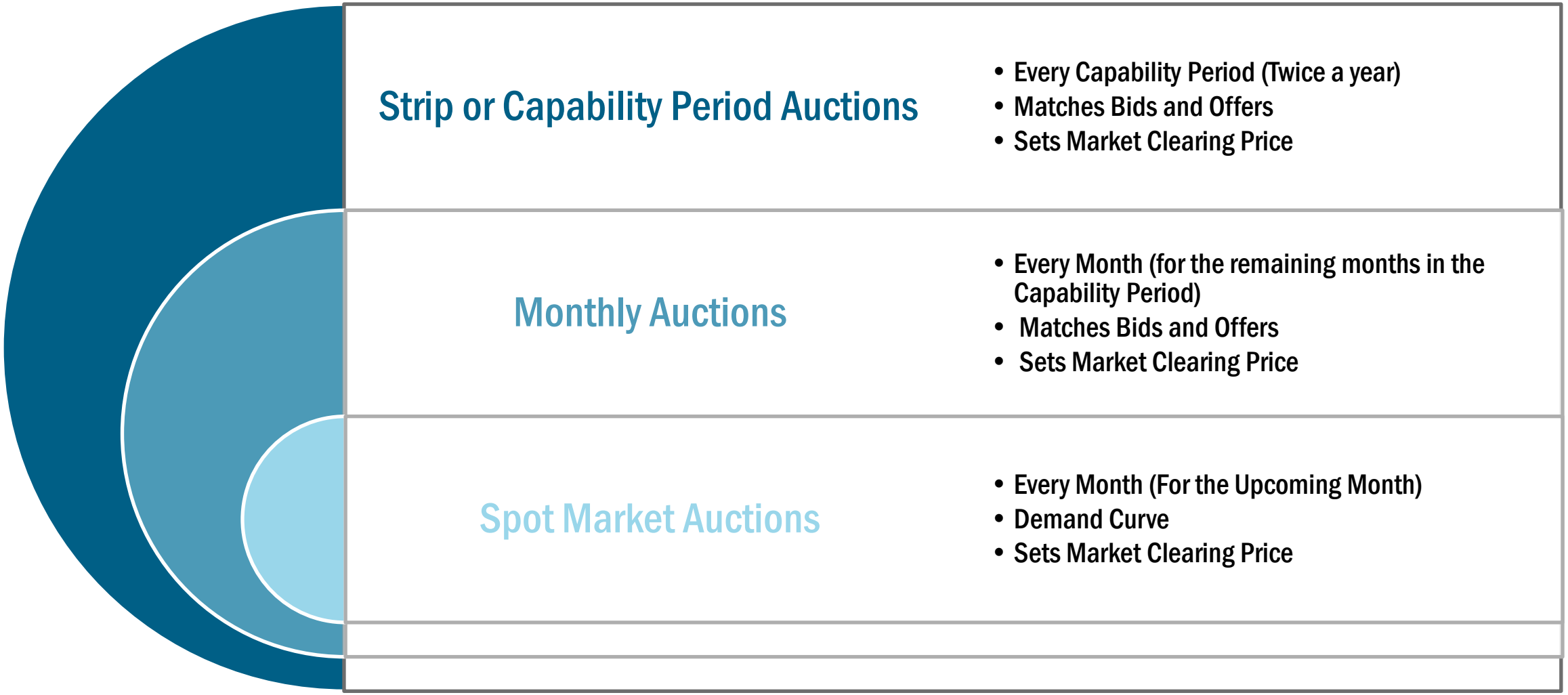
- Determining the amount of capacity obligation to procure - How much must be purchased?
  - Unforced Capacity (UCAP)
    - Three components that determine the UCAP for LSEs
      - Forecasted peak load for each LSE
      - Installed Reserve Margin (IRM)
      - Statewide outage rate

UCAP

Auxiliary Processes and Activities

- UCAP for LSEs:
  - All LSEs are required to purchase a specific amount of the Total NYCA Capacity Requirement
  - LSEs may also have Locational Capacity Requirements
    - (G-J Locality, LI and NYC)
  - Calculated every capability period by NYISO
  - Each month, every LSE must satisfy its minimum UCAP requirement

ICAP Market Auctions



ICAP Market Settlements

Monthly Capacity Auction Settlement ($)	=	Auction Award (MWs)	x	Applicable Auction Market Clearing Price ($/kW - month)

Multiplied by conversion factor 1000 to convert MW to kW

- Auction Awards appear in following weekly invoice
  - Monthly amount is prorated by the number of days on the weekly invoice divided by the number of days in the month
- Bilateral Transactions are settled between parties outside of NYISO

ICAP Market Summary

- Benefits of the ICAP Market
- Difference between ICAP and UCAP
- Processes and activities associated with the ICAP Market
  - Capacity Required
  - Capacity Available
  - Capacity Suppliers Qualified to Offer
  - LSE Obligation to Procure
  - ICAP Auctions and Awards
  - ICAP Settlements

Additional Resources

- Tariffs – MST and OATT
- Installed Capacity Manual
- NYISO Load Forecasting Manual
- ICAP Automated Market User's Guide
- Market Participant User's Guide

Questions?

For any future assistance, please contact NYISO Stakeholder Services at stakeholder_services@nyiso.com or by phone at (518) 356-6060