Alternative Methods for Determining LCRs: Update

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Agenda

- **Overview**
- **Phase 2: Refining the Methodology**
  - Complete Tan45
  - Cost Curve Sensitivities
  - Aligning Cost and Requirements
- **Next Steps**
  - Phase 2: Final Refinements
  - Phase 3: Market Simulations
- **Questions**

Overview

- This presentation will provide an update on the NYISO's further work on examining alternative methods for determining LCRs

Complete Tan45 - Update

Complete Tan45 Conclusions

- **The current conclusions based on analysis to date are**
  - Simplified analysis was reasonable approximation
  - Still observing stability in the optimization method relative to the current process

Cost Curve Sensitivities

Cost Curve Sensitivities

- **The following sensitivities were tested**
  - Net CONE
    - Fixed Value
    - 5 point curve
    - 5 point curve (doubled slope)
  - Reference Price
    - Fixed Value
    - 5 point Curve
  - Gross CONE
    - Single Value

Cost Curve Sensitivities: Shape of the Cost Curve

- Single value cost curves are simple, but are an over simplification of reality. Therefore, they can result in counter-intuitive results
- Elasticity is needed to adequately reflect system conditions
- Therefore, elasticity is valuable in the development of the net CONE curves

Cost Curve Sensitivities: Net CONE

- **Net CONE is the levelized embedded costs of a peaking plant net of energy and ancillary services revenues**
  - Represents the marginal cost of providing capacity
  - Same formulation used to establish the ICAP Demand Curves

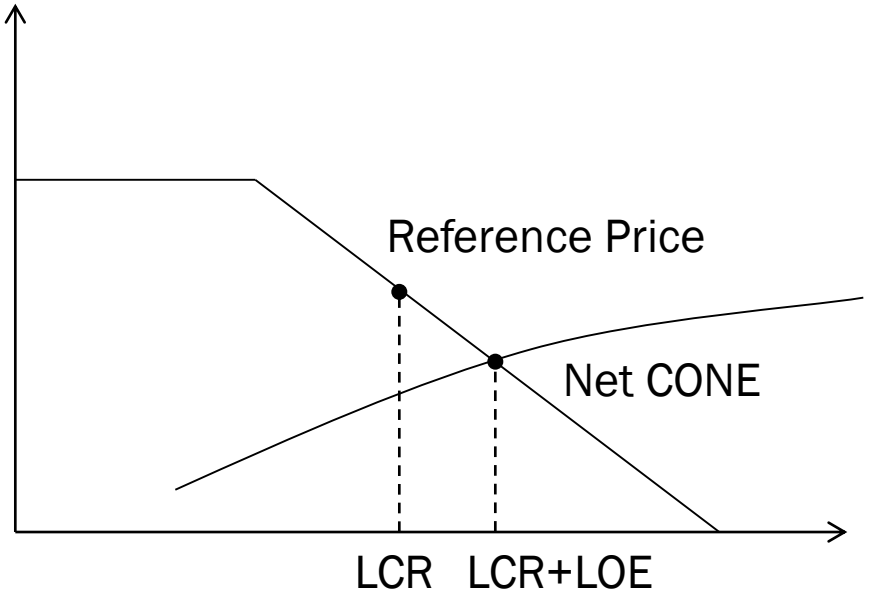
Aligning Cost (Price) and Requirements

Current Objective Function

- Capacity quantity of each Locality used in the objective function corresponds to 100% of the Locality's requirement
- Prices (*i.e.*, net CONE) used in the objective function corresponds to the level of excess (LOE) condition

Aligning Cost and Requirements

- Need to ensure there is alignment between the capacity requirements (quantity) being optimized and the cost (price) being assumed when calculating total cost



Methods for Aligning Cost and Requirements

- **The NYISO has identified and is examining the following methods for aligning costs and requirements**
  - Alter Objective Function
    - Alters the quantity in the objective function, but not the decision variables (*i.e.*, LCRs)
  - Alter Cost Curve
    - Alters the prices in the objective function
  - Alter the Optimal Requirements
    - Alters the decision variables to be the optimal quantity of capacity at the LOE condition

Altering Objective Function

Scenario	Zone J LCR	Zone K LCR	G-J LCR
Current LCR Methodology	81.4%	103.2%	91.3%
Optimized Methodology	77.5%	107.0%	91.0%
Refined Optimized Methodology (Altered Objective function)			
Refined Optimized Methodology (Aligned Cost Curve)	78.2%	105.6%	90.9%
Refined Optimized Methodology * (Optimal capacity at LOE condition)	78.9%	105.3%	91.5%

*Note: Results for the Refined Optimized Methodology (Altered Objective Function) are still being evaluated and will be provided at a future ICAPWG

Next Steps

Phase 2: Refine Methodology

- The NYISO will:
  - Return to ICAPWG with more results from sensitivities to inform discussion on methodology
  - Develop final methodology to be used in future Phases

Phase 3: Market Simulations

- **Goal:** Simulate additional market situations to demonstrate performance of methodology
- The NYISO will:
  - Perform sensitivities with multiple changes to the system
  - Evaluate how the process would be performed with full Tan45 followed by optimization

Other Next Steps

- The NYISO will consider input received during today's ICS meeting
- Additional comments sent to zstines@nyiso.com will be considered
- The NYISO will return to a future ICS meeting to discuss its progress and adjustments to the plan after considering comments or results

2017 Project Development

Stage	Objective	Specific Topics:
Proof of Concept	Demonstrate alternative methodology in relation to guiding principles (*i.e.*, least cost, stability, robust, predictability)	Generation +/- Unit net CONE +/- Transmission +/-
Refine Methodology	Modify the alternative method to ensure that all aspects have a purpose and are being performed as a result of sound market and engineering principles	Unit net CONE curves Potential Bounds Modeling methodology
Market Simulations	Simulate realistic market situations to demonstrate performance of methodology	Changes in resources Topological changes Locality configurations
Defining Process	Develop a process for the methodology that ensures guiding principles are being achieved over time	Develop process of method Process timeline Transition methods
Demonstrating Market Benefits	Demonstrate the methodology results in market benefits and resolve any issues that arise from its implementation	LOLE Criterion Consumer impact Multiyear simulation Cost allocation
Final Market Design	Summarize all findings and develop a final market design for implementation	Develop final market design

Questions?

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- Planning the power system for the future
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