

Balance-of-Period TCC Auctions – Market Design Review & Proposed Credit Policy

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Agenda

- ◆ Review history of Balance-of-Period TCC Auction design proposal and vote
- ◆ Balance-of-Period TCC Auction design review
 - *Benefits*
 - *Scope*
 - *Bidding features*
 - *Auction design*
- ◆ Credit requirements review
- ◆ Next steps

Background

- ◆ The Balance-of-Period (BoP) TCC Auction design was voted upon by stakeholders as part of the approval of the Multi-Duration Centralized TCC Auction market design.
 - *Market Design approved at the August 4, 2010 BIC meeting*
 - [Agenda 11 TCC EFP1 MD Mkt Design Revised.pdf](#)
- ◆ A project was identified to gather functional requirements and determine the scope of the implementation effort that includes the multi-duration format and the sale of Non-Historic Fixed Price TCCs.
 - *Project milestone was reported as complete at the June 23, 2011 BPWG meeting*
 - [BPWG 2011ProjectMilestones 06 23 11 approved.pdf](#)

Background (contd.)

- ◆ An update on the implementation effort was presented to stakeholders citing increased complexity and scope of the effort
 - *Project Status presented at the May 12, 2011 MIWG meeting*
 - [Multi-Duration Project Status MIWG 051211 v2.pdf](#)

- ◆ The plan to deliver the functionality as a multi-phased approach was presented to stakeholders
 - *Project Status presented at the October 19, 2011 MIWG meeting*
 - [Agenda -4 Multi-Duration Project Update.pdf](#)

Balance-of-Period TCC Auction Benefits

- ◆ The BoP TCC Auction provides Market Participants the ability to reconfigure their portfolios in all the remaining months of the Capability Period that are offered as part of the auction
 - *The Monthly Reconfiguration Auctions are single period, one month auctions that do not provide MPs the ability to reconfigure their portfolios for more than one month in the future*

- ◆ The BoP TCC Auction decreases the amount of time collateral is held on a six month TCC auction award
 - *With the BoP TCC Auction design, collateral is re-calculated at the end of each month within a Capability Period*

Balance-of-Period TCC Auction Scope

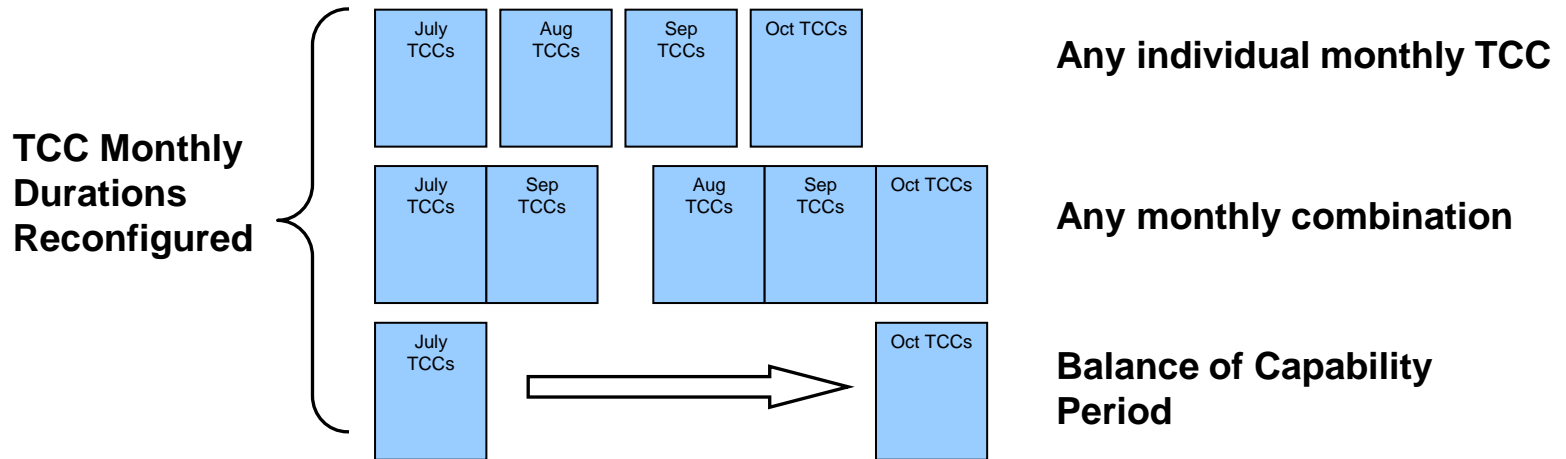
- ◆ **The BoP TCC Auctions shall achieve the following objectives:**
 - *Each BoP TCC Auction shall include all the remaining months in a Capability Period*
 - *The BoP TCC Auctions shall replace the Monthly Reconfiguration Auctions*
 - **The first BoP TCC Auction for a Capability Period shall occur after the last round of the Centralized TCC Auction**
 - *No new capacity shall be made available in a BoP TCC Auction*
 - *Market Participant (MP) Invoices shall be generated monthly at the end of a BoP TCC Auction*
 - *With the implementation of BoP TCC Auctions, MPs participating in the NYISO TCC market shall be subject to new credit requirements (discussed later in this presentation)*

Balance-of-Period TCC Auction Bidding

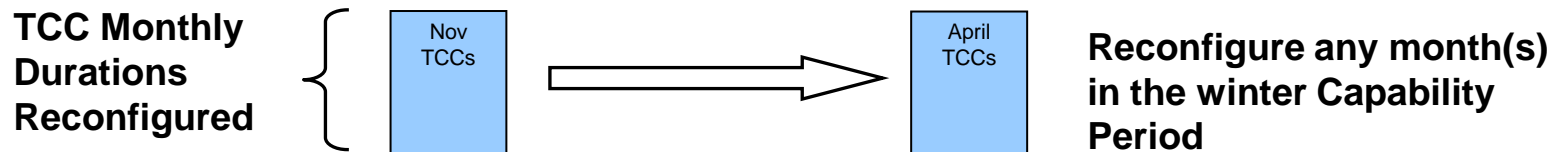
- ◆ The BoP TCC Auctions shall have the following bidding features:
 - *MPs can bid in one or more months (or “periods”) in a BoP TCC Auction*
 - The term “period” is used to denote the individual time frames for which a bid can be specified
 - In a BoP TCC Auction, each period is always one month in duration
 - *MPs can choose to submit a single bid that covers more than one period in a BoP TCC Auction*
 - *The periods selected by the MP in a multi-period bid need not be contiguous*
 - *MPs can choose to offer only a portion of a multi-period award*
 - Example: MP awarded 5 MW in the months of July and August on a single bid can choose to sell 1 MW in the month of July and 2 MW in the month of August in the next BoP TCC Auction that includes the months of July and August of that year

Balance-of-Period TCC Auction Bidding

Example: July Monthly Balance-of-Period TCC Auction



Example: November Monthly Balance-of-Period TCC Auction



Balance-of-Period TCC Auction Design

- ◆ **The BoP TCC Auction has the following features:**
 - *Each period in a multi-period bid shall clear the same number of MWs or the entire bid shall not clear*
 - *The clearing price of a multi-period bid shall be the sum of the rounded clearing prices in each period included in that bid*
 - *The following information will be posted publically:*
 - **The clearing price at each valid PTID in each period**
 - **The quantity of TCCs awarded and the periods in which the TCCs were awarded**
 - **The binding constraints in each period**

Balance-of-Period TCC Auction Credit Requirements Review

Background

- ◆ The NYISO and MPs worked collaboratively throughout 2015 to develop and finalize the BoP TCC Auction credit policy
- ◆ Detailed analysis supporting this proposal can be found in the September 22, 2015 CPWG meeting materials

Proposed Credit Policy Assumptions

- ◆ BoP TCCs are monthly TCCs purchased in a BoP TCC Auction
- ◆ The price of a BoP TCC will be based on the Market Clearing Price for that TCC
- ◆ MPs will pay for these TCCs upon completion of the BoP TCC Auction in which they are purchased

Proposed Update to Bidding Requirement

- ◆ MPs will have the ability to bid to purchase TCCs for longer than a one month duration within the Capability Period during the BoP TCC Auction (i.e. two, three, four or five month TCC)

- ◆ As such, updates to the Bidding Requirement are necessary. The NYISO proposes the following updates:
 - *One Month TCC – higher of \$600 or Bid price (currently in the Tariff)*
 - *Two Month TCC – higher of \$900 or Bid price*
 - *Three Month TCC – higher of \$1,200 or Bid price*
 - *Four Month TCC – higher of \$1,500 or Bid price*
 - *Five Month TCC – higher of \$1,800 or Bid price*
 - *Six Month TCC – higher of \$2,000 or Bid price (currently in the Tariff)*

Proposed Credit Policy

- ◆ The BoP TCC Auction credit policy will be made up of three components
 - *Current month credit requirement*
 - The NYISO will update the credit formulas for current month TCCs to take account of the additional data on TCC outcomes that has become available since the current rules were developed in early 2006
 - Current month will also include the upcoming month once the BoP TCC Auction has run for the remainder of the Capability Period but has not yet started
 - *Future month credit requirement*
 - The BoP TCC Auction credit requirements reflect the need for a fundamental extension of the current TCC collateral design to define credit requirements for future month TCCs
 - *Future six-month credit requirement*
 - The goal of this credit requirement is to establish sufficient credit support to cover the expected payments due on the TCC portfolio at the time credit support is posted to cover the last six months of an annual TCC

Current Month Summary

- ◆ Under the proposed BoP TCC Auction credit policy, credit coverage for the current month of a TCC purchased as a six-month or annual TCC will be determined by the current month TCC formula

- ◆ While the current monthly formula includes distinct credit coverage margin formulas for each month, the proposed formulas will initially be the same for all months, subject to further discussion with MPs
 - *The CMS will maintain the capability to implement distinct monthly formulas to allow changes to be made based on experience with BoP TCC Auctions*

- ◆ The monthly credit coverage formula will include distinct credit coverage margin formulas for Zone J, Zone K and Non-JK
 - *The CMS will have the capability to implement distinct formulas for Intra-J, Intra-K and Neither-JK TCCs to allow changes to be made based on experience with BoP TCC Auctions*

Current Month Proposed Policy

- ◆ The following slide provides the formulas for determining margins that the NYISO proposes in the updated current month formulas

- ◆ The price paid for the TCC will be subtracted from the margin to determine the credit requirement
 - *For positive TCCs, this could result in a credit offset to the overall TCC credit requirement*
 - *As is done today, negative TCCs will likely have an increased credit requirement as the price paid to the MP will be added to the margin*

Current Month Proposed Formulas

- ◆ Zone J Formula:

$$\text{Margin} = \begin{cases} \alpha \sqrt{[-(4.454 \times 10^6) + 2400(TCC \text{ price})]}, & \text{if } TCC \text{ price} \geq 10000 \\ \alpha[184.148 + 0.42369378(TCC \text{ price})], & \text{if } 2500 \leq TCC \text{ price} < 10000 \\ \alpha \sqrt{[(1.171 \times 10^6) + 150(TCC \text{ price})]}, & \text{if } 0 \leq TCC \text{ price} < 2500 \\ \alpha \sqrt{[(1.171 \times 10^6) + 2725.8|TCC \text{ price}|]}, & \text{if } 0 > TCC \text{ price} \geq -5740 \\ \alpha \sqrt{[-(6.632 \times 10^7) + 14484|TCC \text{ price}|]}, & \text{if } TCC \text{ price} < -5740 \end{cases}$$

Where $\alpha_{\text{low}} = 1.250$, $\alpha_{\text{medium}} = 1.500$, $\alpha_{\text{high}} = 1.650$

- ◆ Non-JK Formula

$$\text{Margin} = \begin{cases} \alpha \sqrt{-(1.100 \times 10^7) + 5000(TCC \text{ price})}, & \text{if } TCC \text{ price} \geq 10000 \\ \alpha[-448.67282 + 0.66936708(TCC \text{ price})], & \text{if } 2500 \leq TCC \text{ price} < 10000 \\ \alpha \sqrt{(2.500 \times 10^5) + 500(TCC \text{ price})}, & \text{if } 0 \leq TCC \text{ price} < 2500 \\ \alpha \sqrt{(2.500 \times 10^5) + 6000|TCC \text{ price}|}, & \text{if } -2500 \leq TCC \text{ price} < 0 \\ \alpha \sqrt{-(4.600 \times 10^7) + 24500|TCC \text{ price}|}, & \text{if } TCC \text{ price} < -2500 \end{cases}$$

Where $\alpha_{\text{low}} = 1.000$, $\alpha_{\text{medium}} = 1.125$, $\alpha_{\text{high}} = 1.2375$

- ◆ Zone K Formula:

$$\text{margin} = \begin{cases} \alpha \sqrt{-(2.350 \times 10^6) + 3500(TCC \text{ price})}, & \text{if } TCC \text{ price} \geq 10000 \\ \alpha[556.6431 + 0.51573748(TCC \text{ price})], & \text{if } 1000 \leq TCC \text{ price} < 10000 \\ \alpha \sqrt{(1.000 \times 10^6) + 150(TCC \text{ price})}, & \text{if } 0 \leq TCC \text{ price} < 1000 \\ \alpha \sqrt{(1.000 \times 10^6) + 15000|TCC \text{ price}|}, & \text{if } -2500 \leq TCC \text{ price} < 0 \\ \alpha \sqrt{(3.600 \times 10^7) + 1000|TCC \text{ price}|}, & \text{if } TCC \text{ price} < -2500 \end{cases}$$

Where $\alpha_{\text{low}} = 1.625$, $\alpha_{\text{medium}} = 1.750$, $\alpha_{\text{high}} = 1.925$

Future Month Summary

- ◆ The future month credit requirement will be recalculated each month using the prices as determined in the most recent BoP TCC Auction
- ◆ The credit requirement for each month will be rolled off as the settlements for that month are completed
- ◆ There will not be a credit requirement for a TCC that is sold within the current Capability Period

Future Month Proposed Policy

- ◆ The proposed credit policy for future month TCCs will initially use historical PJM data to define the index ratio used in calculating credit requirements for future month TCCs
- ◆ As NYISO data becomes available following implementation of the BoP TCC Auction, the NYISO will use a combination of historical NYISO TCC and PJM FTR data to define the index ratio used in calculating credit requirements for future month TCCs

Future Month Proposed Policy

- ◆ The proposed methodology for calculating the credit requirement for future month TCCs is based on individual monthly credit coverage margins for each future month of the Capability Period for which a TCC is held
 - *Margins will be calculated by multiplying the monthly credit requirement for the TCCs held for that month by an index ratio that will be calculated utilizing PJM data*

Future Month Proposed Policy

- ◆ Distinct index ratios will be used for each month
 - *Index ratios were developed using data for summer, winter and shoulder months, respectively*
 - Summer months are May, June, July and August
 - Winter months are December, January and February
 - Shoulder months are March, April, September, October and November

Future Month Proposed Policy

- ◆ Proposed Index Ratios Spring Auctions – Summer Capability Period

Table 11
Spring Auctions

As of Date	Collateral for Month					
	May	June	July	August	September	October
April	Current	1 Month in Advance Summer	2 Month in Advance Summer	3 Month in Advance Summer	4 Month in Advance Shoulder	5 Month in Advance Shoulder
Index Ratio	1	0.3473	0.2858	0.2858	0.3243	0.3243
May	-	Current	1 Month in Advance Summer	2 Month in Advance Summer	3 Month in Advance Shoulder	4 Month in Advance Shoulder
Index Ratio		1	0.3473	0.2858	0.3633	0.3243
June	-	-	Current	1 Month in Advance Summer	2 Month in Advance Shoulder	3 Month in Advance Shoulder
Index Ratio			1	0.3473	0.3684	0.3633
July	-	-	-	Current	1 Month in Advance Shoulder	2 Month in Advance Shoulder
Index Ratio				1	0.4255	0.3684
August	-	-	-	-	Current	1 Month in Advance Shoulder
Index Ratio					1	0.4255
September	-	-	-	-	-	Current
Index Ratio						1

Future Month Proposed Policy

- Proposed Index Ratios Autumn Auctions – Winter Capability Period

Table 12
Autumn Auctions

As of Date	Collateral for Month					
	November	December	January	February	March	April
October	Current	1 Month in Advance Winter	2 Month in Advance Winter	3 Month in Advance Winter	4 Month in Advance Shoulder	5 Month in Advance Shoulder
Index Ratio	1	0.4204	0.3202	0.3082	0.3243	0.3243
November	-	Current	1 Month in Advance Winter	2 Month in Advance Winter	3 Month in Advance Shoulder	4 Month in Advance Shoulder
Index Ratio		1	0.4204	0.3202	0.3633	0.3243
December	-	-	Current	1 Month in Advance Winter	2 Month in Advance Shoulder	3 Month in Advance Shoulder
Index Ratio			1	0.4204	0.3684	0.3633
January	-	-	-	Current	1 Month in Advance Shoulder	2 Month in Advance Shoulder
Index Ratio				1	0.4255	0.3684
February	-	-	-	-	Current	1 Month in Advance Shoulder
Index Ratio					1	0.4255
March	-	-	-	-	-	Current
Index Ratio						1

Future Six-Month TCC Proposed Policy

- ◆ The goal of the future six-month TCC credit requirement is to establish sufficient credit support to cover the expected payments due on the TCC portfolio at the time credit support is posted to cover the last six months of an annual TCC
 - *Expected payments due to or from the TCC holder are reflected in the price of the six-month TCC when it is re-valued prior to the beginning of the Capability Period*
- ◆ Given that the NYISO will not have the ability to re-value the second six months of the annual TCC in the BoP TCC Auctions, the NYISO will use an implicit price, calculated from the Centralized TCC Auctions, to determine the credit requirement for the second six months of an annual TCC
- ◆ The implicit price for the future six-month TCC is calculated as the final round price of the annual TCC less the second round price of the corresponding six-month TCC

Future Six-Month TCC Proposed Policy

- ◆ The following slides provide the formulas for determining margins that the NYISO proposes for the future six-month TCC formulas

- ◆ Collateral Formula Scaling Factors are as follows:
 - *Low - 0.4 scaling factor to margin for all TCCs*

 - *Medium - 0.625 scaling factor to margin of Winter Non-J TCCs and 0.5 scaling factor to margin of all other TCCs*

 - *High - 0.75 scaling factor to margin of Winter Non-J TCCs and 0.625 scaling factor to margin of all other TCCs*

Future Six-Month TCC Formulas

- ◆ The formulas for the per MW margins and total collateral are set forth below. α is the scaling factor; $| |$ signifies absolute value
 - *Winter Zone J*
 - If $| \text{Initial Price} | \geq \$17,500$
 - [1] Margin = $+\alpha (6,513 * | \text{Initial Price} | - 63,200,000) .^5$
 - [2] Collateral = $- \text{TCC price} + \alpha (6,513 * | \text{Initial Price} | - 63,200,000) .^5$
 - If $| \text{Initial Price} | < \$17,500$
 - [3] Margin = $\alpha (4,000,000 + 2,673 * | \text{Initial Price} |) .^5$
 - [4] Collateral = $- \text{TCC Price} + \alpha (4,000,000 + 2,673 * | \text{Initial Price} |) .^5$
 - *Summer Zone J*
 - If $| \text{Initial Price} | \geq \$30,000$
 - [5] Margin = $+\alpha (10,630 * | \text{Initial Price} | - 257,300,000) .^5$
 - [6] Collateral = $- \text{TCC Price} + \alpha (10,630 * | \text{Initial Price} | - 257,300,000) .^5$
 - If $| \text{Initial Price} | < \$30,000$
 - [7] Margin = $\alpha (4,000,000 + 1,920 * | \text{Initial Price} |) .^5$
 - [8] Collateral = $- \text{TCC Price} + \alpha (4,000,000 + 1,920 * | \text{Initial Price} |) .^5$

Future Six-Month TCC Formulas

- ◆ The formulas for the per MW margins and total collateral are set forth below. α is the scaling factor; $| |$ signifies absolute value
 - *Winter Non-Zone J*
 - If $| \text{Initial Price} | \geq \$10,000$
 - [9] Margin = $+\alpha (5,634 * | \text{Initial Price} | - 8,047,461) \cdot .5$
 - [10] Collateral = $- \text{TCC price} + \alpha (5,634 * | \text{Initial Price} | - 8,047,461) \cdot .5$
 - If $\$4,877.8 \leq \text{Initial Price} < \$10,000$
 - [11] Margin = $\alpha (462,539 + 4,783 * \text{Initial Price}) \cdot .5$
 - [12] Collateral = $- \text{TCC Price} + \alpha (462,539 + 4,783 * \text{Initial Price}) \cdot .5$
 - If $\$0 \leq \text{Initial Price} < \$4,877.8$
 - [13] Margin = $\alpha (1000 + .794992141 * \text{Initial Price})$
 - [14] Collateral = $- \text{TCC Price} + \alpha (1000 + .794992141 * \text{Initial Price})$
 - If $-\$4,877.8 \leq \text{Initial Price} < \0
 - [15] Margin = $\alpha (1000 - .794992141 * \text{Initial Price})$
 - [16] Collateral = $- \text{TCC Price} + \alpha (1000 - .794992141 * \text{Initial Price})$
 - If $-\$10,000 \leq \text{Initial Price} < -\$4,877.8$
 - [15] Margin = $\alpha (462,539 + 4,783 * \text{Initial Price}) \cdot .5$
 - [16] Collateral = $- \text{TCC Price} + \alpha (462,539 + 4,783 * \text{Initial Price}) \cdot .5$

Future Six-Month TCC Formulas

- ◆ The formulas for the per MW margins and total collateral are set forth below. α is the scaling factor; $| |$ signifies absolute value
 - *Summer Non-Zone J*
 - If $| \text{Initial Price} | \geq \$10,000$
 - [19] Margin = $+ \alpha (10,457 * | \text{Initial Price} | - 44,400,000) \cdot 0.5$
 - [20] Collateral = $- \text{TCC price} + \alpha (10,457 * | \text{Initial Price} | - 44,400,000) \cdot 0.5$
 - If $| \text{Initial Price} | < \$10,000$
 - [21] Margin = $\alpha (25,000,000 + 3,517 * | \text{Initial Price} |) \cdot 0.5$
 - [22] Collateral = $- \text{TCC Price} + \alpha (25,000,000 + 3,517 * | \text{Initial Price} |) \cdot 0.5$

Future Six-Month TCC Formulas

- ◆ The formulas for the per MW margins and total collateral are set forth below. α is the scaling factor; $| |$ signifies absolute value
 - *Winter Zone K*
 - If $| \text{Initial Price} | \geq \$17,500$
 - [23] Margin = $+1.28 * \alpha (6,513 * | \text{Initial Price} | - 63,200,000) \cdot .5$
 - [24] Collateral = $- \text{TCC price} + 1.28 * \alpha (6,513 * | \text{Initial Price} | - 63,200,000) \cdot .5$
 - If $| \text{Initial Price} | < \$17,500$
 - [25] Margin = $+1.28 * \alpha (4,000,000 + 2,673 * | \text{Initial Price} |) \cdot .5$
 - [26] Collateral = $- \text{TCC Price} + 1.28 * \alpha (4,000,000 + 2,673 * | \text{Initial Price} |) \cdot .5$
 - *Summer Zone K*
 - If $| \text{Initial Price} | \geq \$30,000$
 - [27] Margin = $+1.28 * \alpha (10,630 * | \text{Initial Price} | - 257,300,000) \cdot .5$
 - [28] Collateral = $- \text{TCC Price} + 1.28 * \alpha (10,630 * | \text{Initial Price} | - 257,300,000) \cdot .5$
 - If $| \text{Initial Price} | < \$30,000$
 - [29] Margin = $+1.28 * \alpha (4,000,000 + 1,920 * | \text{Initial Price} |) \cdot .5$
 - [30] Collateral = $- \text{TCC Price} + 1.28 * \alpha (4,000,000 + 1,920 * | \text{Initial Price} |) \cdot .5$

Note: Zone K formulas are Zone J formulas multiplying the margin by 1.28

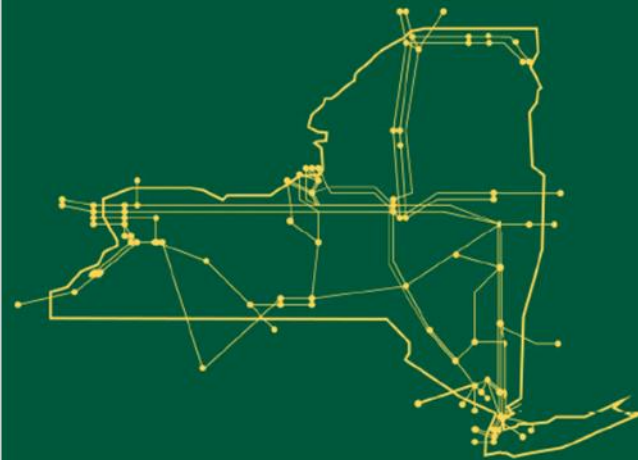
Balance-of-Period TCC Auction Recommended Credit Policy

- ◆ Given MP feedback to date, the NYISO recommends utilizing the medium margin for the current month credit requirement formulas in combination with the medium scaling factors for the future six-month TCC credit requirements
- ◆ After sufficient data is available, the index ratios for the future months of the BoP TCC Auction credit policy would be recalculated periodically using a combination of historical PJM FTR Auction data and NYISO BoP TCC Auction data
- ◆ Potential for including tariff authority for the NYISO to adjust the margins prior to the auction with advance notice to the marketplace if NYISO determines MPs are over or under collateralized

Next Steps

- ◆ Review TCC BoP design and credit requirements – March 23, 2016
- ◆ In addition to feedback provided during today's meeting, stakeholders can provide feedback on today's presentation by April 15, 2016 to deckels@nyiso.com
- ◆ Discuss any feedback or updates to the proposed design – April 2016
- ◆ Present initial draft of tariff revisions to stakeholders – May 2016
- ◆ Review stakeholder feedback and refine tariff language – May through July 2016
- ◆ Seek stakeholder approval at BIC/MC – September 2016
- ◆ Seek Board of Directors approval – November 2016
- ◆ Deploy software to production – June 2017

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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