



# Consumer Impact Analysis Methodology: Constraint Specific Transmission Shortage Pricing

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# Background

- **Transmission facility ratings limit the amount of energy that can flow from one location to the next on the bulk electric system.**
- **The NYISO assigns a non-zero constraint reliability margin (CRM) to most facilities and interfaces to help manage transmission modeling uncertainty.**
  - The CRM value represents a reduction to the otherwise applicable transmission facility rating or interface limit that is used to set the effective limit in the market software
  - A zero value CRM is applied to facilities that accommodate flows out of generation pockets, as well as external interfaces
- **The existing transmission constraint pricing (TCP) logic applies a single graduated pricing mechanism to all facilities assigned a non-zero CRM value.**

## Background (Contd.)

- The NYISO is proposing to utilize a revised and more graduated transmission shortage pricing mechanism that better accounts for the various non-zero CRM values assigned to facilities.
- The NYISO's proposal is intended to better align the transmission shortage pricing mechanism with the severity of transmission constraints.
- As part of the revised transmission shortage pricing mechanism, the NYISO is also proposing to eliminate most occurrences of constraint relaxation by including pricing values for shortages that exceed the applicable CRM value and assigning a non-zero CRM value to internal facilities currently assigned a zero value CRM

# Background – Current Transmission Shortage Pricing Mechanism

- The following limits on Shadow Prices are applied in instances of transmission shortages (implemented on June 20, 2017)

Facility Type	Shortage (MW)	Shortage Price (\$/MWh)	Shadow Price Cap
Non-Zero CRM Value	Up to 5	\$350	\$4000
	>5 to 20	\$1175	
Zero Value CRM	N/A	N/A	\$4000

# Summary of the Proposal

- **The NYISO proposes to implement a revised approach to the current TCP logic consisting of the following components:\***
  1. Establish a revised six-step transmission shortage pricing mechanism for facilities currently assigned a non-zero CRM value (see the following slide for additional details)
    - Each step corresponds to a specified percentage of the applicable CRM value. The final step will price all shortages in excess of the applicable CRM value
  2. Apply a 5 MW CRM value to internal facilities currently assigned a zero value CRM, with a separate two-step transmission demand curve mechanism for such facilities
    - First step is valued at \$100/MWh. This step would price transmission shortages up to the proposed CRM value.
    - Second step is valued at \$250/MWh. This step would price all shortages in excess of the proposed CRM value.
  3. Maintain the current single value \$4,000/MWh shadow price capping method for external interface facilities (zero value CRM) permitting the continued use of constraint relaxation for external interfaces

*\*Refer to the presentation at the [June 17, 2021 ICAPWG/MIWG meeting](#) for additional details regarding the NYISO's proposal*

# Proposal for Non-Zero CRM Value Facilities

- The proposed 6-step transmission demand curve structure for various non-zero CRM values is represented in the table below:

Proposed Transmission Shortage Pricing Curve steps												
CRM Value (MW)	Step 1 (MW)	Step 1 (\$/MWh)	Step 2 (MW)	Step 2 (\$/MWh)	Step 3 (MW)	Step 3 (\$/MWh)	Step 4 (MW)	Step 4 (\$/MWh)	Step 5 (MW)	Step 5 (\$/MWh)	Step 6 (MW)	Step 6 (\$/MWh)
10	<=2	\$200	>2-4	\$350	>4-6	\$600	>6-8	\$1,500	>8-10	\$2,500	>10	\$4,000
20	<=4	\$200	>4-8	\$350	>8-12	\$600	>12-16	\$1,500	>16-20	\$2,500	>20	\$4,000
30	<=6	\$200	>6-12	\$350	>12-18	\$600	>18-24	\$1,500	>24-30	\$2,500	>30	\$4,000
50	<=10	\$200	>10-20	\$350	>20-30	\$600	>30-40	\$1,500	>40-50	\$2,500	>50	\$4,000
60	<=12	\$200	>12-24	\$350	>24-36	\$600	>36-48	\$1,500	>48-60	\$2,500	>60	\$4,000
65	<=13	\$200	>13-26	\$350	>26-39	\$600	>39-52	\$1,500	>52-65	\$2,500	>65	\$4,000
100	<=20	\$200	>20-40	\$350	>40-60	\$600	>60-80	\$1,500	>80-100	\$2,500	>100	\$4,000

# Consumer Impact Analysis (IA) Evaluation Areas

- Develop the potential impact on all four evaluation areas

RELIABILITY

COST IMPACT/  
MARKET EFFICIENCIES

ENVIRONMENT/  
NEW TECHNOLOGY

TRANSPARENCY

# Cost Impact Methodology and Assumptions



# Cost Impact Methodology – Energy Market Impact

- **Using the NYISO’s market software, re-run select Day-Ahead Market (DAM) days. The following revisions will be included in the market software re-runs:**
  1. Incorporate the proposed six-step transmission demand curve mechanism for facilities currently assigned a non-zero CRM value
    - See Slide 6 for additional details
  2. Assign a 5 MW CRM value to internal facilities currently assigned a zero value CRM, and incorporate the proposed two-step transmission demand curve mechanism for such facilities
    - See Slide 5 for additional details

Note: Consistent with the NYISO’s proposal, the re-runs will maintain the current single value \$4,000/MWh shadow price capping method for external interface facilities

# Cost Impact Methodology – Energy Market Impact (cont'd)

- **Proposed approach to select days for re-runs:**
  - Select multiple days based on actual historical DAM transmission constraint costs during recent months (June through mid-July 2021) to ensure the simulations are based on updated software and market rules. The proposed shortage pricing values for the revised six-step transmission demand curve mechanism will be used as the basis for selecting appropriate days
    - The actual historical binding transmission constraints for each hour will be segmented into pricing ranges (“categories”) as further described below to determine the total number of binding transmission constraints for each category for each hour. The segmented counts will then be summed for all hours of each day to determine the total count of binding transmission constraints occurring within each category for each day
    - For any given hour, it is possible for binding transmission constraints to occur in more than one category
  - The historical binding transmission constraint costs will be categorized as follows:
    - Category 1: Transmission constraint cost of less than \$200/MWh
    - Category 2: Transmission constraint cost between \$200/MWh and \$350/MWh
    - Category 3: Transmission constraint cost between \$350/MWh and \$600/MWh
    - Category 4: Transmission constraint cost between \$600/MWh and \$1,500/MWh
    - Category 5: Transmission constraint cost between \$1,500/MWh and \$2,500/MWh
    - Category 6: Transmission constraint cost between \$2,500/MWh and \$4,000/MWh
  - The days selected for use in conducting the re-runs will represent the day with the highest number of transmission constraint pricing values identified for each category; provided that separate days will be utilized for each category
- **Compare prices from re-run cases to the original prices to determine the delta in zonal LBMPs and Ancillary Service prices**
  - The NYISO will determine a price delta value corresponding to each category identified above

# Cost Impact Methodology – Energy Market Impact (cont'd)

- **The price delta values calculated using re-run prices and original prices will be applied selectively to days in a one year period to estimate the potential annual consumer impact**
  - The NYISO is proposing to use DAM outcomes and load values from 2019 for purposes of this analysis
  - 2019 DAM days will be reorganized into different categories based on the similar logic as adopted for selecting days for re-runs (see Slide 10) and as further described below
  - Days will be categorized as follows:
    - “Category 6” day: two or more transmission constraint costs of \$2,500/MWh - \$4,000/MWh
    - “Category 5” day: two or more transmission constraint costs of \$1,500/MWh - \$2,500/MWh
    - “Category 4” day: two or more transmission constraint costs of \$600/MWh - \$1,500/MWh
    - “Category 3” day: two or more transmission constraint costs of \$350/MWh - \$600/MWh
    - “Category 2” day: two or more transmission constraint costs of \$200/MWh - \$350/MWh
    - “Category 1” day: two or more transmission constraint costs of less than \$200/MWh
  - It is possible for a day to have sufficient variation in binding transmission constraint costs to qualify for more than one category. In such instances, the day will be assigned to the highest value category applicable for such day
    - For example, if a day qualifies as both a Category 1 and a Category 3 day, the day will be deemed a Category 3 day for purposes of estimating the potential energy market impact
  - Price delta values calculated from re-runs in each category are applied to the days in the respective category as determined above
    - For example, the applicable price delta value corresponding to the re-run from a Category 1 day will be applied to all days in 2019 that fall into this category.

## Cost Impact Methodology – Energy Market Impact (cont'd)

- **The price delta values will be used to estimate the energy market impact due to changes in DAM Energy and Ancillary Service prices**
  - The price delta values determined from the analysis will be applied to the actual, historical DAM prices to calculate adjusted DAM Energy and Ancillary Service prices
  - The impact due to changes in Energy and Ancillary Service prices will be summed to determine an estimated annual impact
    - The LBMP delta (\$/MW) will be multiplied by the corresponding hourly actual real-time load during the historical one-year period to determine the impact due to the change in Energy prices
    - The Ancillary Service price delta(s) will be multiplied by the actual reserve requirements during the historical one-year period to determine the impact due to the change in Ancillary Service prices

# Capacity Market Impact

- Updated Energy and Ancillary service prices calculated from SCUC re-runs will be reviewed to assess whether a capacity market impact assessment would be meaningful and therefore warranted
- If a capacity market impact assessment is warranted, then the NYISO will calculate revised net EAS revenue offset values and resulting reference price values using the 2021-2022 Capability Year ICAP Demand Curve inputs and parameters. This will be used to estimate the potential impact of the proposal on the ICAP Demand Curves
  - Adjusted DAM and Real-Time Market LBMPs will be calculated using the results of energy market impact analysis to estimate changes in net EAS revenue offset values.

# Additional Impacts

# Other Impacts

- **Evaluate other Impacts:**
  - Reliability Impacts
  - Environmental Impacts
  - Impact on Transparency

# Next Steps

- **Q3 2021**

- Seek stakeholder feedback on the proposed methodology
- Conduct Consumer Impact Analysis

- **Q3/Q4 2021**

- Present Consumer Impact Analysis