New York ISO
Independent System Operator

Time-Differentiated TCCs

Reposted with corrections discussed at the May 25, 2021 ICAPWG/MIWG meeting included in red text

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Agenda

- Background
- Defining Time-Differentiated Products
- Analysis of Day-Ahead Market (DAM) Congestion Costs
- Conclusion
- Next Steps

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Background

2021 Approved Market Project

- The 2021 Time-Differentiated TCCs project deliverable is a Q4 Market Design Concept Proposed
- 2021 Project Schedule Milestone Update
- 2021 Approved Market Projects Product and Project Management
  - See Project 24 (Pages 25-26 of 26)

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Project Objectives & Deliverable

- **2021 Project Deliverable: Market Design Concept Proposed**
- **The objective of this project is to work with stakeholders to develop market rule changes needed to facilitate the creation of Transmission Congestion Contract (TCC) products that apply to different periods of time**
  - Current TCC product is a 24x7 product for the applicable effective period
- **The project description notes that the NYISO's assessment will include:**
  - The number of different types of TCCs that would be valid during each month (including whether any new time-differentiated product offerings would supplement, or replace the current 24-hour product)
  - The hours in which each type of time-differentiated TCC would be valid
  - The procedures the NYISO would use to: (1) auction time-differentiated TCCs, (2) establish the prices of those TCCs, (3) allocate auction revenue, and (4) allocate costs or revenues associated with increases or decreases in transfer capability

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Defining Time-Differentiated Products

Time-Differentiated TCC Products

- **During the 2021 project prioritization process, certain Market Participants advocated that time-differentiated TCC products could offer several benefits:**
  - Better align TCC products with over-the-counter (OTC) energy market trading products
  - Better align TCC products with similar products available in neighboring markets
  - Provide improved hedging opportunities and improved ability to customize TCC portfolios to better align with specific load and/or generation profiles

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Considerations for Time-Differentiated Products

- **Certain Market Participants noted that the most important factors in considering the structure/definition of time-differentiated products are the alignment with OTC energy market trading and product offerings in neighboring markets**
  - These Market Participants further noted that such consistency was more important than developing products specific to congestion patterns in NYCA

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Over-the-Counter Energy Trading

- Participants in OTC energy trading can purchase energy futures from various trading hubs, which are based on reference prices for different NYISO zonal hubs
  - These contracts can be purchased based upon on-peak or off-peak hours, which are defined as follows:
    - On-peak: Monday – Friday, Hours Beginning (HB) 7 – HB 22
    - Off-peak: All other hours and NERC holidays
- NYISO's current TCC product is a 24-hour (or around the clock) product, which may not align with OTC trading of time-differentiated products
- Certain Market Participants advocated that aligning TCC product offerings with time-differentiated OTC products could improve efficiency in hedging congestion costs

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Product Offerings in Neighboring Markets

- **Neighboring markets offer on-peak and off-peak Financial Transmission Rights (FTR) products**
  - PJM offers three products: 24-hour, on-peak, and off-peak
  - ISO-NE offers two products: on-peak and off-peak
  - Both PJM and ISO-NE use the same definition for on-peak and off-peak hours:
    - On-peak: Monday – Friday, HB 7 – HB 22
    - Off-peak: All other hours and NERC holidays
- **Certain Market Participants advocated that better aligning TCC product offerings with neighboring markets could provide efficiency for entities participating across the regional markets**

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Proposed Time-Differentiated TCC Products

- Two proposals were presented by Market Participants for time-differentiated TCC products during the 2021 project prioritization process
- These proposals were as follows:
  - Option A: Consisted of 2 categories
    - On-peak: defined as Monday-Friday, HB 7 – HB 22
    - Off-peak: defined as all other hours and holidays
  - Option B: Consisted of 3 categories
    - On-peak weekday: defined as non-holiday weekdays, Monday-Friday, HB 7 – HB 22
    - On-peak weekend/holiday: defined as Saturday-Sunday and holidays, HB 7 – HB 22
    - Off-peak: defined as all other hours, Monday-Sunday, HB 0 – HB 6, HB 23
- The difference between the options was the breakout of an on-peak weekend category from the off-peak category within Option B

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Analysis of DAM Congestion Costs

DAM Congestion Costs in NYCA

- As noted earlier, certain Market Participants have noted a preference for using a standard industry definition of on-peak and off-peak hours to develop time-differentiated TCC products
- NYISO conducted an analysis of nodal and zonal DAM congestion costs to assess the consistency of congestion patterns in NYCA with industry definitions of on-peak and off-peak hours
  - NYISO also analyzed congestion costs along select internal paths

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DAM Congestion Costs in NYCA (continued)

- **NYISO's analysis of DAM congestion costs consisted of the following:**
  - Historic data period: 1/1/2016 through 12/31/2020
  - Every hour of the data set was categorized as follows:
    - On-Peak Weekday (orange bars): Monday – Friday, HB 7 – HB 22
    - On-Peak Weekend (yellow bars): Saturday – Sunday, HB 7 – HB 22
    - Off-Peak Hours (blue bars): HB 0 – HB 6, and HB 23
      - Does not currently account for holidays (which would be categorized as off-peak hours)
  - Each graph also displays the hourly average value for the applicable data set
  - NYISO analyzed patterns based on specific months (*e.g.*, January 2019), a single month across years (*e.g.*, January), and across the entire data set (2016-2020)
- **In general, the data demonstrated that patterns of DAM congestion costs in the NYCA were consistent with the conventional industry definition of on-peak and off-peak hours**
  - The following graphs are a sample of the various observations in the data analyzed by NYISO

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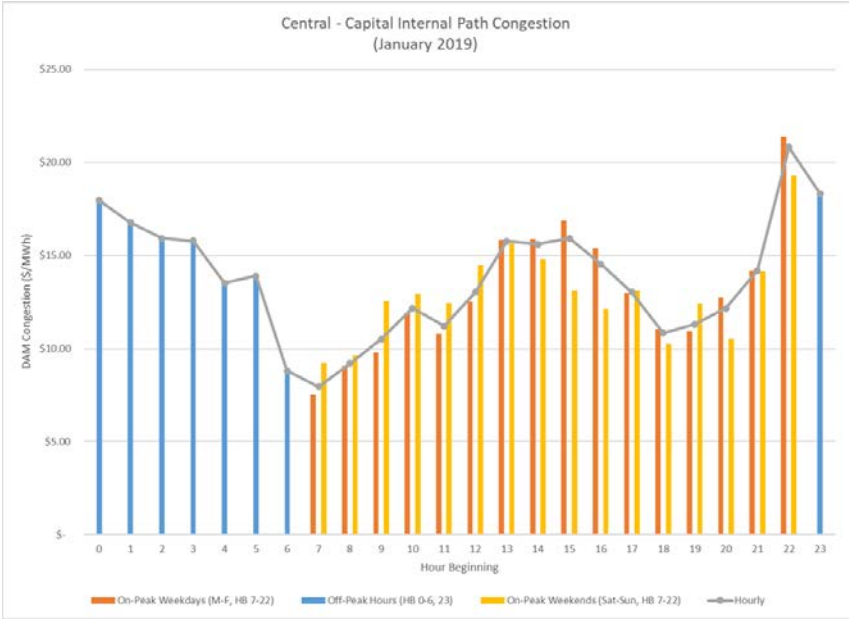
Central-Capital Internal Path Congestion (January 2019)

- **This graph displays the average hourly DAM congestion cost for the month of January 2019 for the internal congestion path of Central to Capital (Central East)**
  - In this example, Central is the source and Capital is the sink. The congestion is calculated as follows, with the sink and source prices based on the congestion component of the zonal LBMP
    - [(-1 x DAM Cong. Sink Price) – (-1 x DAM Cong. Source Price)]
    - Positive values indicate power is moving into an area of higher congestion
- **The graph shows that there is a tight relationship between on-peak and off-peak hours**
  - There is some observable difference between off-peak and on-peak weekend hours



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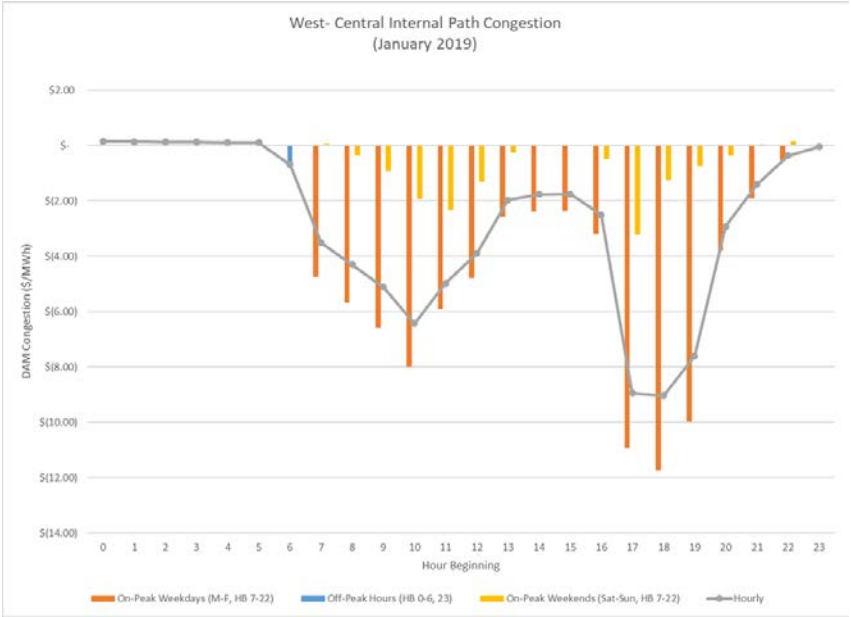
West-Central Internal Path Congestion (January 2019)

- **This graph displays the average hourly DAM congestion cost for the month of January 2019 for the internal congestion path of West to Central**
  - In this example, West is the source and Central is the sink. The congestion is calculated as follows, with the sink and source prices based on the congestion component of the zonal LBMP
    - [(-1 x DAM Cong. Sink Price) – (-1 x DAM Cong. Source Price)]
    - Negative values indicate power is moving into an area of lower congestion
- **The graph shows a clear difference in congestion costs between on-peak and off-peak hours**
  - There is some observable difference between off-peak and on-peak weekend hours



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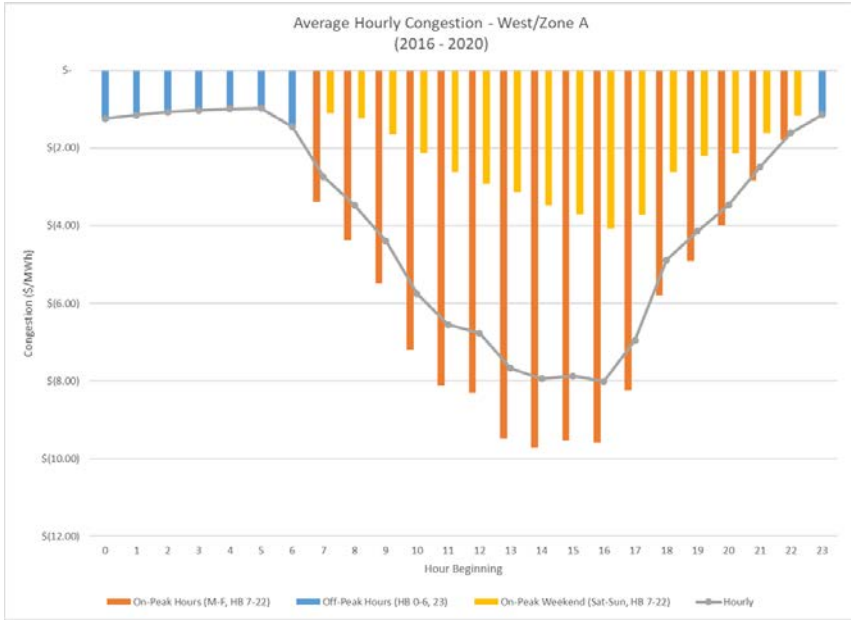
West/Zone A (2016-2020)

- **This graph displays the average hourly DAM congestion cost between 2016 and 2020, based on the congestion cost component of the zonal LBMP**
  - In this example, negative congestion indicates congestion into Zone A
- **The graph shows a difference between on-peak and off-peak hours**
  - There is some observable difference between off-peak and on-peak weekend hours; however, in general, the off-peak and on-peak weekend hours are fairly similar



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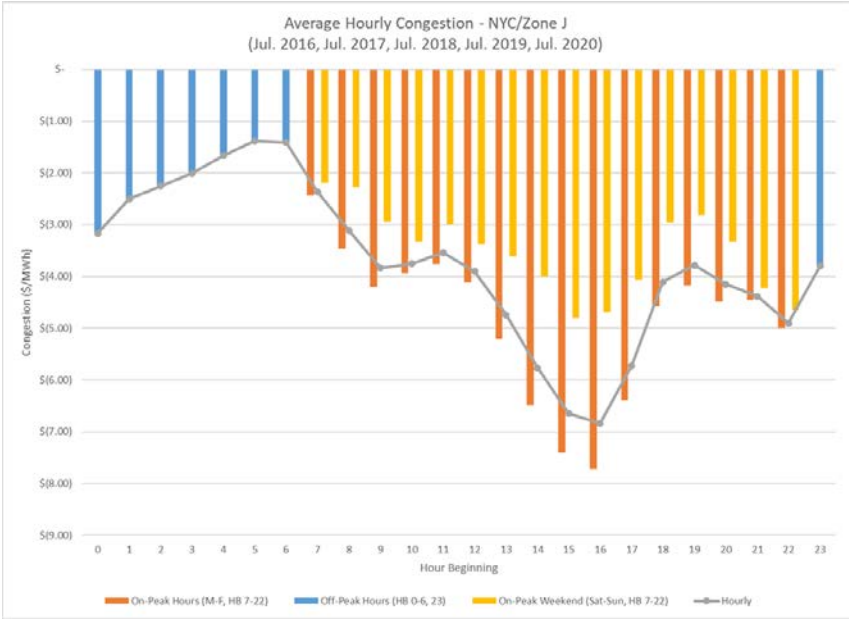
NYC/Zone J (Month of July)

- **This graph displays the average hourly DAM congestion cost for the month of July across all years, based on the congestion cost component of the zonal LBMP**
  - In this example, negative congestion indicates congestion into Zone J
- **The graph shows a difference between on-peak and off-peak hours**
  - There is some observable difference between off-peak hours and on-peak weekend hours; however, in general, the off-peak and on-peak weekend hours are fairly similar
- **The trends in this graph are representative of many of the zones analyzed**



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Conclusion

Conclusion

- **NYISO's assessment concludes that time-differentiated TCC products would best be defined as:**
  - On-peak: Monday – Friday, HB 7 – HB 22, except holidays
  - Off-peak: all hours not encompassed by on-peak definition (Monday – Friday, HB 0 – HB 6, and HB 23; all hours on weekends and holidays)
- **This conclusion is supported by the following:**
  - Observations of DAM congestion patterns in NYCA
  - Conventional industry definition of OTC energy products available for NYISO's market
  - On-peak/off-peak products in neighboring wholesale markets (i.e., PJM, ISO-NE)

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Next Steps

Additional Project Components

- **NYISO is currently considering the following:**
  - Whether the time-differentiated products will supplement, or replace the current 24-hour product
  - How the time-differentiated products will be optimized within TCC auction software (*i.e.*, simultaneously evaluated or auctioned independently)
  - Identifying process/procedure changes that would need to be implemented to accommodate time-differentiated product offerings
  - Consumer impact assessment methodology and analysis

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Questions?

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

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