



Intertie Deviation Settlement Discussion

Brad Cooper

Manager, Market Design Policy

Danielle Tavel

Policy Development Data Analyst

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ISO PUBLIC

Purpose of this initiative is to incentivize delivery of awarded energy on interties

- Intertie resources that do not meet their cleared market schedules cause impacts on market pricing and grid stability
- The ISO has recognized high levels of undelivered intertie resources
- The ISO is proposing a new under/over delivery charge (UODC) to address the non-delivery of intertie resources

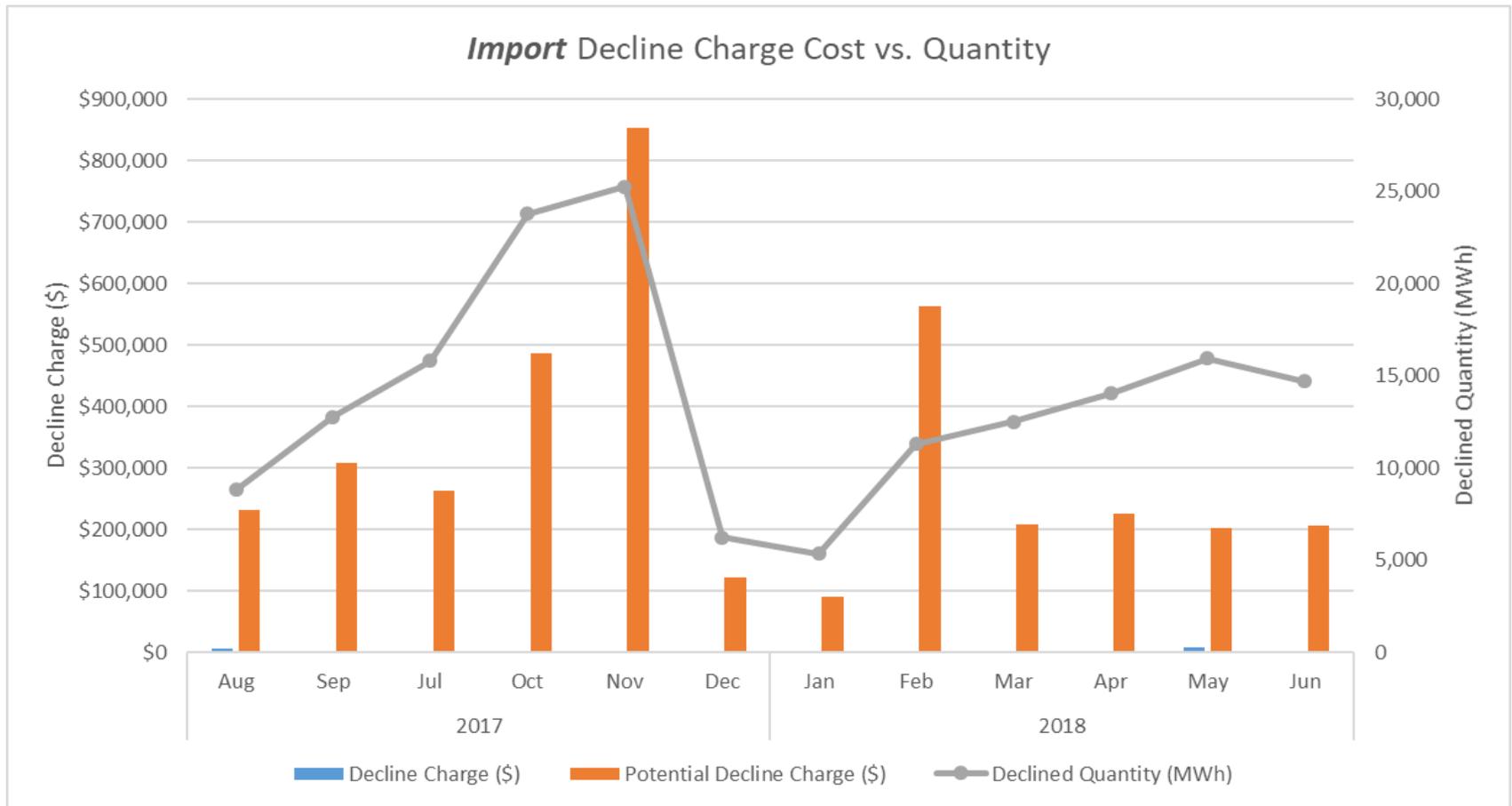
Proposed under/over delivery charge will address gaps in existing decline charge

- Existing decline charge framework is ineffective because:
 - Monthly threshold is too high and includes curtailments
 - Charge only applies to hourly block resources
 - Charge does not account for declined decremental schedules
- Proposed under/over delivery charge will incentivize delivery of accepted awards and minimize impact of undelivered intertie resources on real-time pricing

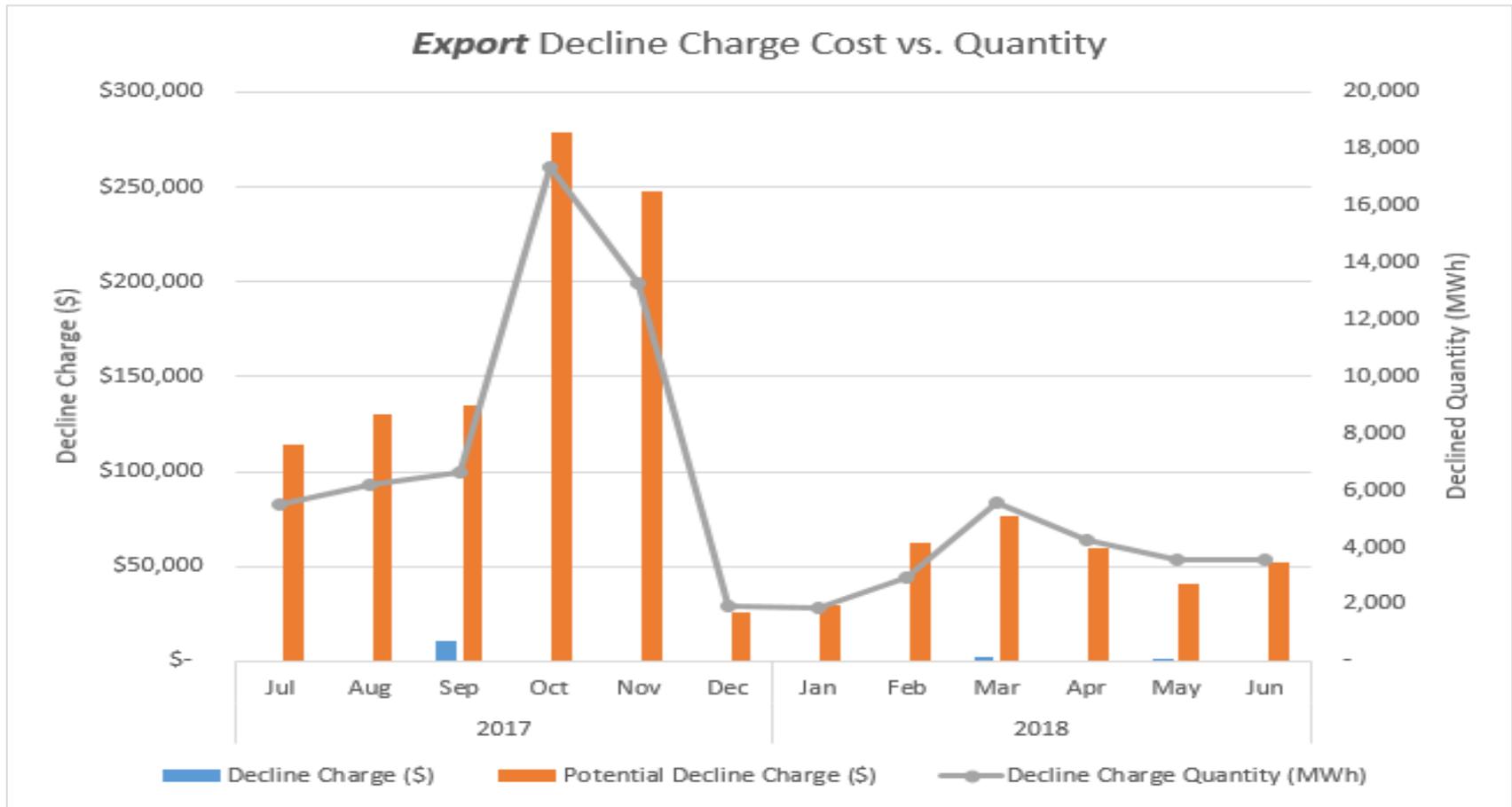
Intertie Deviation Settlement

DATA ANALYSIS

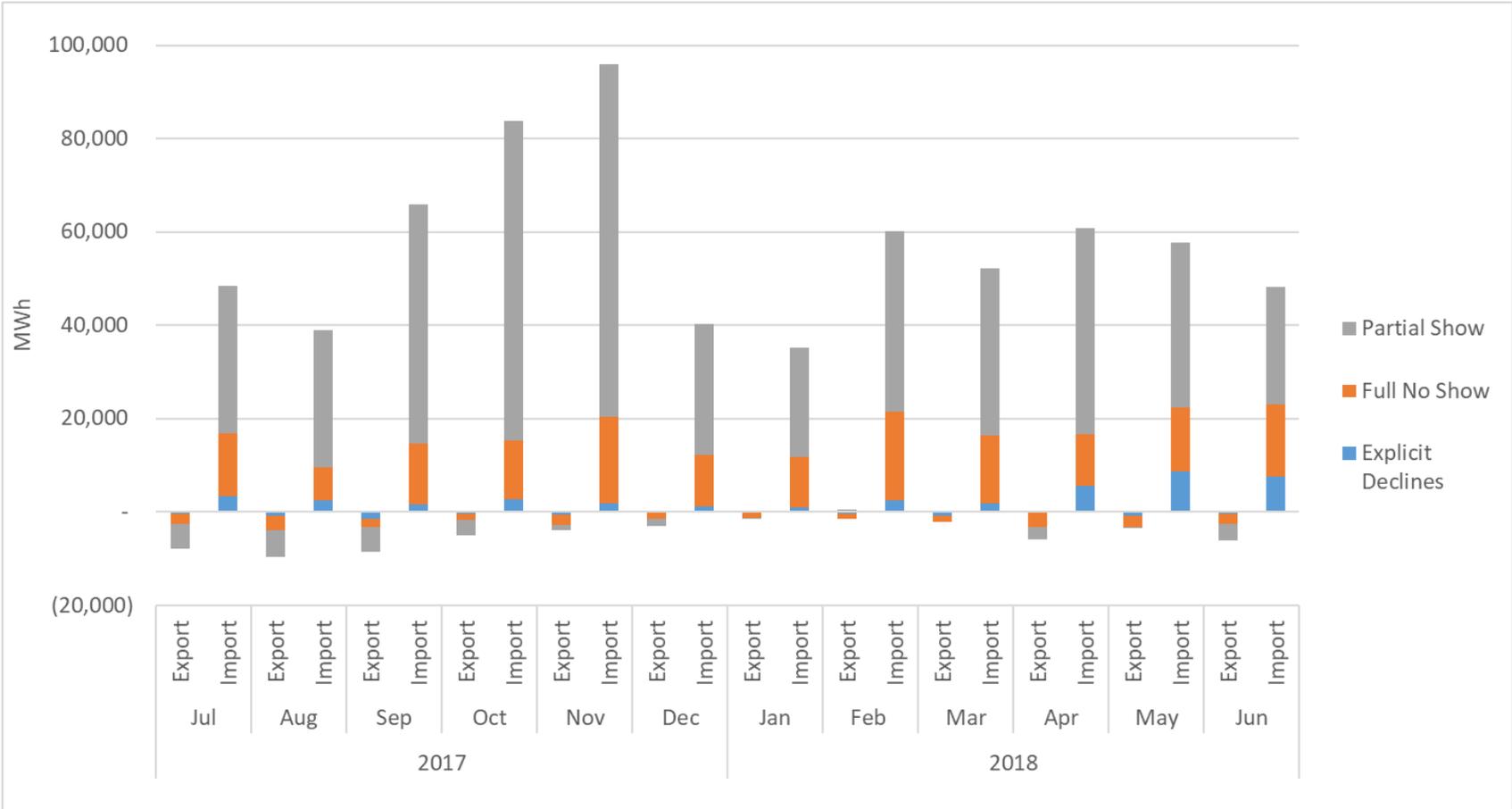
Decline charge settlement data: imports



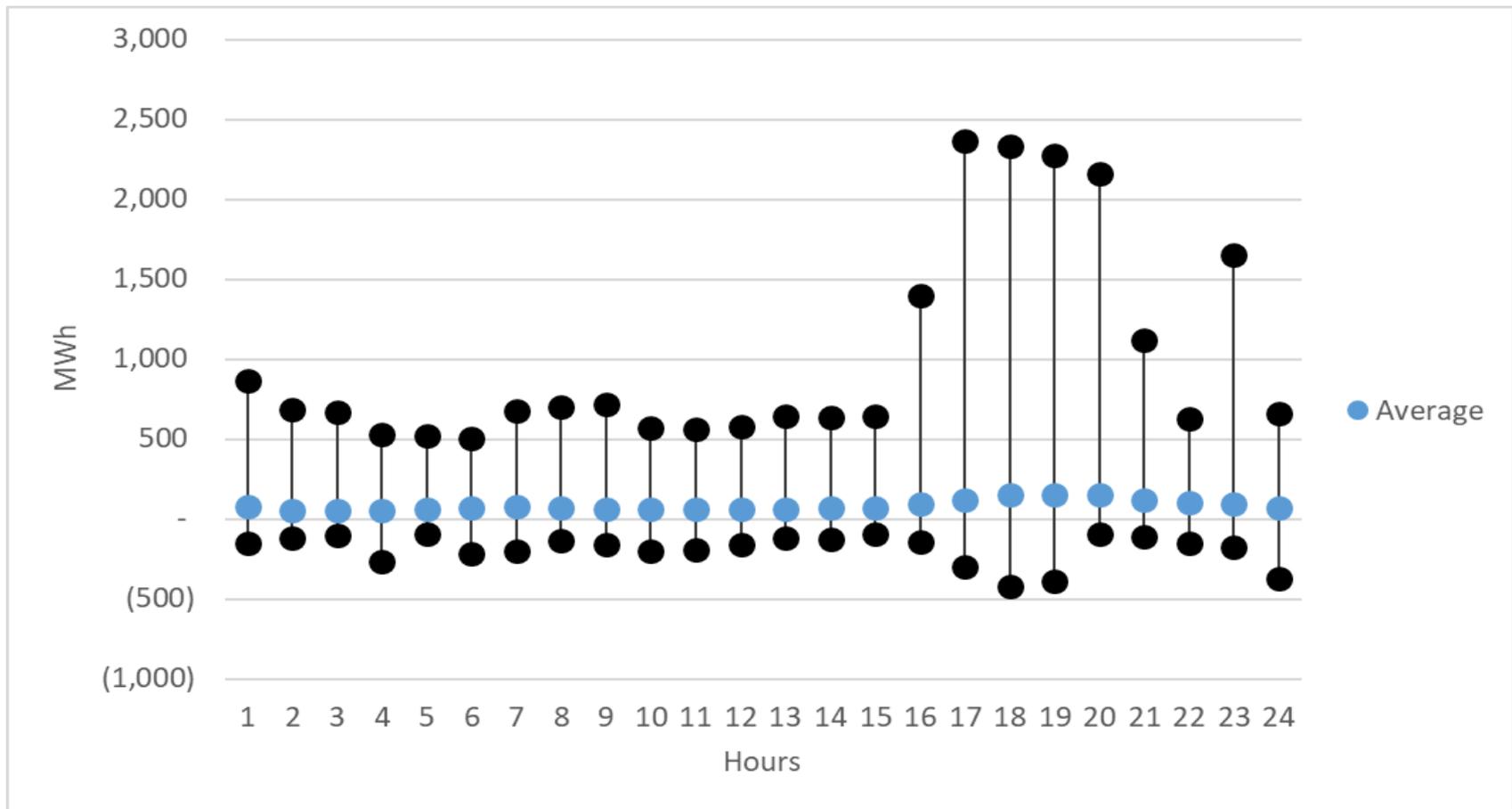
Decline charge settlement data: exports



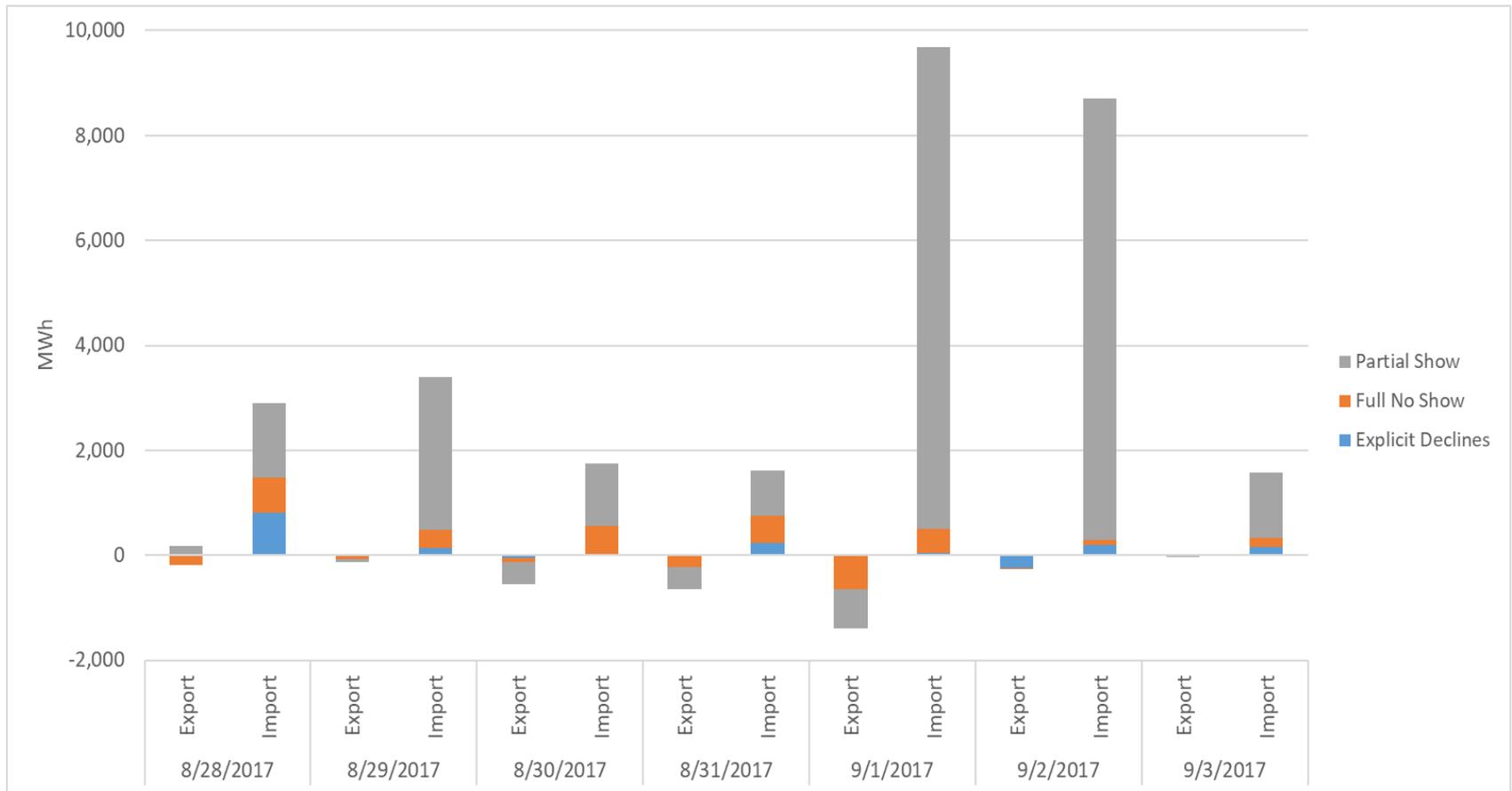
Undelivered Interties (July 2017 – June 2018)



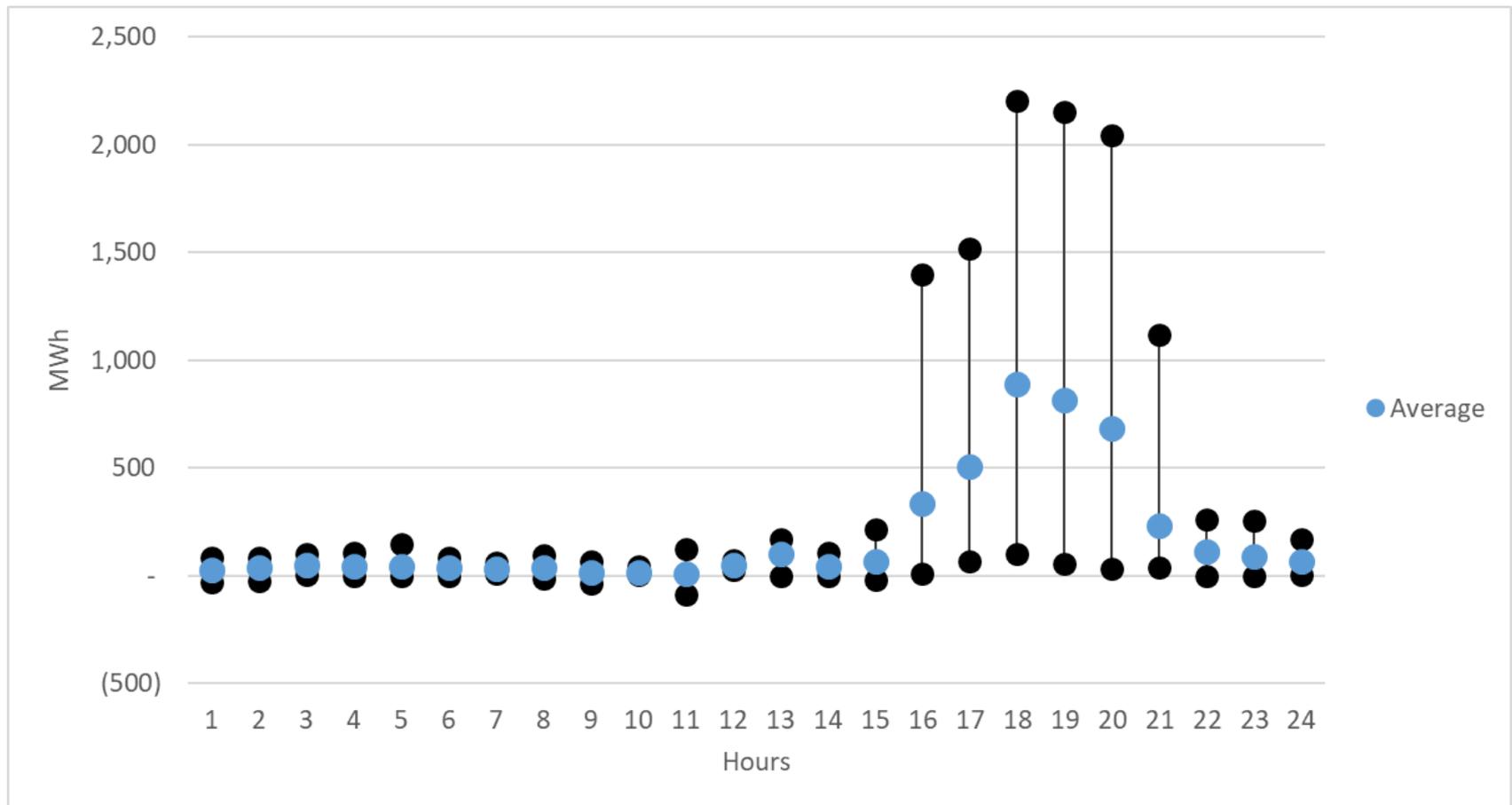
Range of Hourly Undelivered Interties (July 2017 – June 2018)



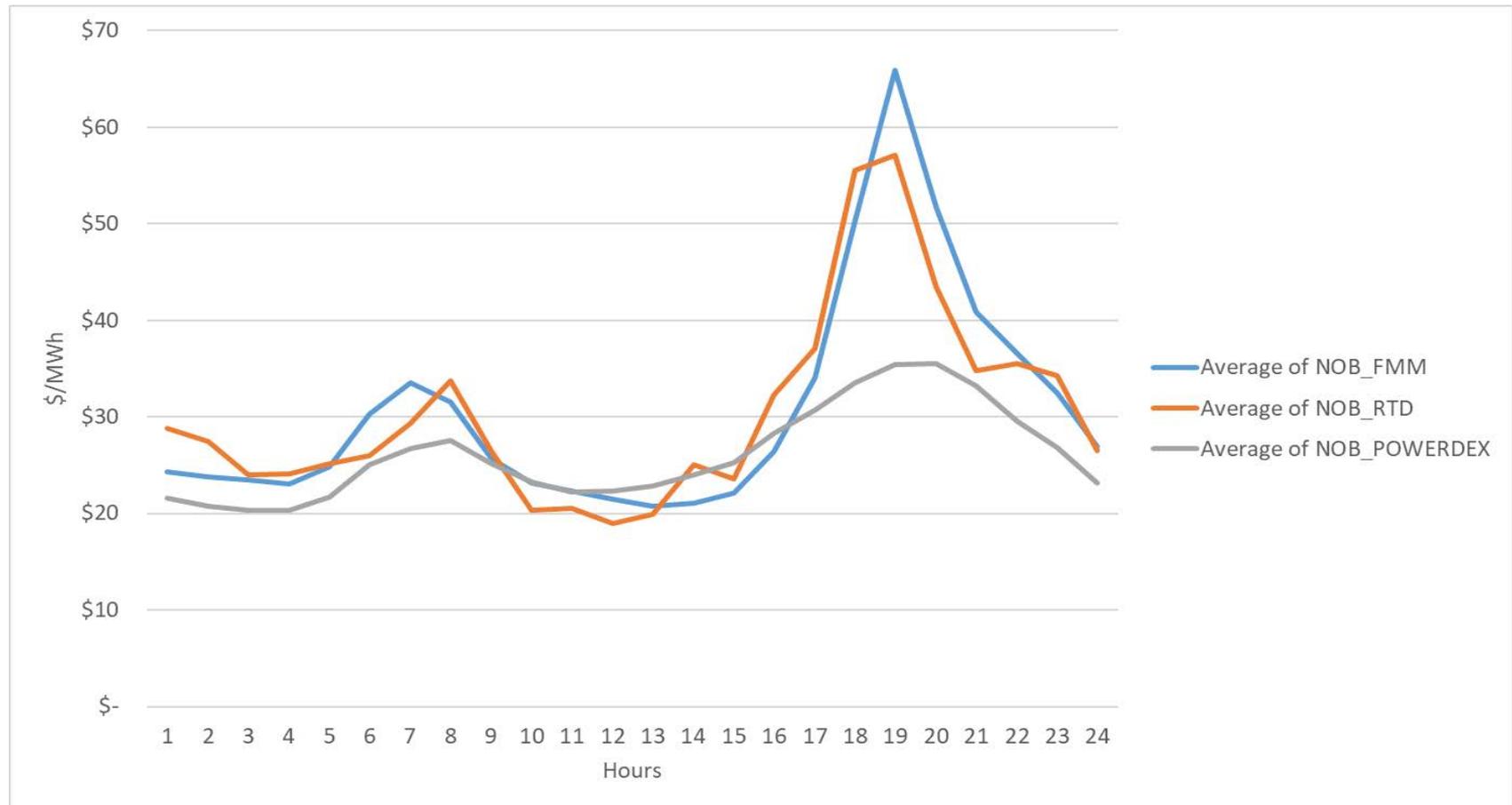
Undelivered Interties during Sept 2017 Heat Wave



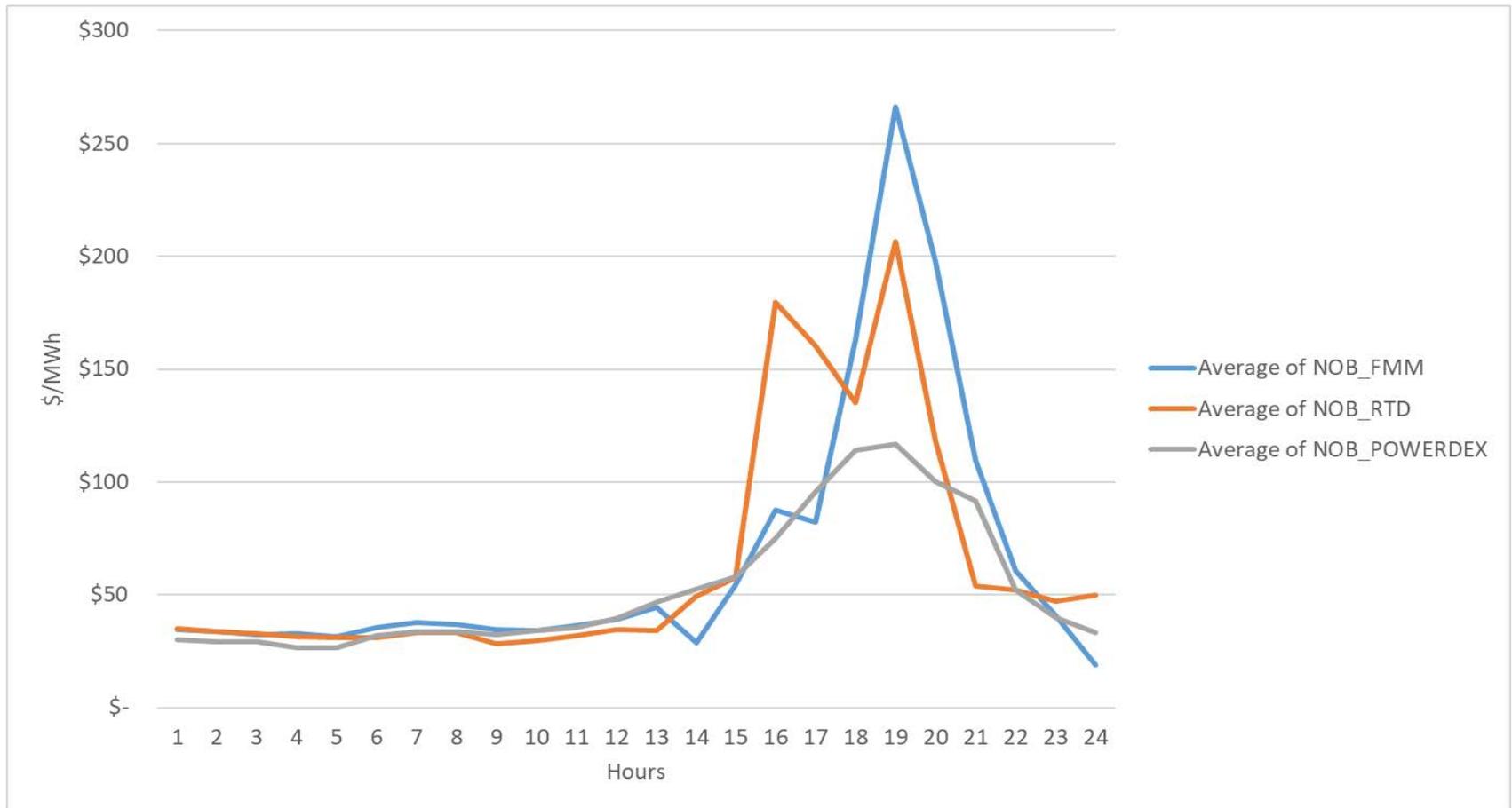
Range of Hourly Undelivered Interties (8/28/2017-9/3/2017)



Average hourly prices at NOB (June 2017 – July 2018)



Average hourly prices at NOB during Sept 2017 Heat Wave



Intertie Deviation Settlement

UNDER/OVER DELIVERY CHARGE PROPOSAL

Propose under/over delivery charge (UODC) to strengthen incentives to deliver imports/exports scheduled in HASP

- 15-minute market dispatch will be based on transmission profile in submitted E-Tag
- Curtailed E-Tags will be excluded from the under/over delivery penalty
- The under/over delivery charge will be evaluated in each fifteen-minute interval
- Declined and undelivered energy will be subject to $\text{UODC} = 0.5 \times \text{MAX}(\text{FMM LMP}, \text{RTD LMP})$, with a \$10/MWh minimum

Logic for fifteen-minute awards for hourly block resources is based on submission of an E-Tag

FMM Binding Interval	Time of Operating Hour	Time of market run	Logic Used to Determine FMM Binding schedule for Hourly Block Resources
<i>TRANSMISSION PROFILE DUE AT T-40</i>			
1	00 – 15	T-37.5 RTPD5	MIN (HASP schedule, ADS accepted amount, E-Tag transmission profile)
2	15 – 30	T-22.5 RTPD4	MIN (HASP schedule, ADS accepted amount, E-Tag transmission profile)
<i>ENERGY PROFILE DUE AT T-20</i>			
3	30 – 45	T-7.5 RTPD7	E-Tag energy profile
4	45 – 00	T+7.5 RTPD6	E-Tag energy profile

Under/over delivery charge will be calculated using the HASP schedule as a reference point

Bid Option	Determination of Under/Over Delivery Quantity
Hourly Block	Absolute Value (HASP Schedule – after the fact E-Tag Energy Profile)

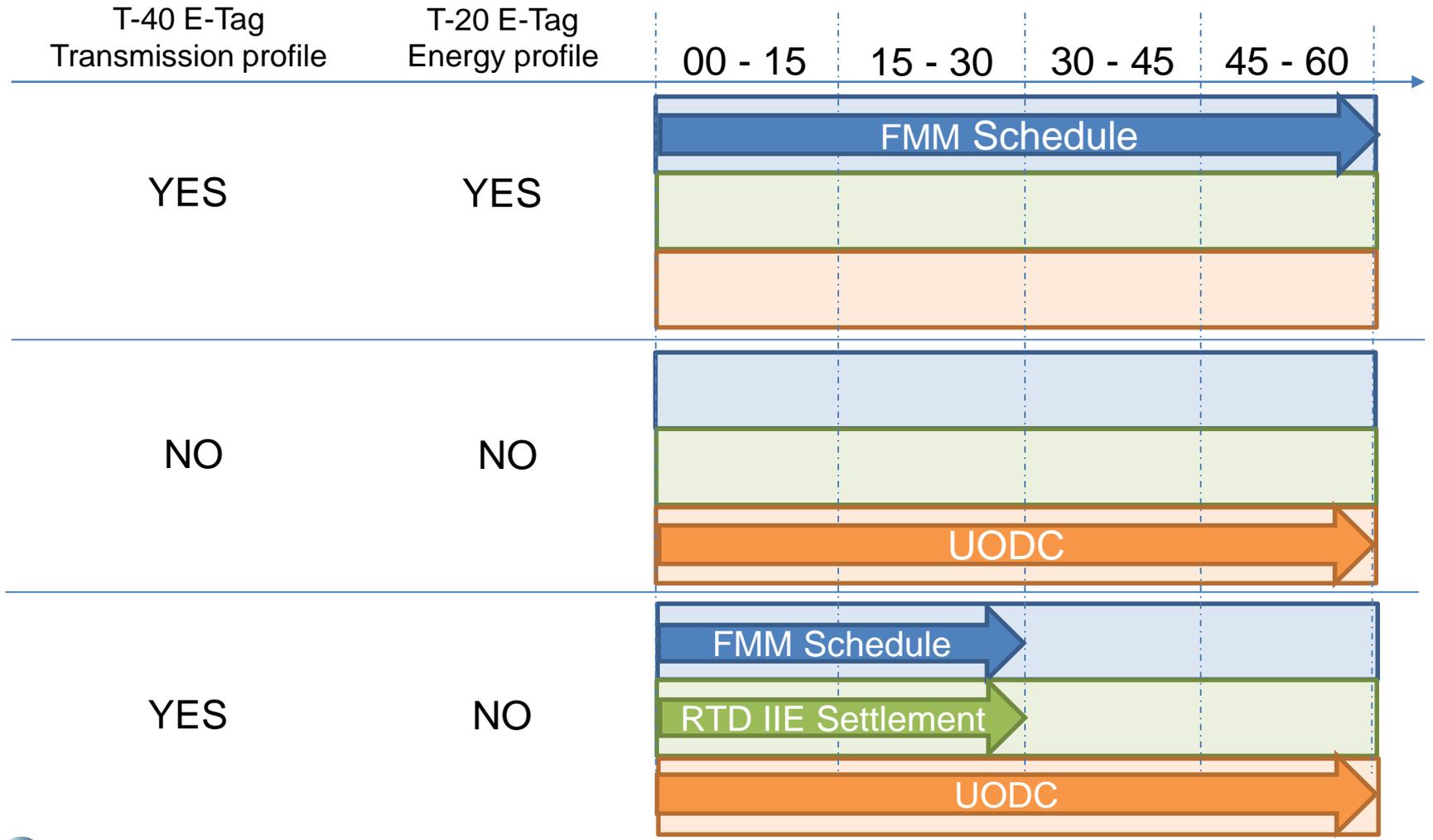
- HASP is the last opportunity to dispatch hourly-block resources
- If HASP schedule is declined, FMM must use other resources pool to compensate for the shortage

Bid Option	Determination of Under/Over Delivery Quantity
Fifteen-minute dispatchable	E-Tag Transmission Profile – HASP schedule If negative, penalty applies If positive, penalty does not apply

- If transmission profile is submitted to support the HASP schedule, energy profile will auto-adjust to match FMM schedule
- If transmission profile is not submitted, it's impossible for energy to be awarded and delivered

Impacts and timeline of hourly block E-Tagging

FMM Schedule
RTD IIE Settlement
UODC



MWh values for various hourly block E-Tagging scenarios

	SCENARIO 1 100 MW in DAM No T-40 E-Tag No T-20 E-Tag	SCENARIO 2 100 MW in DAM Yes T-40 E-Tag No T-20 E-Tag	SCENARIO 3 100 MW in HASP No T-40 E-Tag No T-20 E-Tag	SCENARIO 4 100 MW in HASP Yes T-40 E-Tag No T-20 E-Tag
DAM Schedule	100	100	0	0
HASP Schedule	100	100	100	100
T-40 E-Tag Transmission Profile	0	100	0	100
FMM Schedule	0	50	0	50
FMM IIE	-100	-50	0	50
T-20 E-Tag Energy Profile	0	0	0	0
RTD IIE	0	-50	0	-50
UODC	100	100	100	100

Proposed charge will equal $0.5 \times \text{MAX}(\text{FMM LMP}, \text{RTD LMP})$, with a \$10/MWh minimum

- Using the LMP enables the charge to be comparable to the impact the decline had on the real-time market
- Use of the greater of the FMM or RTD provides the strongest incentive to deliver awarded energy
 - This is necessary because at times the FMM price is higher than the RTD price
- Floor of \$10 for under/over delivery charge will ensure the incentive still applies even if pricing is low
- Additional 25% penalty if an SC accepts a HASP schedule in ADS by T-45 but does not submit an E-Tag
 - This results in additional operational challenges

ISO proposes to exclude curtailments from counting towards under/over delivery charge

- Tags that have been *adjusted* by the scheduling coordinator will count towards the under/over delivery penalty
- Tags that have been *curtailed* by a balancing authority area operator (or transmission service provider) for reliability reasons will be excluded from the under/over delivery penalty

Exclusion of curtailments from the proposed charge allows for the elimination of the 10% threshold

- The existing decline charge is not effective because scheduling coordinators rarely exceed the 10% monthly threshold
- Purpose of the 10% threshold was to specifically account for curtailments
 - By excluding curtailments the threshold is not necessary
- ISO proposes to apply the under/over delivery charge on a 15-minute interval basis