



California ISO

# Intertie Deviation Settlement: Straw Proposal

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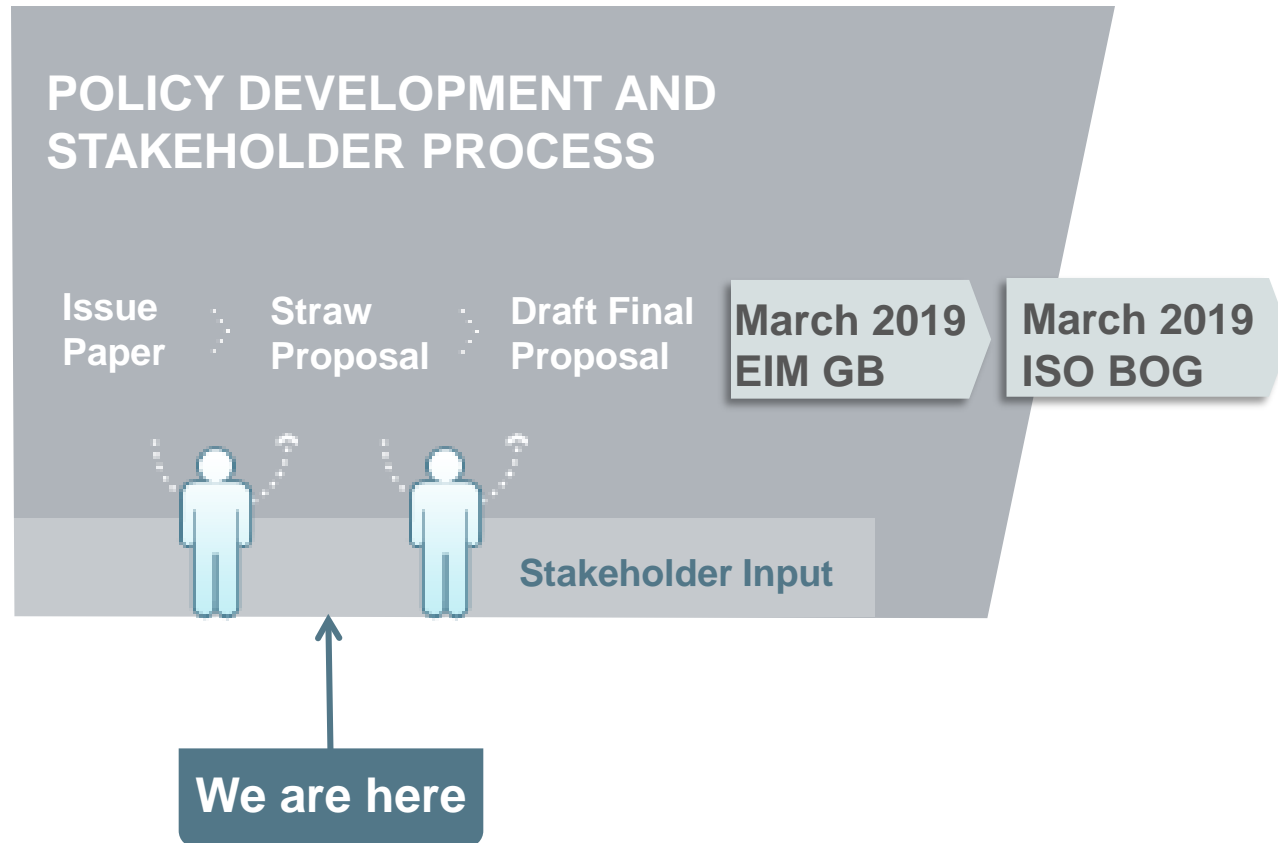
October 15, 2018

ISO PUBLIC

# Agenda

Time	Topic	Presenter
10:00 – 10:10am	Welcome	Jody Cross
10:10 – 10:30am	Background – issue paper review	Megan Poage
10:30 – 12:00pm	Impact of undelivered intertie resources	Megan Poage
12:00 – 1:00pm	Lunch	
1:00 – 1:30pm	Data analysis review	Danielle Tavel
1:30 – 3:00pm	Under/over delivery charge proposal	Megan Poage
3:00 – 3:15pm	Additional Items	Megan Poage
3:15 – 3:30pm	Next Steps	Jody Cross

# ISO Policy Initiative Stakeholder Process



Intertie Deviation Settlement

# **BACKGROUND: ISSUE PAPER REVIEW**

# 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
- This initiative will analyze the existing Decline Charge and ultimately propose a new settlement methodology for intertie deviations

## HASP awards should be accepted and supported with the submission of an E-Tag

- E-Tags serves as receipts and are used to determine the net scheduled interchange (NSI)
- The ISO fifteen-minute market begins running at ~T-40 and assumes the E-Tag value will equal the HASP schedule
- NAESB requires E-Tags are submitted by T-20
- E-Tags that are not submitted to match the HASP schedule create operational challenges

If the HASP schedule cannot be delivered, scheduling coordinators should notify the ISO prior to the FMM

- HASP schedules should be accepted
- **Declined awards** (prior to T-40) allow the ISO markets to re-commit resources or manually dispatch
  - Scheduling coordinators decline awards in the ADS system
- If awards are accepted, but **no E-Tag** is submitted, the ISO market does not have time to make necessary adjustments
  - Real-time dispatch (RTD) must make up for the discrepancy

The decline charge is only applied if declines exceed 10% of total MWh transactions over a month

- Declines include any deviation including curtailments
- If declines are less than 10% of MWh transactions, no charge is applied
- If declines are more than 10% of MWh transactions, a decline charge of \$10 or 50% of the FMM LMP (whichever is greater) will be applied per MWh that exceeds the threshold



# Failure to submit an E-Tag causes operational challenges

- HASP schedules should always be delivered
- If they are not, advanced notification is beneficial for ISO markets and operators
  - Allows for time to manually dispatch, if necessary
  - Enables accurate FMM pricing and schedules
- No E-Tag may result in price increase in the real-time dispatch

# QUESTIONS?

Intertie Deviation Settlement

# **IMPACT OF UNDELIVERED INTERTIE RESOURCES**

# Current Decline Charge: Example # 3

- No DA Award, INC in RTM, Award Declined

	Interval 1	Interval 2	Interval 3	Interval 4
DA award	0 MW	0 MW	0 MW	0 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	0 MW	0 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
<b>Instructed Imbalance Energy =</b> <i>DA – FMM at FMM LMP</i>	0 MW	N/A	0 MWh
<b>FMM Undelivered Quantity</b> <i>Decline Charge = 50% FMM LMP*</i>	100 MW	1 – 4	100 MWh
<b>Operational Adjustment =</b> <i>FMM – E-Tag at RTD LMP</i>	0 MW	N/A	0 MWh

\*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

# Current Decline Charge: Example # 4

- No DA Award, INC in RTM, No eTag submitted

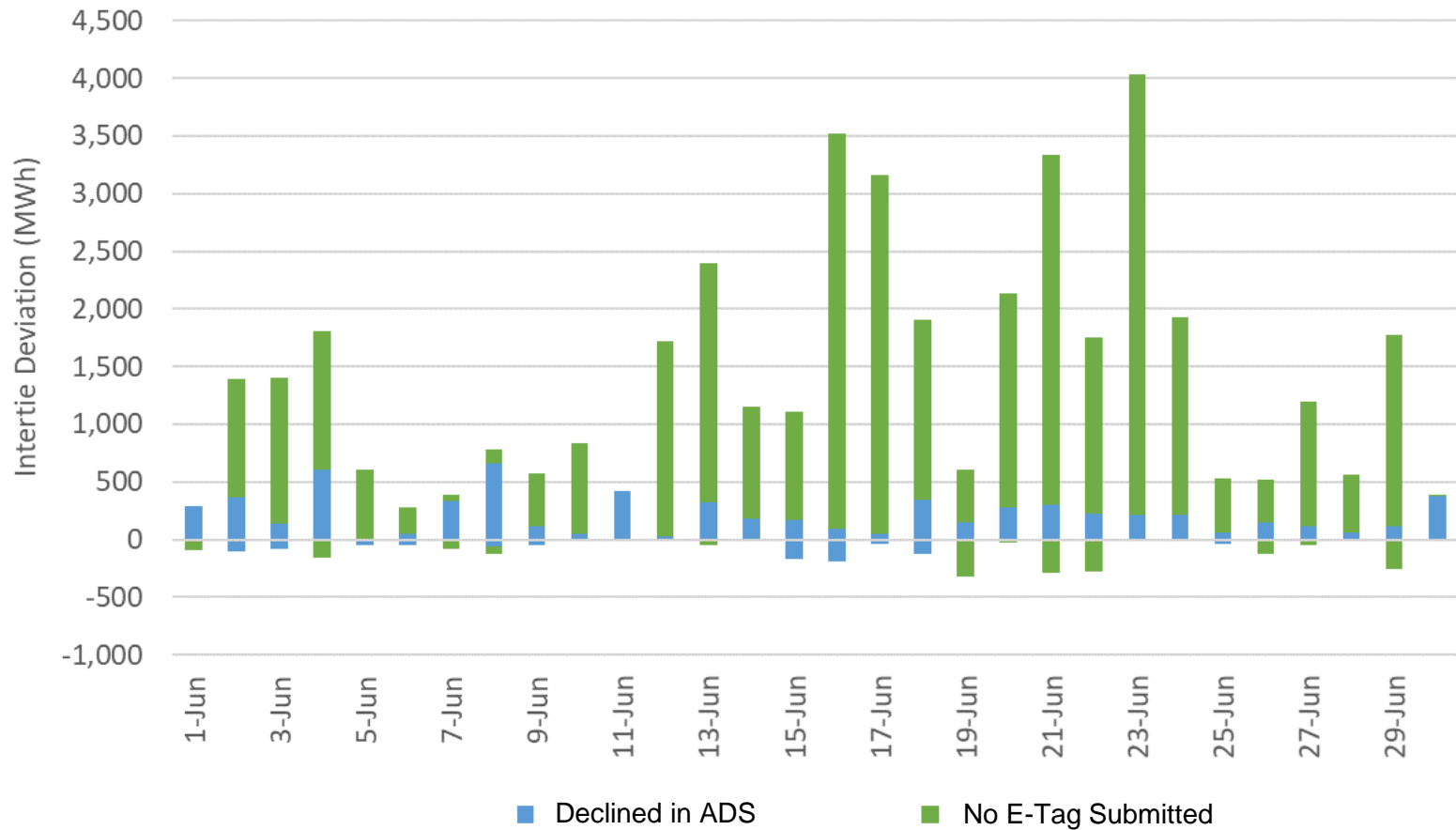
	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	0 MW	0 MW	0 MW	0 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	100 MW	100 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
<b>Instructed Imbalance Energy =</b> <i>DA – FMM at FMM LMP</i>	100 MW	1 – 2	50 MWh
<b>FMM Undelivered Quantity</b> <i>Decline Charge = 50% FMM LMP*</i>	100 MW	3 – 4	50 MWh
<b>Operational Adjustment =</b> <i>FMM – E-Tag at RTD LMP</i>	100 MW	1 – 2	50 MWh

\*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

# Undelivered interties primarily occur due to the failure to submit an E-Tag

## Undelivered intertie resources in June 2018



# Decline of HASP schedules in the ADS system primarily occur due to “bad bids”

Reason for Decline	% of Total Declines, Imports	% of Total Declines, Exports
<b>Bad Bid Submitted</b>	50.38%	53.76%
<b>No Available Transmission</b>	19.68%	-0.61%
<b>Economic Consideration</b>	16.89%	44.96%
<b>Unit Derate</b>	8.60%	1.89%
<b>Line Down</b>	4.45%	0.00%

## Failure to submit an E-Tag matching the accepted HASP schedule may occur for various reasons (1 of 2)

- Energy cannot be delivered due to a forced outage
- Energy is not delivered because seller elects to deliver the energy elsewhere
- Speculative energy supply was bid into the market but is not tied to a physical generator or transmission



# Failure to submit an E-Tag matching the accepted HASP schedule may occur for various reasons (2 of 2)

Category	Factors Driving Delivery Failure	Risk to CAISO (and EIM)
<b>Physical supply, delivery according to final award</b>	Forced outages or de-rates at source BAA; transmission curtailment	<b>Risk generally not correlated</b> to alternative supply conditions; comparable to risks for internal resources
<b>Physical supply, but seller elects non-delivery to CAISO in order to sell in other markets</b>	Risk that more attractive market opportunities exist outside CAISO	<b>Risk is elevated</b> during tight regional supply conditions; <b>Consequences are also likely more severe</b> , as CAISO faces fewer or more costly alternative supply options
<b>Speculative energy supply (non-RA)</b>	Risk that external supply is not available, or price makes physical delivery uneconomic for seller	

Source: Powerex comments on Intertie Deviation Settlement issue paper, page 5.

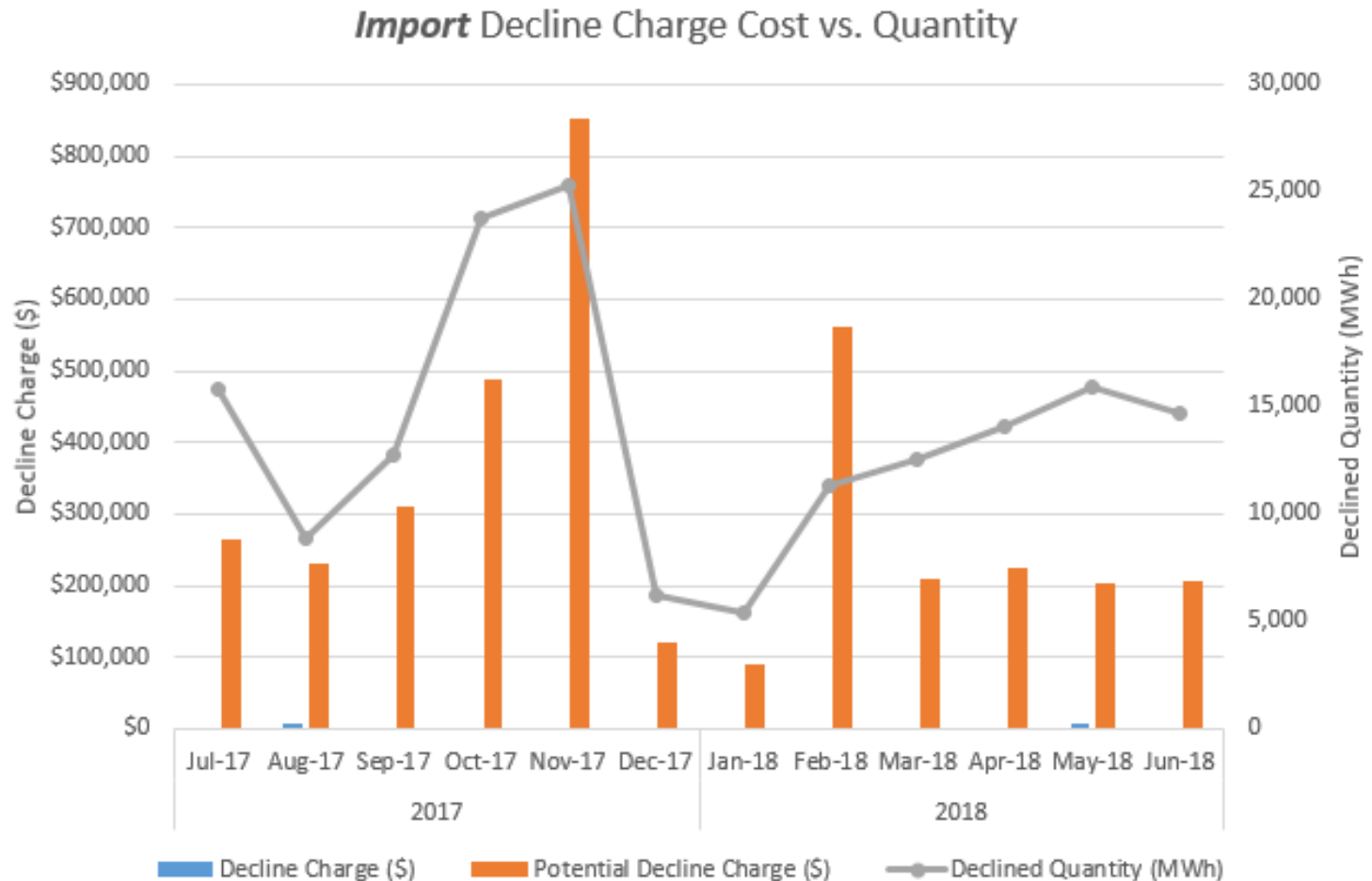
## Decline charge settlement data: July 2017 – June 2018

- **Decline Charge (\$)** is the total charge applied to all scheduling coordinators in the import and export direction respectively for a given month
- **Potential Decline Charge (\$)** is the total cost of the decline charge if it were applied by interval and without a threshold
- **Declined Quantity (MWh)** is the total amount of undelivered intertie resources including declined, under-tagged, and curtailed resources for all scheduling coordinators in the import and export direction respectively for a given month

# Decline charge settlement data: imports (1 of 2)

IMPORTS Date	Decline Charge (\$)	Decline Charge as % of Potential	Potential Decline Charge (\$)	Declined Quantity (MWh)
<b>2017</b>	<b>\$ 5,886</b>	<b>0.26%</b>	<b>\$ 2,265,863</b>	<b>92,706</b>
Jul-17	\$ -	0.00%	\$ 263,560	15,827
Aug-17	\$ 5,886	2.55%	\$ 231,042	8,812
Sep-17	\$ -	0.00%	\$ 309,106	12,772
Oct-17	\$ -	0.00%	\$ 487,151	23,800
Nov-17	\$ -	0.00%	\$ 853,499	25,258
Dec-17	\$ -	0.00%	\$ 121,505	6,237
<b>2018</b>	<b>\$ 7,815</b>	<b>0.52%</b>	<b>\$ 1,495,763</b>	<b>73,867</b>
Jan-18	\$ -	0.00%	\$ 91,105	5,346
Feb-18	\$ -	0.00%	\$ 562,312	11,302
Mar-18	\$ -	0.00%	\$ 208,247	12,507
Apr-18	\$ -	0.00%	\$ 225,683	14,055
May-18	\$ 7,815	3.87%	\$ 201,958	15,954
Jun-18	\$ -	0.00%	\$ 206,458	14,704
<b>Grand Total</b>	<b>\$ 13,701</b>	<b>0.36%</b>	<b>\$ 3,761,626</b>	<b>166,573</b>

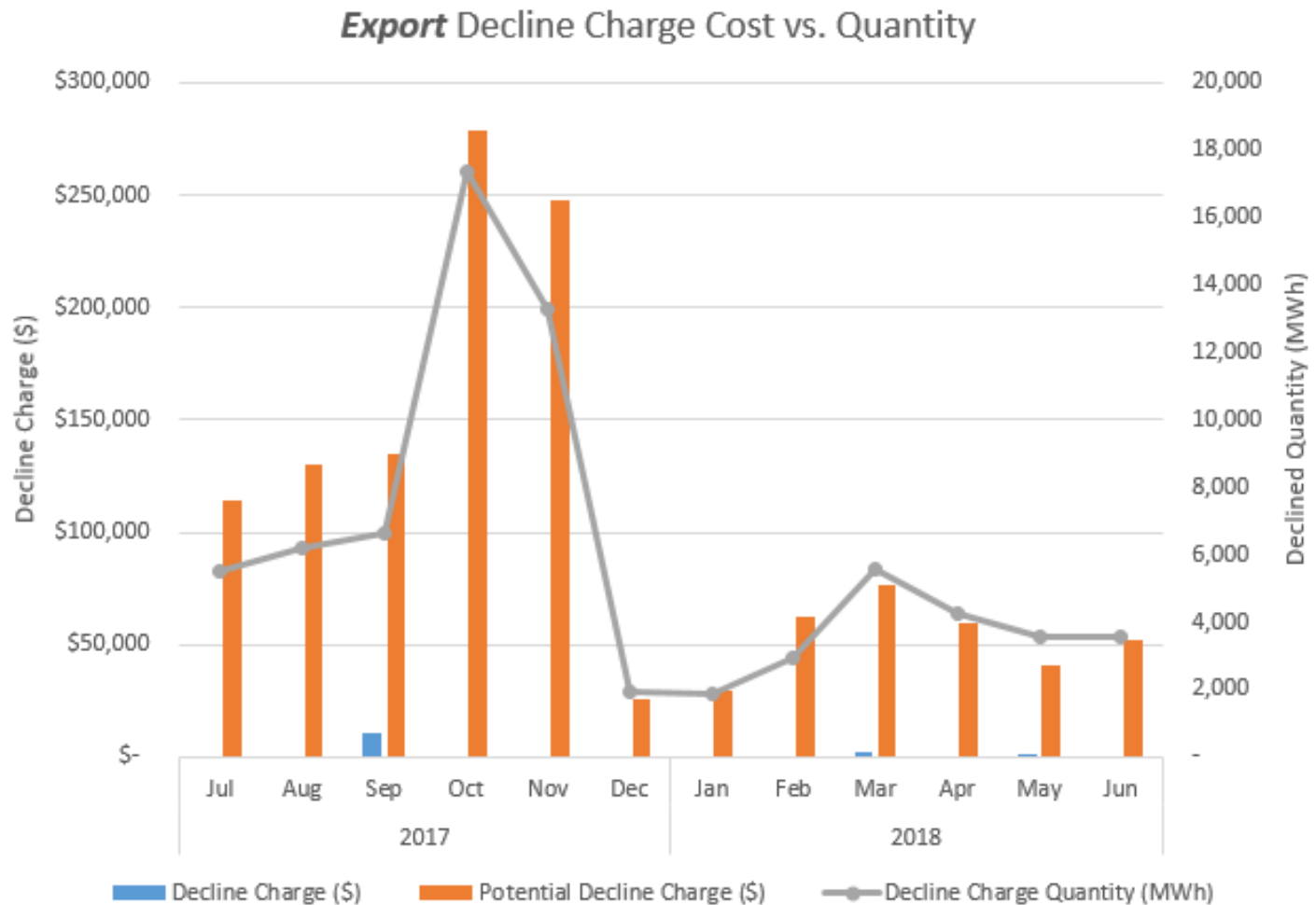
# Decline charge settlement data: imports (2 of 2)



# Decline charge settlement data: exports (1 of 2)

EXPORTS Date	Decline Charge (\$)	Decline Charge as % of Potential	Potential Decline Charge (\$)	Decline Charge Quantity (MWh)
<b>2017</b>	<b>\$ 10,809</b>	<b>1.16%</b>	<b>\$ 930,630</b>	<b>50,901</b>
Jul	\$ -	0.00%	\$ 113,811	5,507
Aug	\$ -	0.00%	\$ 130,402	6,182
Sep	\$ 10,809	8.03%	\$ 134,579	6,662
Oct	\$ -	0.00%	\$ 279,018	17,340
Nov	\$ -	0.00%	\$ 247,447	13,286
Dec	\$ -	0.00%	\$ 25,372	1,925
<b>2018</b>	<b>\$ 2,995</b>	<b>0.93%</b>	<b>\$ 321,397</b>	<b>21,785</b>
Jan	\$ -	0.00%	\$ 29,706	1,900
Feb	\$ -	0.00%	\$ 62,521	2,945
Mar	\$ 2,225	2.90%	\$ 76,742	5,566
Apr	\$ -	0.00%	\$ 59,528	4,268
May	\$ 770	1.89%	\$ 40,796	3,547
Jun	\$ -	0.00%	\$ 52,105	3,558
<b>Grand Total</b>	<b>\$ 13,804</b>	<b>1.10%</b>	<b>\$ 1,252,026</b>	<b>72,687</b>

# Decline charge settlement data: exports (2 of 2)



# QUESTIONS?

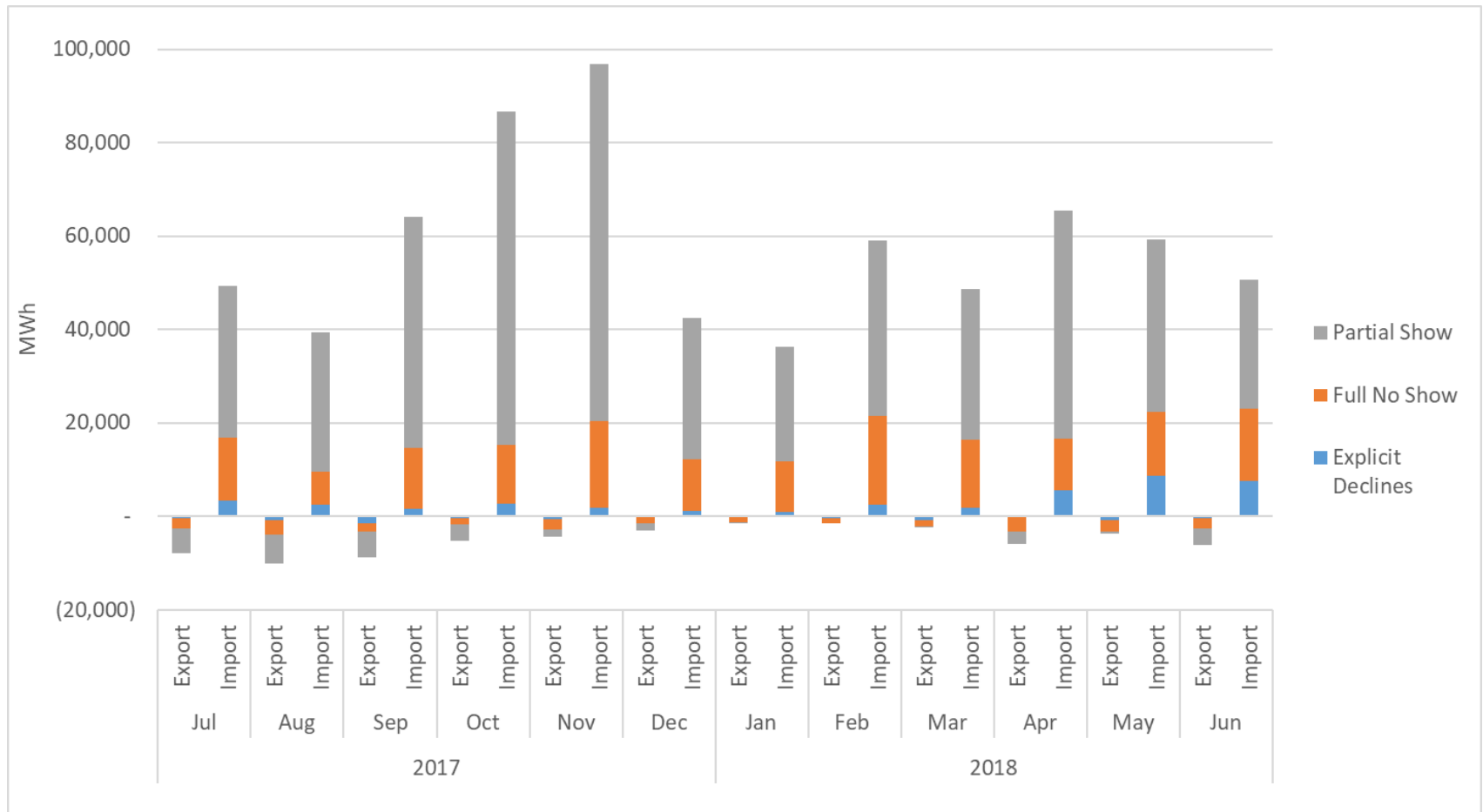
# LUNCH BREAK



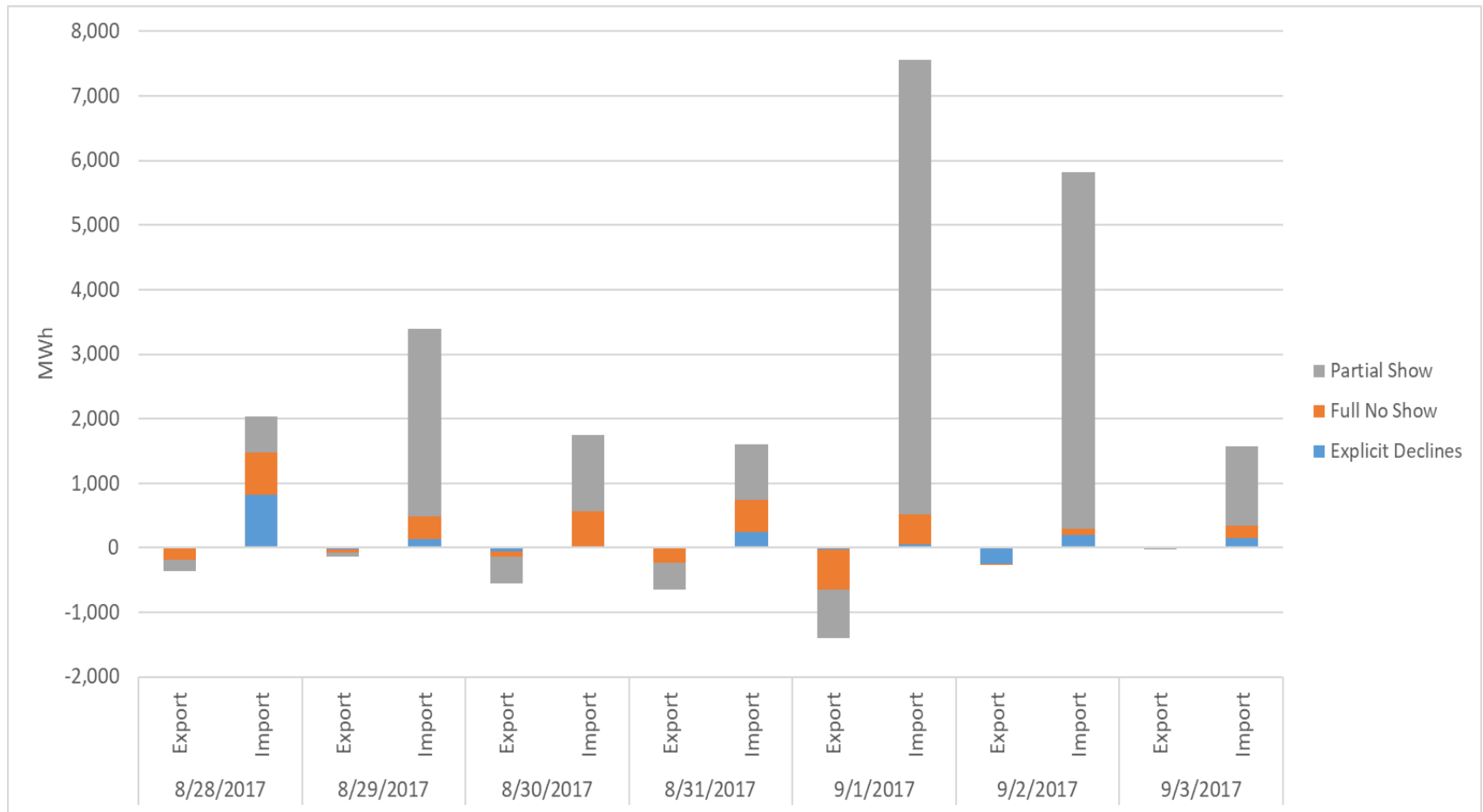
Intertie Deviation Settlement

# DATA ANALYSIS REVIEW

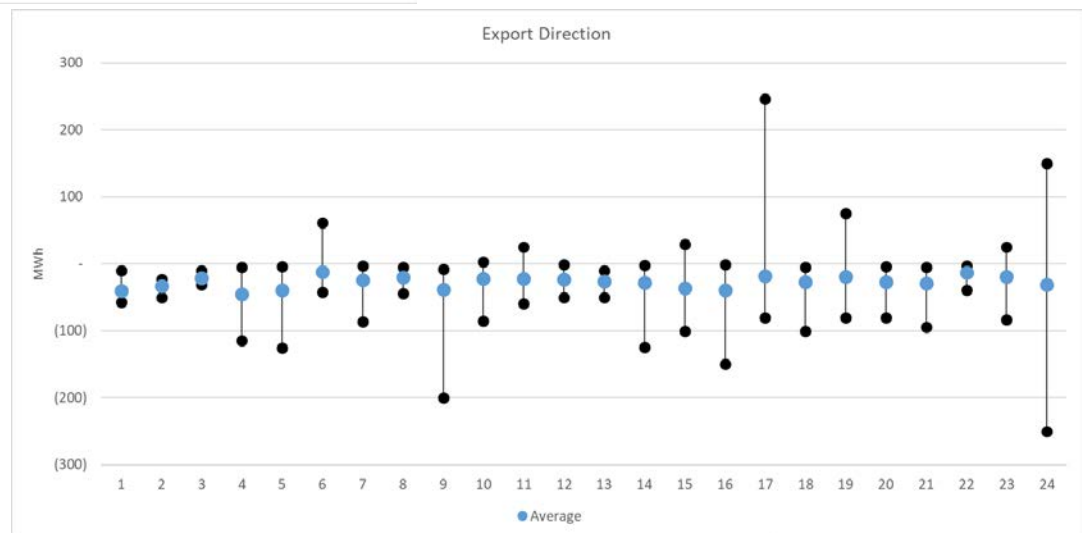
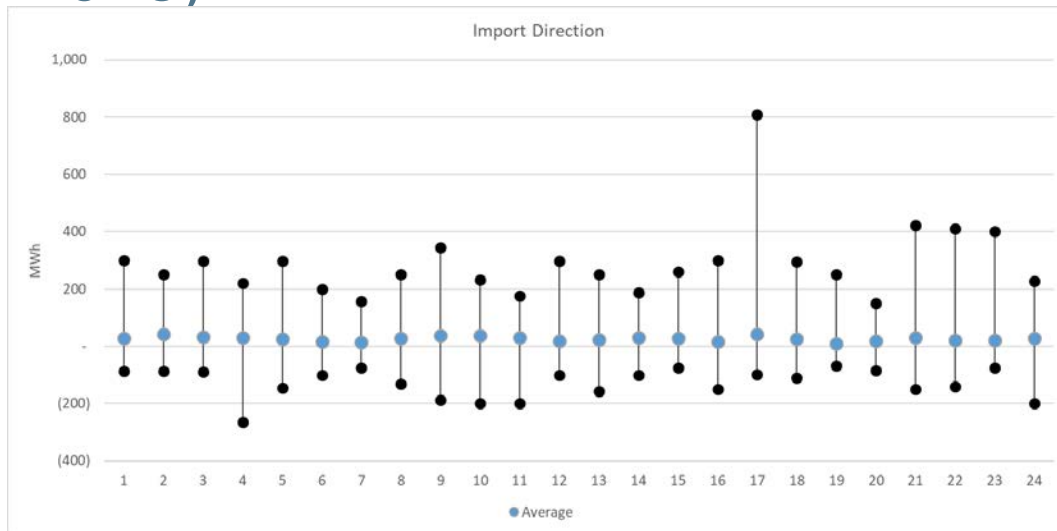
# Undelivered Interties (July 2017 - June 2018)



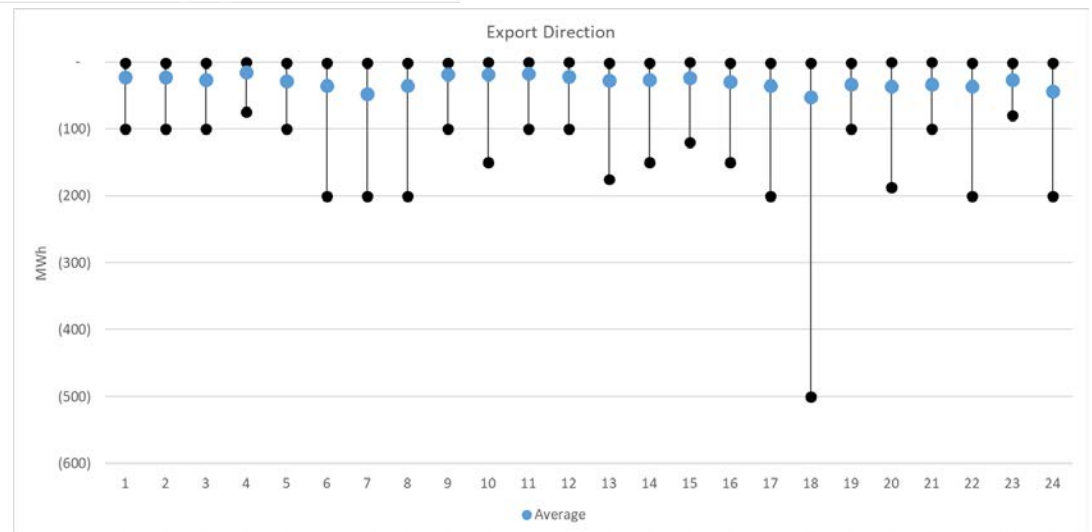
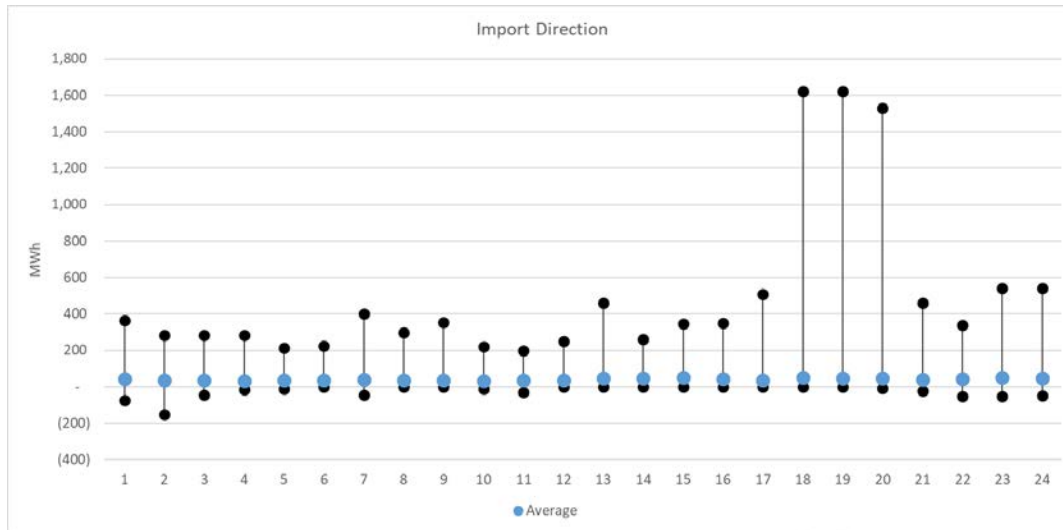
# Undelivered Interties during Sept 2017 Heat Wave



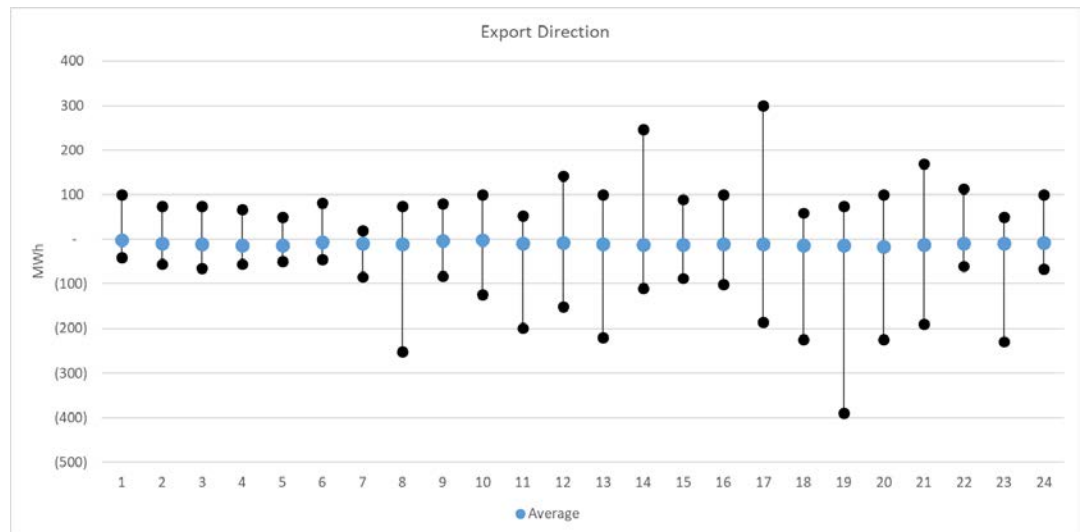
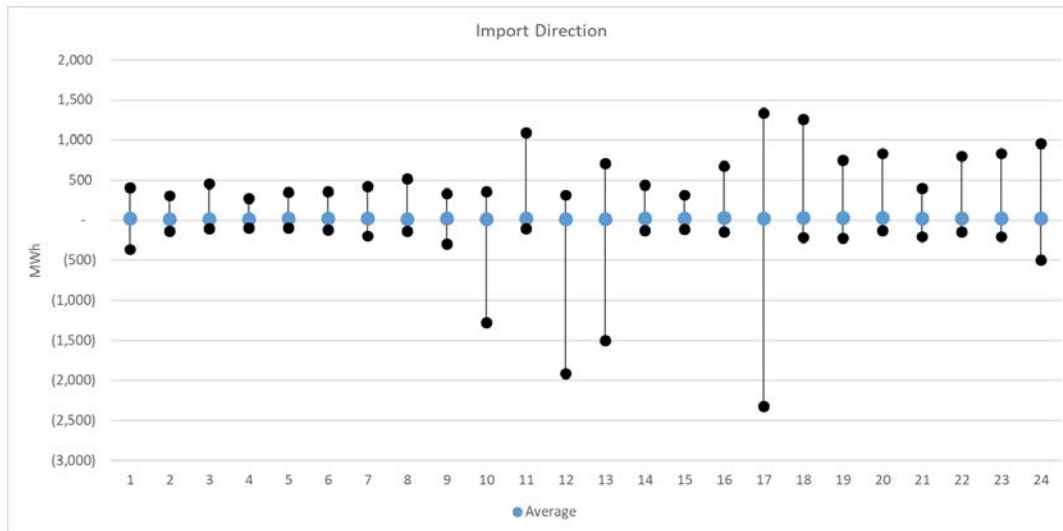
# Average Hourly Explicit Declines (July 2017 – June 2018)



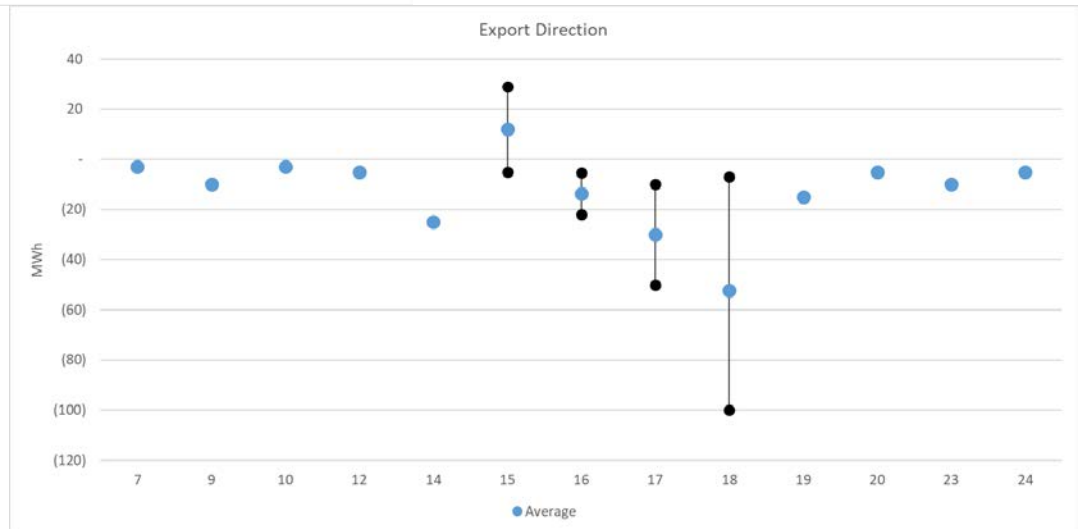
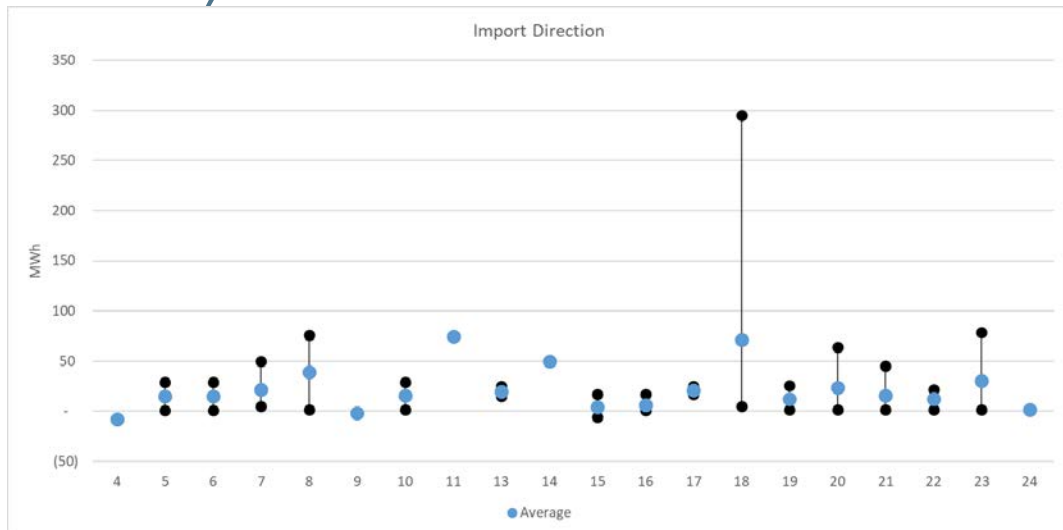
# Average Hourly Full No Show (July 2017 – June 2018)



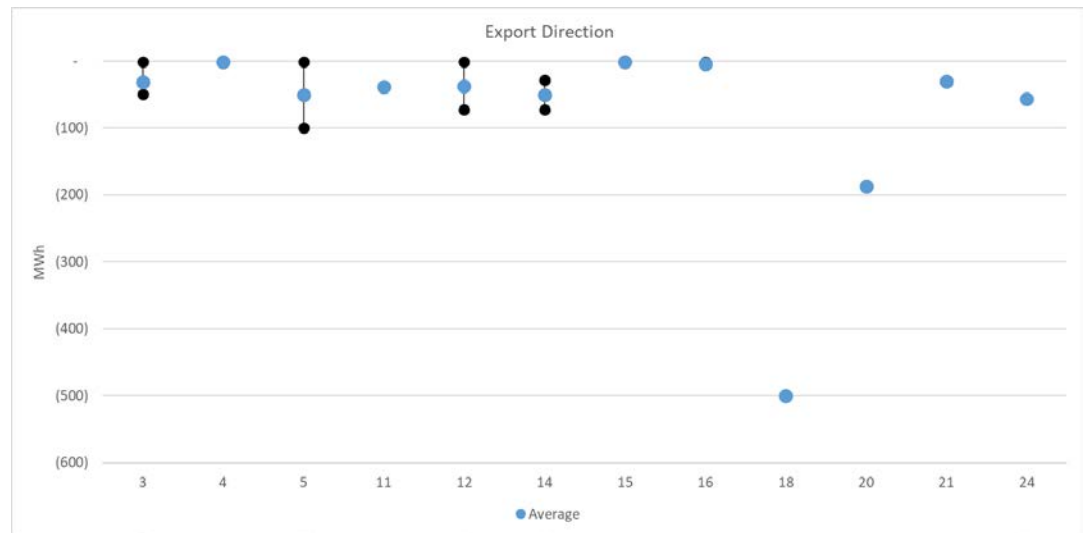
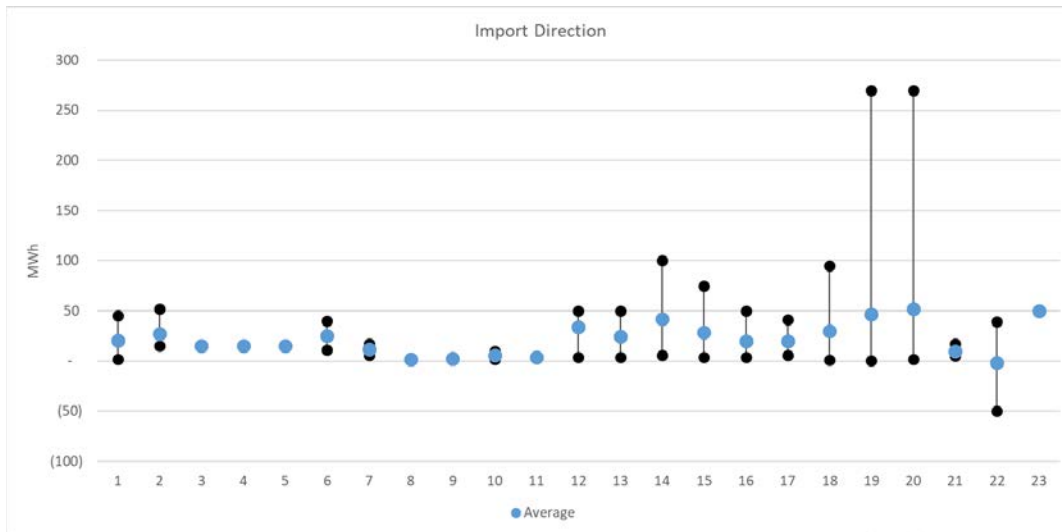
# Average Hourly Partial Show (July 2017 – June 2018)



# Average Hourly Explicit Declines (Sept 2017 Heat Wave)

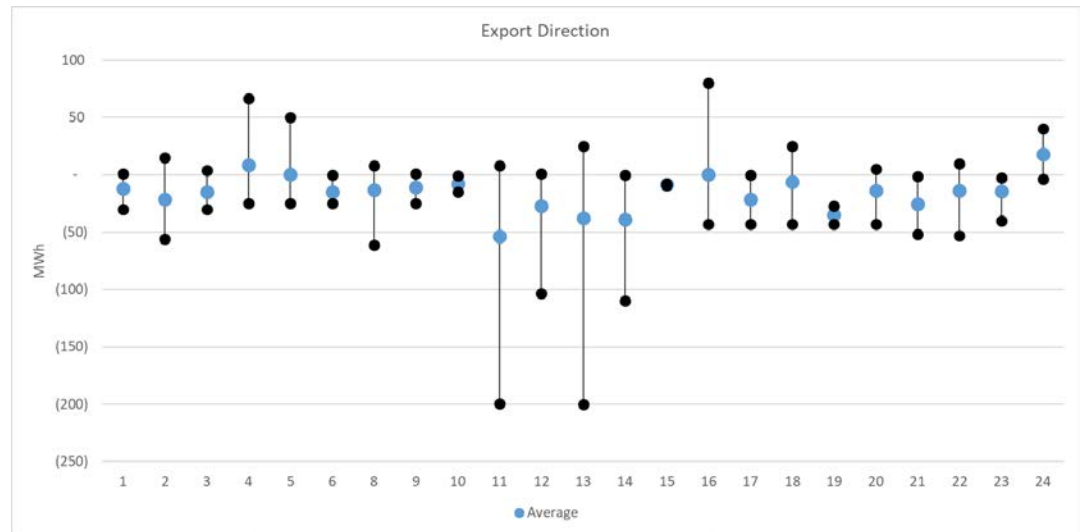
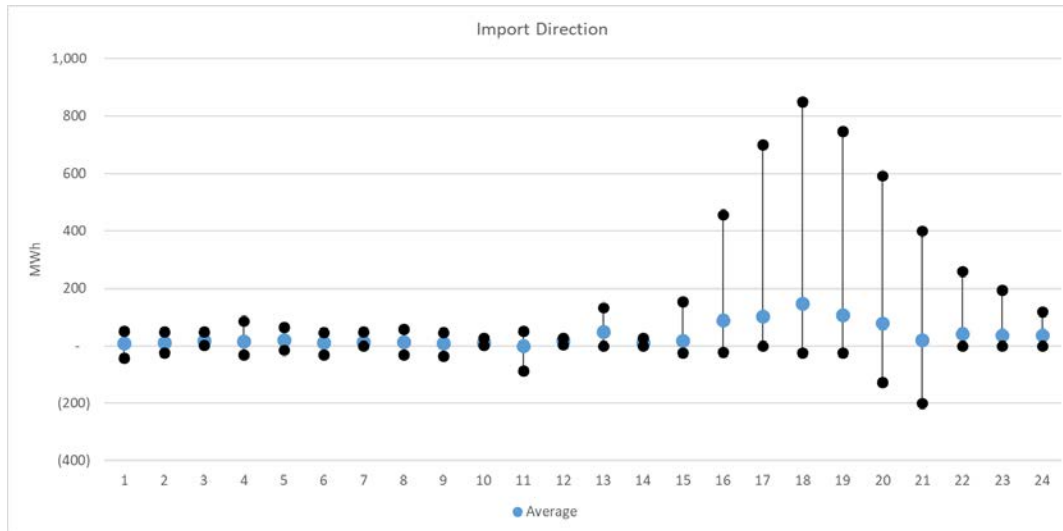


# Average Hourly Full No Show (Sept 2017 Heat Wave)





# Average Hourly Partial Show (Sept 2017 Heat Wave)



# QUESTIONS?

Intertie Deviation Settlement

# **UNDER/OVER DELIVERY CHARGE PROPOSAL**

## 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

## Implement real-time E-Tagging requirement for hourly-block resources

- E-Tags must be submitted by T-40
- FMM award will be based on the E-Tag value
  - FMM award = minimum of the HASP schedule, ADS accepted award, or E-Tag transmission profile
- Ensures FMM is aware of tagged values and eliminates pricing impacts to RTD
- Aligns with requirements for fifteen-minute dispatchable intertie resources

# Proposed logic for the determination of fifteen-minute binding awards for hourly block resources is based on submission of an E-Tag

FMM Binding Interval	Time of Operating Hour	Logic Used to Determine FMM Binding Award for Hourly Block Resources
1	00 – 15	MIN (HASP schedule, ADS accepted award, E-Tag transmission profile)
2	15 – 30	MIN (HASP schedule, ADS accepted award, E-Tag transmission profile)
3	30 – 45	E-Tag energy profile
4	45 – 00	E-Tag energy profile

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

- Tags that have been *adjusted* will count towards the under/over delivery charge
- Tags that have been *curtailed* by a balancing authority area operator for reliability reasons will be excluded from the under/over delivery charge

## 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

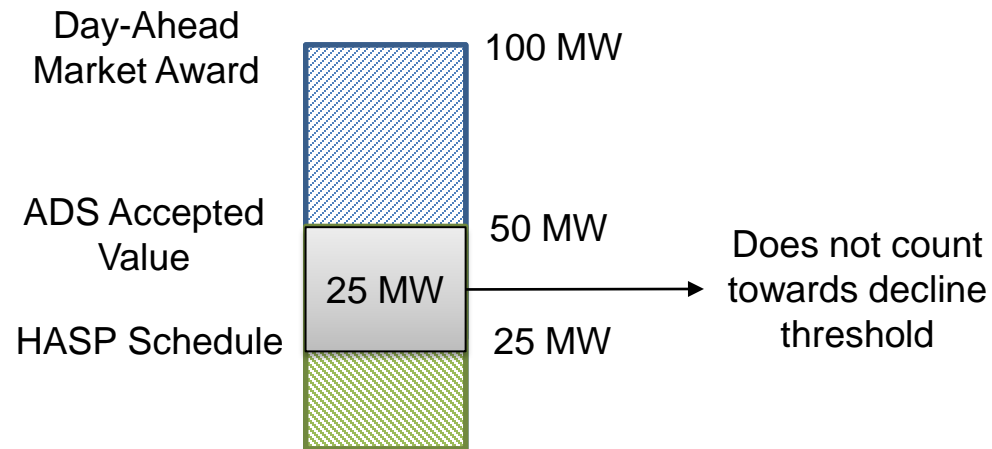


# Comparison of the reference schedule to the E-Tag encourages acceptance and delivery of awarded energy

Bid Option	Determination of Under/Over Delivery Quantity
<b>Self-Schedule Hourly Block</b>	Absolute Value (HASP Schedule – after the fact E-Tag Energy Profile)
<b>Economic Hourly Block</b>	
<b>Economic Hourly Block with Intra-Hour Option (once-change)</b>	
<b>Economic (fifteen-minute dispatchable)</b>	Absolute Value (FMM Schedule – after the fact E-Tag Energy Profile)
<b>Economic Variable Energy Resource</b>	
<b>Dynamic</b>	Excluded from under/over delivery charge

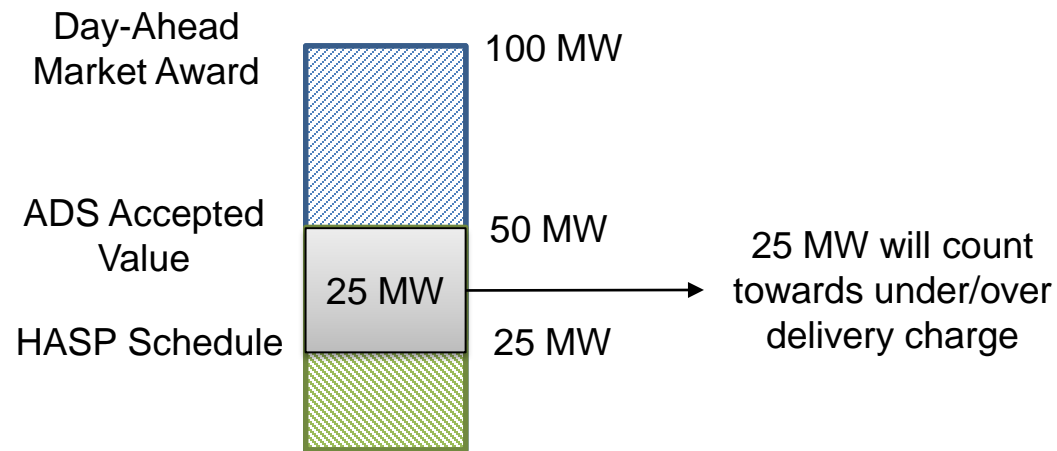
# Existing policy allows for decline of decremental dispatches with no impact to decline charge threshold

- Existing **decline charge** only applies when final award is less than HASP Schedule
  - Declines of decremental import (or incremental export) resources may result in operational impacts



# ISO proposes to apply new charge to both under and over delivery in comparison to reference schedule

- New **under/over delivery charge** will address decline of decremental dispatches



## Proposed charge will equal 50% of RTD LMP and will be allocated to measured demand

- Use of the RTD LMP will enable the charge to be comparable to the impact the decline had on the real-time market
  - Deviations will continue to be settled for applicable operational adjustment
  - Curtailments will be excluded from under/over delivery charge
- Floor of \$0 for under/over delivery charge will ensure scheduling coordinators are not paid for deviations when pricing is negative
- Continue to allocate funds to measured demand less ETCs and TORs

# New business practice will address partial accepted award resulting in over-scheduled intertie (1 of 3)

eTag	DA	HASP	Accepted DOT	Curtailed MW	Final eTag
Import_2	50	50	50	5	45
Import_3	100	100	100	10	90
Import_4	0	25	25	2	23
Import_1	50	75	75	8	67
Export_1	0	(50)	(25)	0	(25)
LIMIT	200	200	200	200	200
TOTAL	200	200	225	25	200

Accepted incremental dispatch

Partial accepted decremental dispatch

## New business practice will address partial accepted award resulting in over-scheduled intertie (1 of 3)

- If SC with a partially accepted (or declined) *incremental export* has an import schedule at the same intertie:
  - ISO operator will manually adjust the import schedule to accommodate the partially accepted (or declined export schedule)
- If SC with a partially accepted (or declined) *decremental import* has an export schedule at the same intertie:
  - ISO operator will manually adjust the import schedule to accommodate the partially accepted (or declined export schedule)

# New business practice will address partial accepted award resulting in over-scheduled intertie (1 of 3)

	eTag	DA	HASP	Accepted DOT	Curtailed MW	Final eTag
	Import_2	50	50	50	0	50
	Import_3	100	100	100	0	100
Accepted incremental dispatch	Import_4	0	25	25	0	25
	Import_1	50	75	75	25	50
Partial accepted decremental dispatch	Export_1	0	(50)	(25)	0	(25)
	LIMIT	200	200	200	200	200
	TOTAL	200	200	225	25	200

# Under/Over Deviation Charge Settlement Worksheet

Interval	1	2	3	4	5	6	7	8	9	10	11	12
DAM	0											
HASP Schedule	100											
HASP ADS Accept	100											
FMM	0			0			0			0		
E-Tag T-40	0											
E-Tag T-20	0											
LMP												
DAM	\$40.00											
FMM	\$45.00			\$45.00			\$45.00			\$45.00		
RTD	\$45.00	\$45.00	\$45.00	\$45.00	\$45.00	\$45.00	\$30.00	\$30.00	\$30.00	\$30.00	\$30.00	\$30.00
Settlement												
DAM	\$0.00											
FMM	\$0.00			\$0.00			\$0.00			\$0.00		
RTD	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Decline Charge	\$187.50	\$187.50	\$187.50	\$187.50	\$187.50	\$187.50	\$125.00	\$125.00	\$125.00	\$125.00	\$125.00	\$125.00
Net per interval	\$187.50	\$187.50	\$187.50	\$187.50	\$187.50	\$187.50	\$125.00	\$125.00	\$125.00	\$125.00	\$125.00	\$125.00
TOTAL FOR HOUR	\$1,875.00											

<http://www.caiso.com/Documents/IntertieDeviationSettlementWorksheet.xlsx>



# Decline Charge vs. Under/Over Delivery Charge

<b>Decline Charge</b>	<b>Under/Over Delivery Charge</b>
FMM binding award for interval 1 & 2 of operating hour = ADS accepted value*	FMM binding award for interval 1 & 2 of operating hour = min(HASP dispatch, ADS accepted value, E-Tag transmission profile)*
Curtailments included	Curtailments excluded
10% monthly threshold	No threshold - applied per 15-min interval
Compares HASP schedule to FMM award	Compares reference schedule to E-Tag
Applies to hourly block resources	Applies to all inertia resources**
Applies to under scheduling	Applies to under and over scheduling
Charged at 50% of FMM LMP	Charged at 50% of RTD LMP
Allocated to monthly measured demand less ETCs and TORs	Allocated to measured demand less ETCs and TORs

\*for hourly block resources

\*\*excluding dynamic resources

## Benefits of proposed under/over deviation charge:

- Allows for more effective and economic market solution and pricing
- Allows SC to be protected when curtailment occurs, but holds SC accountable to submit tags for awarded energy
- Aligns with framework for 15-minute resources
  - Tag must be submitted by T-40
  - Award is based on tagged value (transmission profile)
  - If tag exists, ITS can automatically adjust energy profile
- Market makes assumptions based on scheduling coordinator actions as opposed to market assumed values
- Charge is comparable to the impact the deviation had on the market

# QUESTIONS?

Intertie Deviation Settlement

# ADDITIONAL ITEMS

## Response to stakeholder comments that are outside the scope of this initiative

- Resource Adequacy on the interties will be addressed in the *RA Enhancements* initiative
- Moving the FMM timeline closer to T-20 does not address inertia declines
- ISO operating procedures explicitly specify it is the responsibility of Scheduling Coordinators to submit tags for awarded energy
- ISO will not pursue an uninstructed deviation penalty in this initiative
  - Internal gen is tied to a physical resource
  - Internal gen can be dispatched every 5 minutes and does not require the procurement and allotment of transmission

## Fifteen-minute curtailments and E-Tag information will be included in the *DAME* initiative

- DAME Phase 1 proposes 15-minute scheduling and bidding granularity for the day-ahead market
  - Requires alignment between the day-ahead market and real-time market
- Business practice of 15-minute curtailments and use of 15-minute transmission profiles will be included in the DAME Phase 1 proposal
  - Scheduled for implementation in Fall 2020

# Proposed EIM Governing Body Classification

- The Decline Charge impacts the real-time market
- “EIM GB has the right to submit to the Board its advice” on policies that impact the real-time market.
- The CAISO proposes the EIM Governing Body has a **advisory** role for this initiative

# QUESTIONS?



Intertie Deviation Settlement

# NEXT STEPS

# Proposed Initiative Schedule

Milestone	Date
<i>Post Issue Paper/Straw Proposal</i>	<i>August 15, 2018</i>
<i>Stakeholder Call</i>	<i>August 22, 2018</i>
<i>Stakeholder Written Comments Due</i>	<i>September 5, 2019</i>
<i>Post Straw Proposal</i>	<i>October 8, 2018</i>
<i>Stakeholder Meeting</i>	<i>October 15, 2018</i>
Stakeholder Written Comments Due	October 29, 2018
Stakeholder Working Group Meeting	December 14, 2018
Stakeholder Written Comments Due	December 21, 2018
Post Draft Final Proposal	January 15, 2019
Stakeholder Call	January 22, 2019
Stakeholder Written Comments Due	January 29, 2019
EIM Governing Body Meeting	March 12, 2019
Board of Governors Meeting	March 27-28, 2019

