



Joint and Common Market

# **FREEZE DATE ALTERNATIVES**

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# Background

- Reference date of April 1, 2004, known as “Freeze Date”, is used as mechanism to determine firm rights on flowgates based on pre-market firm flows.
- As we move further away from the current Freeze Date (>16 years), issues with the current date have become prominent.
- RTOs and their stakeholders agreed that there is a need to work on Freeze Date alternatives.

# Acronyms

FFE - Firm Flow Entitlement

FFL – Firm Flow Limit

TLR – Transmission Loading Relief

HBAA – Historical Balancing Authority Area

TSR – Transmission Service Reservation

CMR – Congestion Management Resource

BAA – Balancing Authority Area

GTL – Generation-to-Load

PTP – Point-to-Point

# Key Definitions

## *Firm Flow Entitlement*

Firm limits used in forward market constructs and after-the-fact real-time market settlements between one or more Market Based Operating Entities.

## *Firm Flow Limit*

The maximum value of Firm Flows an entity can have on a Coordinated or Reciprocal Coordinated Flowgate, based on procedures defined in Sections 4 and 5 of the CMP agreement.

# How FFE and FFL is Used

## FFE- Firm Flow Entitlement (Net)

- Market to Market Real-time congestion payments with market entities; non-owner pays when real time market flow over FFE (MISO/SWPP/PJM)
- Day Ahead Market uses FFEs to determine limits for next operating day
- FTR Auctions uses the limit for flowgate's in yearly and monthly auction process

## FFL-Firm Flow Limit (Directional)

- Sets the Firm and Non-Firm Market Flow limits for markets flows in TLRs process
- Used in sale of Firm Transmission approval process

# Phase II – Freeze Date Solution Update

## FFE

- Markets have officially agreed to an FFE solution
- A final version of the whitepaper that captures this solution has been posted
- CMPWG is engaging our vendor (OATI) for cost and timeline estimates of enhancements
- Soon to start drafting JOA/CMP language updates
- Agreements include Market Flow calculation updates

## FFL

- Evaluating multiple proposals
- Very likely will use the same inputs as FFE
- Aiming to reach agreement before FFE exits planning phases and combine FFE and FFL into one CMP update

## CMPWG Priorities

- Draft JOA/CMP Language
- Obtain cost estimate from vendors for FFE
- Reach conceptual agreement for FFL



# Proposed FFE Solution



# FFE Formulation

1



2



3

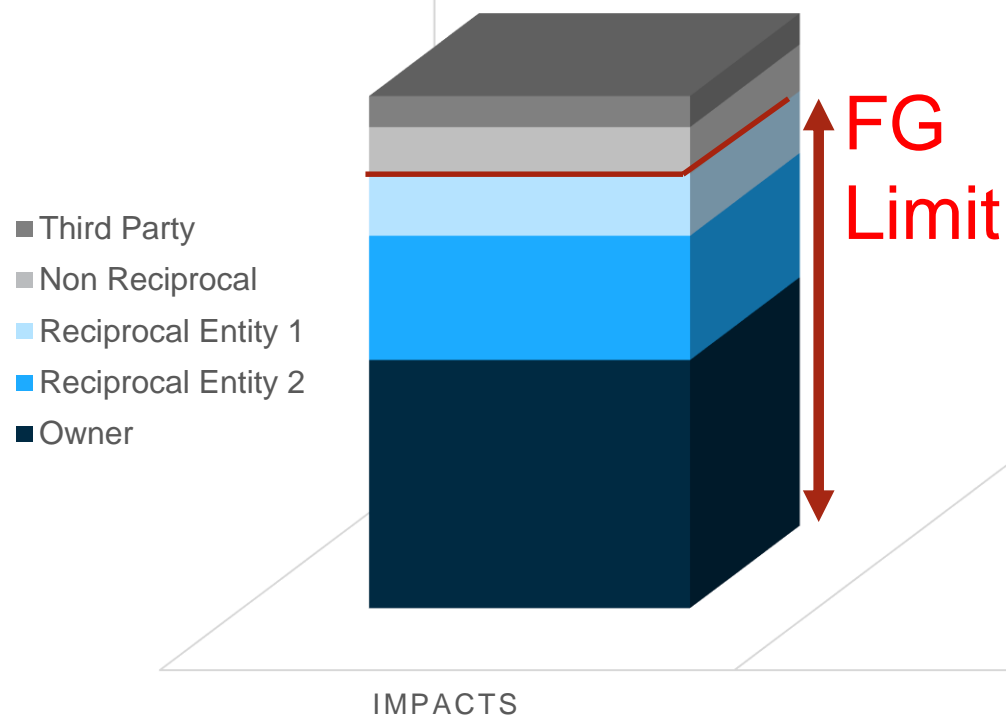




# Input #1 Net Allocations

Net Allocations

## ALLOCATING NET IMPACTS ON EACH FLOWGATE



## Principles

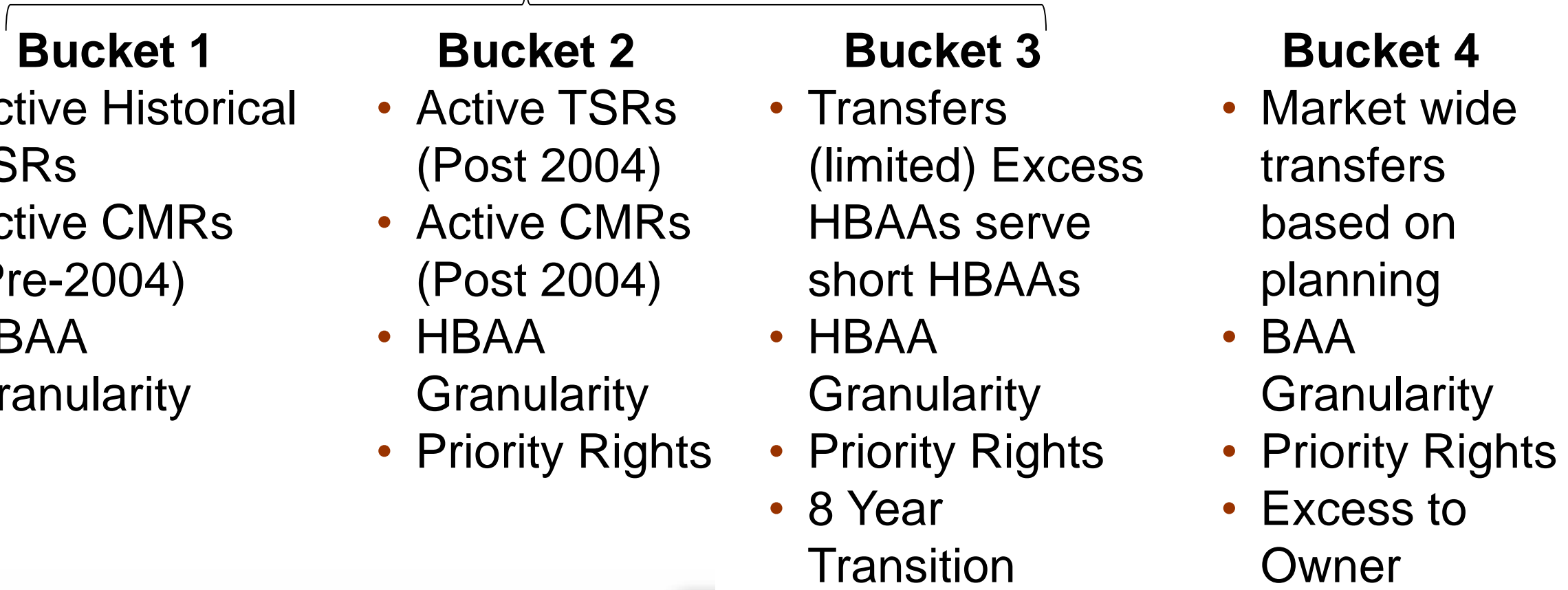
- Respect Flowgate limits
- Prioritize historical impacts
- Prioritize coordinated impacts
- Prioritize curtailable impacts
- Award excess to Transmission Provider of Flowgate

# Allocations Consider 4 Major Impact Categories

Net Allocations

$$\text{Total Impact} = \text{Bucket 1} + \text{Bucket 2} + \text{Bucket 3} + \text{Prevailing Bucket 4}$$

## Pre-Market Integration Granularity



# Impact Calculation Methodology

Net  
Allocations

Impact calculation refers to the calculation of firm transmission reservation impacts and generation-to-load impacts on flowgates which are then used in determining the allocations on each flowgate

$$\begin{aligned}\text{Total Impact on Flowgate} &= \text{Historic LBA impact} + \text{Prevailing bucket 4 impact} \\ &= (B1+B2+B3) + (PB4) \text{ impact}\end{aligned}$$

- Bucket 1
  - Serve active Freeze Date Inter-BA TSRs
  - Serve HBAA Load using Freeze Date network resources
- Bucket 2
  - Serve remaining active Inter-BA TSRs
  - Serve HBAA Load using Post Freeze Date network resources
- Bucket 3
  - Excess HBAA serve short HBAA on a pro-rata basis
- Bucket 4
  - Serve RTO Load using RTO Dispatch
  - Bucket 4 prevailing Impact = Bucket 4 RTO Impact - sum of B1, B2, B3 Impact

# Prevailing Bucket 4 for FFE

Net  
Allocations

- The prevailing bucket 4 impacts represent the change or delta impact between historical HBAA to RTO dispatch
- Mainly applicable to markets entities (MISO/SWPP/PJM)
- The prevailing bucket 4 calculation differs for year 0, year 4, and year 8 to allow for phase out mechanism of bucket 3

## **PB4 Impacts = Net RTO(B4) - Net HBAA(B1+B2+B3) impacts**

- For Year 0 to 4: PB4 impacts are capped to Zero if negative **(Historical HBAA impacts higher priority)**
- For Year 4 to 8: PB4 50% counter flows included if negative & Bucket 3 is capped to 50%
- From Year 8 : PB4 100% counter flows included if negative & Bucket 3 step is retired

For year 0 to 4 PB4 counter flows are not included as the bucket 4 counter flows should not reduce the Historical HBAA impacts

# Prevailing Bucket 4 calculation

Net Allocations

Gen-to-Load and Firm TSR Impacts									
Case	Bucket 4 RTO Dispatch	Bucket 1 to 3 HBAA Dispatch	Prevailing Bucket 4 (RTO-HBAA)			Final Impacts (HBAA+PB4)			
			RTO- HBAA	Year 0	Year 4	Year 8	Year 0	Year 4	Year 8
1	60	20	40	40	40	40	60	60	60
2	50	100	-50	0	-25	-50	100	75	50
3	50	-25	75	75	75	75	50	50	50

\* In this example Bucket 1 to 3 HBAA impacts are constant for year 0,4,8 for simplicity

PB4 net impacts on a flowgate are capped if the sum of B1, B2, B3, and PB4 impacts exceeds the net RTO Dispatch

# 12 Specific Classifications Prioritize Impacts

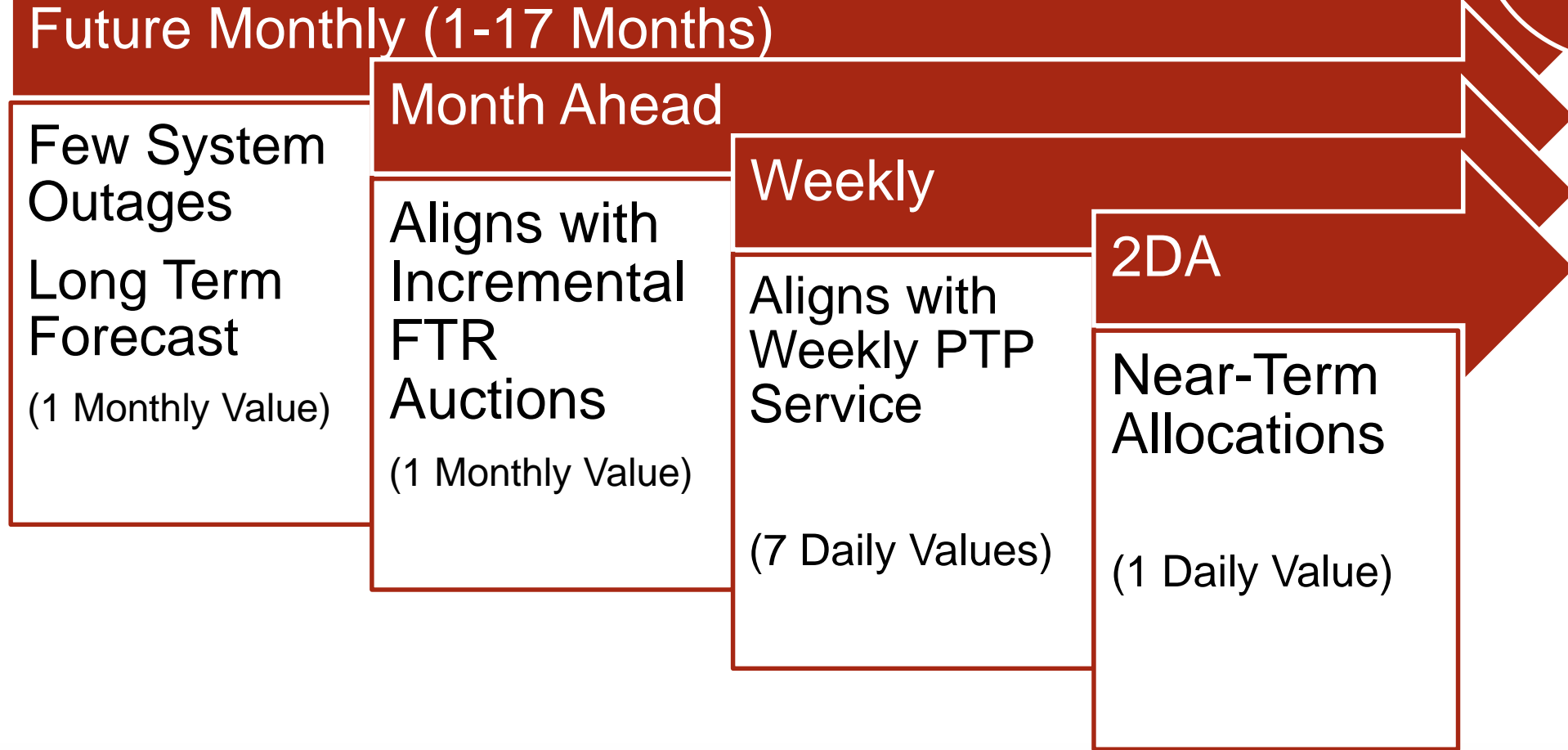


		B1			B2			B3			Prevailing B4				
Net Impact		Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party		
>5%	Priority Rank	1			2			3			9	10			
<5%		4		N/A	5	6		N/A	7	8		N/A	11	12	

- Total impact on a flowgate determined by adding up impacts 1 through 12
  - Third Party <5% are not counted towards Total impact (same as today)
- **All** impacts are eligible for allocation except Third Party <5% impacts
  - >5% Impacts are allocated to all Entities
  - <5% impacts are allocated to all CMP entities
  - Over Impacted Flowgates or Excess capacity is determined by comparing Total impacts (1-12) to Rating
- If FG over impacted, then impacts are removed starting at priority 12, until total considered impacts are at rating
- Non-owner CMP entities curtail <5% flows before owner in B2,B3,B4
- If FG under impacted, then Excess capacity to owner

# Forward Looking Allocations

Net Allocations





# Net Allocation Examples





# All Net Impacts on a Flowgate

	B1				B2				B3				Prevailing B4					
Impacts	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Total	
>5%	10	5		5	10	5		5	5	10			5	5			65	
>5% rank	1				2				3				9	10				
<5%	10	5	5	5	5	5	5	5	10	10	5		5	15	5		85	
<5% rank	4			N/A	5	6		N/A	7	8		N/A	11	12		N/A		
<b>Total Net Impacts on a Flowgate = 150 MW</b>																		

Third Party <5% flows are not allocated as their flows are not curtailed in market-to market process during congestion

# Under Allocated Scenario

Flowgate is under allocated when total impacts (1 to 12) on a flowgate is less than flowgate limit

- Total Impact (Priority 1 to 12) = 150MW
- Rating=200MW

Excess Capacity to Owner = Rating - Total Impact  
= 200 - 150  
= 50 MW

Owner Final Allocation = 60 + 50  
= 110 MW

Entities	Total Impact	Final Allocation
Owner	60	110
CMP RCF	60	60
CMP Non-RCF	20	20
Third Party	10	10
Total	150	200

# Over Allocated Scenario

Flowgate is over allocated when total impacts (1 to 12) on a flowgate is greater than flowgate limit

- Total Impact (Priority 1 to 12) = 150MW
- Rating = 100MW

Over Allocated by = Rating - Total Impact  
Over Allocated by = 100 - 150 = -50MW

Curtailment = 50MW to be at Limit

Entities	Total Impact	Final Allocation
Owner	60	50
CMP RCF	60	30
CMP Non-RCF	20	10
Third Party	10	10
Total	150	100

# Net Impacts Curtailment for Over Allocation

	B1				B2				B3				Prevailing B4					
Impacts	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Owner	CMP RCF	CMP Non-RCF	Third Party	Total	
>5%	10	5		5	10	5		5	5	10			<del>5</del>	<del>5</del>			65	
>5% rank	1				2				3				9	10				
<5%	10	5	5		5	5	5		10	<del>10</del>	<del>5</del>		<del>5</del>	<del>15</del>	<del>5</del>		85	
<5% rank	4			N/A	5	6	N/A	7	8	N/A	11	12	N/A					
<b>Total Net Impacts on a Flowgate after curtailment= 100 MW</b>																		

\* Red indicates impacts curtailed for 50MW of over allocation to cap the impacts to flowgate rating(100MW)

# FFE Formulation

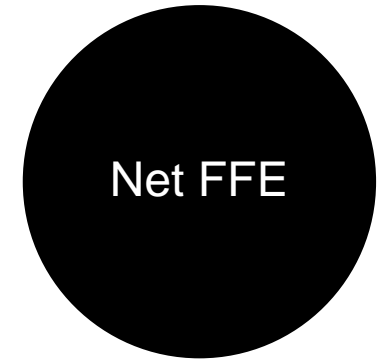
1



2



3



# Input #2 Day-Ahead GTL Impacts

Net Day  
Ahead GTL  
Impacts

- Expected GTL usage for each entity tomorrow based on updated topology and load forecast
- 24 hourly values
- Used to identify expected unused allocation or coordinate expected overuse

# FFE Formulation

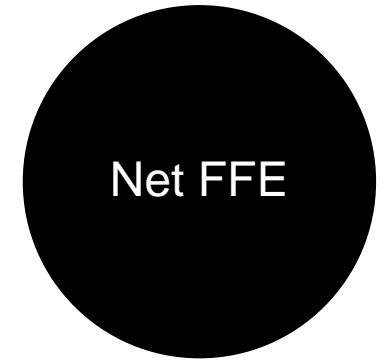
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# Input #3 Real-time Schedule Impacts

Net  
Real-time  
Scheduled  
Impacts

- Scheduled Impacts quantify impact of Interchange Transactions firmed up by Firm PTP TSRs that are included in the Allocation calculation
- These impacts are subtracted from Allocation to remove commercial impacts (GTL)
- Calculated every 15 minutes



# Firm Flow Entitlement Calculation

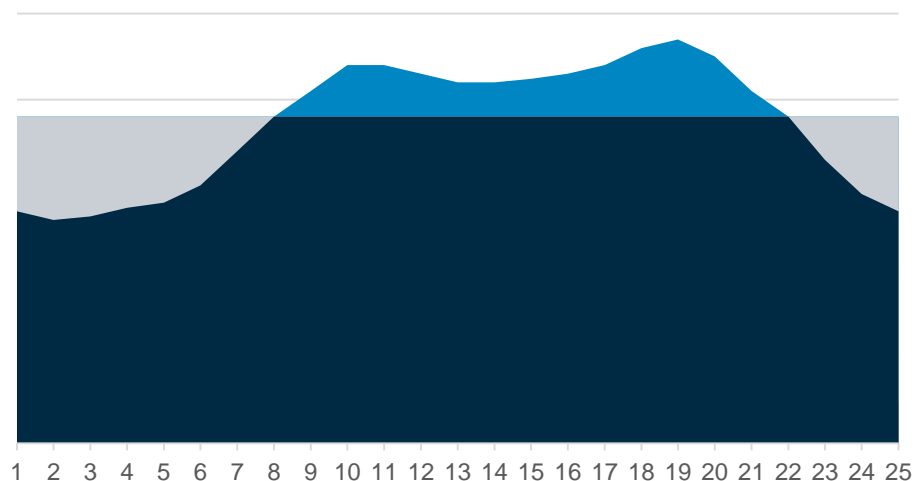
Net FFE

*If (Net 2DA Allocation - Net Schedule Impact) < Net DA GTL*

$$FFE = \text{Net 2DA Allocation} - \text{Net Schedule Impact}$$

*If (Net 2DA Allocation - Net Schedule Impact) > Net DA GTL*

$$FFE = \text{minimum (Net DA GTL, Net 2DA Allocation)}$$



- Light blue represents anticipated overuse based on Day Ahead forecast
- Grey represents anticipated under-use
- Dark Blue represents FFE



# Market Flow Calculation Updates



# MFC - Granularity Change

- Update Market Flow calculation to use current Balancing Authority Area (BAA) granularity when calculating GTL
  - Removes historical granularity
- MISO to use a regional approach
  - Midwest
  - South
  - RDT Transfer



# Firm Flow Limits (FFL)



# FFL Status

- Non-Markets have concerns with original Phase II FFL proposal
  - Concerned with increase in firm limits for markets due to inclusion of Post freeze date network resources & firm inter TSRs in bucket 2; which could lead to more TLR-5 firm curtailment obligations for Non-Markets
- CMPWG Evaluating multiple proposals
  - Directional based approach
  - Net based approach

# FFE/FFL Timeline

Task	Description	Anticipated Date	Status
1	Finalize Whitepaper for FFE	Complete	✓
2	Engage OATI for cost and time estimates	Ongoing	★
3	Communication and feedback with stakeholders	Ongoing	★
4	Start CMP Language Drafting	Ongoing	★
5	Evaluate inclusion of FFL solution*	Q4 2020	★
6	FERC Prefiling Meetings	Q1 2021	★
7	FERC Filing	Q2 2021	★
8	Start Development and Testing	Q2 2021	★
9	Implementation	6/1/2022	★

\* CMPWG will continue to work on conceptual agreement to FFL in parallel

# Freeze Date Whitepaper – FFE Solution

- A special JCM session to receive feedback from stakeholders is scheduled for November 17<sup>th</sup>, 2020
- [The Freeze Date Whitepaper – FFE Solution](#) is posted to the JCM website

# Contacts

Solicit stakeholder feedback – send comments to:

- Matt Sutton [msutton@misoenergy.org](mailto:msutton@misoenergy.org)
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