



## **ERCOT CRR Market Overview**

Donald House  
Supervisor, CRR

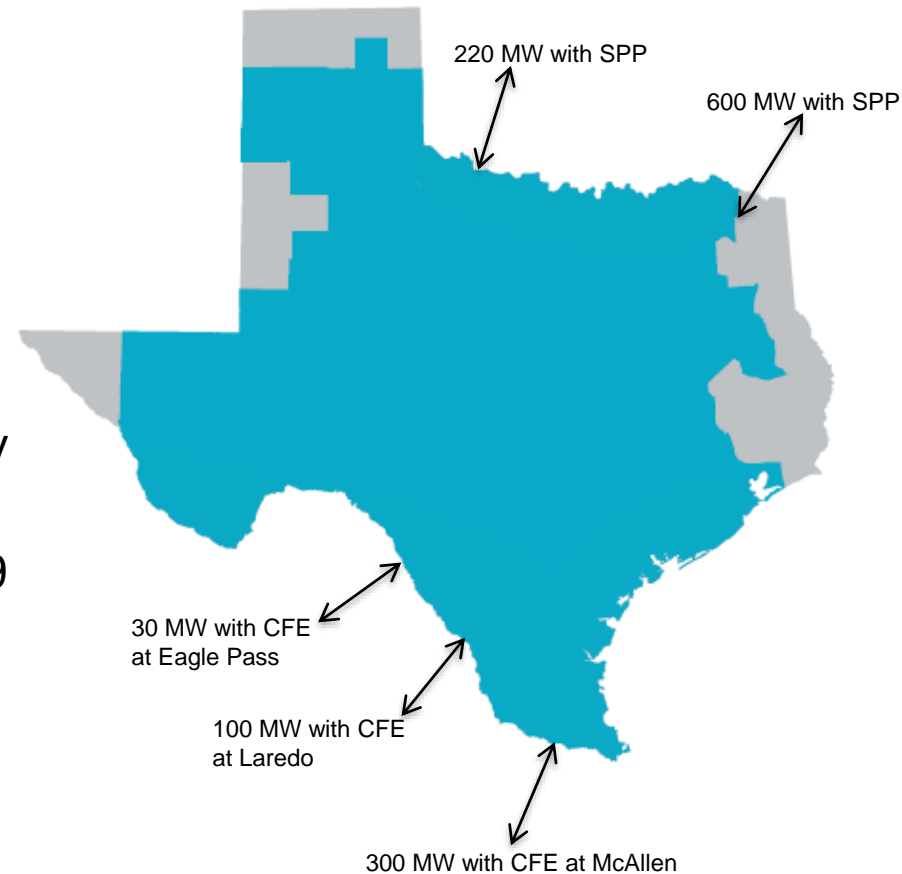
PJM ARR/FTR Market Task Force  
March 25, 2020

# The ERCOT region

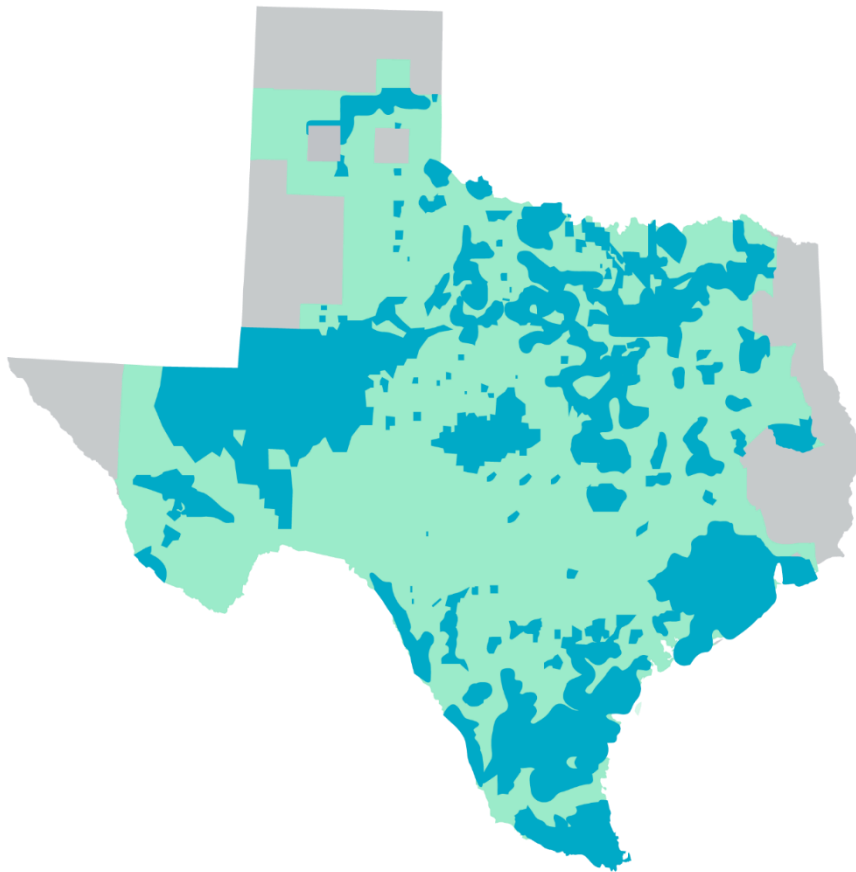
The interconnected electrical system serving most of Texas, with limited external connections

ERCOT connections to other grids are limited to ~1,250 MW of direct current (DC) ties with Southwest Power Pool (SPP) and Comision Federal de Electricidad (CFE), which allow control over the flow of electricity

- 74,820 MW peak load on August 12, 2019
- 680+ generation units
- 82,000+ MW of total installed capacity
  - 23,800+ MW of wind
  - 2,200+ MW of solar
  - 100+ MW of battery storage





# ERCOT includes Competitive, Municipal, and Cooperative service areas



ERCOT covers 75% of the state of Texas land, including 90% of the state's electric load

- More than 26 million consumers in ERCOT
- 75% of ERCOT's load is made up of competitive choice customers

-  Competitive Retail Area
-  Municipally Owned Utilities and Electric Co-Ops

# ERCOT FTR market structure

- ERCOT uses the term Congestion Revenue Right (CRR)
- Some Non-Opt-In Entities (NOIEs), typically municipals/cooperatives, get Pre-assigned CRRs (PCRRs) at a discounted price through an annual allocation process
- CRRs are available as monthly products in long-term (6-month) and monthly auctions and can be traded bilaterally
- CRRs are available in three Times Of Use (TOUs):
  - Peak Weekday, Peak Weekend, Off-peak
  - And a 24-hour TOU for monthly auctions only

## ERCOT FTR market structure – continued

- Both options and obligations are available on any combination of over 585 settlement points for any TOU (excluding points deemed to be electrically similar)
  - Current CRR ownership is approx. 70% options and 30% obligations
- ERCOT also sells an hourly RT congestion product, purchased as a DAM PTP Obligation (not officially part of the CRR market)

# Annual PCRR allocations

- PCRR eligibility is based on the NOIE's generator-to-load contracts that have been in place since before September 1, 1999 (pre-Texas electric market deregulation)
- Eligibility is evaluated prior to each annual allocation and can be reduced or eliminated based on unit retirements, unit seasonal rating changes, or contract changes
  - Retirements and ratings or contract changes can also impact currently owned PCRRs if they occur outside of the annual allocation process cycle
- Allocations are held annually for the calendar year associated with the upcoming CRR First Offering long-term auctions
  - For example, in summer 2020, we will run the allocation for the 2023 calendar year

## Annual PCRR allocations – continued

- Allocation network models are built using the same process as for long-term auction models
- NOIEs only submit nominations for MW (less than or equal to their eligible amount); they do not submit a bid price
- Awarded PCRRs are charged a percentage of the path clearing price (generator source to load zone sink) in the associated CRR First Offering auctions
  - % is based on type of generator and whether PCRR is an Obligation or Option (range from 5-20% of clearing price)
- Once a PCRR is owned, it settles in the Day-Ahead Market (DAM) just like other CRRs
  - They are also tradeable like other CRRs

# CRR market credit requirements

- Each CRR Account Holder (CRRAH) must have an associated Counter-Party (CP) who is responsible for allocating credit for each auction
- Allocated credit should be enough to cover the estimated bid exposures for all CRRAHs associated with the same CP
  - Bid exposure is calculated by multiplying the bid MW by the bid price
    - An adder is applied to Obligation bids to account for their potential negative value
    - The adder =  $-\text{[Min (0, ACI99, ACP)]}$ 
      - Negative values for ACI99 and ACP result in a higher credit requirement
    - ACI99 = 99<sup>th</sup> percentile confidence interval for the previous three years of DAM settlement point prices for the source/sink path in each bid
    - ACP = most recent auction clearing price for the source/sink path in each bid
- If allocated credit does not cover the estimated bid exposure, the CP will have a budget constraint, which could result in fewer awards in the auction



# CRR market credit requirements – continued

- Awarded CRRs are invoiced the next Business Day after the auction results are posted
- Invoice payments are due four Bank Business Days after the invoices are posted
  - Invoices must be paid in order for a CRRAH to take ownership of the awarded CRRs
  - Ownership is required to:
    - Settle CRRs in the DAM
    - Offer CRRs into future auctions
    - Trade CRRs bilaterally

# CRR market credit requirements – continued

- CPs must maintain daily credit to cover their Total Potential Exposure (TPE), which accounts for all associated ERCOT market activity (CRR, DAM, Real-Time)
  - The CRR portion of the TPE also uses the ACI99 and ACP adders when calculating the Future Credit Exposure (FCE) for all owned Obligation CRRs
  - The CP's FCE is calculated for all owned CRRs, including the remaining TOU hours of the current month and all TOU hours for future months
- CPs that do not maintain enough credit to cover their TPE will receive a collateral call from ERCOT Credit

# Long-term and monthly auctions

- Each calendar month, ERCOT holds a long-term auction and a monthly auction
- Long-term auction sequences offer CRRs for the next three years in 6-month blocks (Jan-Jun or Jul-Dec)
  - Seq1 with 70% network capacity
    - Nearest block of Jan-Jun or Jul-Dec
  - Seq2 with 55% network capacity
  - Seq3 with 40% network capacity
  - Seq4 with 30% network capacity
  - Seq5 with 20% network capacity
  - Seq6 with 10% network capacity
    - Furthest block of Jan-Jun or Jul-Dec (going 3 years out)
- Monthly auctions at 90% of network capacity

# CRRs for each month are available in 7 different auctions

Each calendar month is included in 6 long-term auctions and 1 monthly auction

Available % of network capacity for each auction\*



\*Existing CRRs are included in the capacity. The remaining % is available in the auction.



# CRR Activity Calendar

- List of key activity dates for all CRR auctions for current calendar year and the next 2 calendar years

CRR Activity Calendar												
Auction Name	Auction Type	Post Network Model	Post Auction Notice and Credit Window Opens	Post Path Specific Addrs Report	Auction Bid Window Opens 12:01am	Credit Lock Date and Auction Bid Window Closes 5:00pm	Post Auction Results On or Before This Date	Auction Invoice Posted and Credit Released On or Before This Date	CRR Ownership Assigned On or Before This Date 7:30pm	CRR Effective Start Date	CRR Effective End Date	Auction Capacity %
2020.FEB.Monthly.Auction	Monthly	12/30/2019	1/3/2020	1/9/2020	1/14/2020	1/16/2020	1/23/2020	1/24/2020	1/30/2020	2/1/2020	2/29/2020	90
2021.2nd6.AnnualAuction.Seq4	Annual	12/18/2019	12/31/2019	1/15/2020	1/21/2020	1/23/2020	2/6/2020	2/7/2020	2/13/2020	7/1/2021	12/31/2021	30
2020.MAR.Monthly.Auction	Monthly	1/28/2020	1/31/2020	2/6/2020	2/11/2020	2/13/2020	2/20/2020	2/21/2020	2/27/2020	3/1/2020	3/31/2020	90
2022.1st6.AnnualAuction.Seq5	Annual	1/21/2020	1/29/2020	2/13/2020	2/18/2020	2/20/2020	3/5/2020	3/6/2020	3/12/2020	1/1/2022	6/30/2022	20
2020.APR.Monthly.Auction	Monthly	2/25/2020	2/28/2020	3/5/2020	3/10/2020	3/12/2020	3/19/2020	3/20/2020	3/26/2020	4/1/2020	4/30/2020	90
2022.2nd6.AnnualAuction.Seq6	Annual	2/18/2020	2/26/2020	3/12/2020	3/17/2020	3/19/2020	4/2/2020	4/3/2020	4/9/2020	7/1/2022	12/31/2022	10
2020.MAY.Monthly.Auction	Monthly	3/24/2020	3/27/2020	4/2/2020	4/7/2020	4/9/2020	4/16/2020	4/17/2020	4/23/2020	5/1/2020	5/31/2020	90
2020.2nd6.AnnualAuction.Seq1	Annual	3/17/2020	3/25/2020	4/9/2020	4/14/2020	4/16/2020	4/30/2020	5/1/2020	5/7/2020	7/1/2020	12/31/2020	70
2020.JUN.Monthly.Auction	Monthly	4/28/2020	5/1/2020	5/7/2020	5/12/2020	5/14/2020	5/21/2020	5/22/2020	5/29/2020	6/1/2020	6/30/2020	90
2021.1st6.AnnualAuction.Seq2	Annual	4/21/2020	4/29/2020	5/14/2020	5/19/2020	5/21/2020	6/4/2020	6/5/2020	6/11/2020	1/1/2021	6/30/2021	55
2020.JUL.Monthly.Auction	Monthly	5/26/2020	5/29/2020	6/4/2020	6/9/2020	6/11/2020	6/18/2020	6/19/2020	6/25/2020	7/1/2020	7/31/2020	90
2021.2nd6.AnnualAuction.Seq3	Annual	5/18/2020	5/27/2020	6/11/2020	6/16/2020	6/18/2020	7/2/2020	7/6/2020	7/10/2020	7/1/2021	12/31/2021	40
2020.AUG.Monthly.Auction	Monthly	6/29/2020	7/2/2020	7/9/2020	7/14/2020	7/16/2020	7/23/2020	7/24/2020	7/30/2020	8/1/2020	8/31/2020	90

# CRR settlements

- All auction revenue is uplifted to load based on load ratio share
- CRRs are settled using DAM settlement point prices for the source and sink pair for each hour of the CRR product
- CRRs are funded from Day-Ahead Market (DAM) congestion rent
  - Congestion rent = charges to load – payments to generators
  - Excess congestion rent is put in a balancing account with \$10M cap, which is used to cover monthly shortfalls. The remaining is uplifted to load each month.

# CRR defaults

- Owned CRRs for a defaulting entity are offered in a “one-time” auction
  - CRRs for the current month are stopped and do not settle in DAM
  - All CRRs for future months are offered together as a single portfolio
  - Bidders submit a positive bid price to purchase the entire portfolio
    - Do not bid on individual CRRs
  - Winning bidder is awarded all CRRs in the portfolio if they pass a credit check for the additional Future Credit Exposure
  - If there is no winning bid, all CRRs in the portfolio are stopped and do not settle in DAM
- Revenues from the auction are used to offset the default amount
- ERCOT is working with the stakeholders to revise the CRR default process

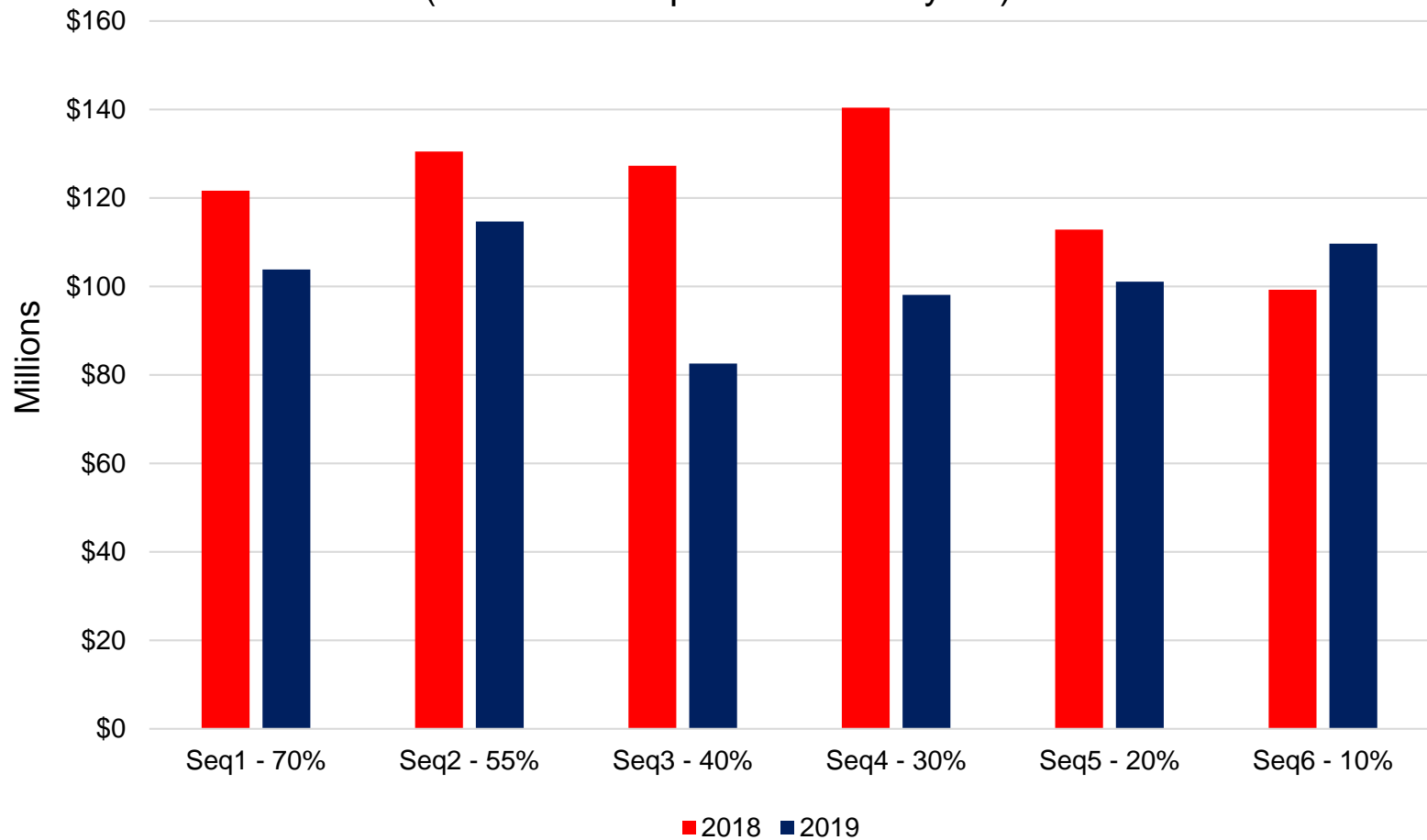
# ERCOT CRR market summary charts

- Auction revenue
  - Long-term and monthly auctions
- Funding
  - Balancing Account Fund
- Value vs cost
- Day-ahead and real-time price convergence



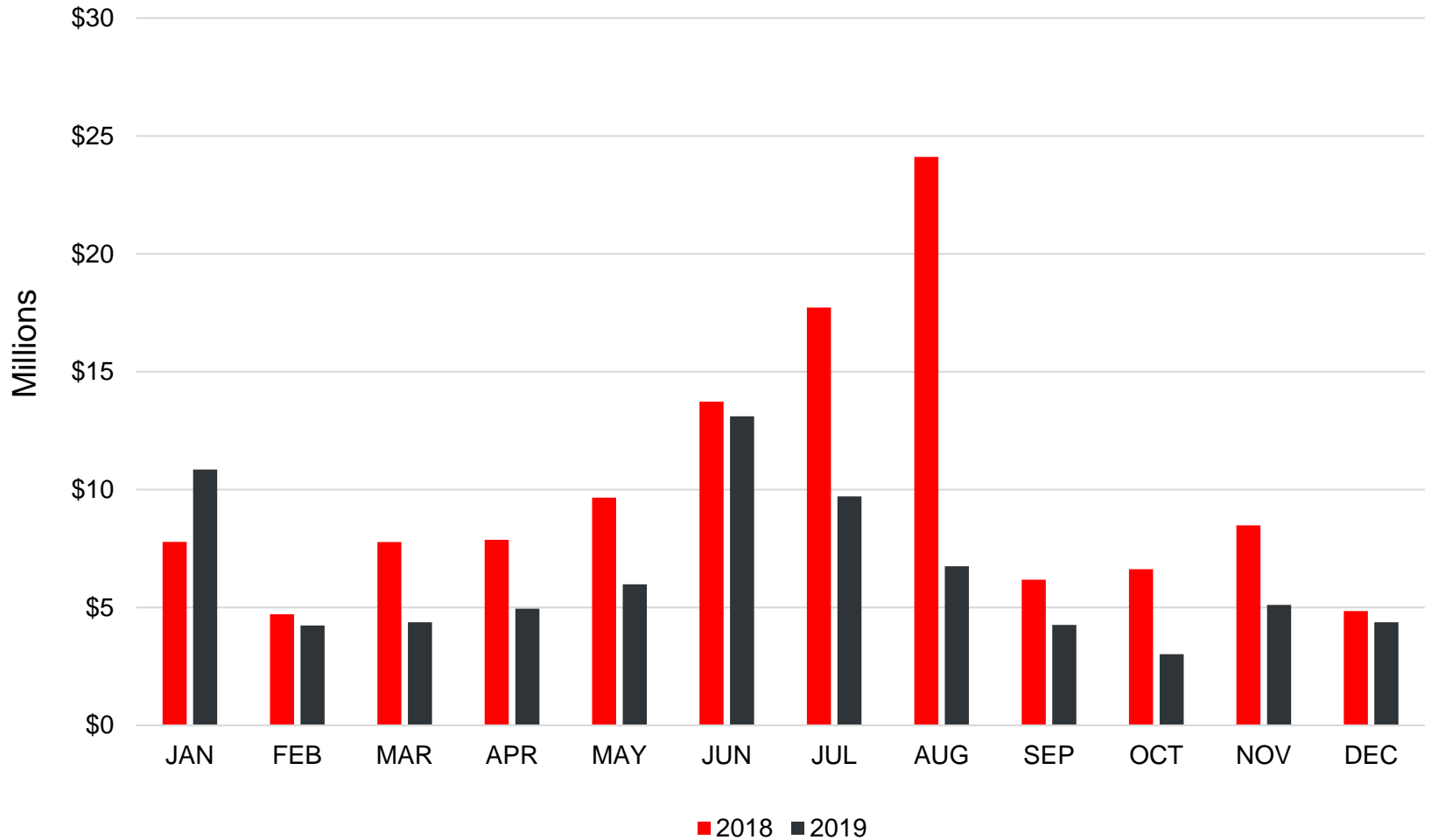
# Long-term auction revenue

Total Auction Revenue for Long-Term Auctions  
(2 of each Seq in a calendar year)



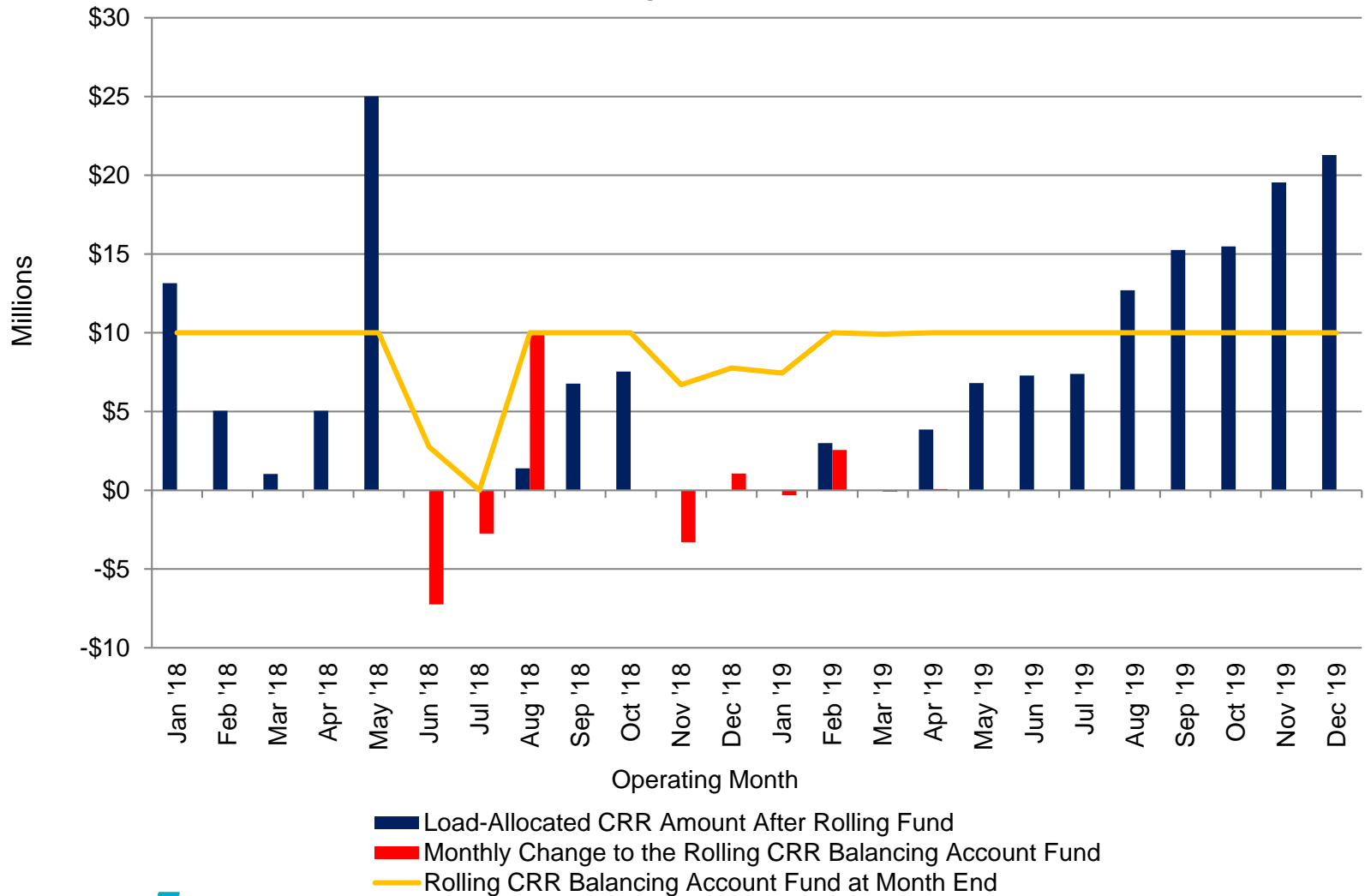
# Monthly auction revenue

Total Auction Revenue for Each Monthly Auction

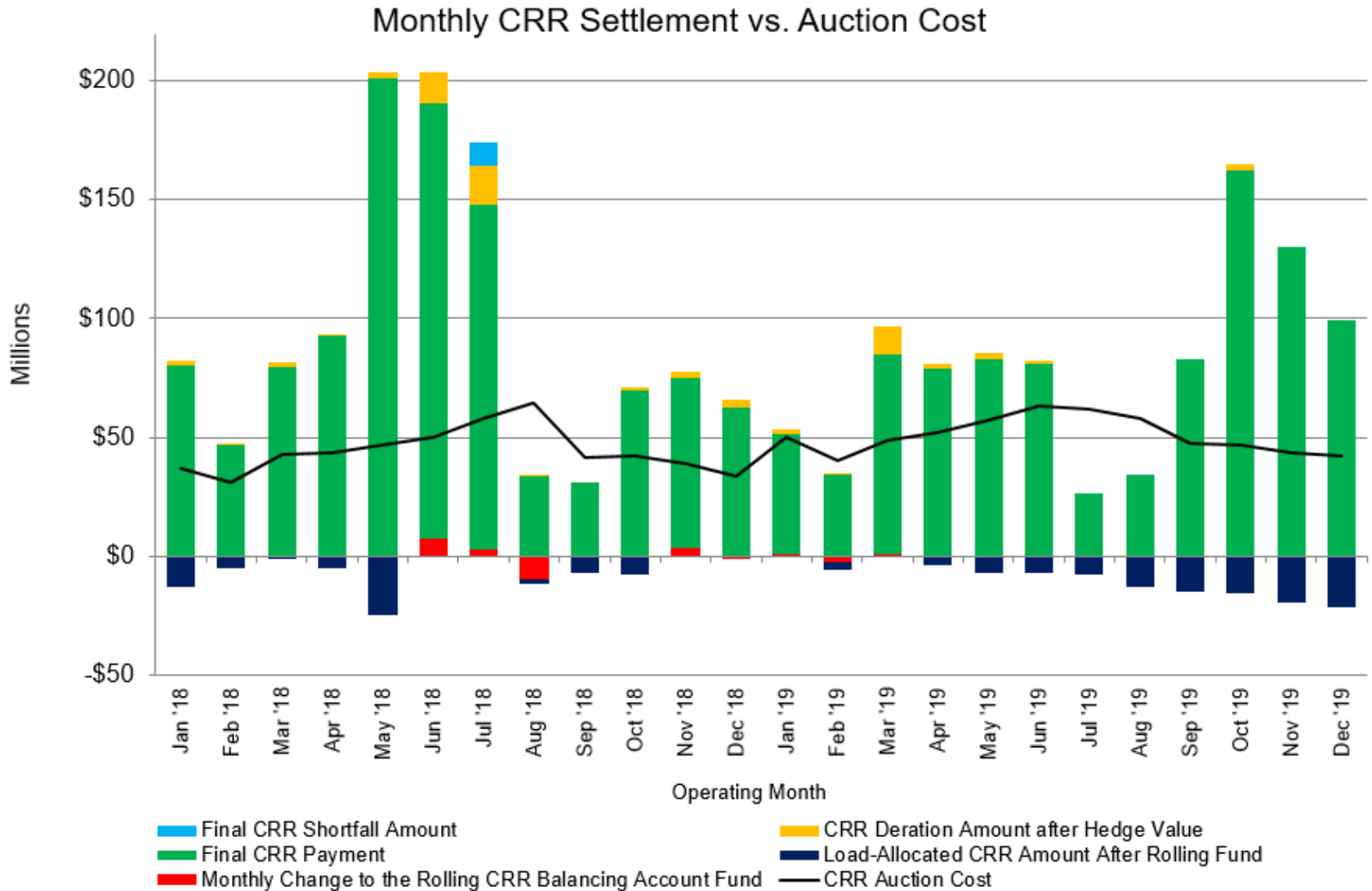


# CRR funding

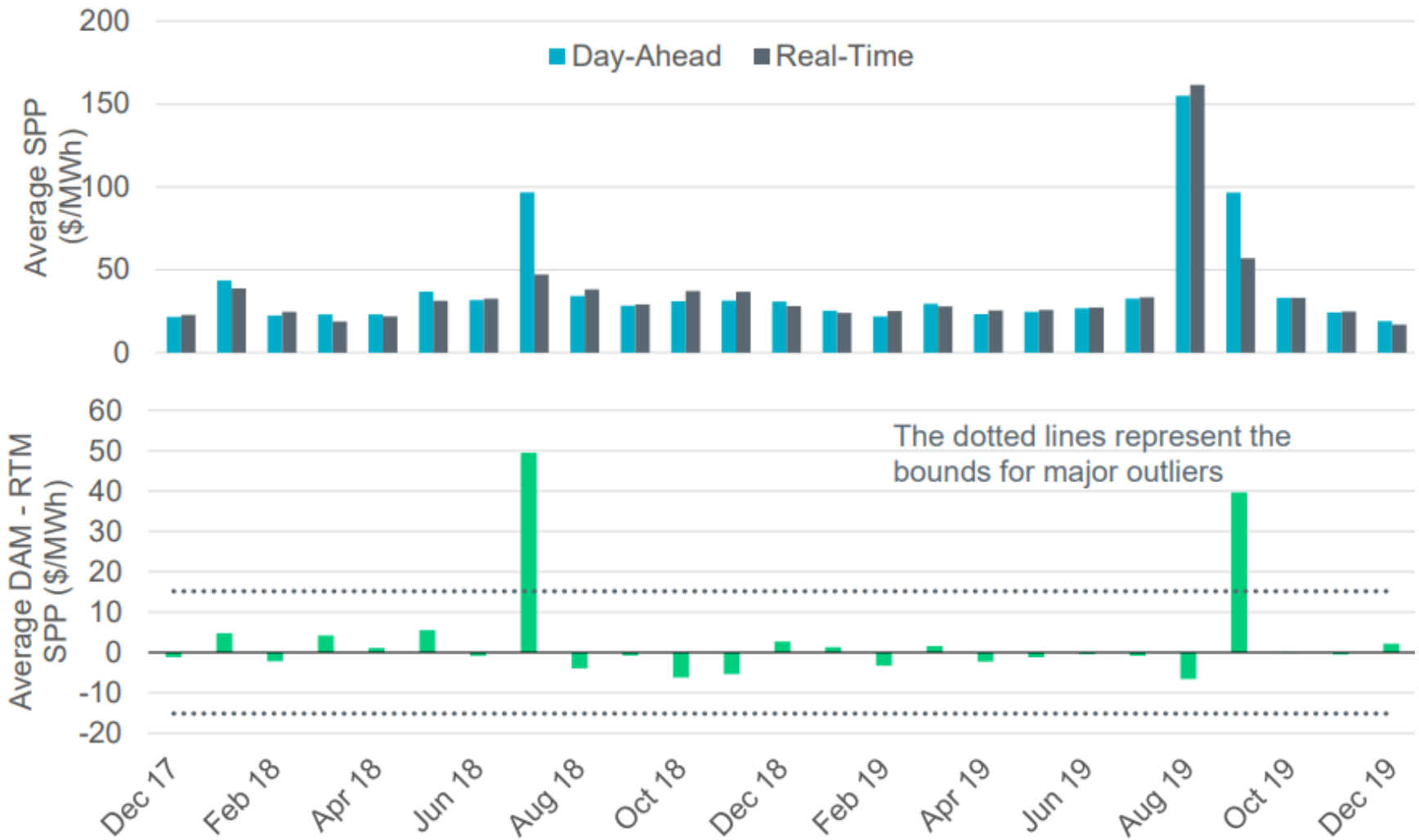
Total Accumulated and Monthly Changes to the Rolling CRR Balancing Account Fund



# Value vs. cost



# DAM and RTM price convergence



# Upcoming market enhancements

- Automatic adjustments to locked auction credit to reduce excess collateral
  - Locked credit will not exceed the pre-auction exposure
- Raising total auction transaction limit from 300,000 to 400,000
  - Per CRRRAH limits will remain at 4,000 transactions for long-term auctions and 10,000 transactions for monthly auctions
- Both changes are targeted for fall 2020