Items in red font on slides 5 – 10 reflect information updated or added since the August 10th MRC Special Session.

Potential FTR Liquidation Process Alternatives

Suzanne Daugherty

Markets and Reliability Committee Meeting

August 23, 2018

Overview

- July 26, 2018 FTR Liquidation Process Waiver Filing
- August 10th Special Markets and Reliability Committee Meeting – Initial Discussion of Potential FTR Liquidation Process Alternatives
- August 23rd Markets and Reliability Committee Meeting:
  - Vote on draft Problem Statement and Issue Charge
- If the Problem Statement and Issue Charge are adopted:
  - August 23rd MRC Meeting: Consideration of motion requesting PJM amend its FTR liquidation process waiver
  - September 7th Special MRC Session @ 1:00 – 4:00 pm to add details to and discuss FTR liquidation process options
  - September 10th through 14th: Non-binding polling on FTR liquidation process options to narrow options and establish non-mutually exclusive voting order at September 27th MRC meeting
  - September 18th Special MRC Session @ 9:00 am – noon to discuss polling results and any refinements to options
    [Credit Subcommittee would be moved from currently scheduled 9:00 – 11:00 am on this day to another date and time near September 18th.]
  - September 27th MRC and MC Meetings: Voting on alternative FTR liquidation process options

Considerations Applicable to all FTR Liquidation Options

1. FERC approval would be required for any revisions to the current Tariff and Operating Agreement FTR liquidation provisions.

2. PJM cannot predict the final total Default Allocation Assessment under any option or even directionally which options might result in a higher or lower final total Default Allocation Assessment compared with another option.

3. Past periods' (a) congestion patterns and levels; (b) default allocation assessment amounts; (c) liquidation prices; and (d) auction bidding volumes are not indicators of what any of these amounts may be in any future periods.

Reference Points:
Monthly Portfolio Volumes and Known Default Allocation Assessments

Monthly FTR Portfolio Volumes *(megawatt hours)*:

- 2018/2019 Planning Year — 54 million *(73%)*
- 2019/2020 Planning Year — 18 million *(24%)*
- 2020/2021 Planning Year — 2 million *(3%)*

Default Allocation Assessments Based on Actual Portfolio Net Losses:

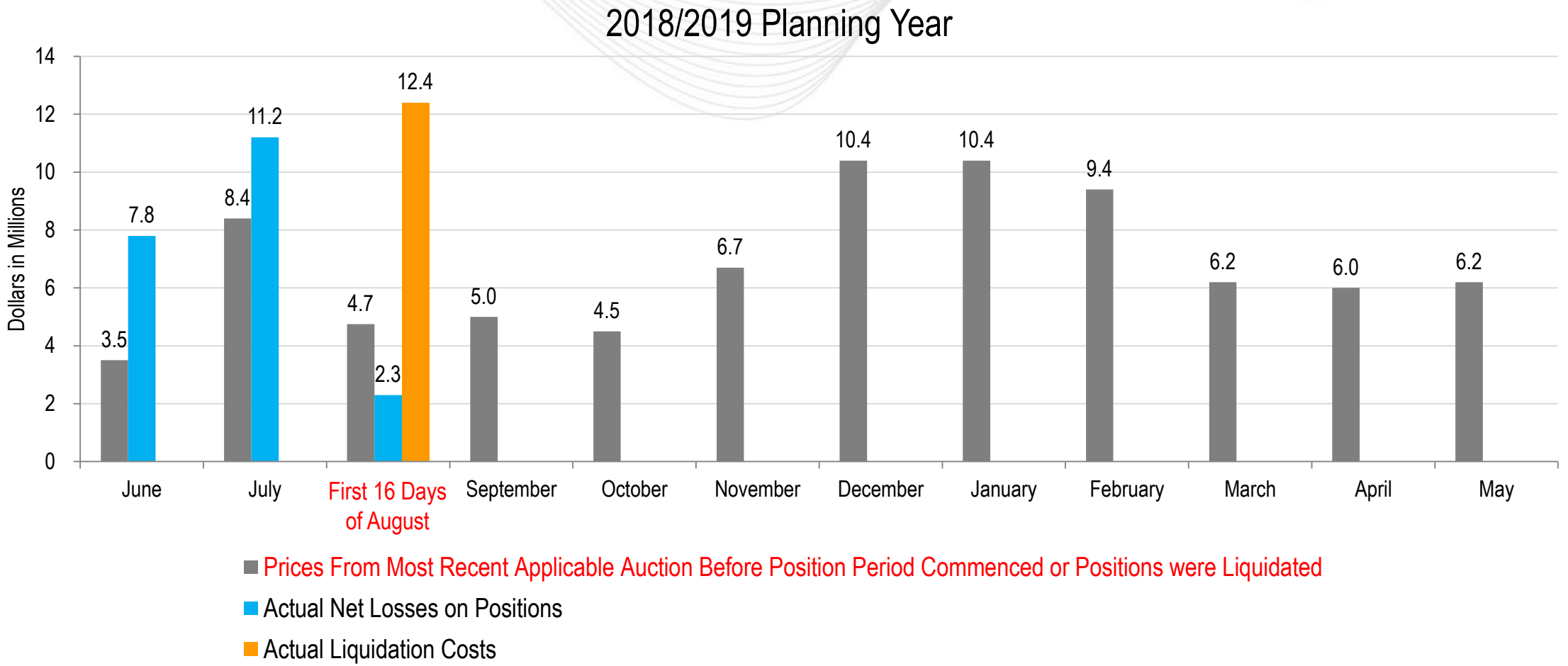
- June 2018 — $7.2 million *(net of $0.6 million collateral)*
- July 1 – 18, 2018 — $9.4 million
- July 19 – 31, 2018 — $1.8 million

July 2018 Total = $11.2 million

Default Allocation Assessment Based on Liquidated Positions:

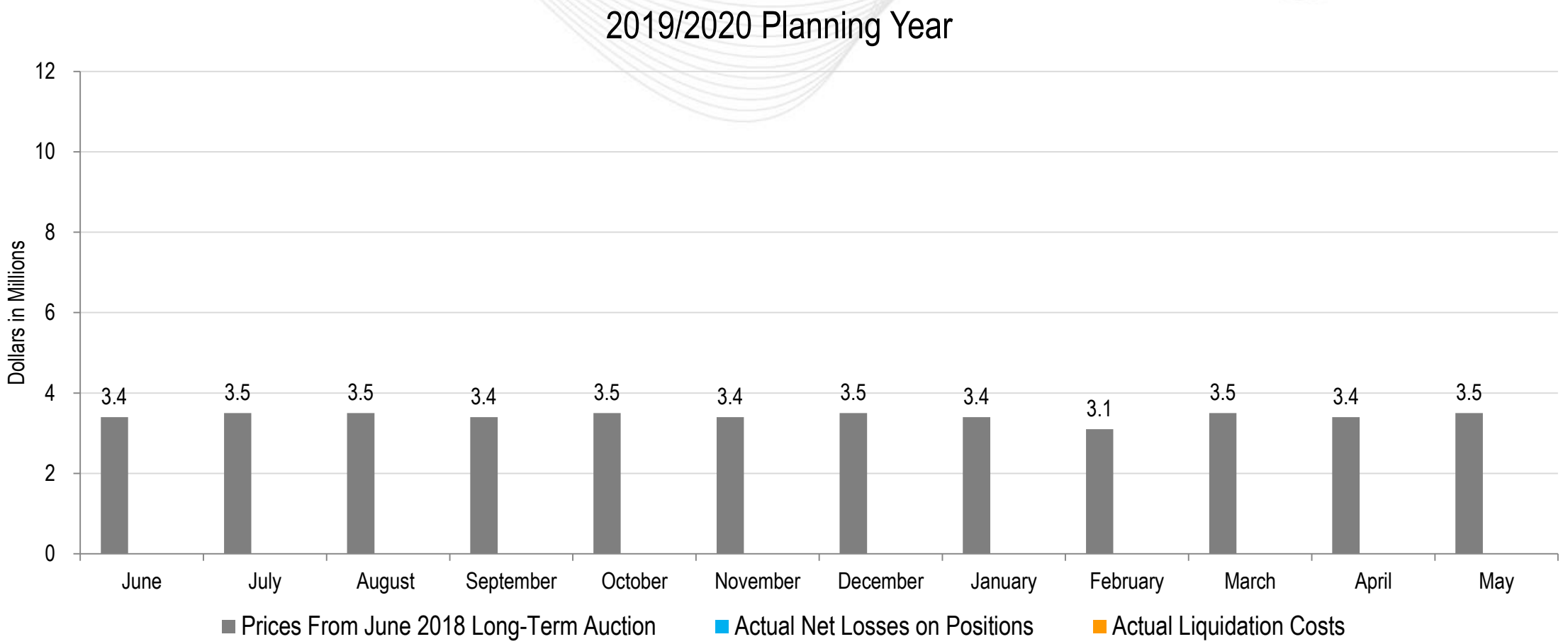
- August 2018 — $24.1 million

Reference Points:
Monthly Auction Prices, Actual Net Losses, and Liquidation Costs

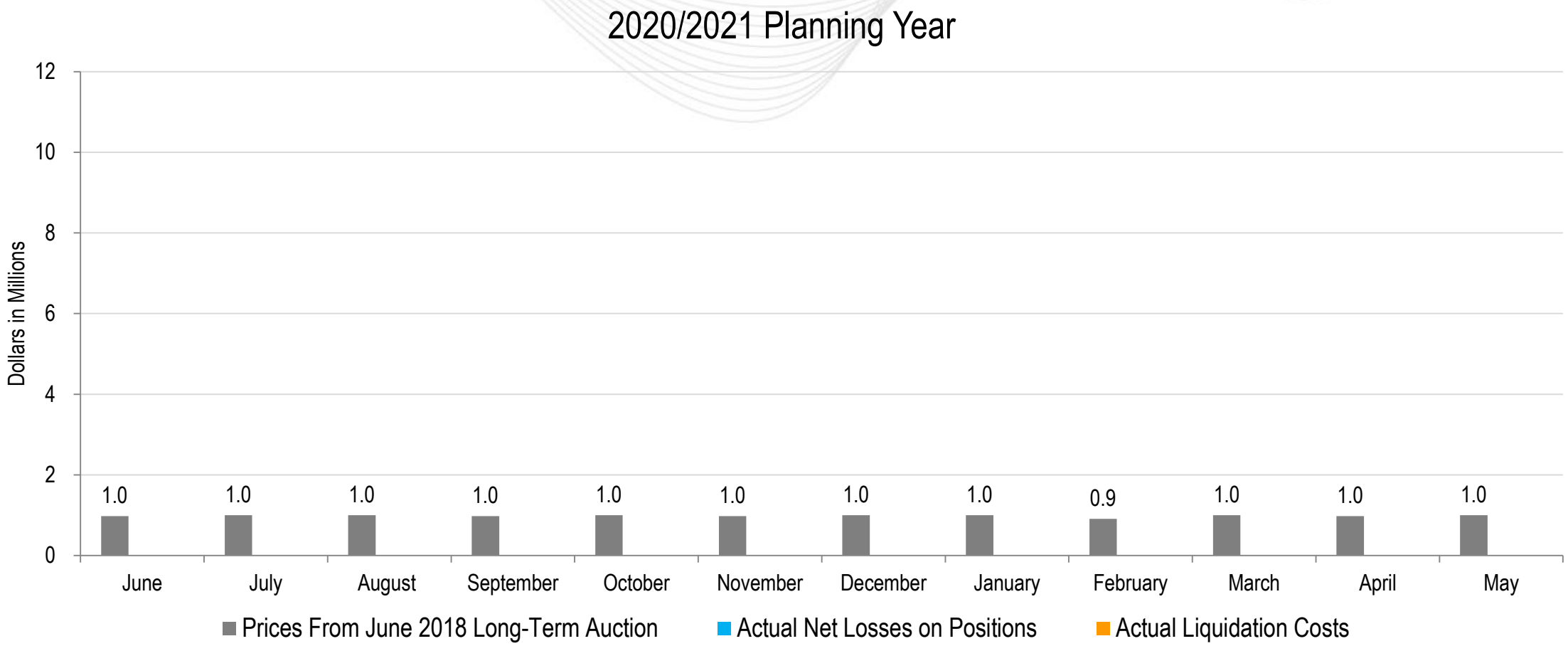


Default Allocation Assessment Quantifiable to date is $42.5 million (June and July actual net losses, net of collateral, plus August liquidation costs).

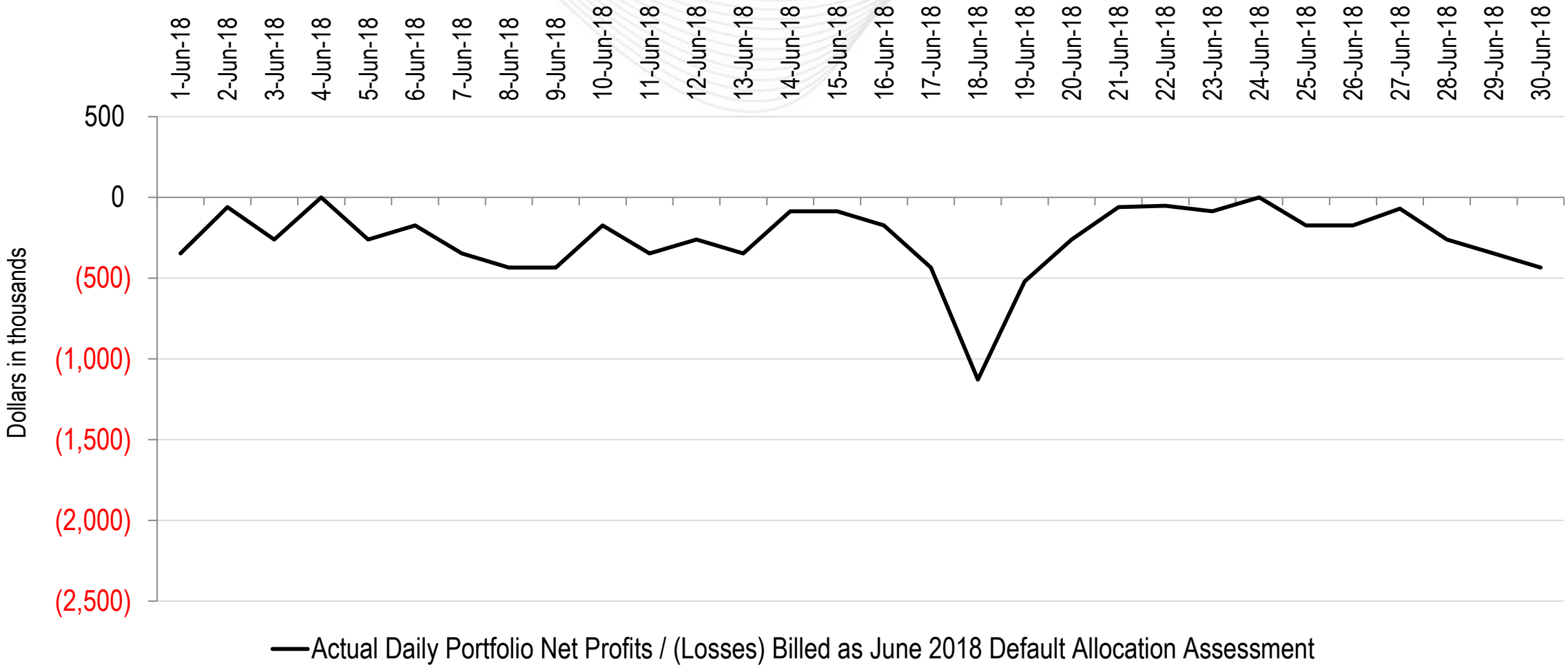
Reference Points:
Most Recent Auction Prices



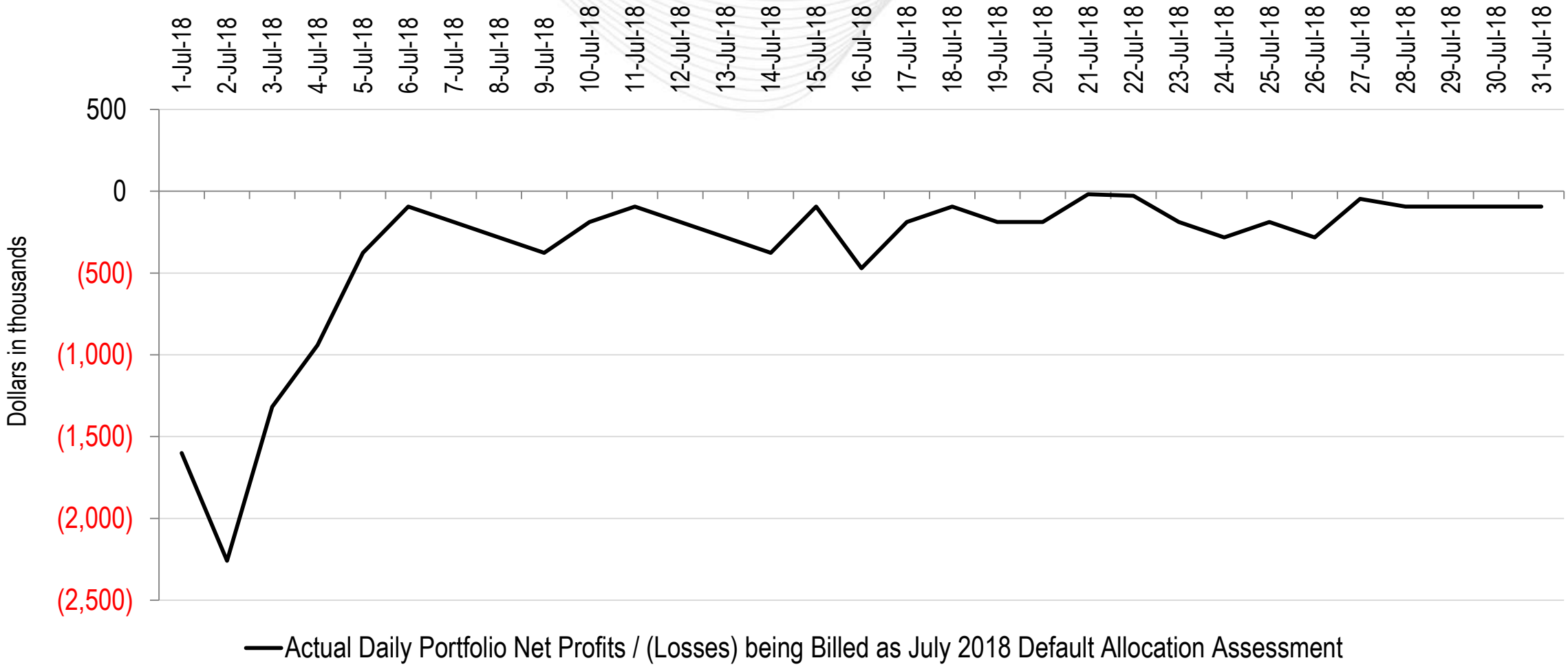
Reference Points:
Most Recent Auction Prices



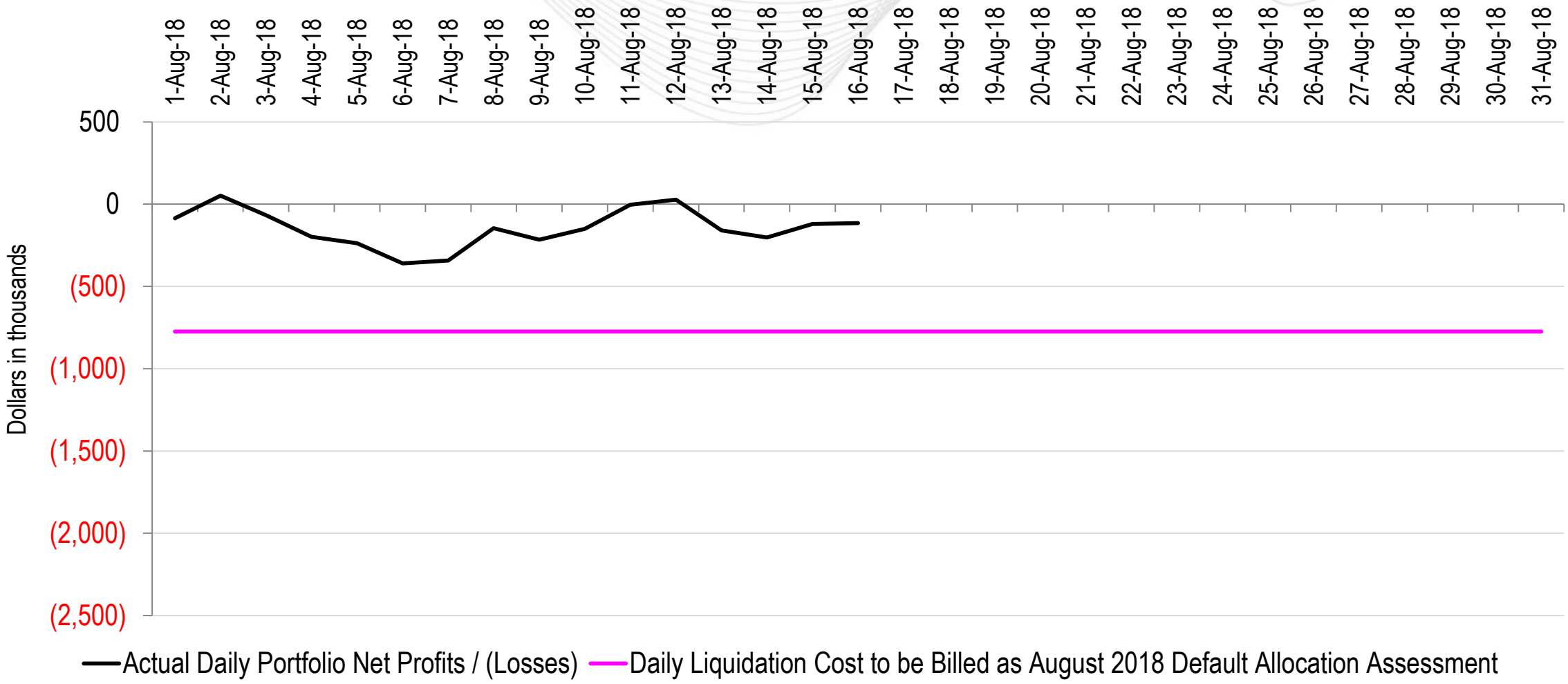
Reference Points:
June 2018 Daily Data



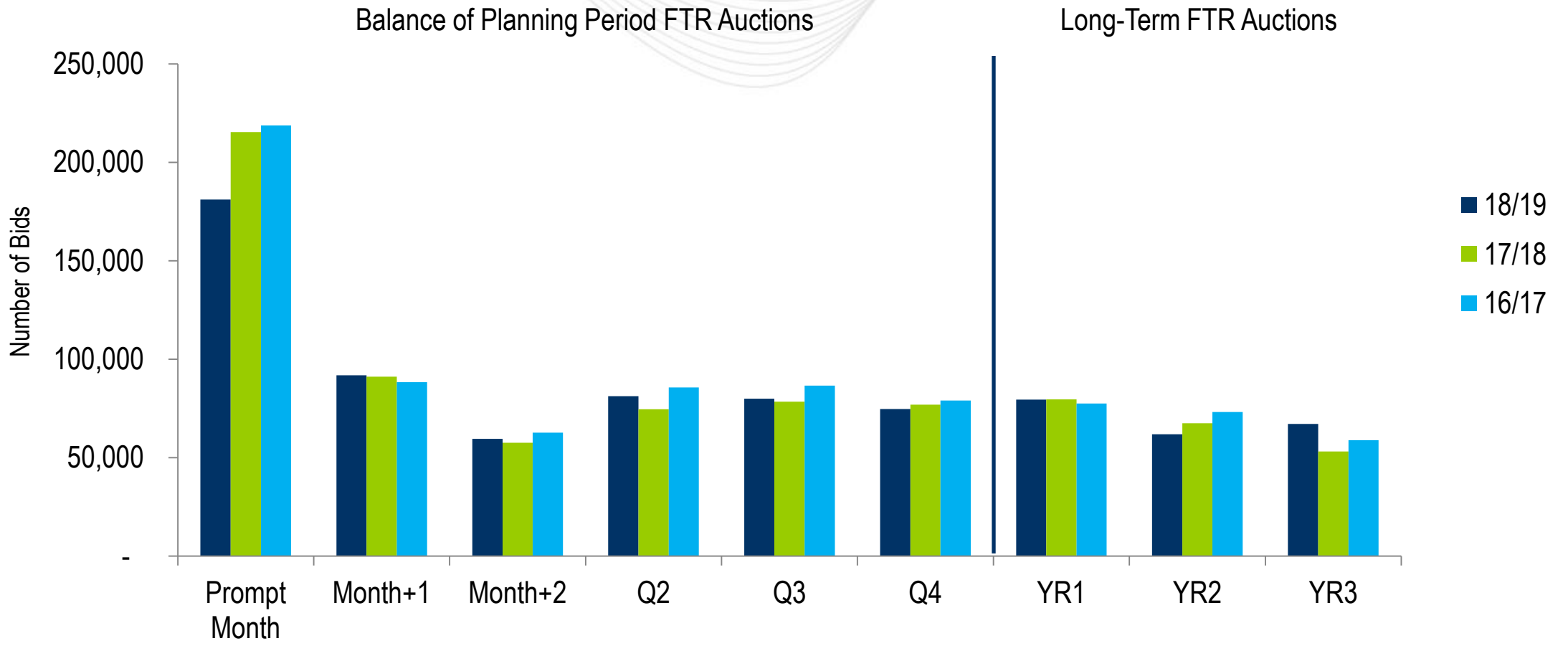
Reference Points:
July 2018 Daily Data



Reference Points:
August 2018 Daily Data



Reference Points:
FTR Auction Liquidity Based on Average Bid Count by Period Type



Source: Monitoring Analytics, LLC

Next Steps

- August 23rd Markets and Reliability Committee Meeting:
  - Vote on draft Problem Statement and Issue Charge
- If the Problem Statement and Issue Charge are adopted:
  - August 23rd MRC Meeting: Consideration of motion requesting PJM amend its FTR liquidation process waiver
  - September 7th Special MRC Session @ 1:00 – 4:00 pm to add details to and discuss FTR liquidation process options
  - September 10th through 14th: Non-binding polling on FTR liquidation process options to narrow options and establish non-mutually exclusive voting order at September 27th MRC meeting
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  - September 27th MRC and MC Meetings: Voting on alternative FTR liquidation process options

Items in red font on slides 15, 19, 23, and 31 – 32 reflect information updated or added since the August 10th MRC Special Session on this topic.

Appendix – Potential FTR Liquidation Process Alternatives

August 10, 2018 Special MRC Meeting Objectives

1. Discuss potential FTR liquidation process options identified to date.

2. Share considerations applicable to each FTR liquidation process option identified to date.

3. Add any Member suggestions to the list of FTR liquidation process options.

4. Establish foundation for August 23rd Markets and Reliability Committee vote on Members' preference whether to (a) continue discussion of FTR liquidation process options or (b) retain the current FTR liquidation process.

Summary of Alternatives Identified to Date

Option	Potentially Applicable to 2018/2019 Positions?	Potentially Applicable to 2019/2020 Positions?	Potentially Applicable to 2020/2021 Positions?
Option A – Status Quo	✓	✓	✓
Option B – Do Not Offer for Liquidation	✓	✓	✓
Option C – Only Offer Prompt Month Positions for Liquidation	✓	✓	✓
Option D – Current Liquidation Process with Cap on Liquidation Costs	✓	✓	✓
Option E – Allow Members to Assume Their Portion of the Portfolio	✓	✓	✓
Option F – Offer Open Positions for Sale as a Package(s)	✓	✓	✓
Option G – Only Liquidate Positions in Periods with “Sufficient” Liquidity	✓	✓	✓
Option H – Only Liquidate Expected Positive Value Positions	✓	✓	✓
Option I – Modified Status Quo	✓	✓	✓
Option J – Don’t Start Liquidating Long-Term FTRs Until Annual Auctions	×	✓	✓
Option K – Cancel All Long-Term FTRs	×	✓	✓
Option L – Rerun Long-Term FTR Auctions without GreenHat Bids	×	✓	✓
Option M – Third Party Manages Portfolio	✓	✓	✓
Option N – Qualified Members May Assume Their Portion of the Portfolio	✓	✓	✓
Option O – Each Member Opts for Settlement or Liquidation	✓	✓	✓

Balance-of-Planning Period Positions
Option A – Status Quo

Per Tariff Attachment K-Appendix, section 7.3.9 and Operating Agreement Schedule 1, section 7.3.9

- All current planning period Financial Transmission Right positions within the defaulting Members' Financial Transmission Right portfolio will be offered for sale in the next available monthly balance of planning period Financial Transmission Rights auction *at an offer price designed to maximize the likelihood of liquidation of those positions*. *[emphasis added]*
- The Financial Transmission Right positions comprising the defaulting Member's portfolio that are liquidated in a Financial Transmission Rights auction should avoid setting the price in the auction at the bid prices with which they were initially submitted.
- In the event that any of the closed out Financial Transmission Rights would set market based on the auction's preliminary solution, then only one-half of each Financial Transmission Rights position will be offered for sale and the auction will be re-executed.
- In the event that any Financial Transmission Rights position that has been closed out once again sets price, then all Financial Transmission Rights scheduled to be liquidated will be removed from the affected auction and the auction will be re-executed excluding the closed out Financial Transmission Right positions.
- Financial Transmission Right positions that are not liquidated will then be offered in the next available auction or specially scheduled auction, as appropriate.

Per Tariff Attachment K-Appendix, section 7.3.9 and Operating Agreement Schedule 1, section 7.3.9

- All long-term Financial Transmission Right positions within the defaulting Members' Financial Transmission Right portfolio will be offered for sale in the next available long-term Financial Transmission Rights auction *at an offer price designed to maximize the likelihood of liquidation of those positions*. *[emphasis added]*
- The Financial Transmission Right positions comprising the defaulting Member's portfolio that are liquidated in a Financial Transmission Rights auction should avoid setting the price in the auction at the bid prices with which they were initially submitted.
- In the event that any of the closed out Financial Transmission Rights would set market based on the auction's preliminary solution, then only one-half of each Financial Transmission Rights position will be offered for sale and the auction will be re-executed.
- In the event that any Financial Transmission Rights position that has been closed out once again sets price, then all Financial Transmission Rights scheduled to be liquidated will be removed from the affected auction and the auction will be re-executed excluding the closed out Financial Transmission Right positions.
- Financial Transmission Right positions that are not liquidated will then be offered in the next available auction or specially scheduled auction, as appropriate.

Option A – Status Quo Considerations

- Designed to liquidate positions quickly allowing Members to know as quickly as possible what the total Default Allocation Assessment will be though no guarantee if / when monthly positions will liquidate.
- Greater risk premiums are likely to be required to liquidate positions farther into the future than sooner due to greater uncertainty about congestion costs farther away from the auction date.
- In less liquid FTR periods during an auction, prices required to liquidate positions could be substantially different than the prices to liquidate positions in more liquid FTR periods. On average for the past year:
  - The number of bids submitted for prompt month positions has been 3.4 times the number of bids submitted for non-prompt month positions.
  - The megawatts of bids submitted for prompt month positions has been 2.3 times the megawatts of bids submitted for non-prompt month positions.

Option B – Do Not Offer for Liquidation

Description: Do not offer any more positions for liquidation.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Members will know monthly Default Allocation Assessment amounts at the same time that PJM issues each applicable month-end invoice (or possibly on a one-month lag basis).
- Members will know the total Default Allocation Assessment amount for each planning year the month after the planning year ends.
- The Default Allocation Assessment amount for any months that are not liquidated will be the actual net losses on each month's positions.
- Members could hedge risk exposure on open positions via acquisition of offsetting or negatively correlated positions.

Option C – Only Offer Prompt Month Positions for Liquidation

Description: Only offer prompt month positions for liquidation in each auction.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Members will know monthly Default Allocation Assessment amounts approximately one month prior to when PJM issues each applicable month-end invoice.
- Members will know the total Default Allocation Assessment amount for each planning year in April of each planning year.
- Positions offered for liquidation in the auctions for which trading volumes have historically been the highest for that month's positions.
- Changes in actual recent congestion may affect liquidation costs compared with liquidation costs that might have been incurred if positions were liquidated sooner.

Option D – Current Liquidation Process with Cap on Liquidation Costs

Description: Offer positions for liquidation in all remaining applicable auctions with (a) a cap on the liquidation price or (b) a cap on the liquidation premium over a reference price.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- For liquidated positions, Members will know monthly Default Allocation Assessment amounts at least one month prior to when PJM issues each applicable month-end invoice.
- Members will know the total Default Allocation Assessment amount for liquidated positions from each planning year no later than April of that planning year.
- Liquidation price cap or liquidation premium cap and reference price would need to be established.
- Public knowledge of any caps on liquidation prices or premiums may lead to bidding strategies that effectively lock-in the caps as the liquidation costs.

Option E – Allow Members to Assume Their Portion of the Portfolio

Description: Prior to executing any other liquidation option, allow Members the option to assume their proportionate share of the FTRs in the portfolio of the defaulting Member.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Members who opt to assume their proportionate share of the FTRs in the portfolio of the defaulting Member would have control over when, if and the volume of those assumed positions they choose to liquidate or hold.
- The smallest unit FTR that can be traded in PJM's FTR system is 0.1 MW.
  - A threshold would need to be established below which any FTR path in the defaulting portfolio could not be assumed by Members.
  - A liquidation process option would need to be selected for the residual portfolio that is either below this volume threshold or that Members do not assume.
  - The Default Allocation Assessment wording would need to be updated to reflect the potential Members who opt to assume their proportionate share of the FTRs in the defaulting portfolio and would then no longer be subject to the Default Allocation Assessment.
- Any Member opting to assume their proportionate share of the positions in the defaulting FTR portfolio would need to comply with all applicable credit requirements to assume the positions.

Option F – Offer Open Positions for Sale as a Package(s)

Description: Offer all open positions for sale as a package.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Might avoid only liquidating potentially favorable positions and not liquidating the riskier positions.
- Could be completed for positions packaged as: entire remaining portfolio, balance of planning period positions, annual positions, planning year quarters, entire months, percentages of positions, and/or tranches.
- Packages could be offered in special auctions, instead of or in addition to scheduled monthly auctions.
- Unclear what level of liquidity may result from offering positions in packages.
- Would need to establish criteria acceptable to Members for PJM to accept liquidation offers, e.g. how many unaffiliated bidders for each package of positions offered for liquidation.
- Should there be any temporary change in the current FTR undiversified adder credit requirement (for all members or investment grade rated members) as it would apply to any package(s) of liquidated FTRs a member acquires? This might increase how many FTR market participants might bid to acquire the positions. This might shift the risk of default to the acquiring member without commensurate credit required before that member acquires the liquidated positions.

Option G – Only Liquidate Positions in Periods with "Sufficient" Liquidity

Description: Only liquidate positions in periods with "sufficient" liquidity.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Default allocation assessments for positions that are not liquidated will not be known as soon as they might be if liquidated sooner.
- Definition of "sufficient" liquidity would need to be established or Members' agreement for PJM to apply its judgment.
- May allow non-prompt month FTRs to be liquidated sooner than waiting for the applicable prompt-month auction.

Option H – Only Liquidate Expected Positive Value Positions

Description: Only liquidate expected positive value positions.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Default allocation assessments for positions that are not liquidated will not be known as soon as they might be if offered for liquidation sooner.
- The Default Allocation Assessment amount for any months that are not liquidated will be the actual net losses on each month's positions.
- Need to define over which auctions positive value positions would be offered for liquidation.
- For expected negative value positions, need to determine what liquidation process option would apply.

Option I – Modified Status Quo

Description: Use status quo unless we expect the portfolio to be negative and then use another option.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Default allocation assessments for positions that are not liquidated will not be known as soon as they might be if offered for liquidation sooner.
- The Default Allocation Assessment amount for any months that are not liquidated will be the actual net losses on each month's positions.
- If the portfolio liquidation is expected to be negative, need to determine what liquidation process option would apply.

Option J – Don't Start Liquidating Long-Term FTRs Until Annual Auctions

Description: Start offering FTRs in the default portfolio for the 2019/2020 and 2020/2021 planning years for liquidation no sooner than the applicable annual auction.

Potential Applicability: × Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Default allocation assessments for long-term FTRs will not be known until at least the applicable annual auction when the positions are first offered for liquidation.
- Would offer positions in auctions for which the liquidity is higher than in the long-term FTR auctions.
- The Default Allocation Assessment amount for any months that are not liquidated will be the actual net losses on each month's positions.

Option K – Cancel All Long-Term FTRs

Description: Cancel all FTRs in the default portfolio for the 2019/2020 and 2020/2021 planning years.

Potential Applicability: × Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- No default allocation assessment for long-term FTR positions.
- Would revise positions (and likely credit requirements) of other long-term FTR market participants.
- May impact FTR revenue adequacy in planning years 2019/2020 and/or 2020/2021.

Option L – Rerun Long-Term FTR Auctions without GreenHat Bids

Description: For future planning years, rerun the applicable FTR auction(s) without the GreenHat bids.

Potential Applicability: × Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- No default allocation assessment for long-term FTR positions.
- Unprecedented to rerun prior auctions.
- Would revise positions (and likely credit requirements) of other long-term FTR market participants.

Option M – Third Party Manages Portfolio

Description: Contract with third party to manage disposition of portfolio of defaulted FTRs.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Qualifications would need to be defined, e.g. include neutral third party with experience in FTR markets.
- Who decides on third party would need to be determined.
- Third party would have discretion whether to liquidate at any time – monthly or longer term auction, or no liquidation.
- Members would bear risk if manager makes bad decision but not under pressure like PJM in status quo process to liquidate immediately and can make rational economic decisions.
- Stakeholders would have to accept the results of all manager's decisions.
- Managers' fee would have to be determined – tie to success of liquidation.

Option N – Qualified Members May Assume Their Portion of the Portfolio

Description: Prior to executing any other liquidation option, allow Members the option to assume their proportionate share of the FTRs in the portfolio of the defaulting Member.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Subject to the conditions below, all paths will be allocated to Members who have FTR positions ("Qualified Members") and may choose to self-manage their allocation.
  - The paths will be allocated based on the percentage of the Qualifying Member's default allocation (e.g. based on their PJM activity).
  - Paths will only be allocated to Qualified Members if each such Member can receive 1/10th of a MW or greater.
  - PJM will run the process by which to determine Qualified Members and their allocation. This information will not be made public.
  - In a special auction, PJM will liquidate 10 tranches of an equal 1/10th split of the remaining share of the portfolio that was not distributed to Qualifying Members, as well as those paths that could not be pro rated because of their size.
- Optional: If a Qualifying Member sells some of its assumed portfolio resulting in a net short portfolio, the 3x undiversified credit adder would be reduced by some amount.

Option O – Each Member Opts for Settlement or Liquidation

Description: Each member gets to choose whether their default charges are based on settlement or liquidation.

Potential Applicability: ✓ Remaining 2018/2019 PY Positions ✓ 2019/2020 and 2020/2021 PY Positions

Considerations:

- Each member selects whether they would prefer their proportionate share of FTRs go to settlement or get liquidated creating two pools of members.
- Each member's default allocation assessment share would need to be recalculated within the settlement / liquidation pool each member elects, e.g. a member with 2% of the total default allocation would have a 5% share of their elected pool's default charges if the pool they selected included 40% of the total default allocation assessment.
- The members opting for liquidation would need to choose a liquidation method.
- For fractional FTRs that cannot be fully allocated to the the two pools, all members would need to decide whether those residual FTRs would be settled or how they would be liquidated.