August heatwave update

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Market Surveillance Committee Meeting
General Session
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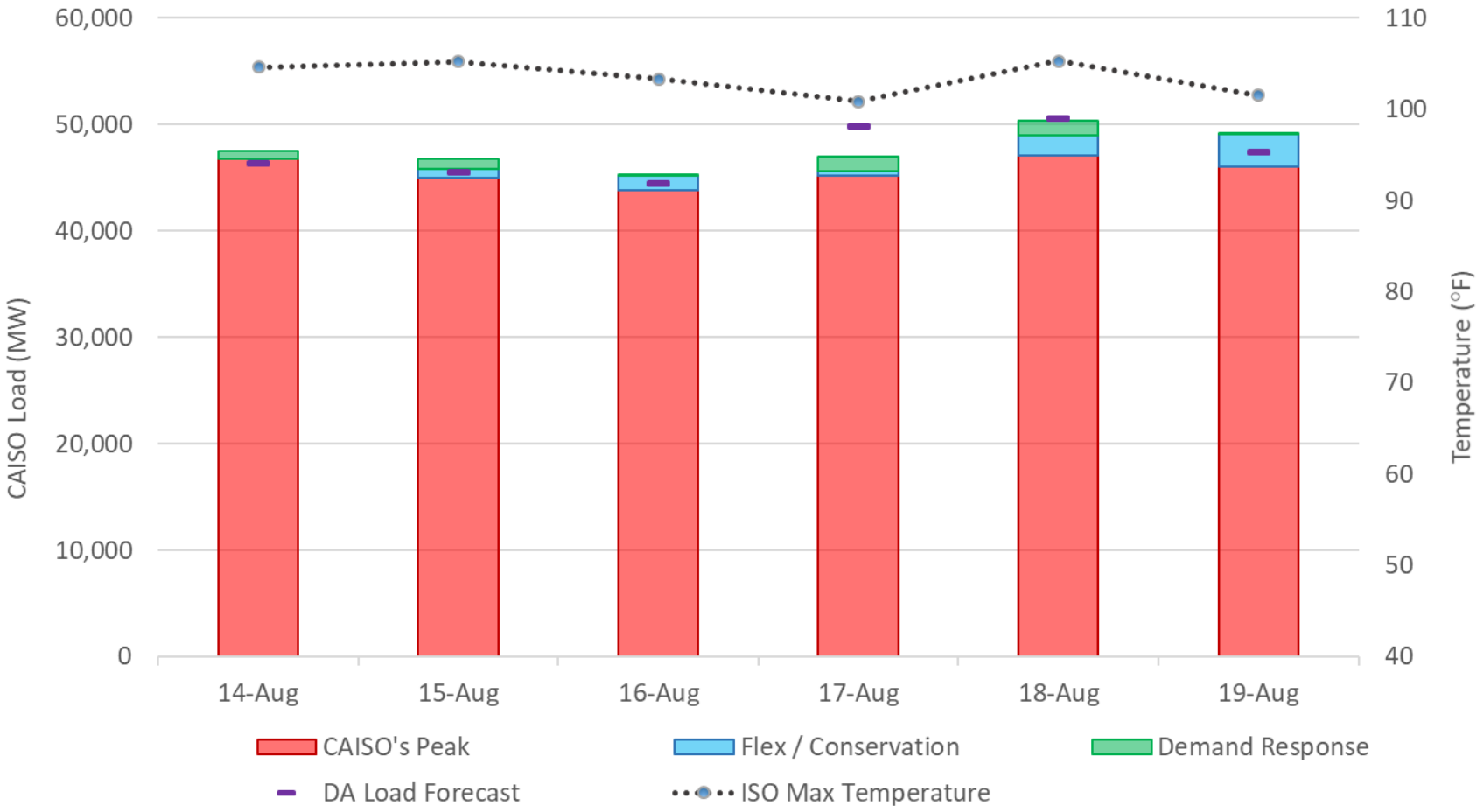
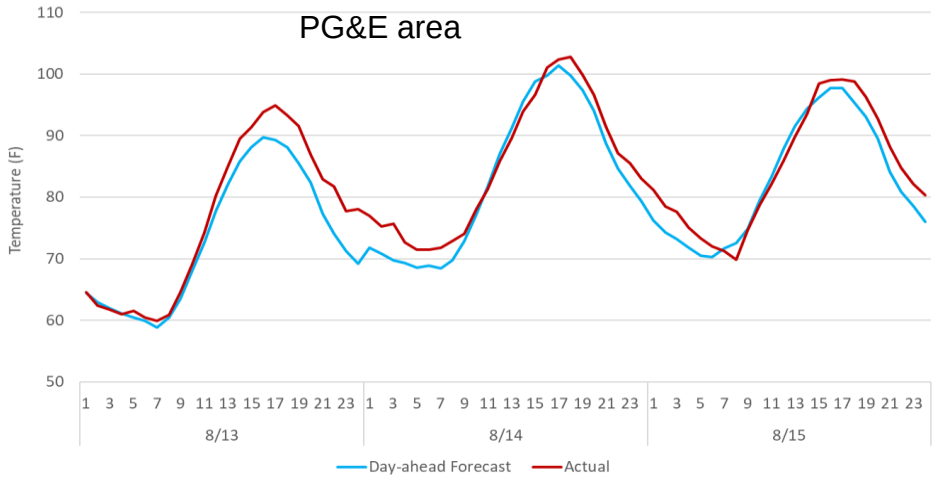
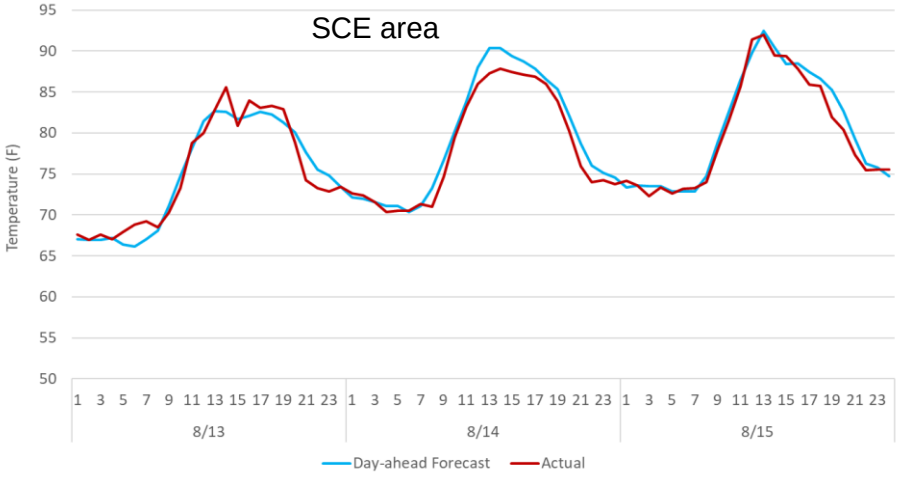
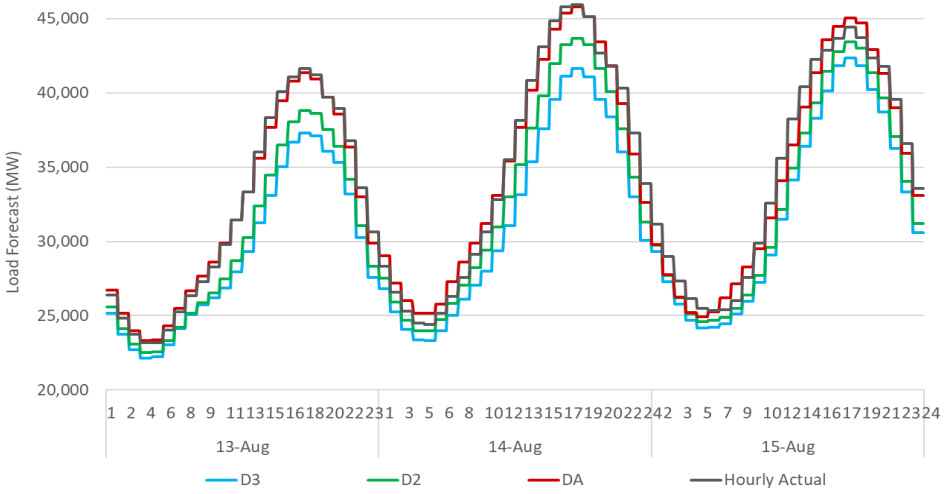
Heatwave drove temperatures over 100F and resulted in high loads

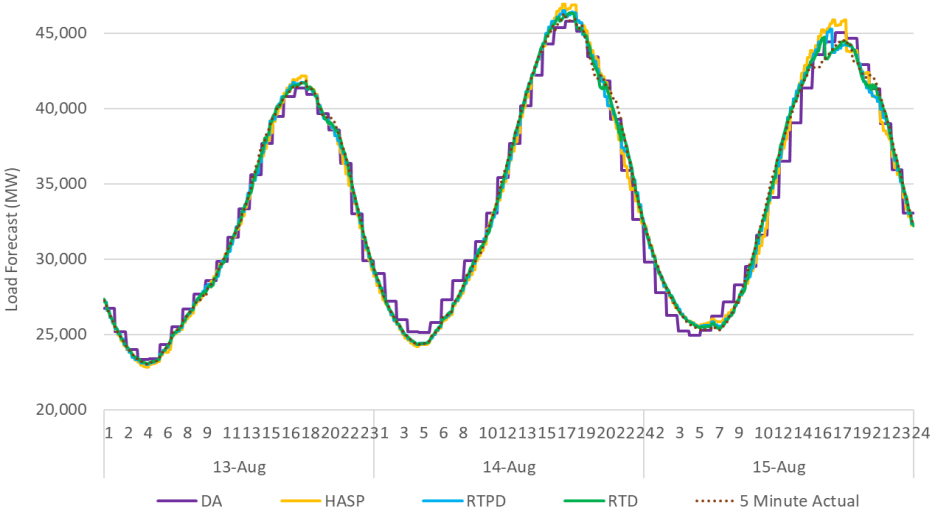


Load forecasts along temperature forecasts were evolving over time

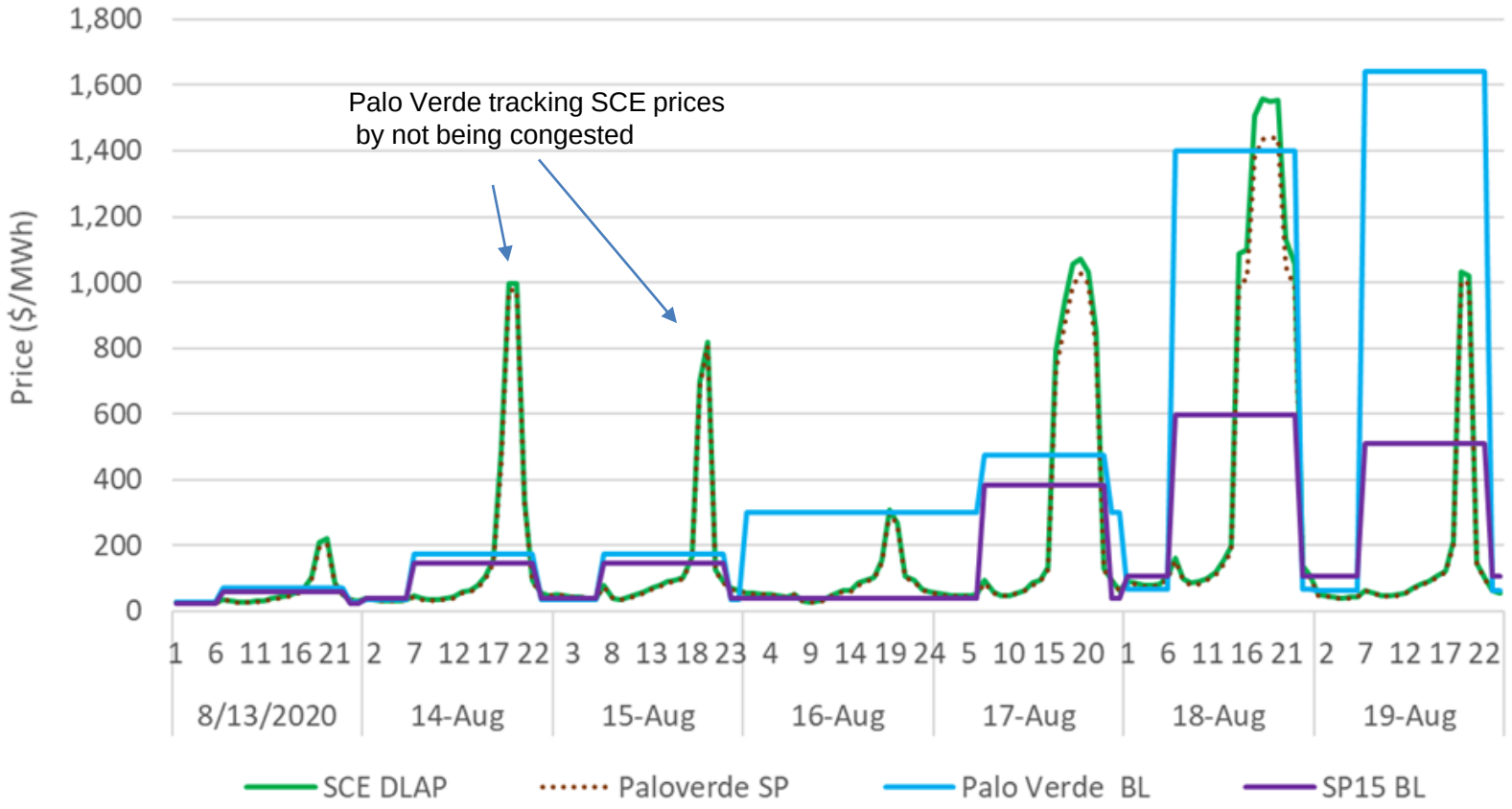




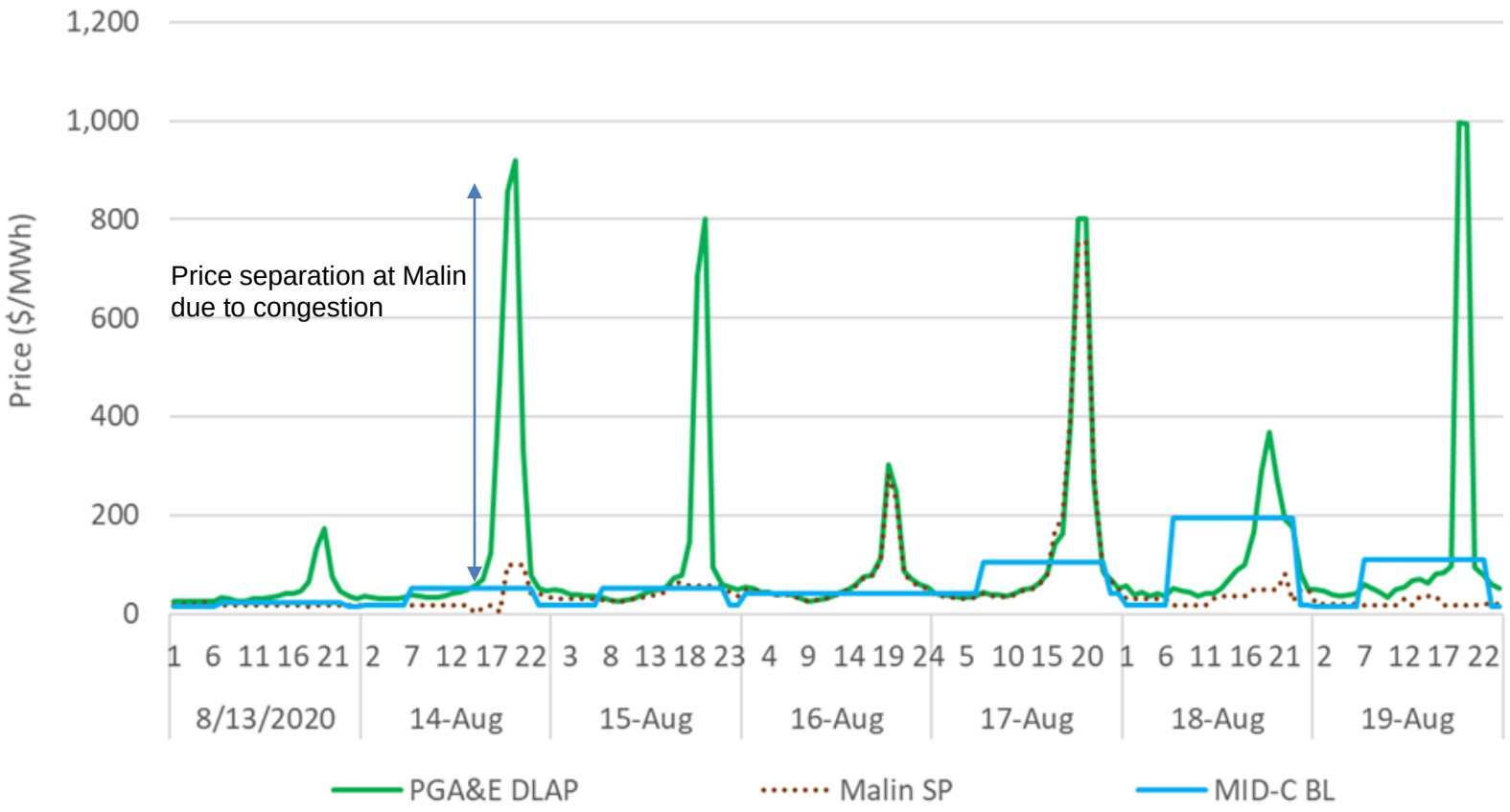




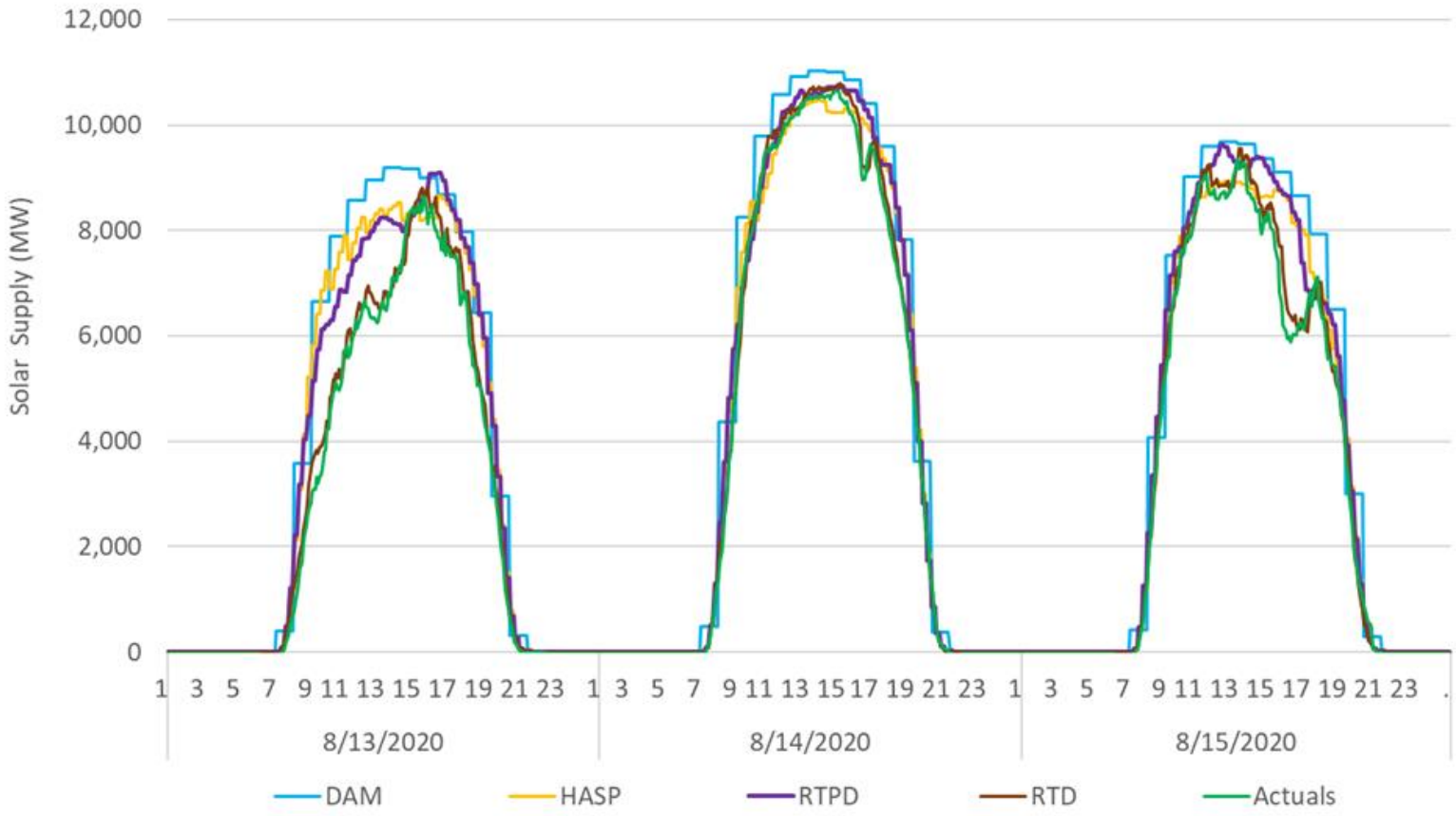
Divergence between external and CAISO prices were observed in the Southern part of the system



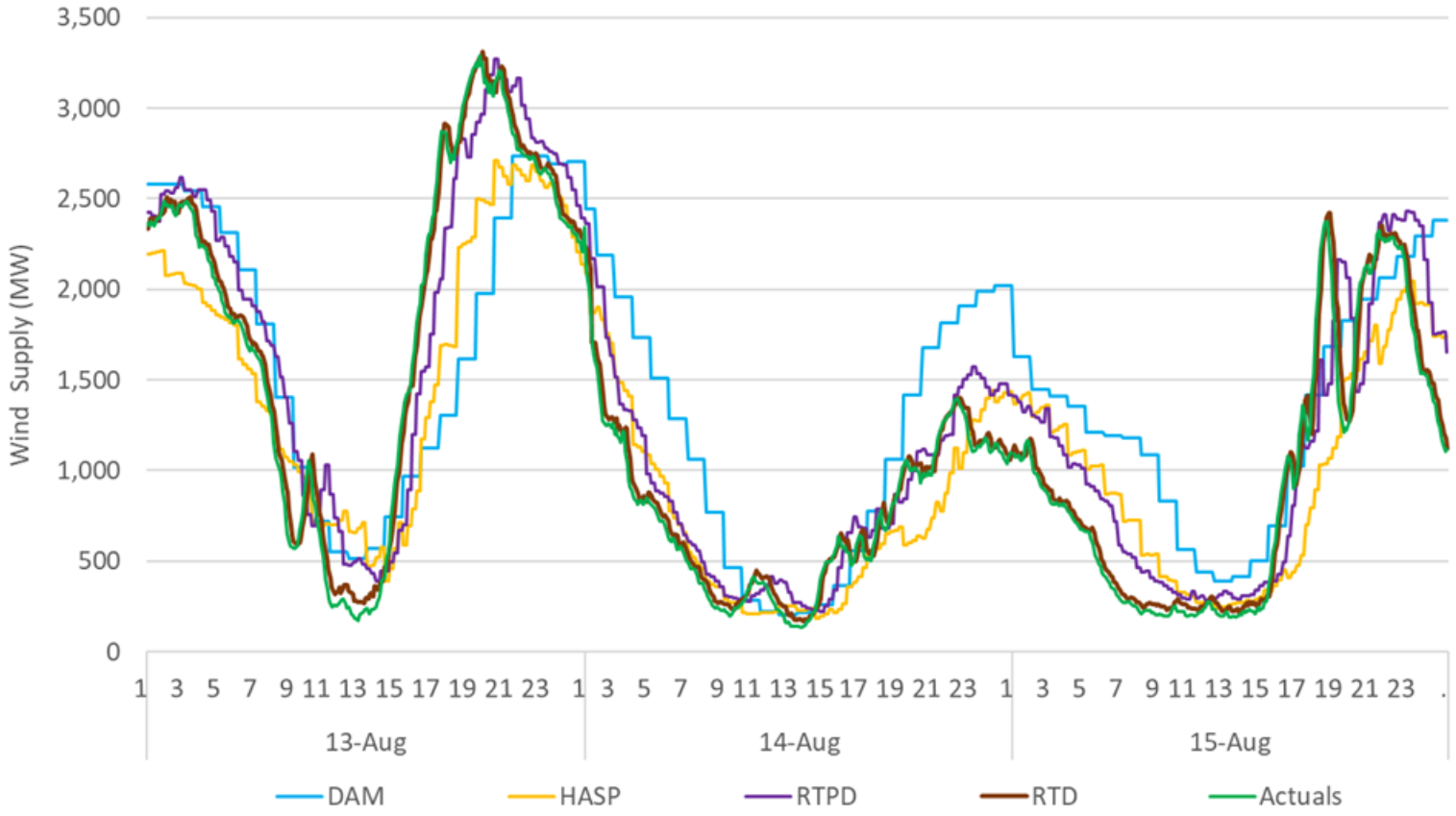
Malin price separated from Northern California due to congestion on Malin intertie, while it tracked closer to bilateral Mid-C price



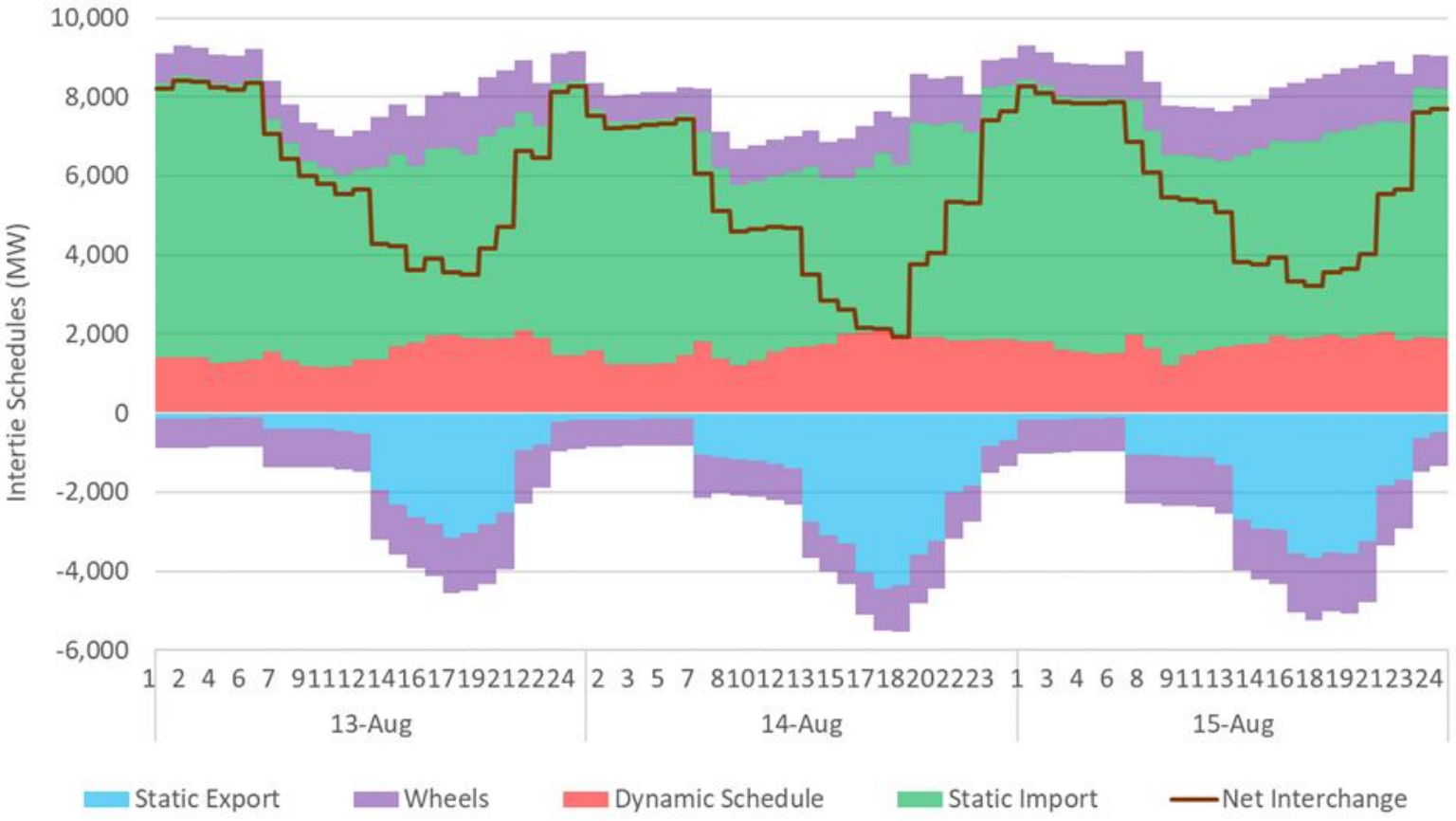
Solar production observed variability during the heatwave



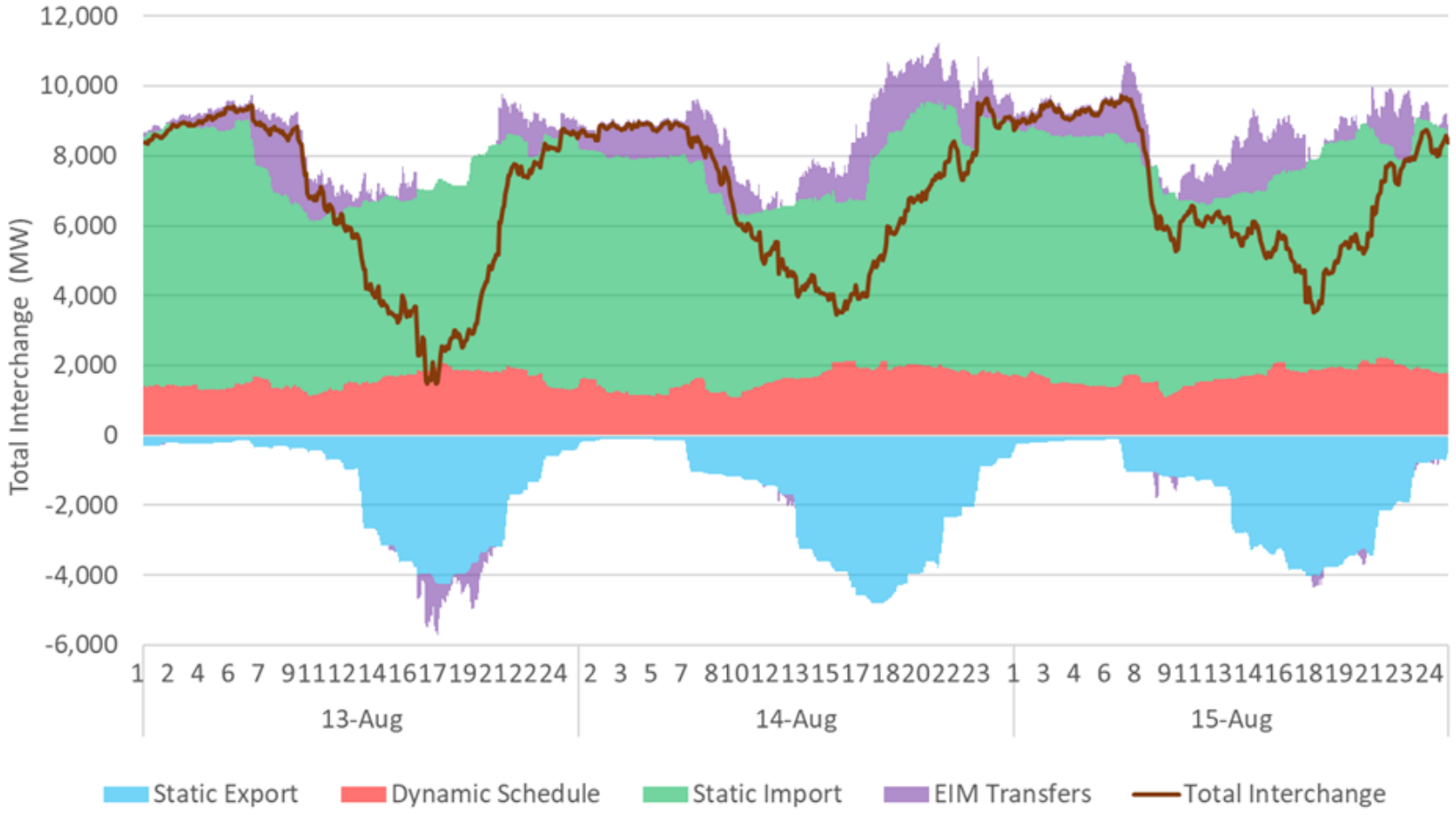
Wind production observed variability during the heatwave



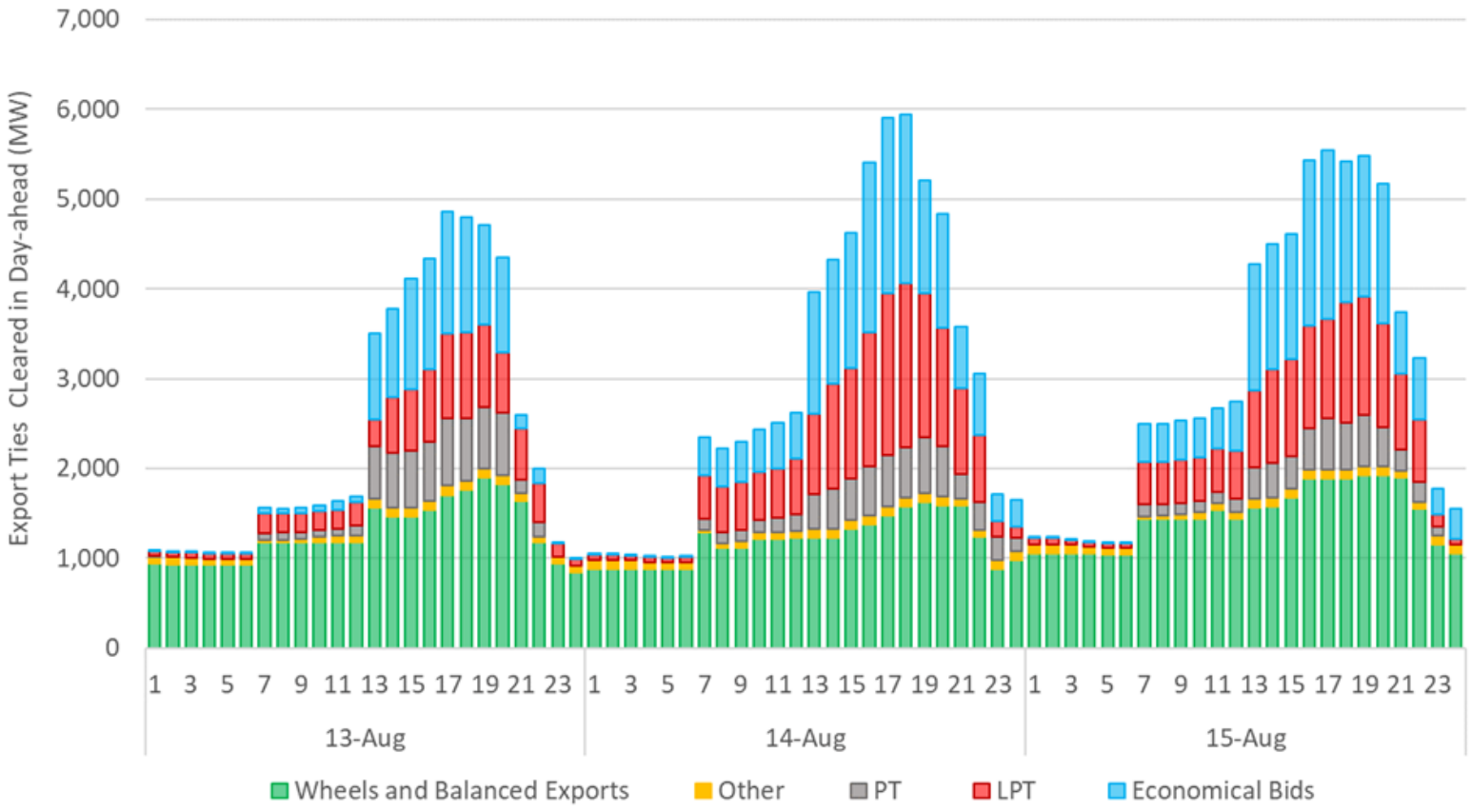
Day-ahead Net Schedule Interchange reached minimum levels during peak hours driven by an increase of exports



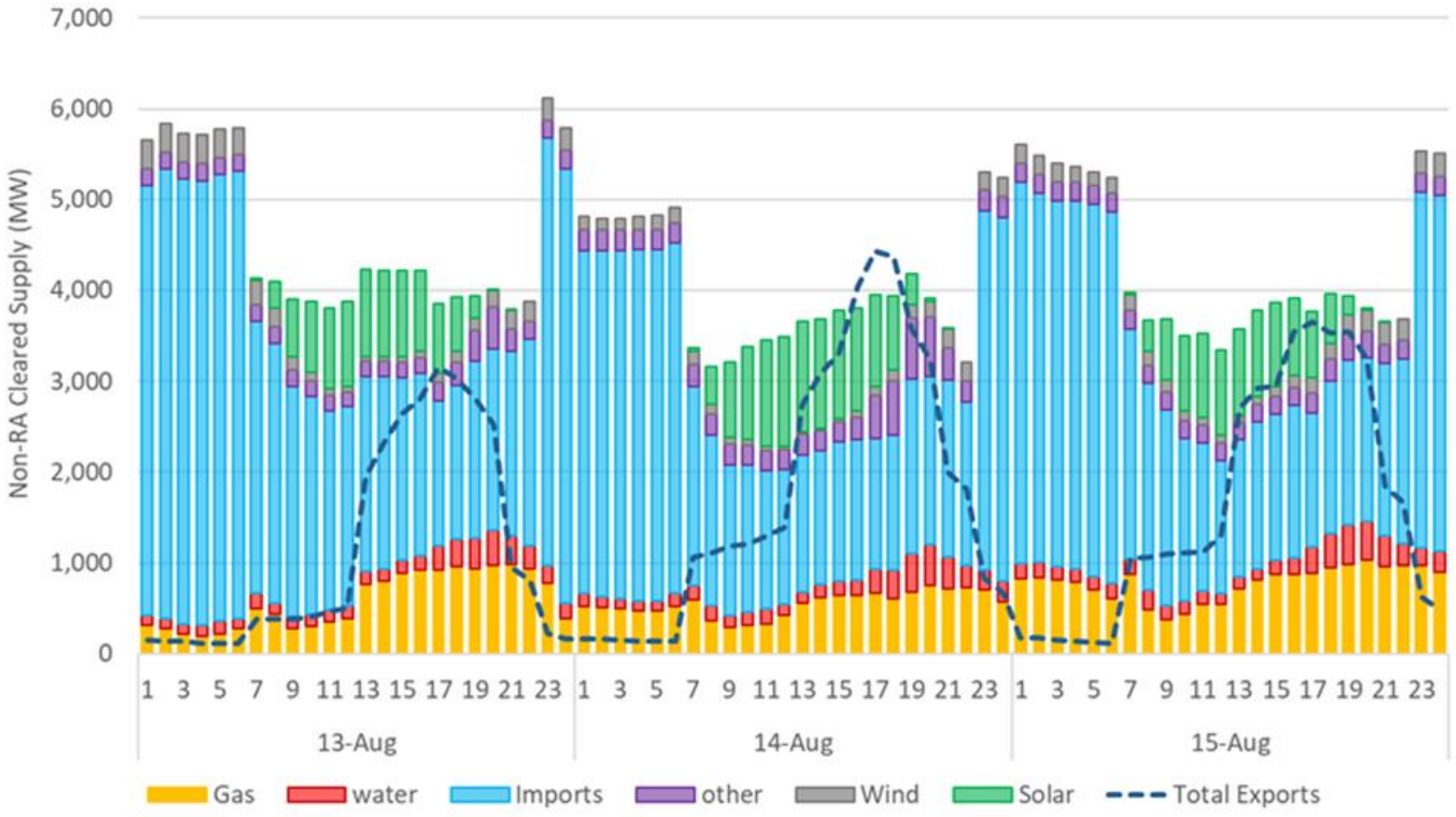
EIM transfers generally provided additional supply during peak hours and added to the real-time total interchange



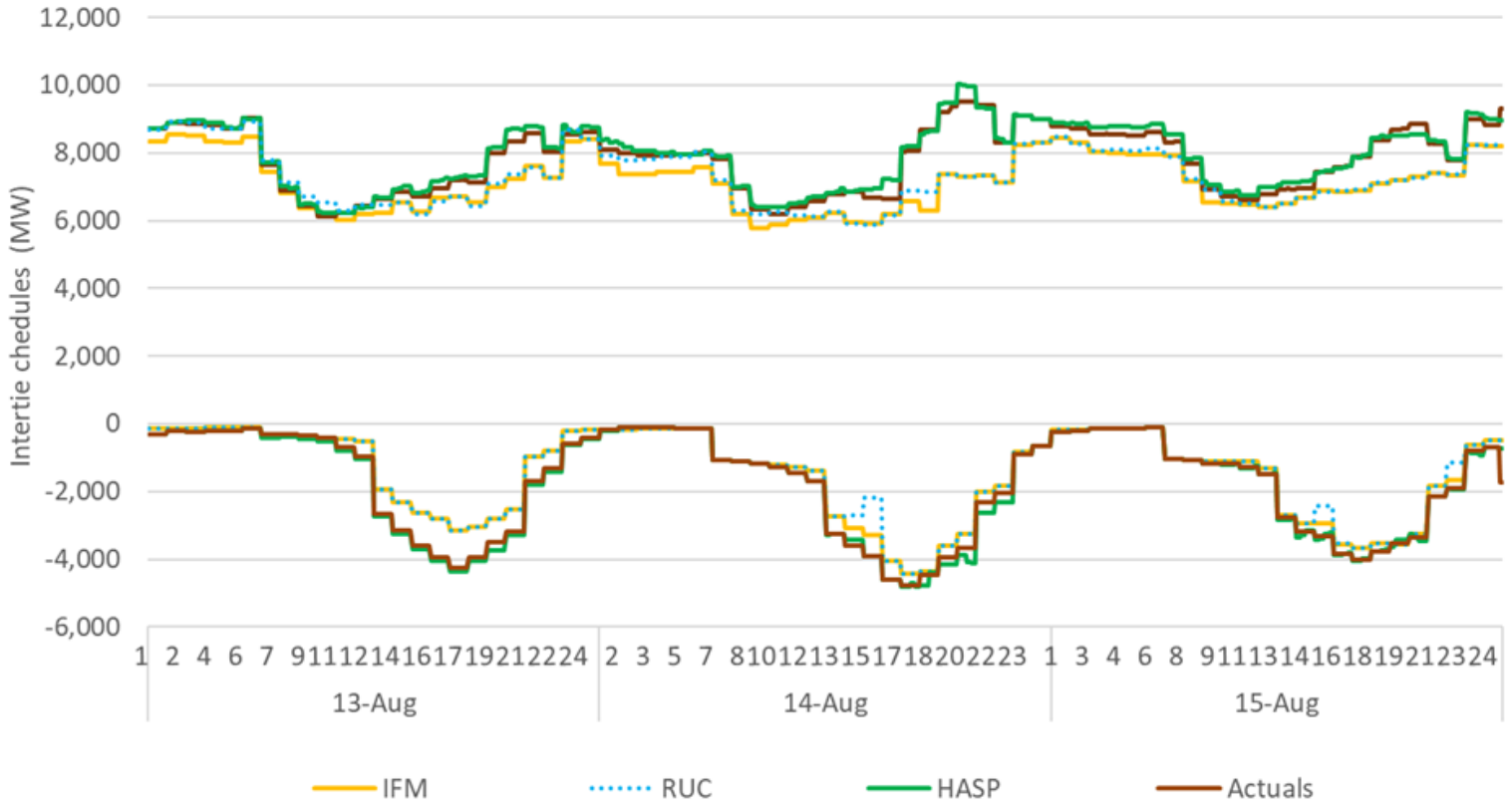
Volume of exports is composed by self schedules and economical bids



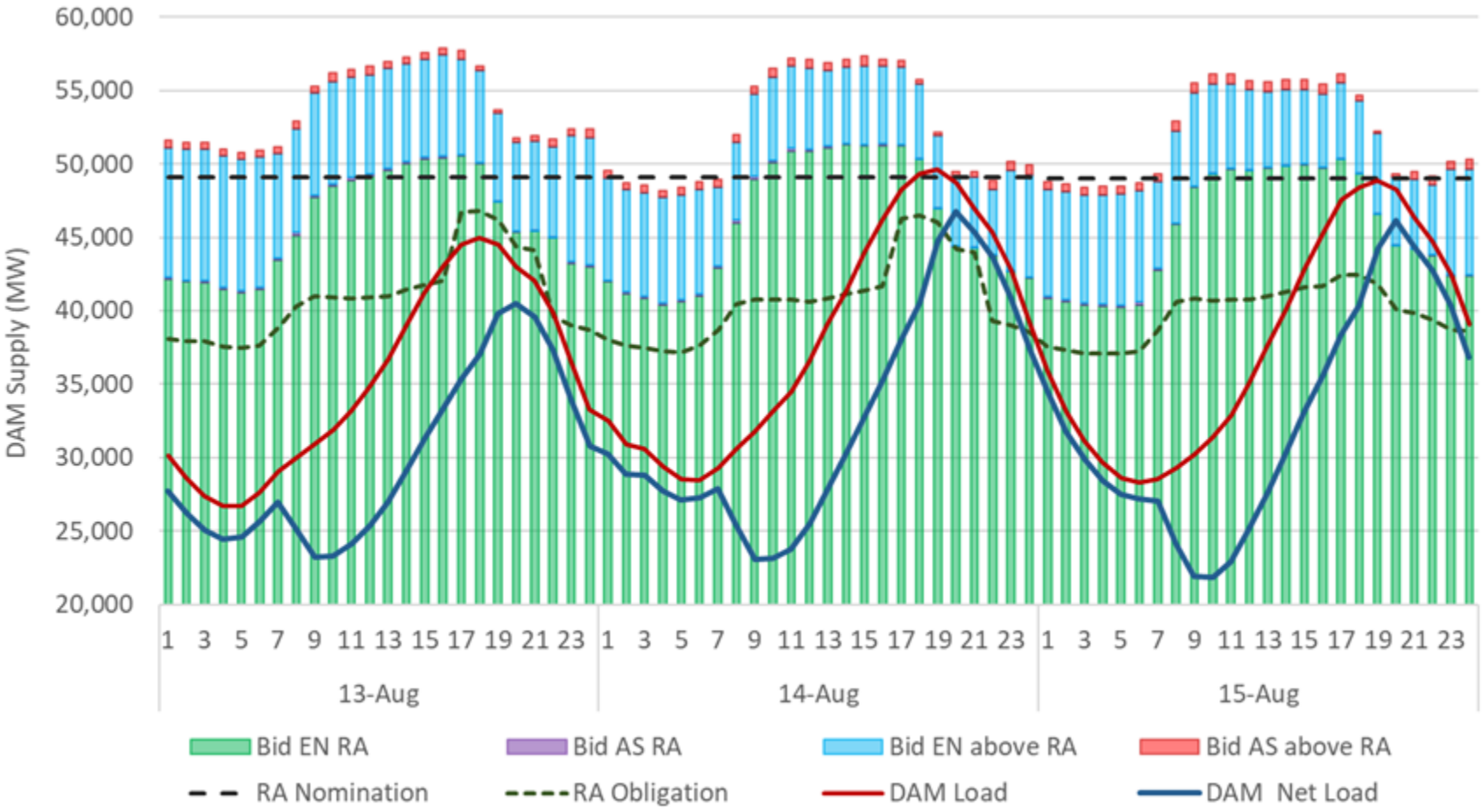
Supply cleared above RA is generally in excess of the volume of cleared exports



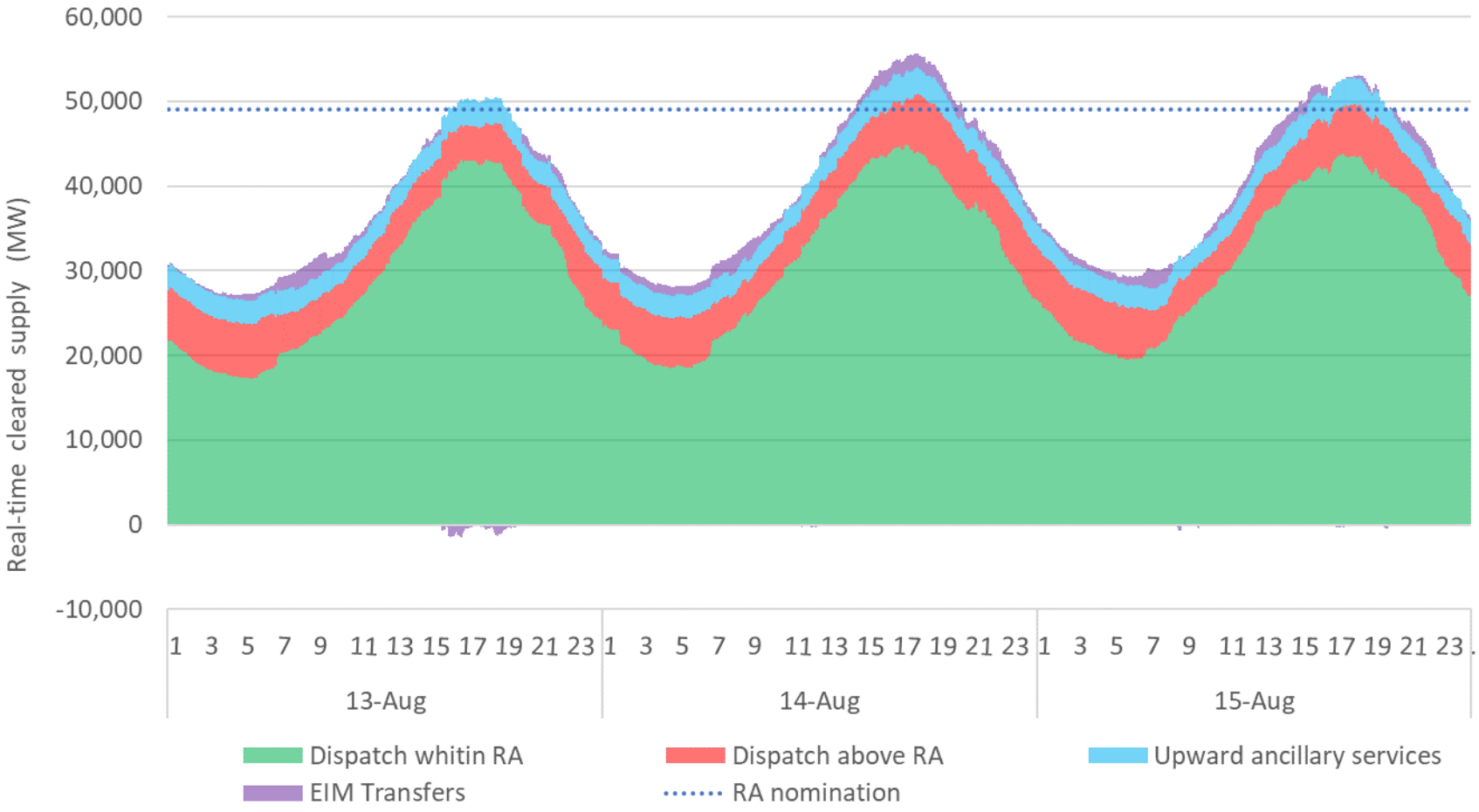
Overall, interties performed well, with additional energy coming in real-time through manual dispatches and emergency ties.



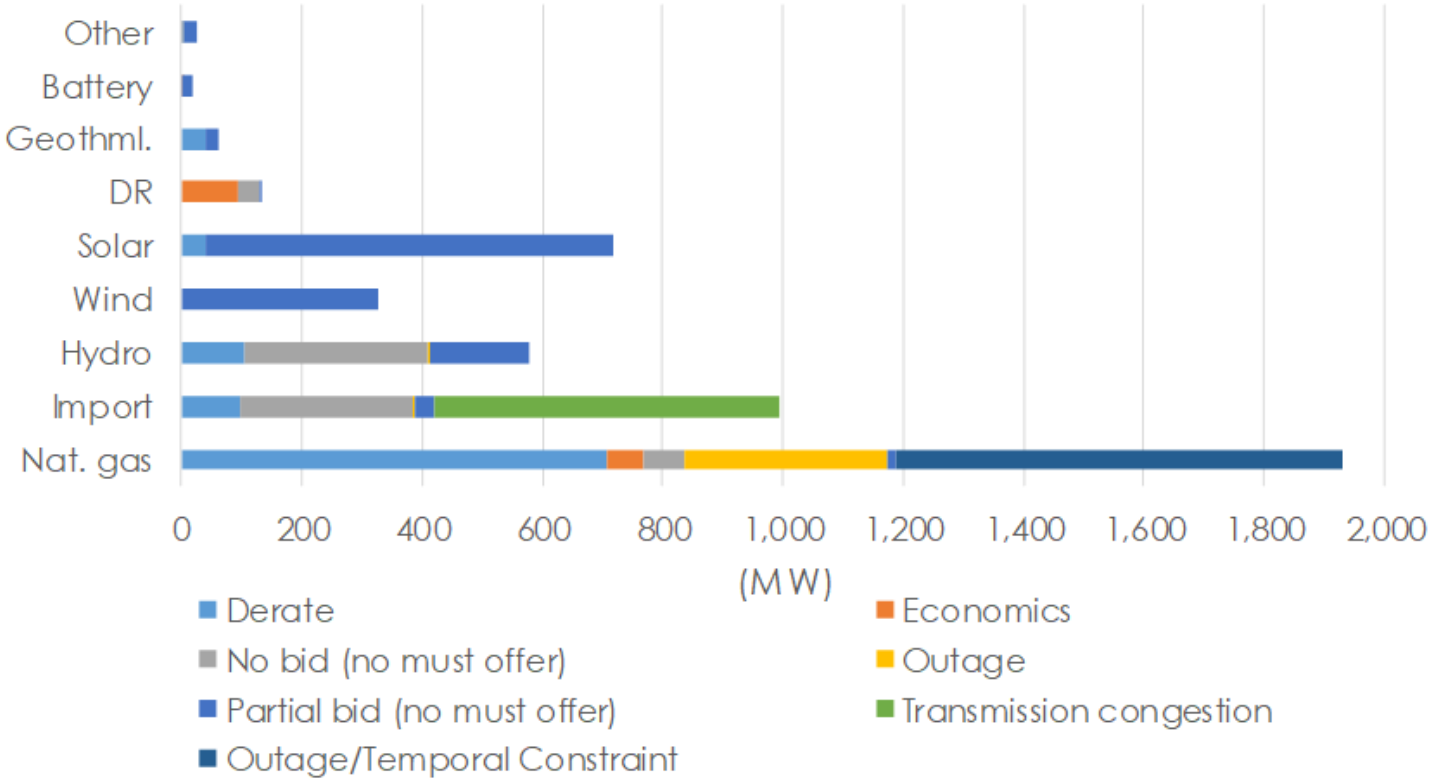
Capacity above shown RA was used to meet load conditions at the gross and net peaks -Day-ahead



Cleared supply in real-time relied on RA capacity and above RA

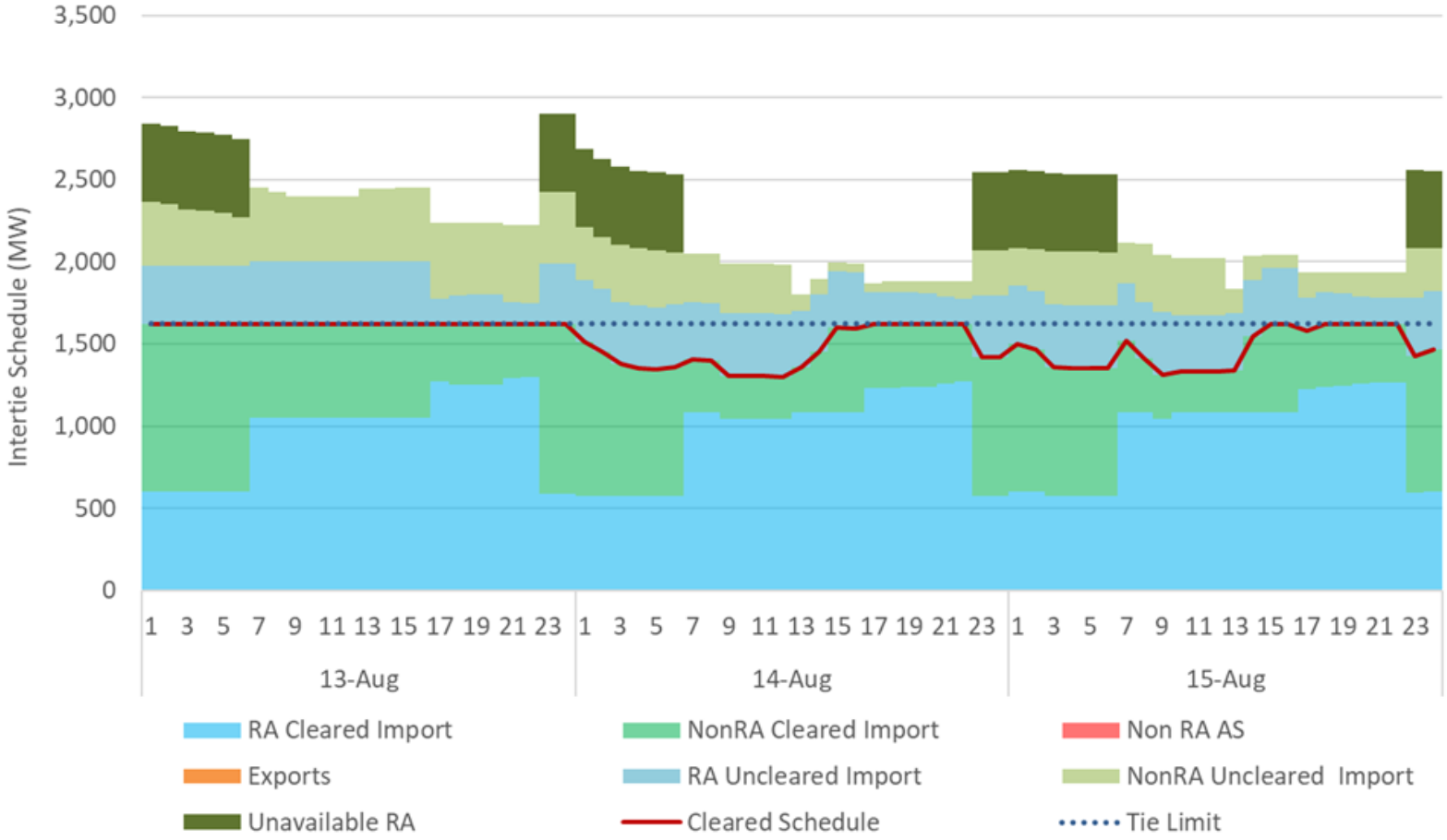


A variety of conditions resulted in certain RA capacity to not be available

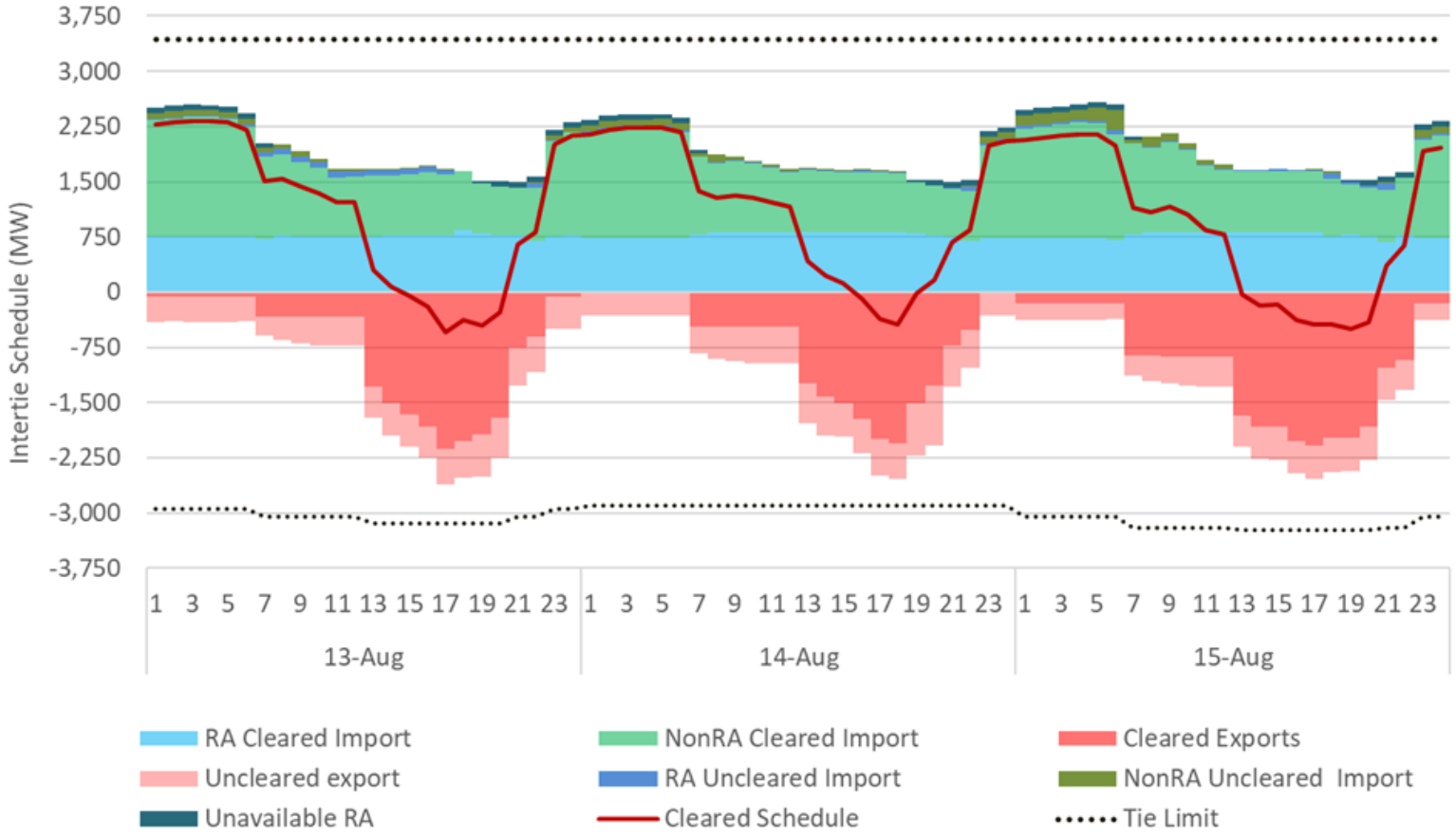


Import capacity got stranded behind Malin intertie due to derated capacity

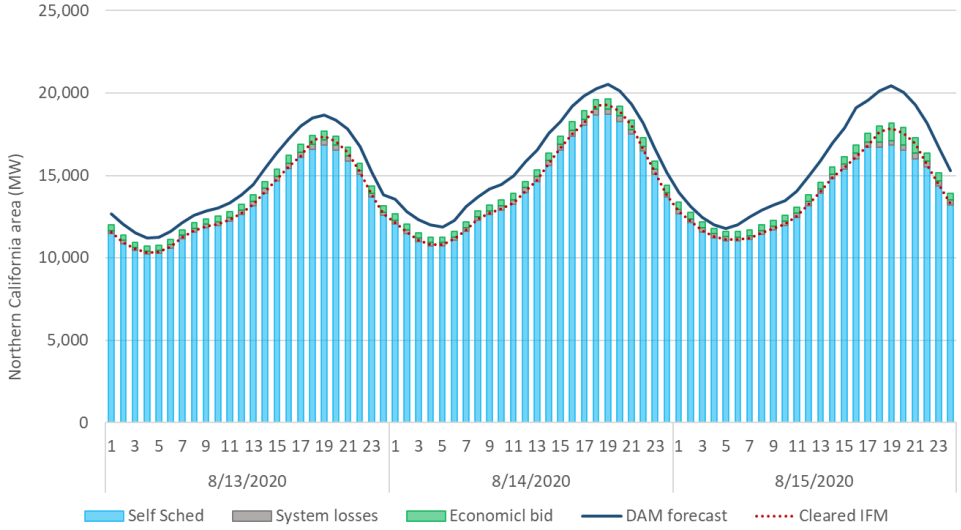
NOB intertie was fully utilized during peak hours and had stranded capacity that could not flow

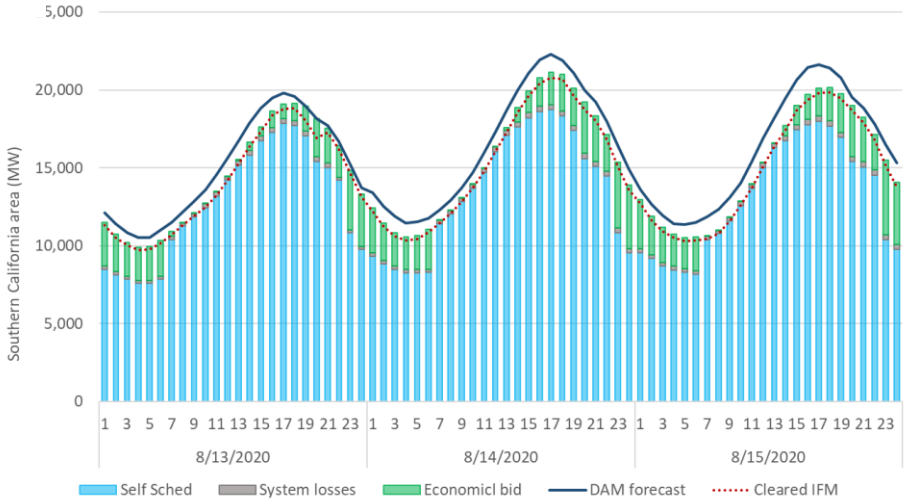


A large share of export was flowing through Paloverde and it became a net export during peak hours

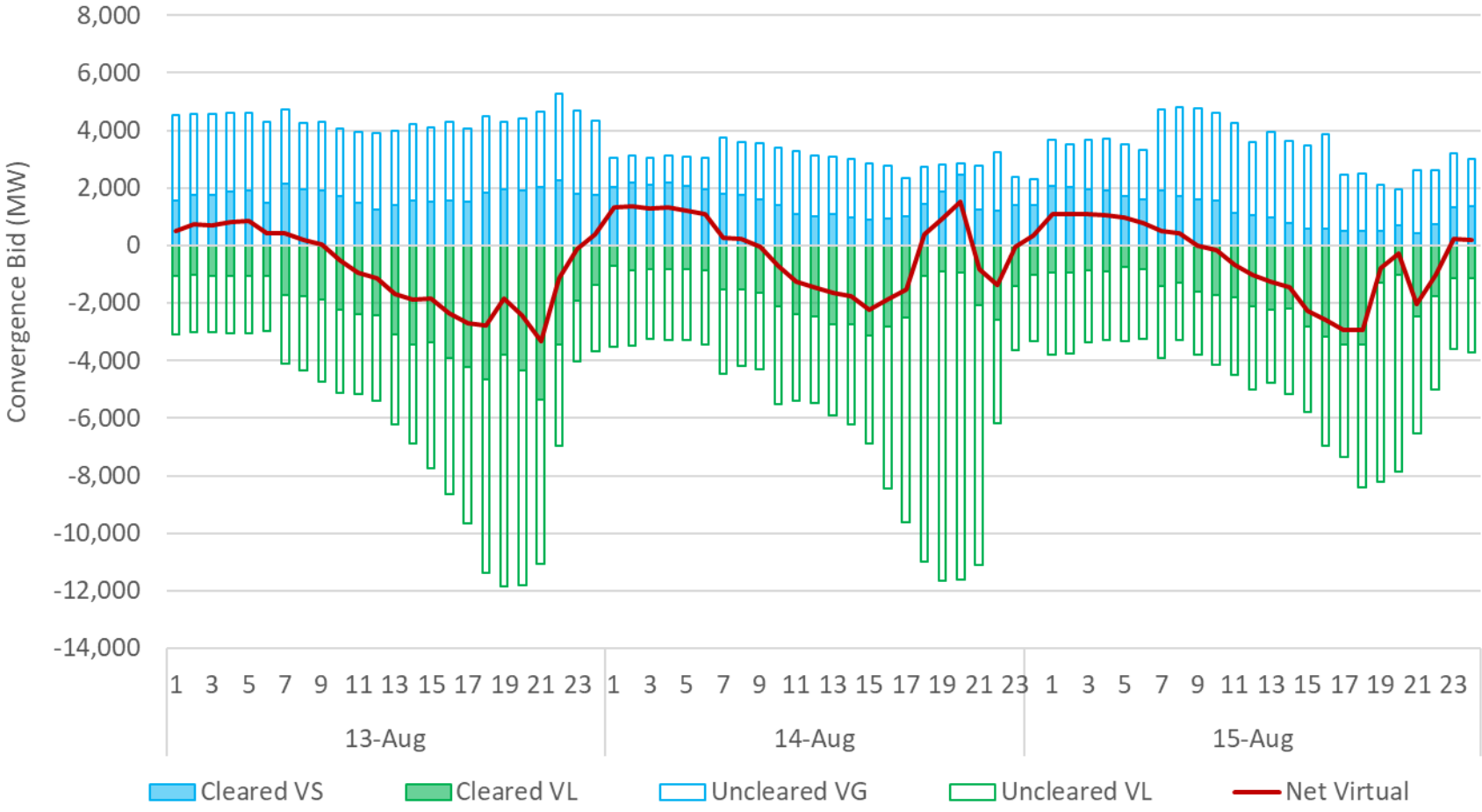


Level of under-scheduling varies by area; the majority of day-ahead demand is self scheduled



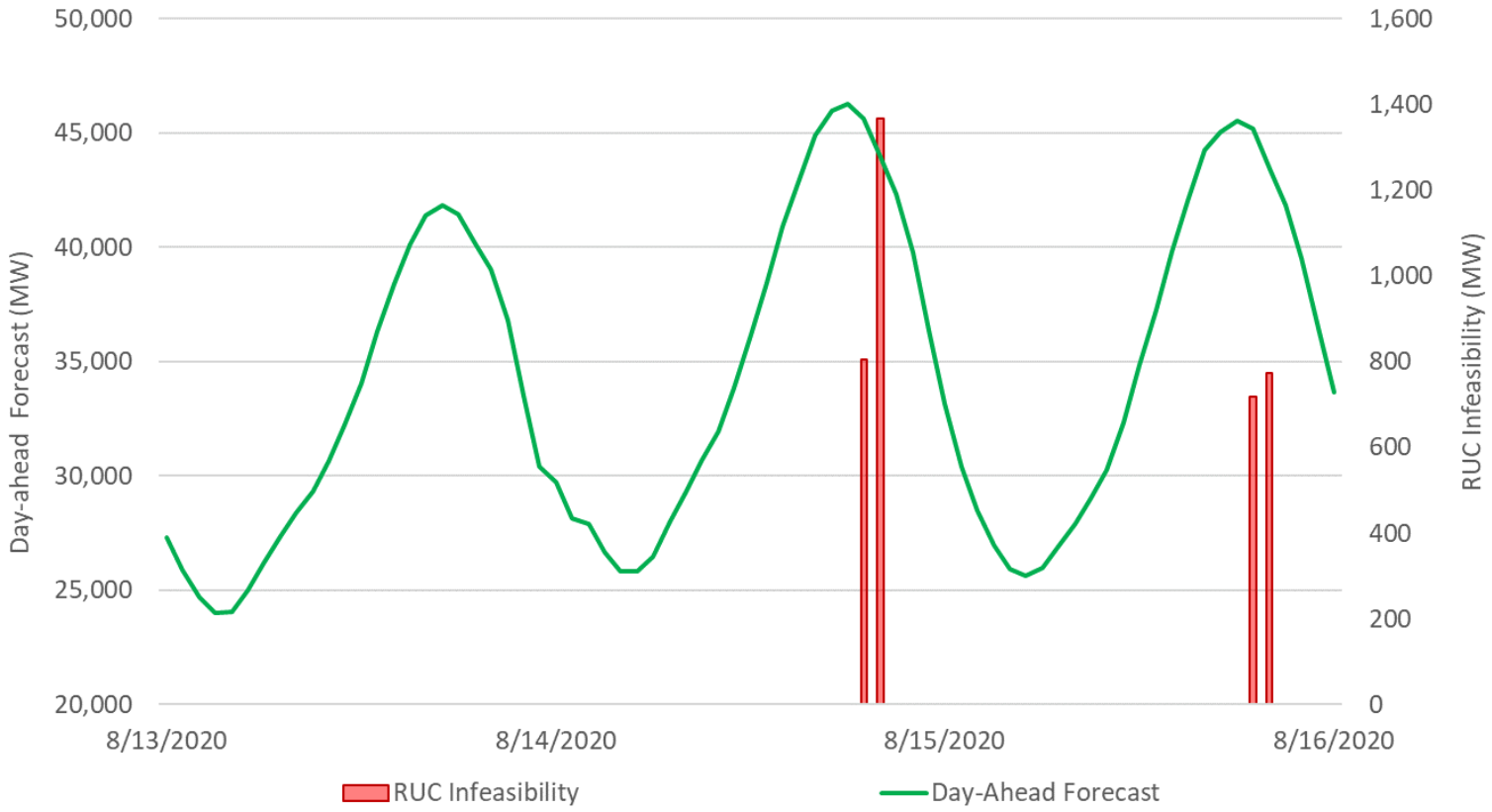


Convergence bids were largely net demand positions



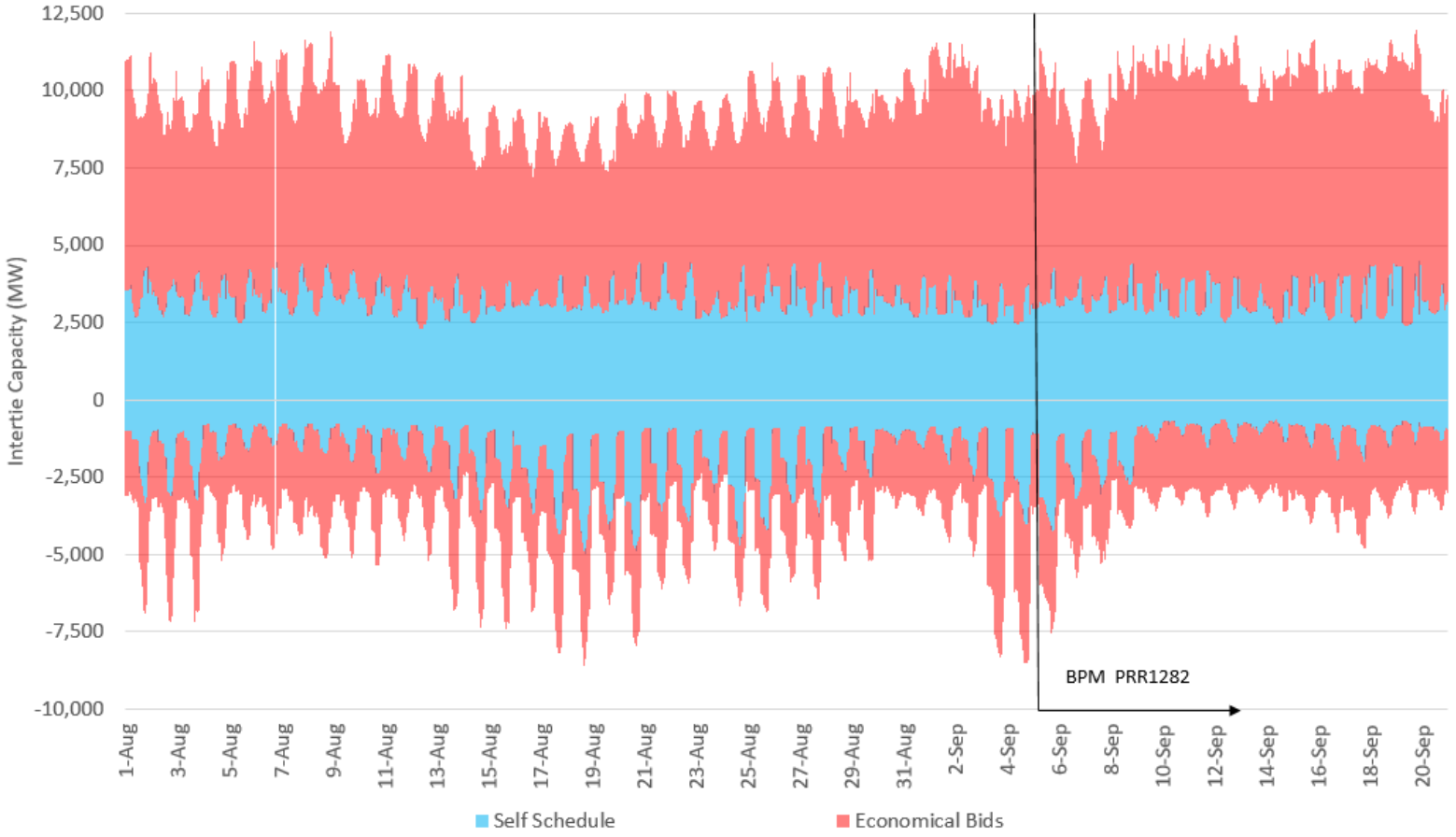
Convergence bids were net supply on August 14 during peak hours

The day-ahead RUC process observed power balance infeasibilities for peak hours against the day-ahead forecast



RUC utilized an upper-level confidence band for load forecast

Day-ahead exports trended higher during tight supply days*



*This includes wheels

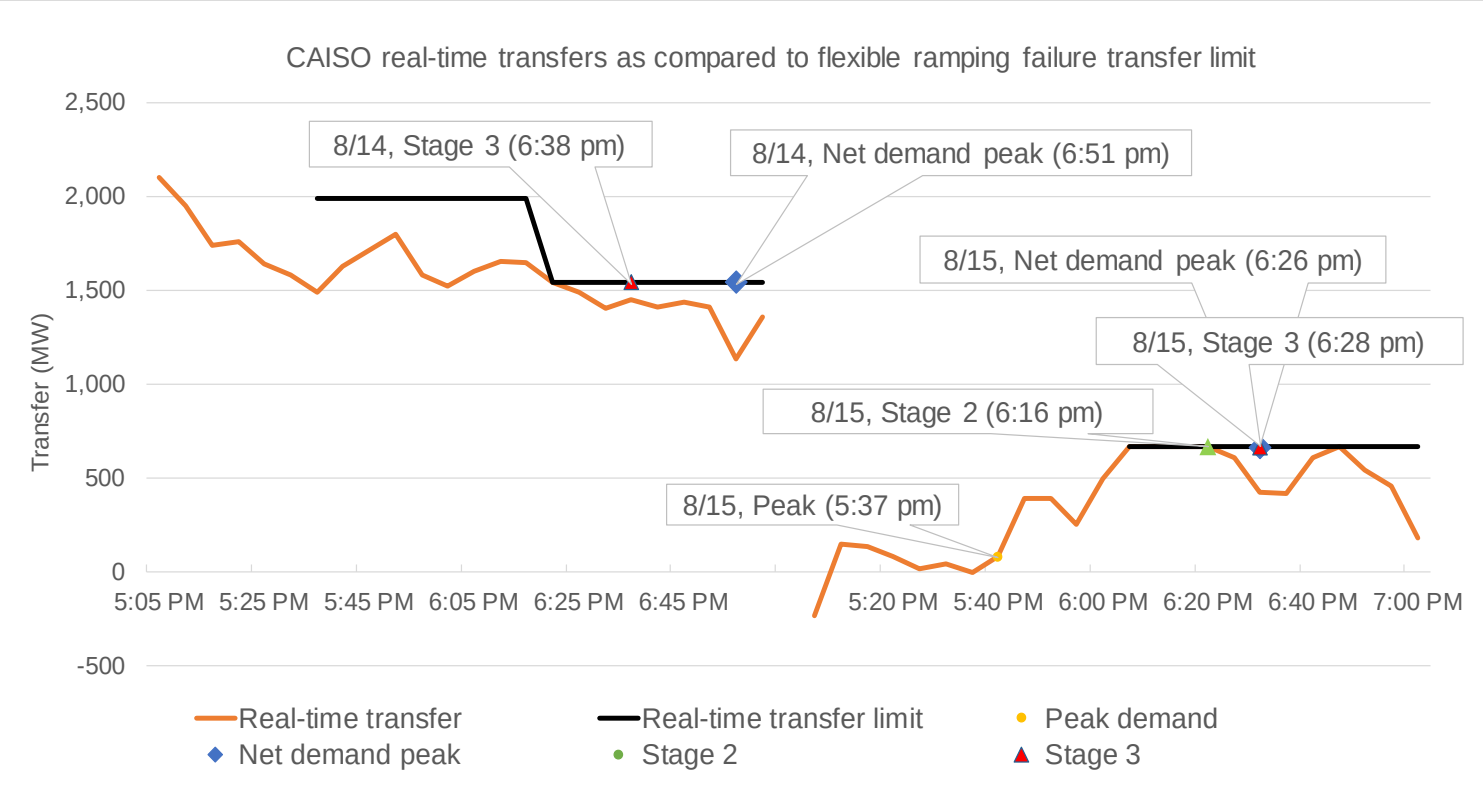
Export tend to be mostly self schedules as they come from the day-ahead process (This includes wheels)

These changes will result in exports with low priority to be curtailed in RUC and HASP under limited supply conditions
Export or import curtailments can happen in RUC and HASP also due to congestion

With this change, any day-ahead exports self scheduled into real-time will have a day-ahead priority only up to the RUC schedule

- Prior to this change the self schedule had a day ahead priority up to the IFM schedule.
- When RUC assesses the need to curtail exports, RUC schedules will be lower than IFM schedules
- Coming into the real-time market:
  - Self schedule up to RUC schedule will have day-ahead priority
  - Any self schedule above RUC level will not have a day-ahead priority.
    - If supported by non-RA, it will have high priority
    - If not supported by non-RA, it will have lowest priority
- The market utilizes the defined priorities and will start making uneconomical adjustment from lowest to highest priority

The flex test failures experienced in CAISO area during peak hours were immaterial to the tight supply conditions



Transfers into the CAISO area were naturally trending below the upper caps set by the failures

DR resources were dispatched during peak hours. Their performance is pending to be assessed