Day-Ahead Market Enhancement Analysis

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Market Analysis and Forecasting

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Objective

Analyze performance and trends in the areas of the day-ahead market that relate to the DAME initiative:

– Historical imbalances

– Imbalance reserve requirements

– RUC adjustments and upper confidence band

– RUC capacity

This presentation is based on the analysis report posted on the ISO website at

http://www.caiso.com/InitiativeDocuments/Day-AheadMarketEnhancementsAnalysisReport-Jan24-2022.pdf

# Historical Imbalances between day ahead and real time continue to be significant
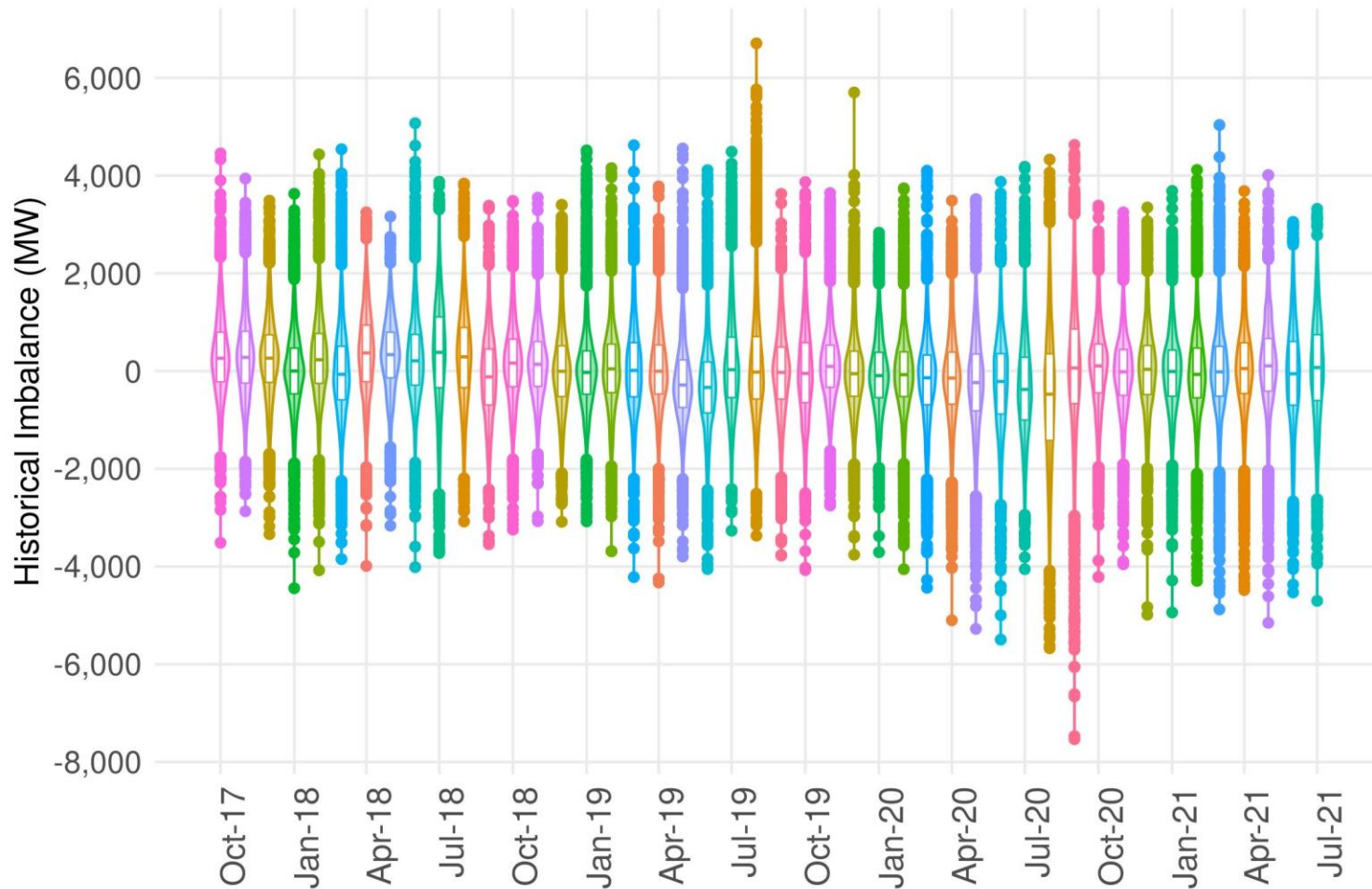
The shape of the plots shows the density and type of distribution of Imbalances

The level of imbalances varies by time of the year and hour
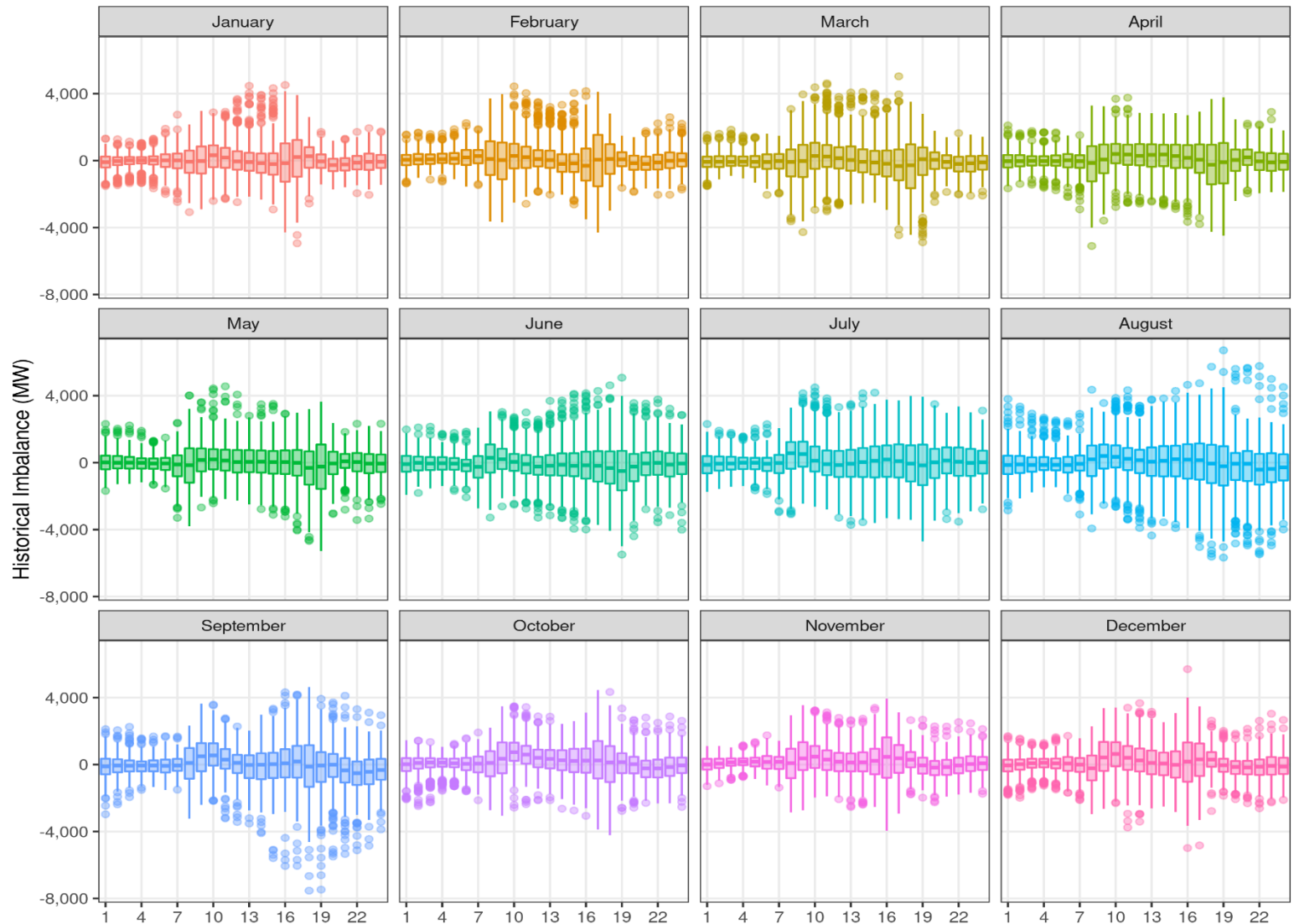
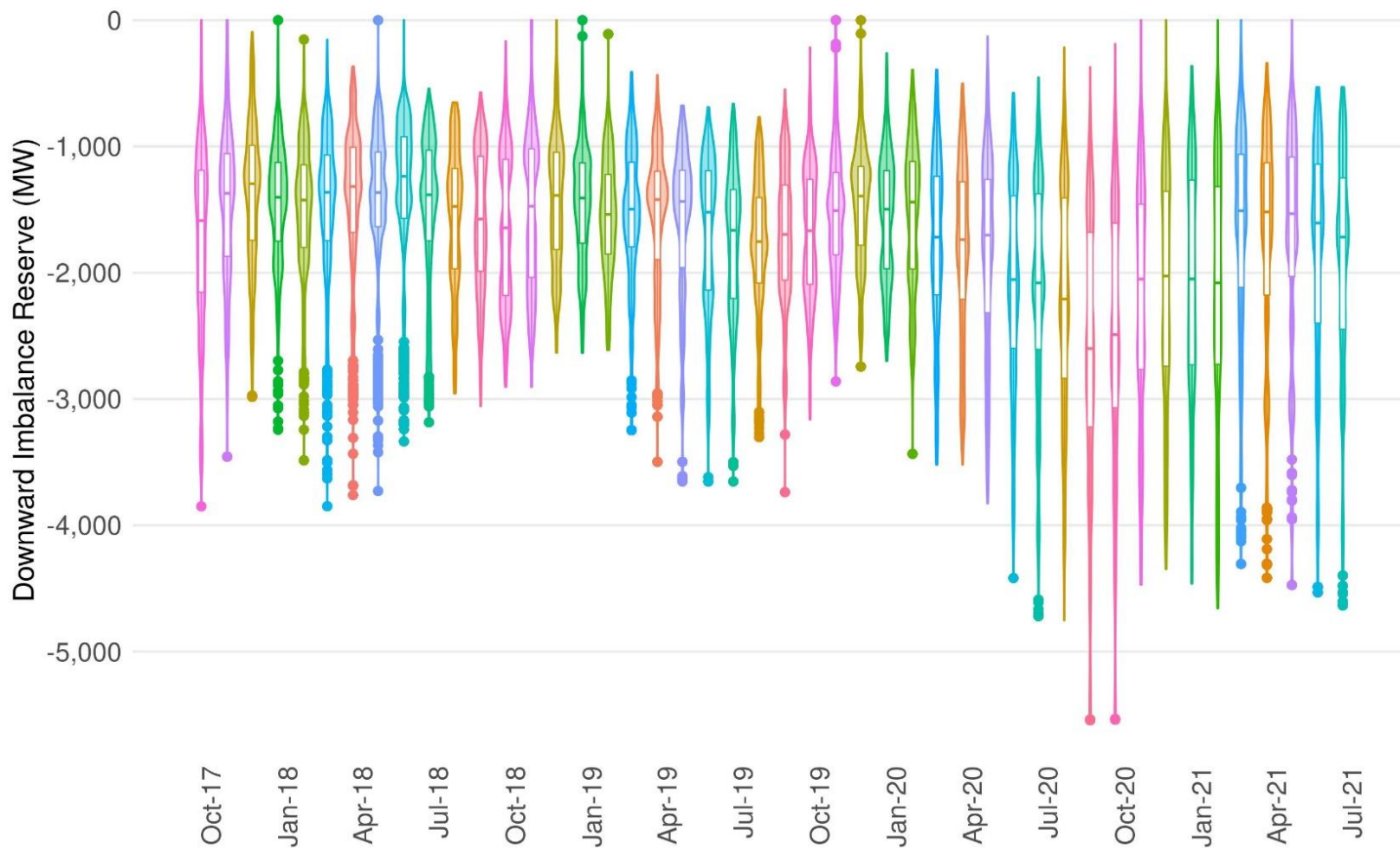
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Period covered: Oct 2017-Jul 2021

Imbalance reserves using a quantile regression approach yields the estimation of requirements - U
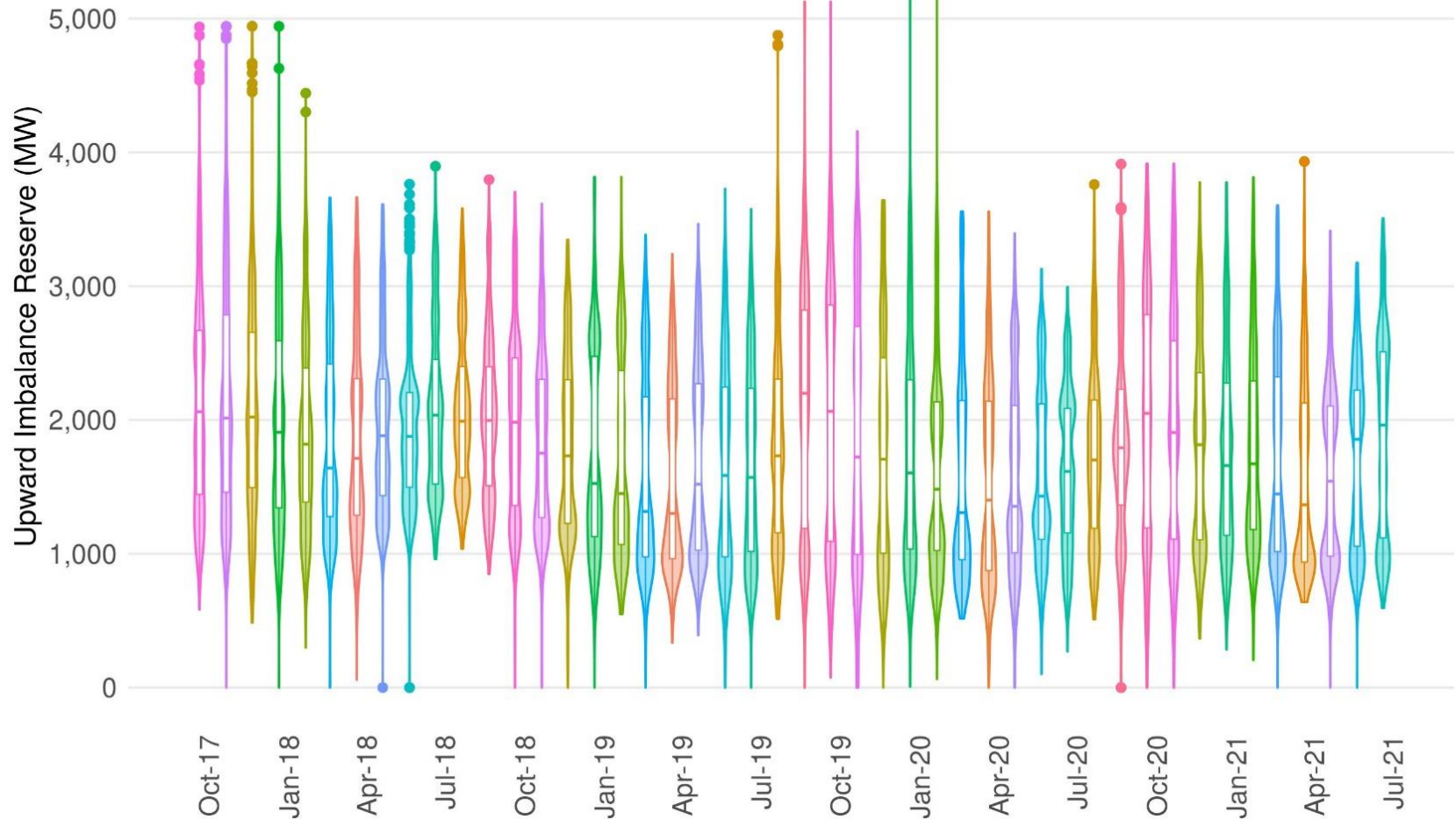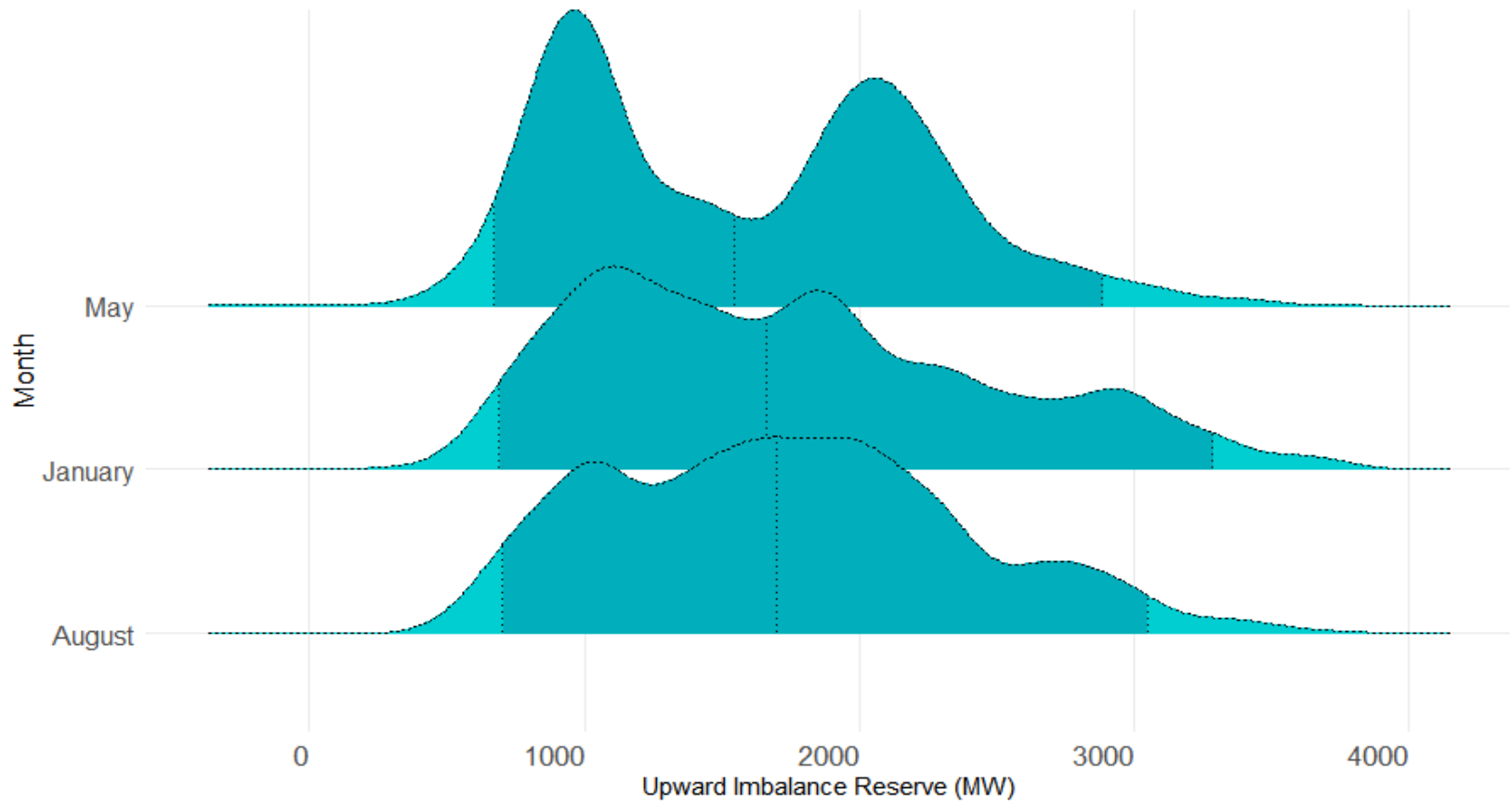
Imbalance reserves using a quantile regression approach yields the estimation of requirements - downward imbalance reserves
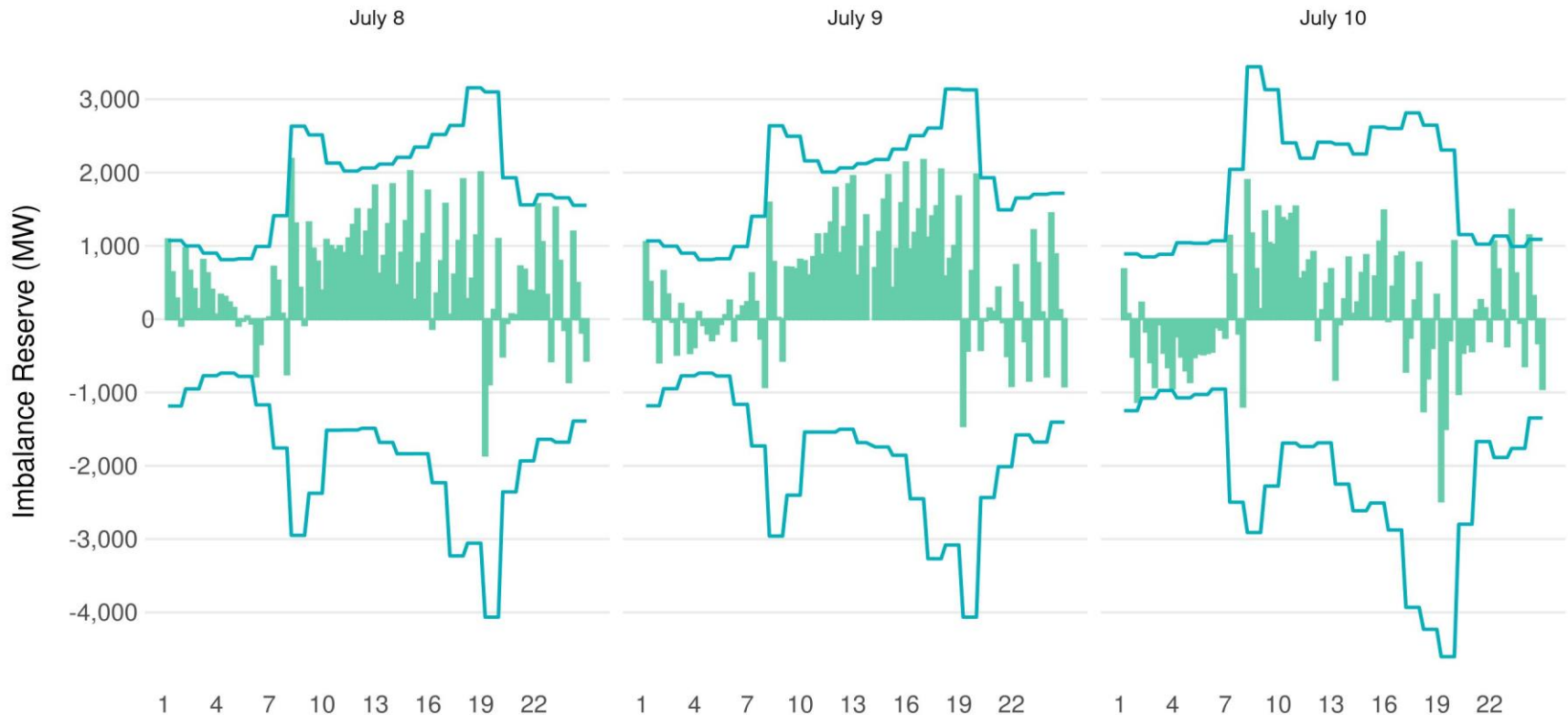
Imbalance reserve requirements varies by time of the year, tracking the net load uncertainty and forecast levels

Lighter blue sections show the 2.5th and 97.5th percentiles

Months covered: Aug 2020, Jan 2021 and May 2021

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Sample of imbalances and estimated imbalance reserve requirements for summer 2021 days with tight supply conditions

Green bars stand for actual imbalances while blue lines represent the upward and downward IR requirements
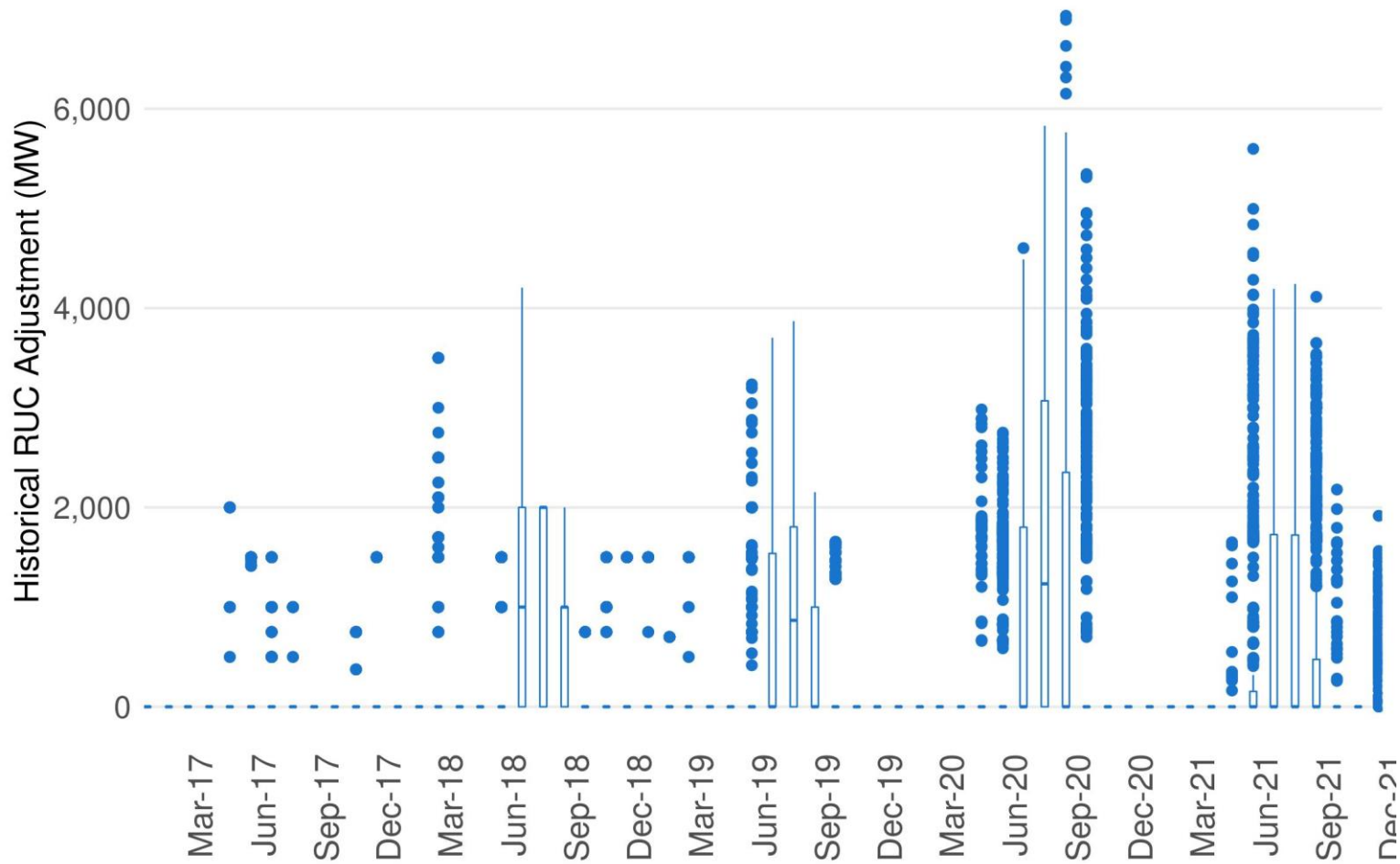
Sample of imbalances and estimated imbalance reserve requirements for volatile conditions in December 2020
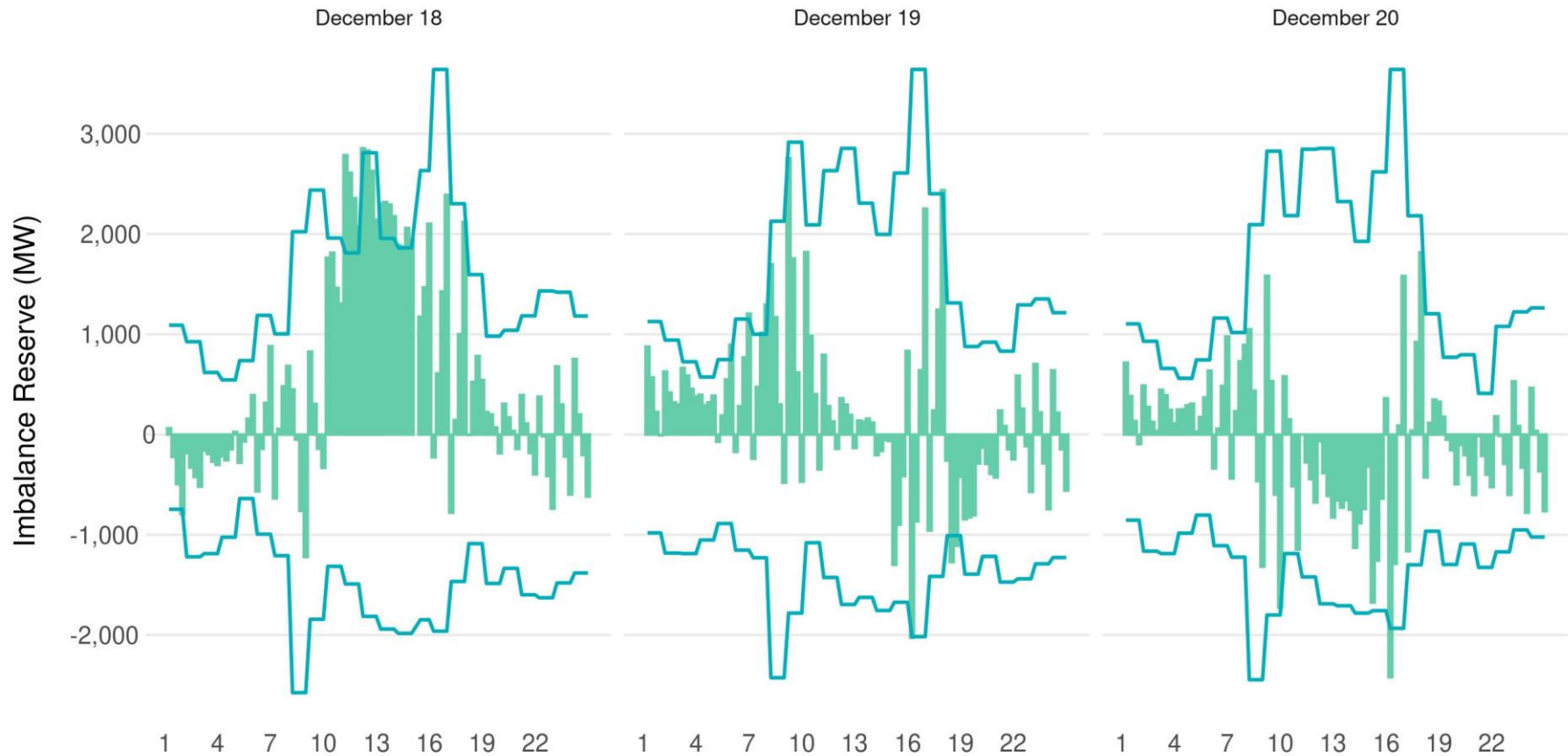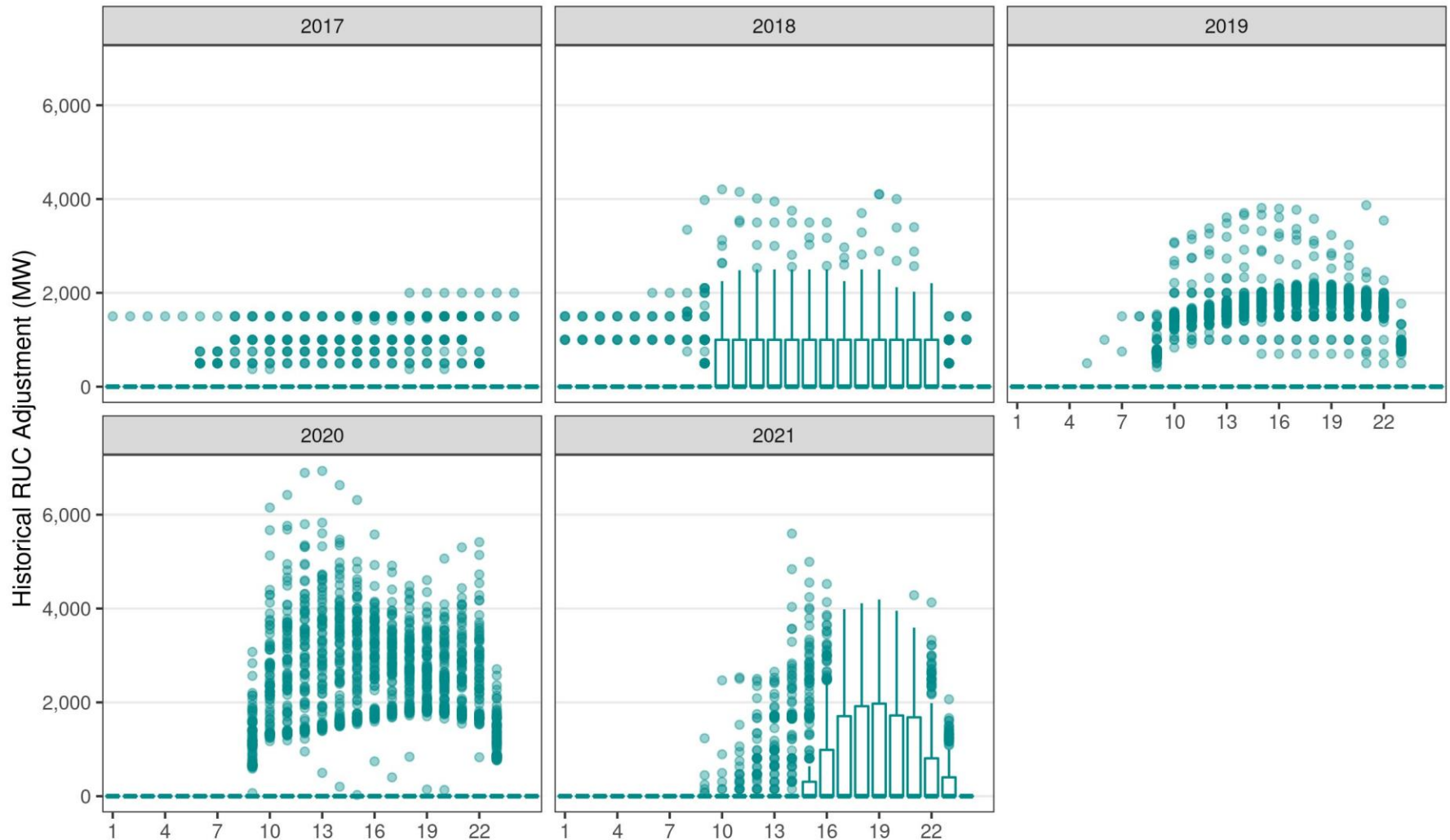

Green bars stand for actual imbalances while blue lines represent the upward and downward IR requirements

RUC adjustments have been used more frequently in summer months and reached the highest level on 2020

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RUC adjustments are mostly concentrated on peak hours and for upward capacity


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The correlation between RUC adjustments and Imbalance reserve needs

- RUC adjustments is generally for upward needs
- RUC adjustments are generally for peak hours only
- Imbalance reserve needs are bi-directional
- Imbalance reserves needs are generally for all hours

The color of the dots represent the level of load forecast

The imbalance reserve coverage of RUC adjustments decreases as the RUC adjustments increases. Imbalance reserves covered about 40% and 60% of RUC adjustments in 2020 and 2021
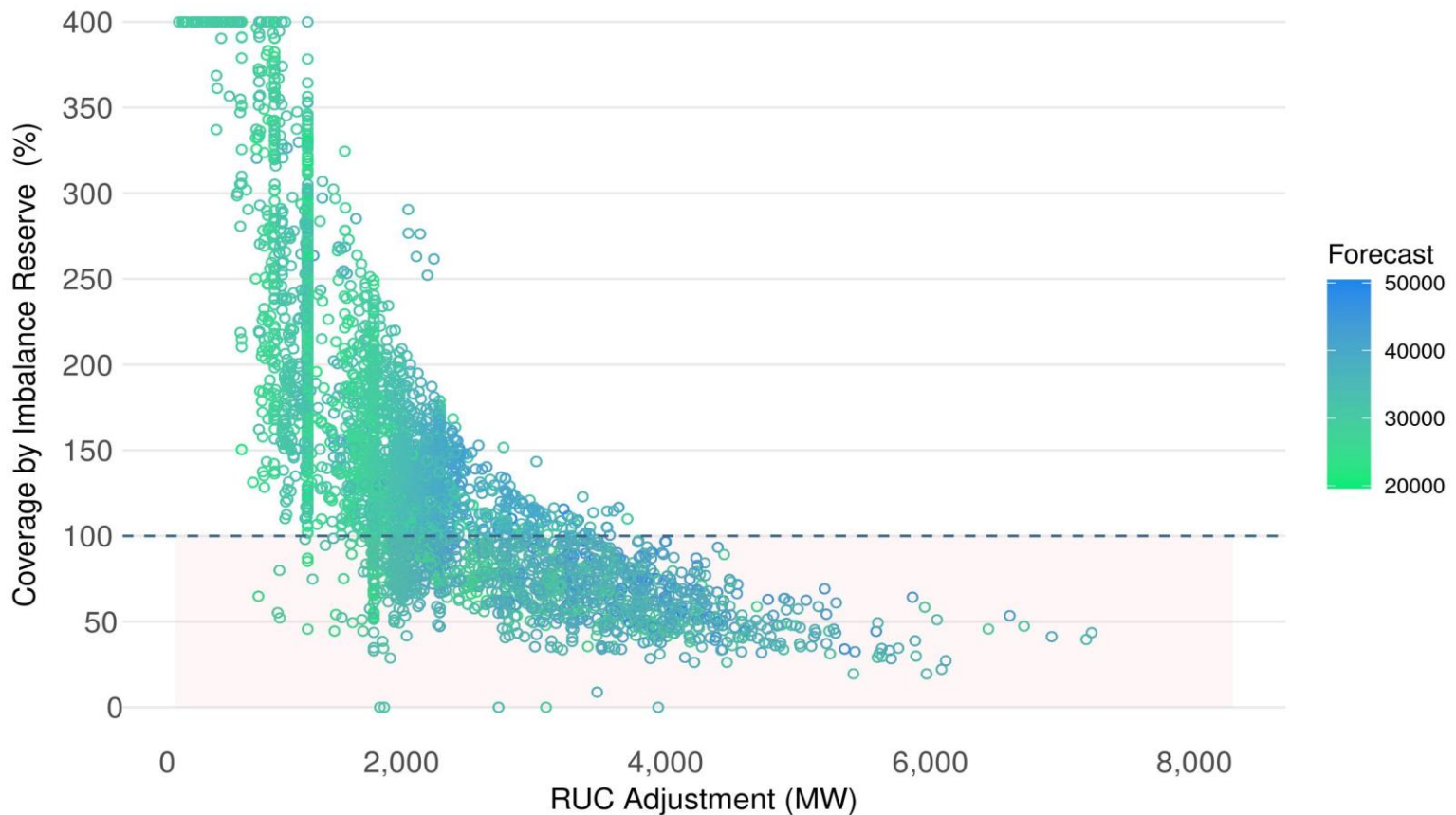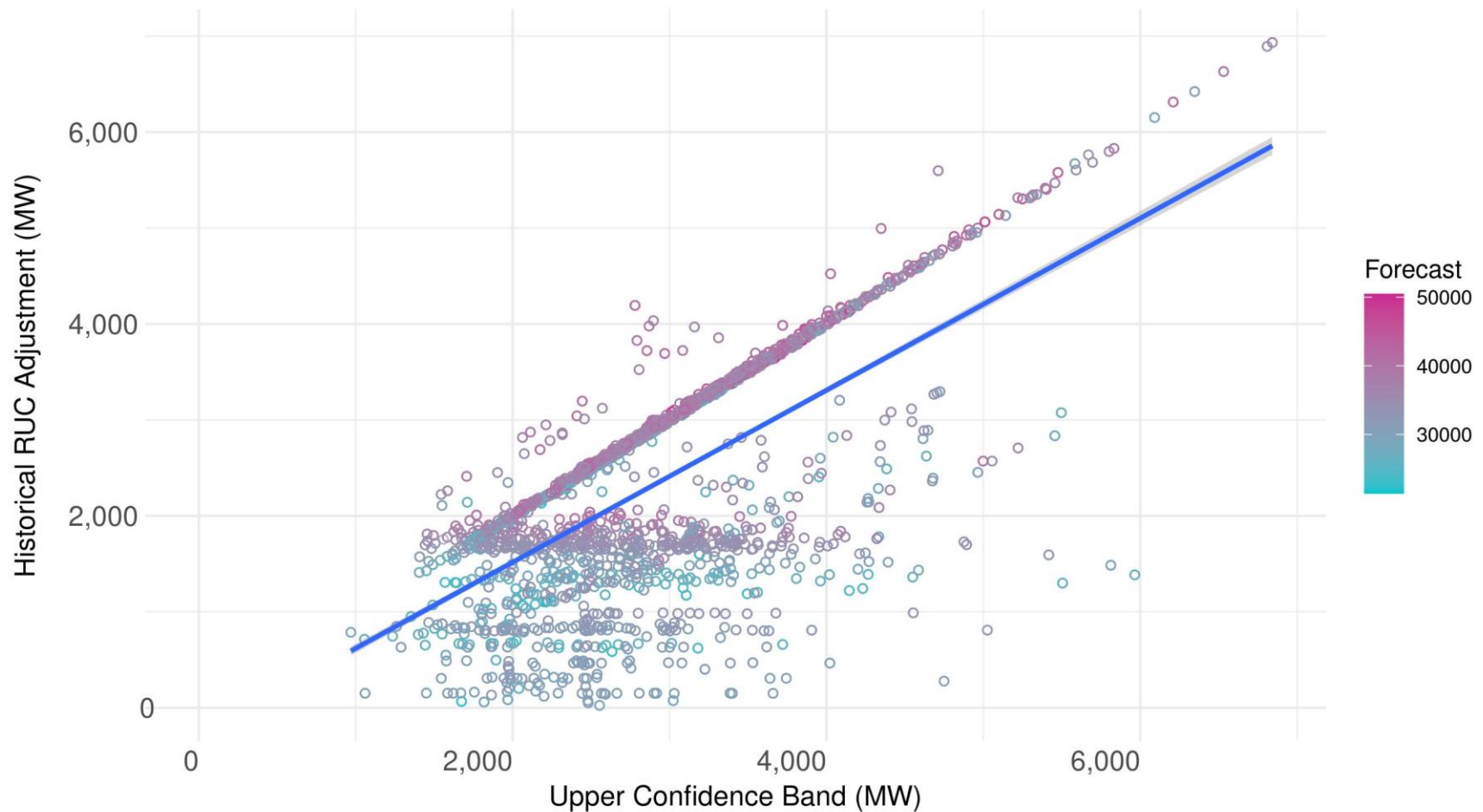

Coverage values capped at 400% for display purposes

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RUC Adjustments in recent months have been guided by a rough estimation of an upper-confidence load forecast

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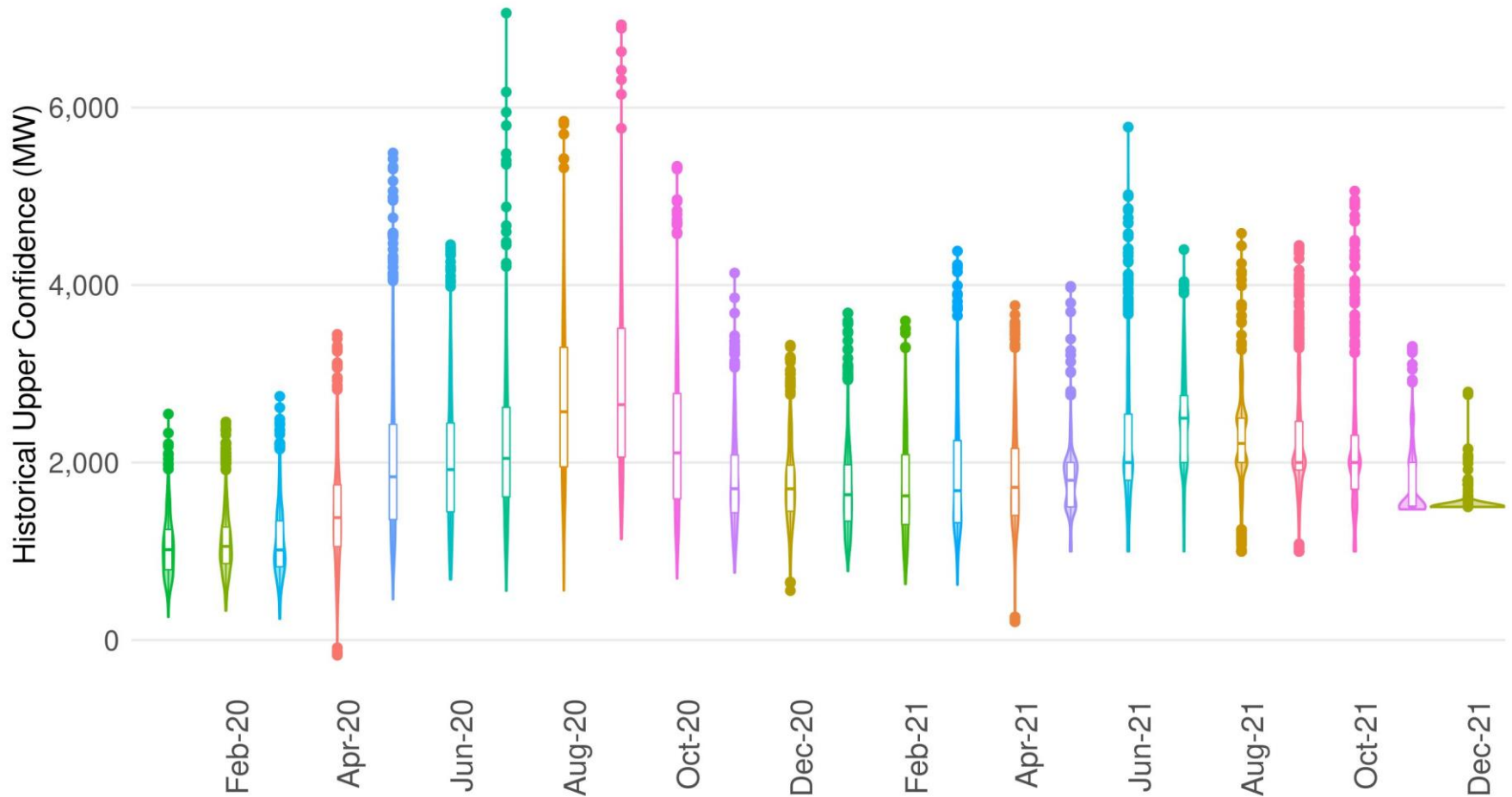
About 16% of the RUC adjustments were the same magnitude of the upper confidence value (dots at 45 degree)
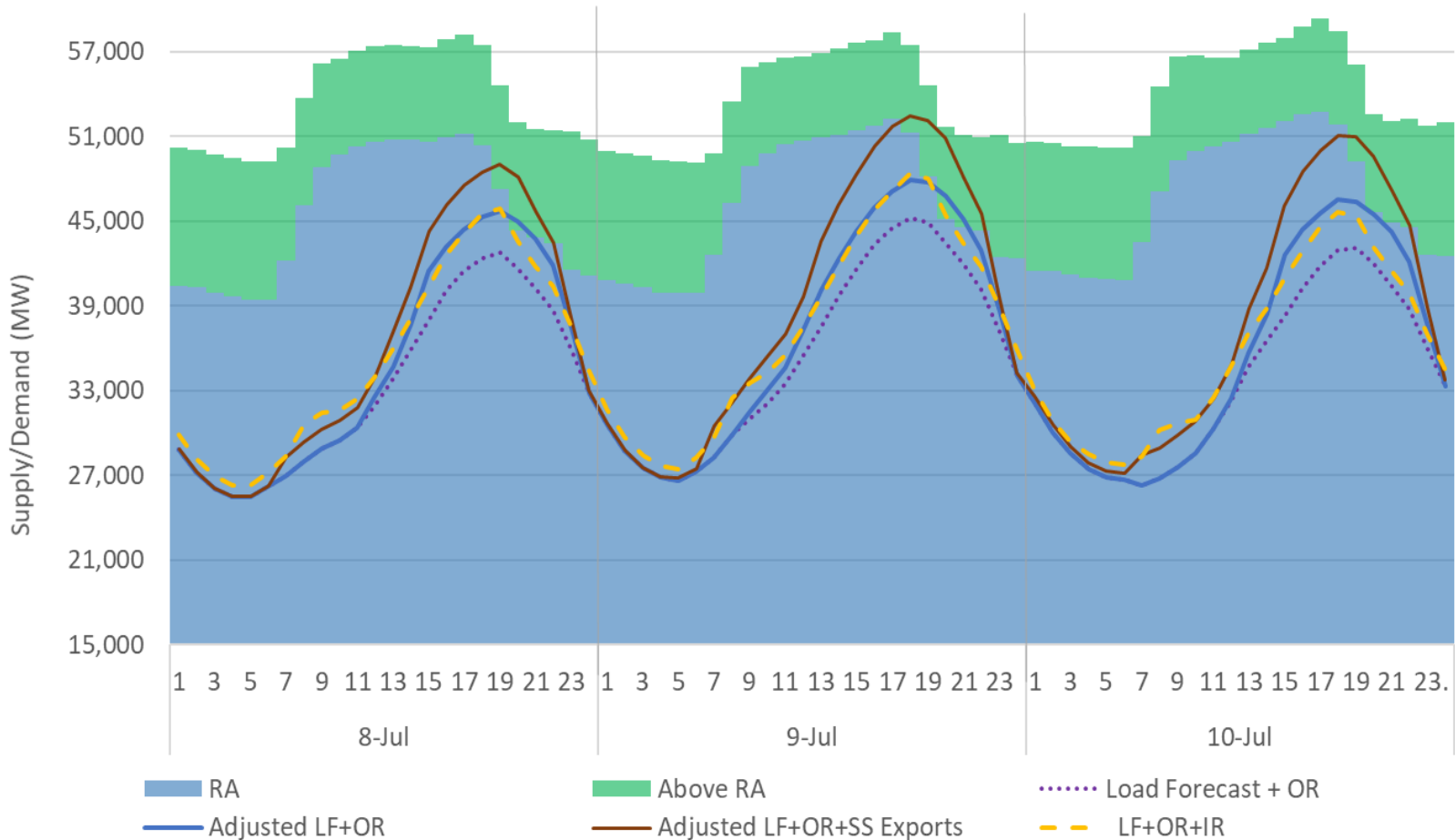
During tight supply days the imbalance reserves, upper confidence and RUC adjustments tracked relatively close
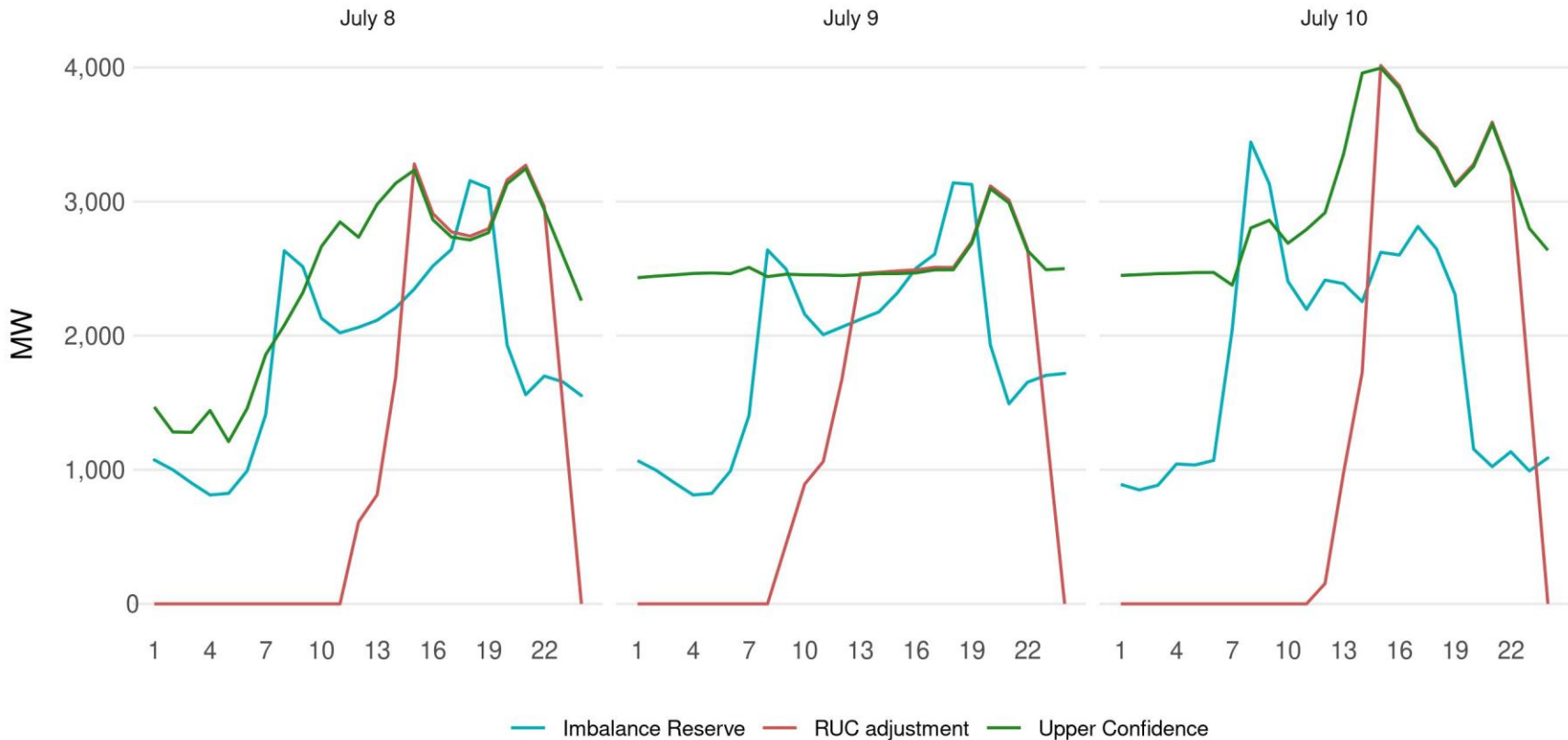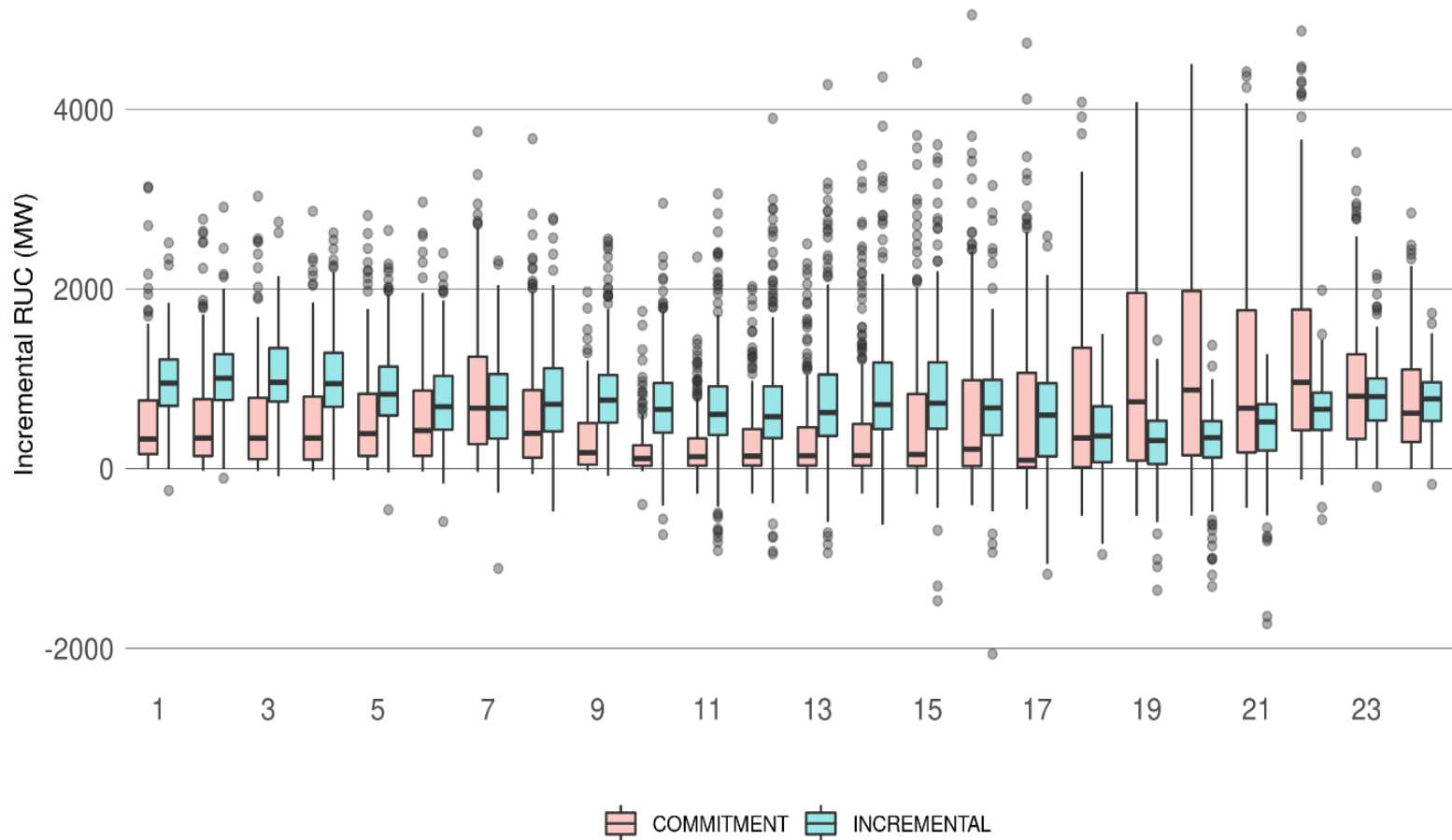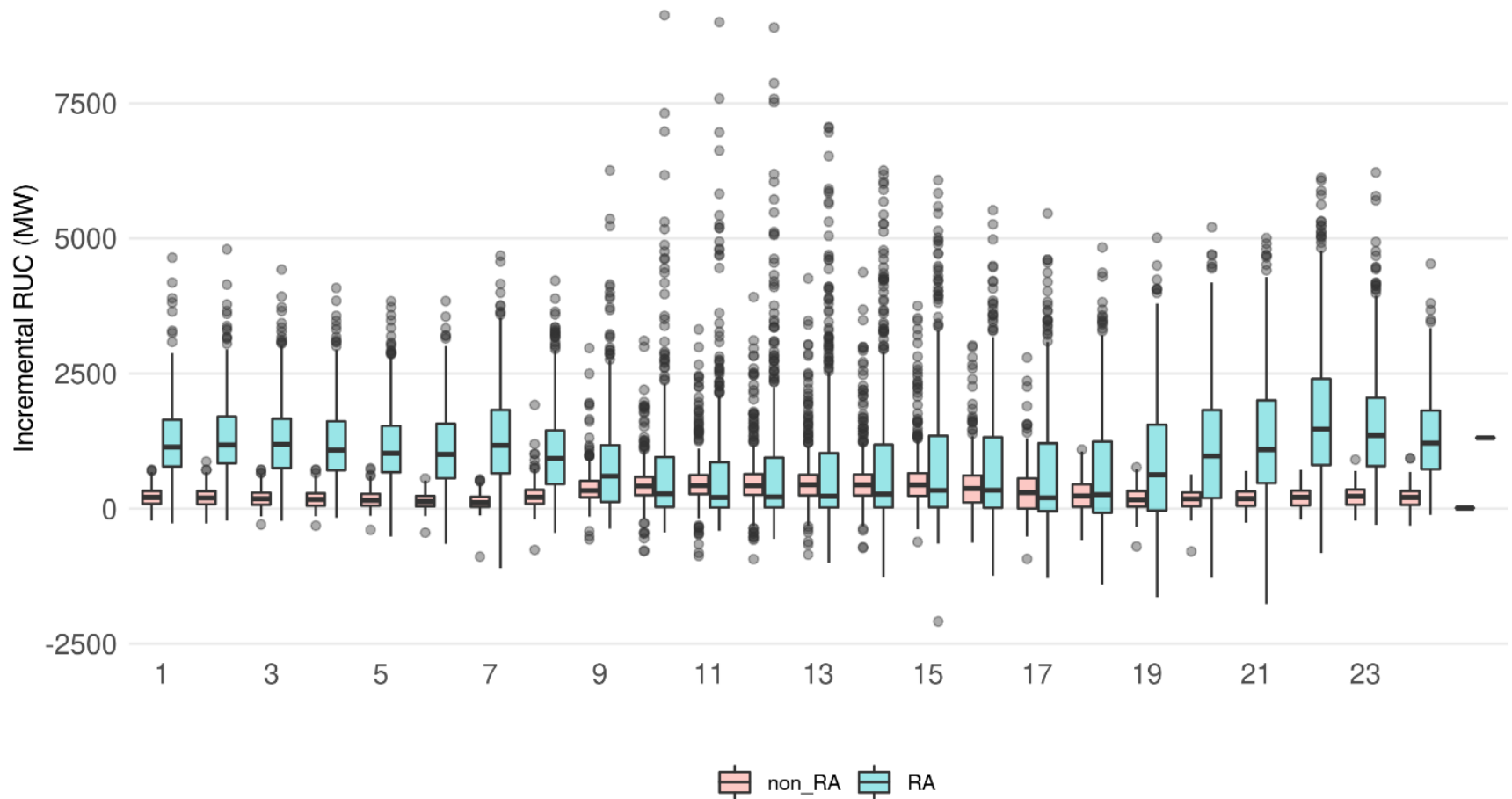
During tight supply days, the imbalance reserves would have imposed similar requirements to those driven by RUC adjustments
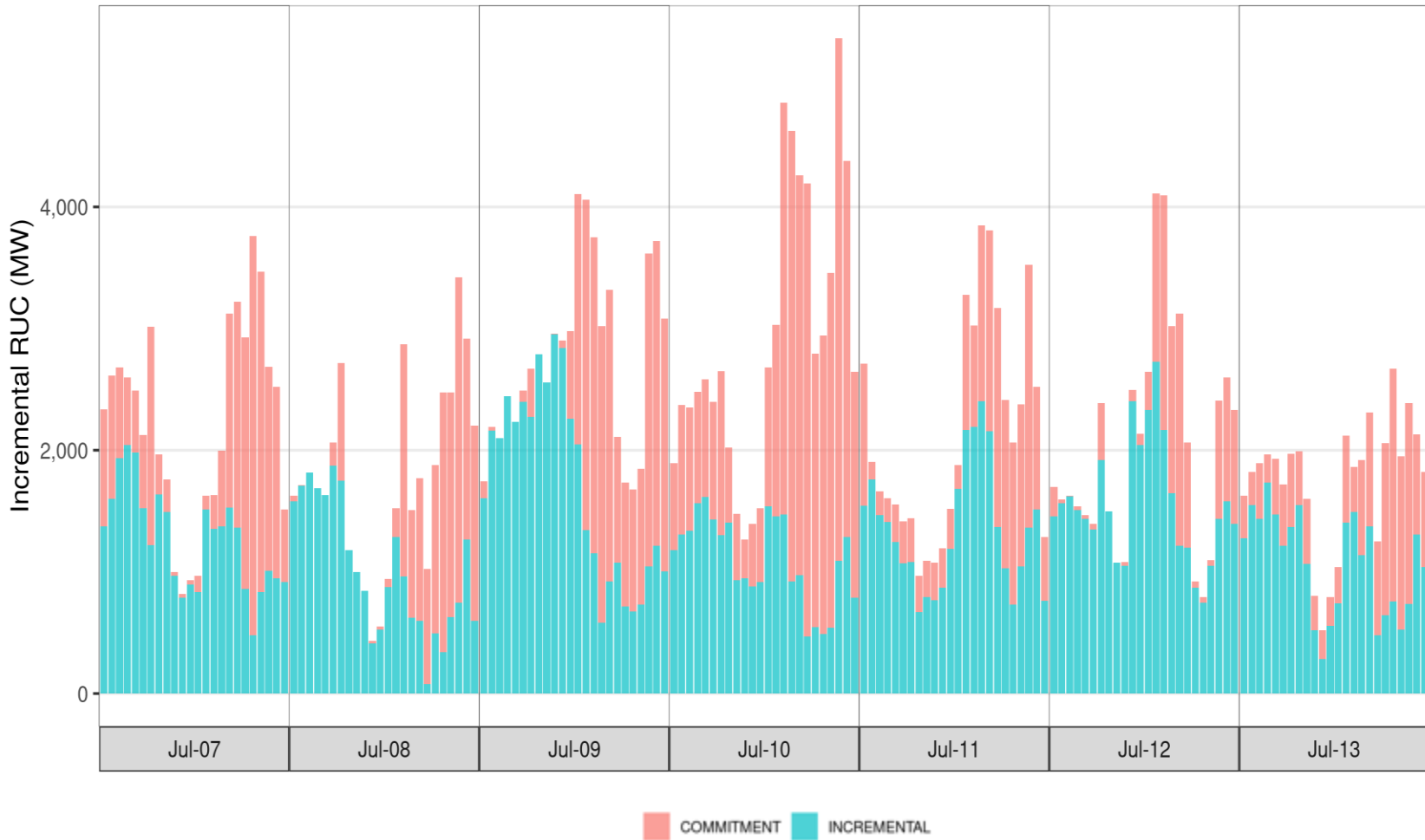
The incremental capacity procured in the RUC process during peak hours is largely supported by units already committed in IFM

# The incremental capacity procured in RUC is largely supported by resource adequacy supply

During peak hours in July, RUC capacity was supported by additional unit commitments

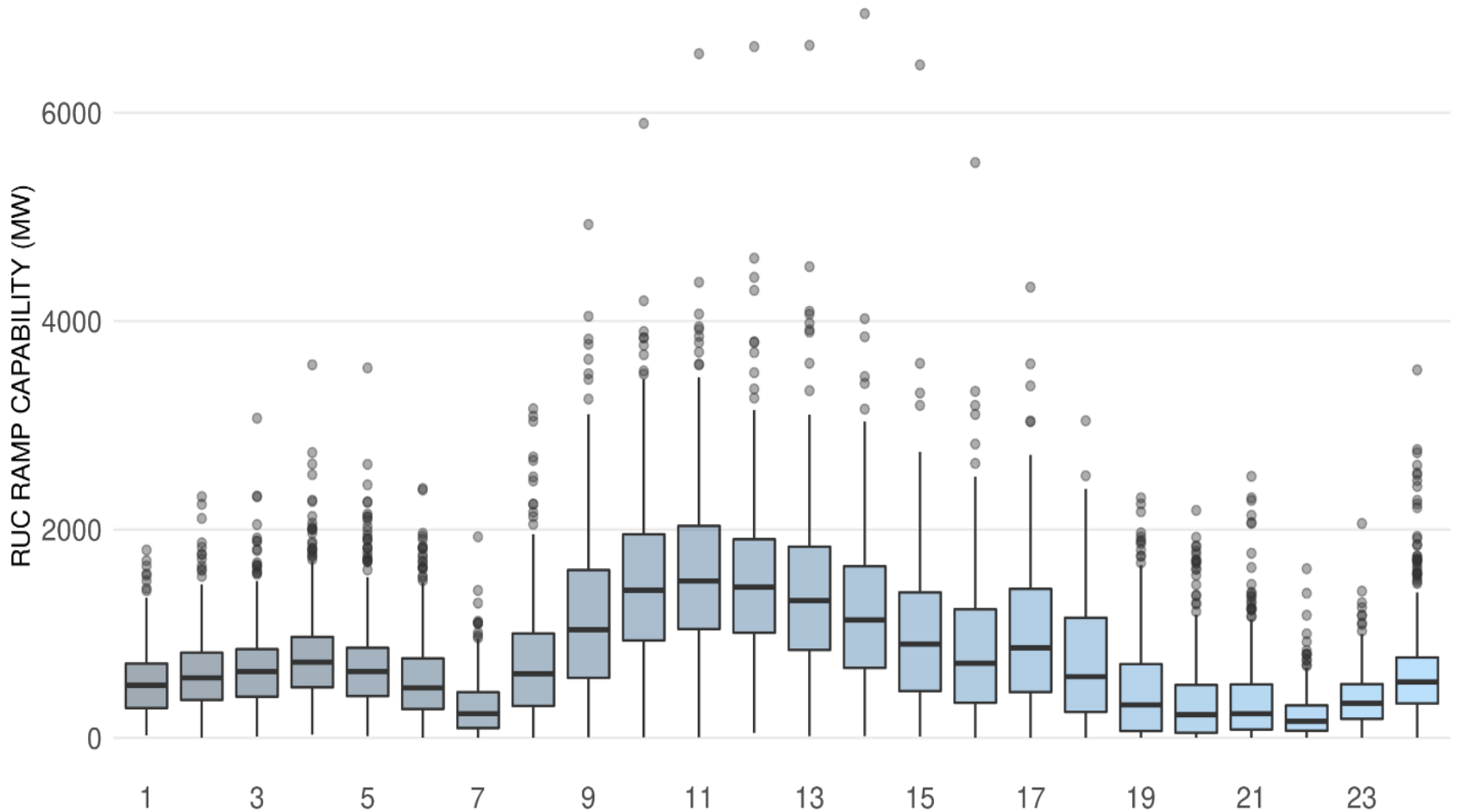# RUC incremental dispatches are supported by different technologies, with gas providing a significant share

During tight-supply days in July, gas resources were the main contributor to support RUC capacity
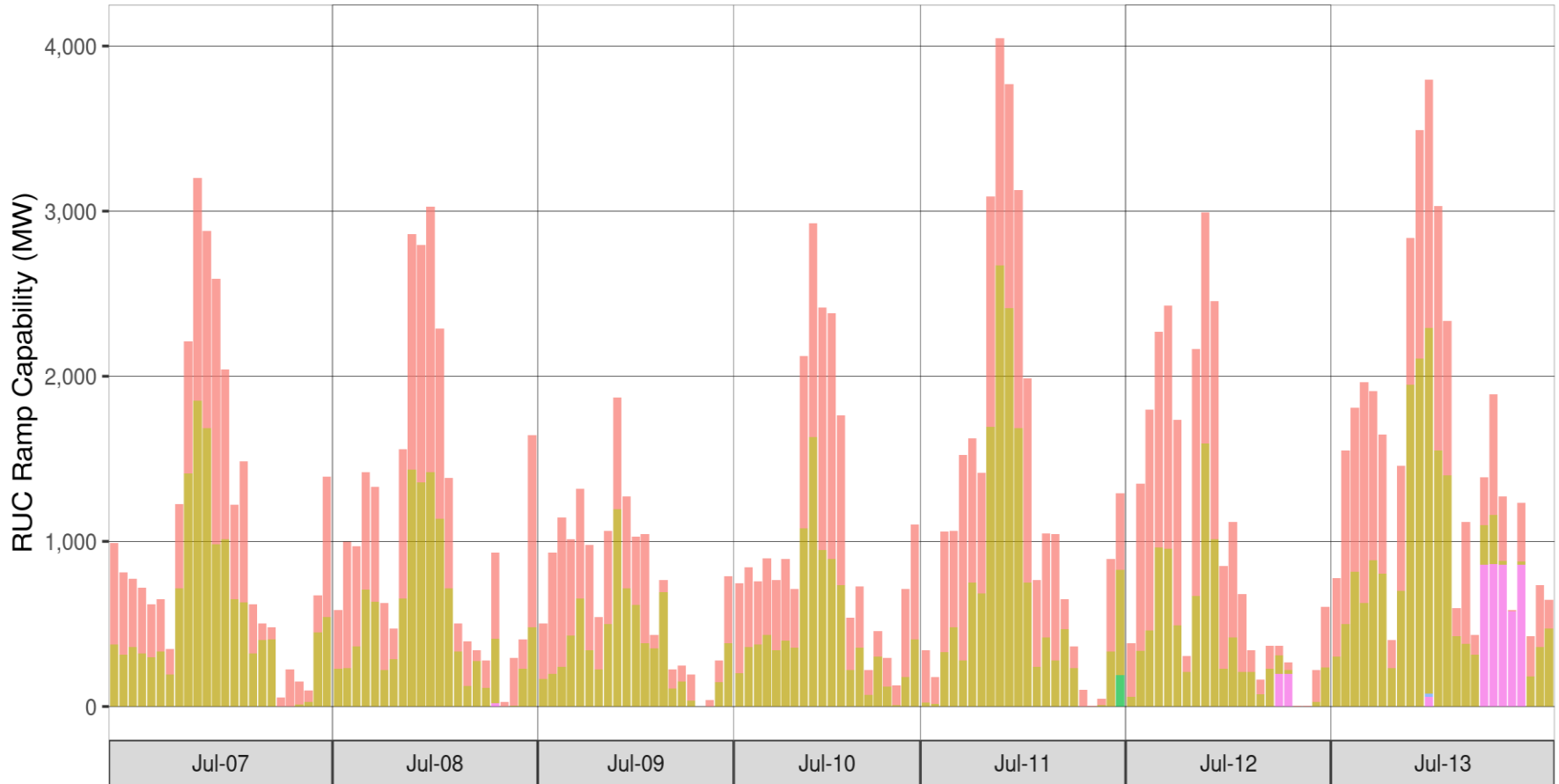
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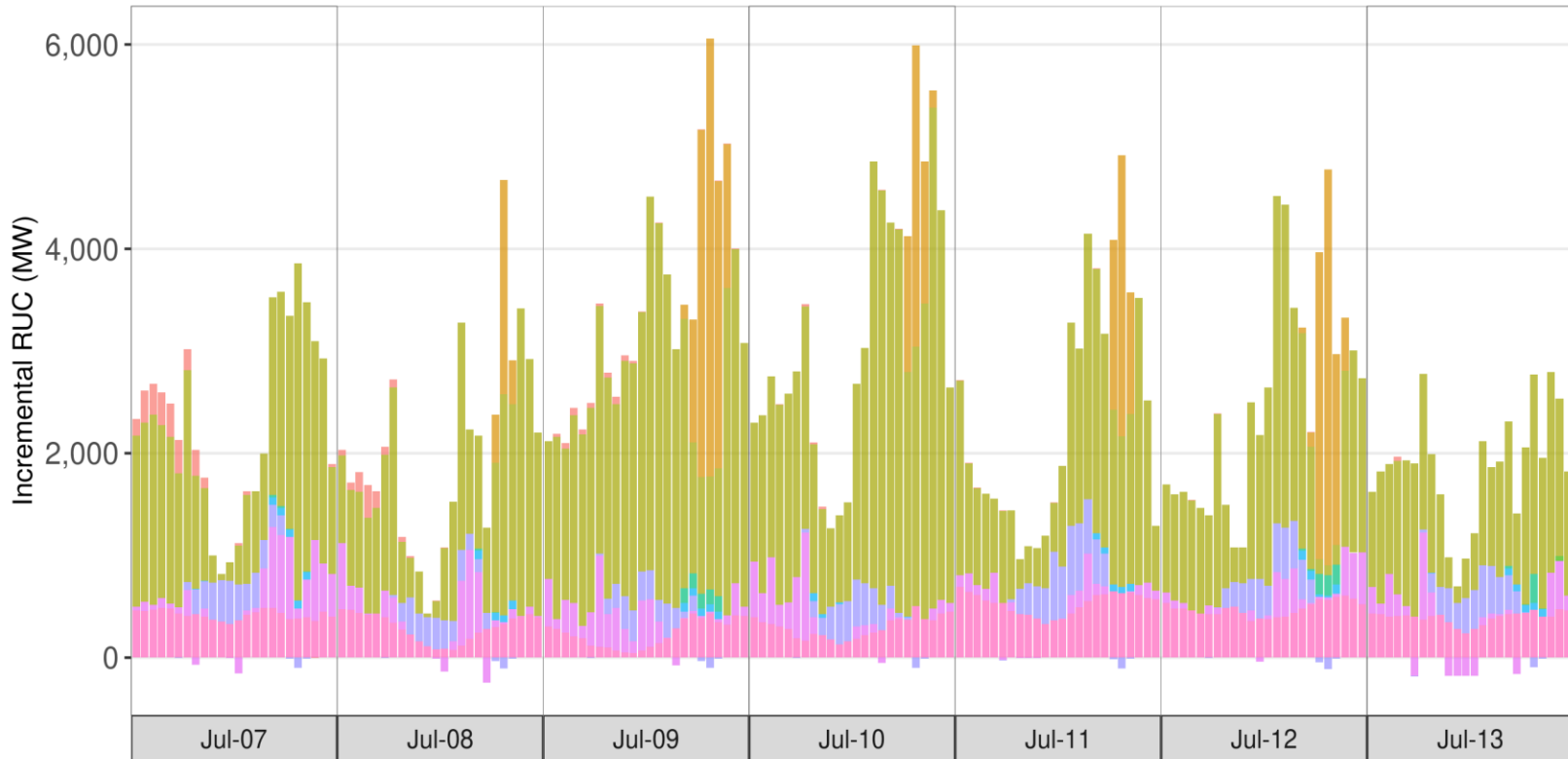
Based on RUC schedules, the level of available ramp capability varies by hour, reaching minimum levels in peak hours

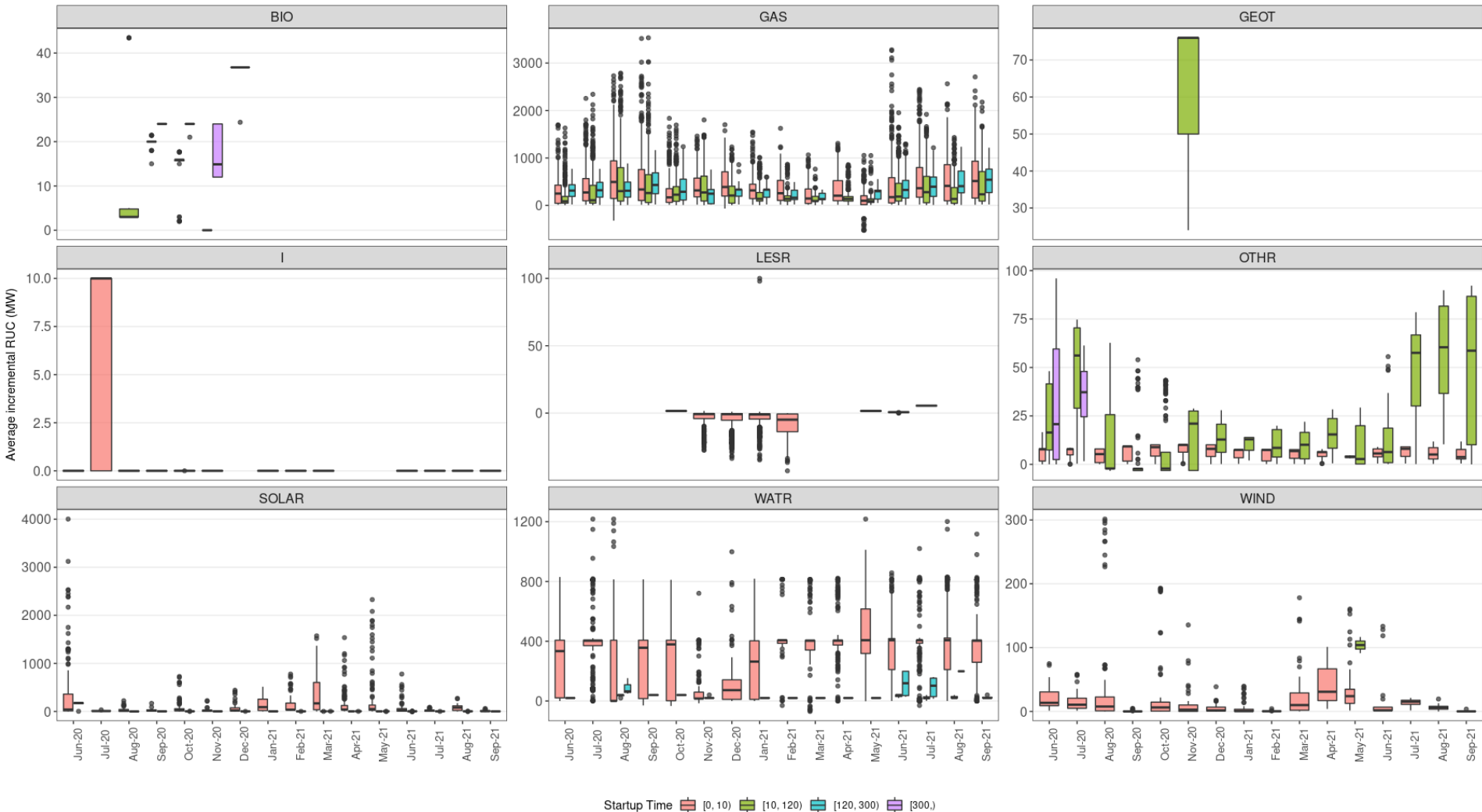# Ramp capability gained with RUC dispatches was supported with resources of different ramp speeds
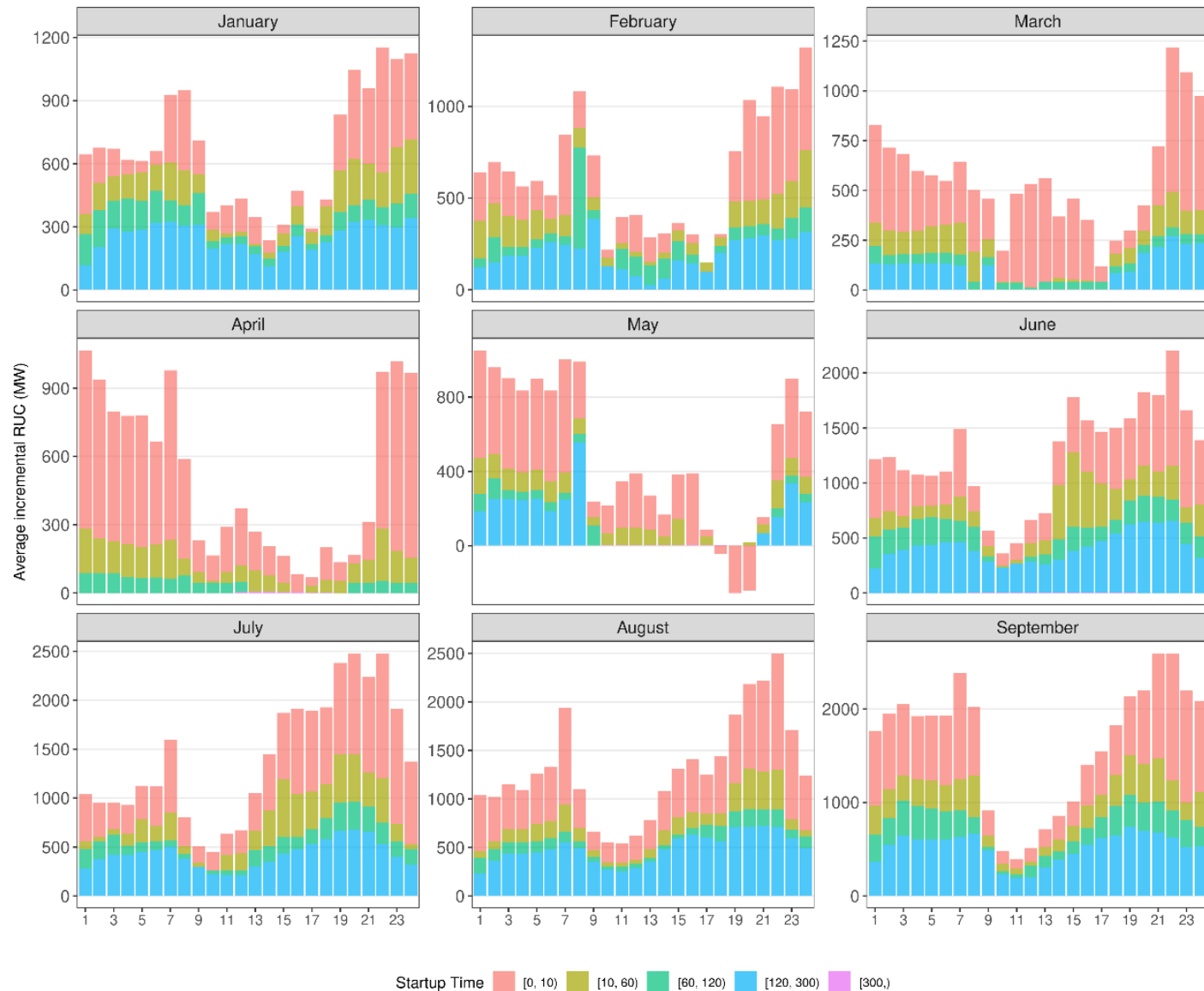
RUC commitments were largely supported with gas resources with varied startup times

RUC commitments were supported by units with diverse start-up times

Additional committed resources in RUC were mostly those with fast startup times