Example: Procuring Reserves above the MRR

Patricio Rocha-Garrido

EPFSTF

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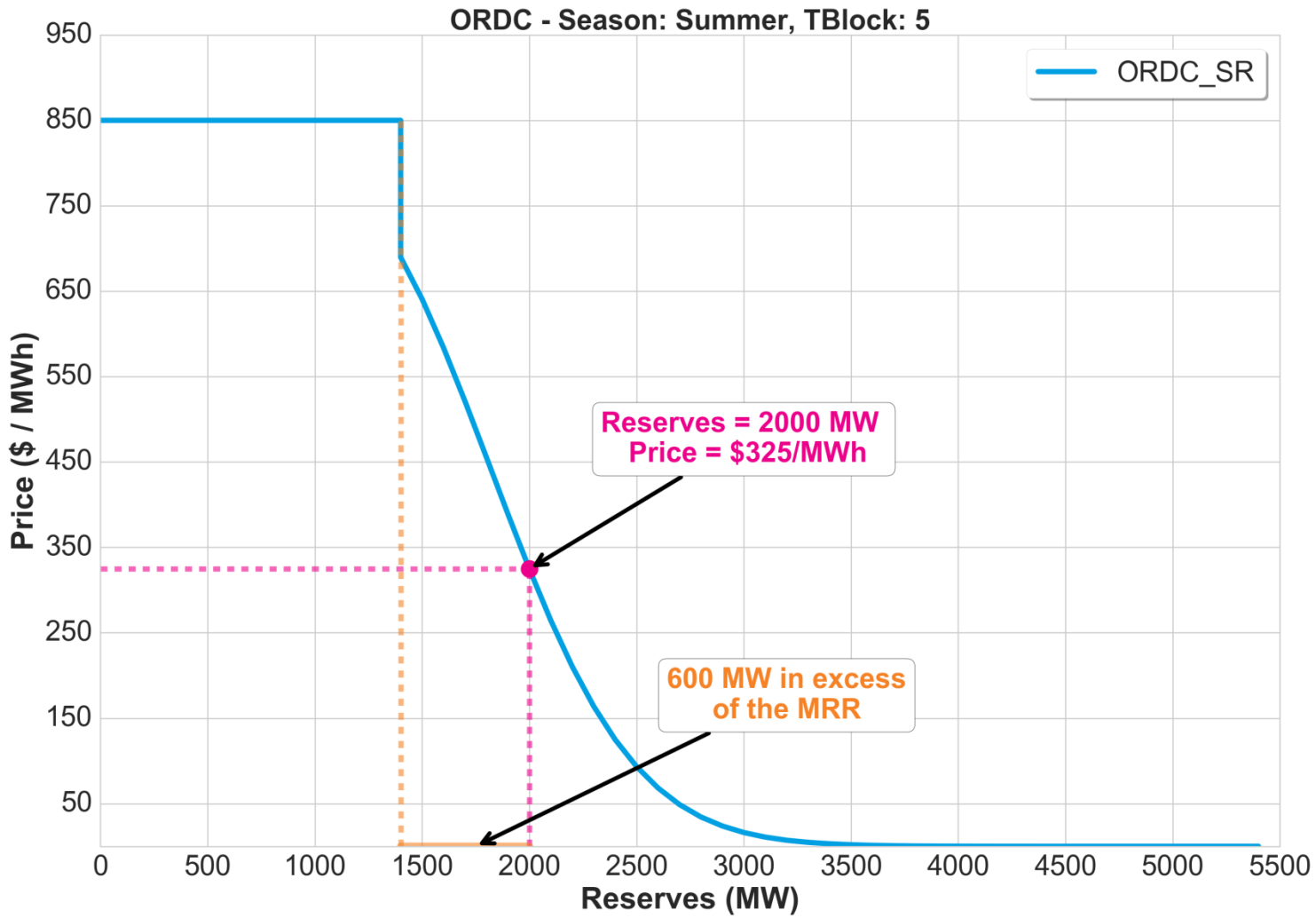
Example



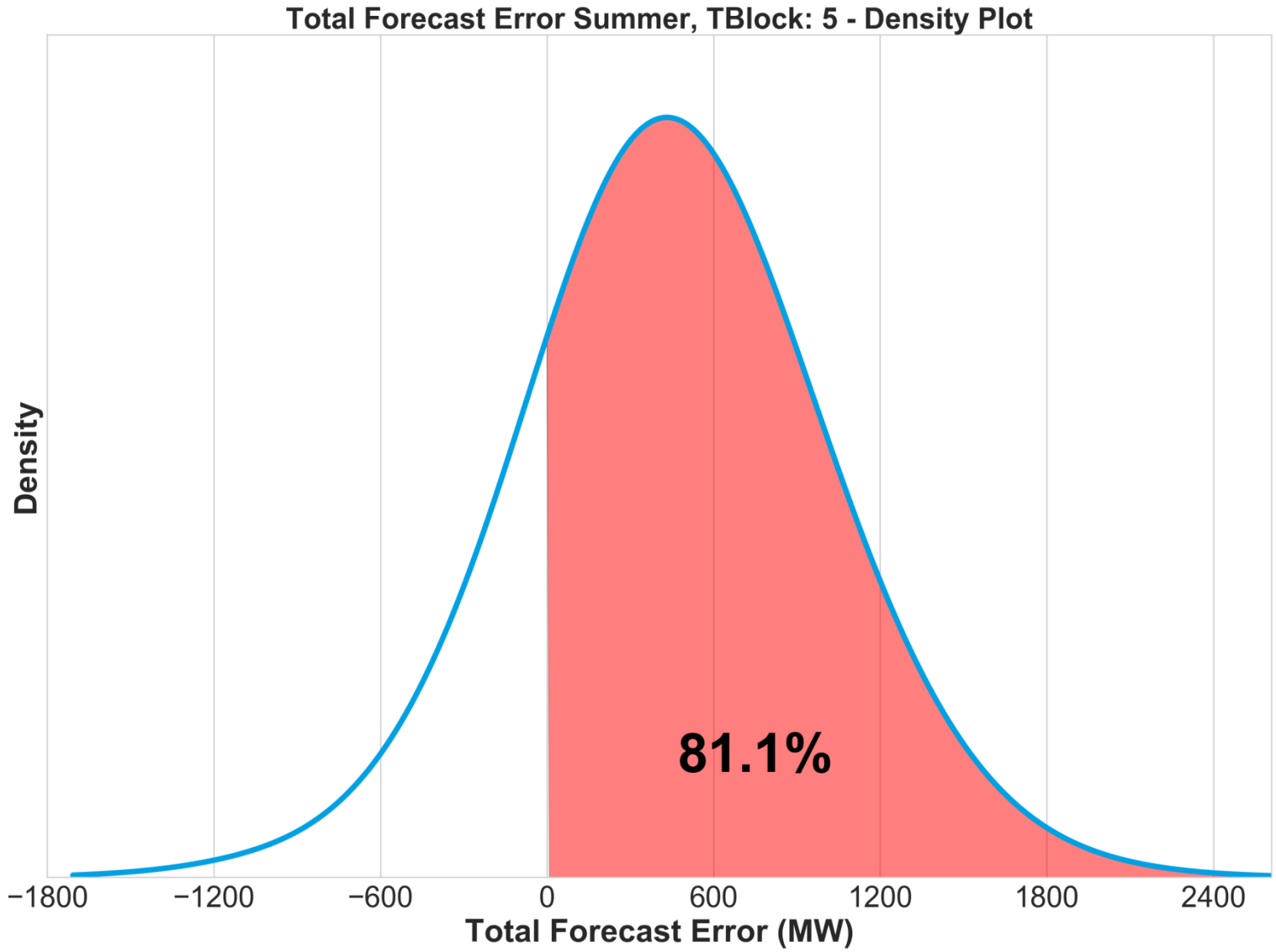
Let's assume there are 2,000 MW of SR in the system at very low offer prices.

Therefore, we clear 2,000 MW of SR at $325/MWh

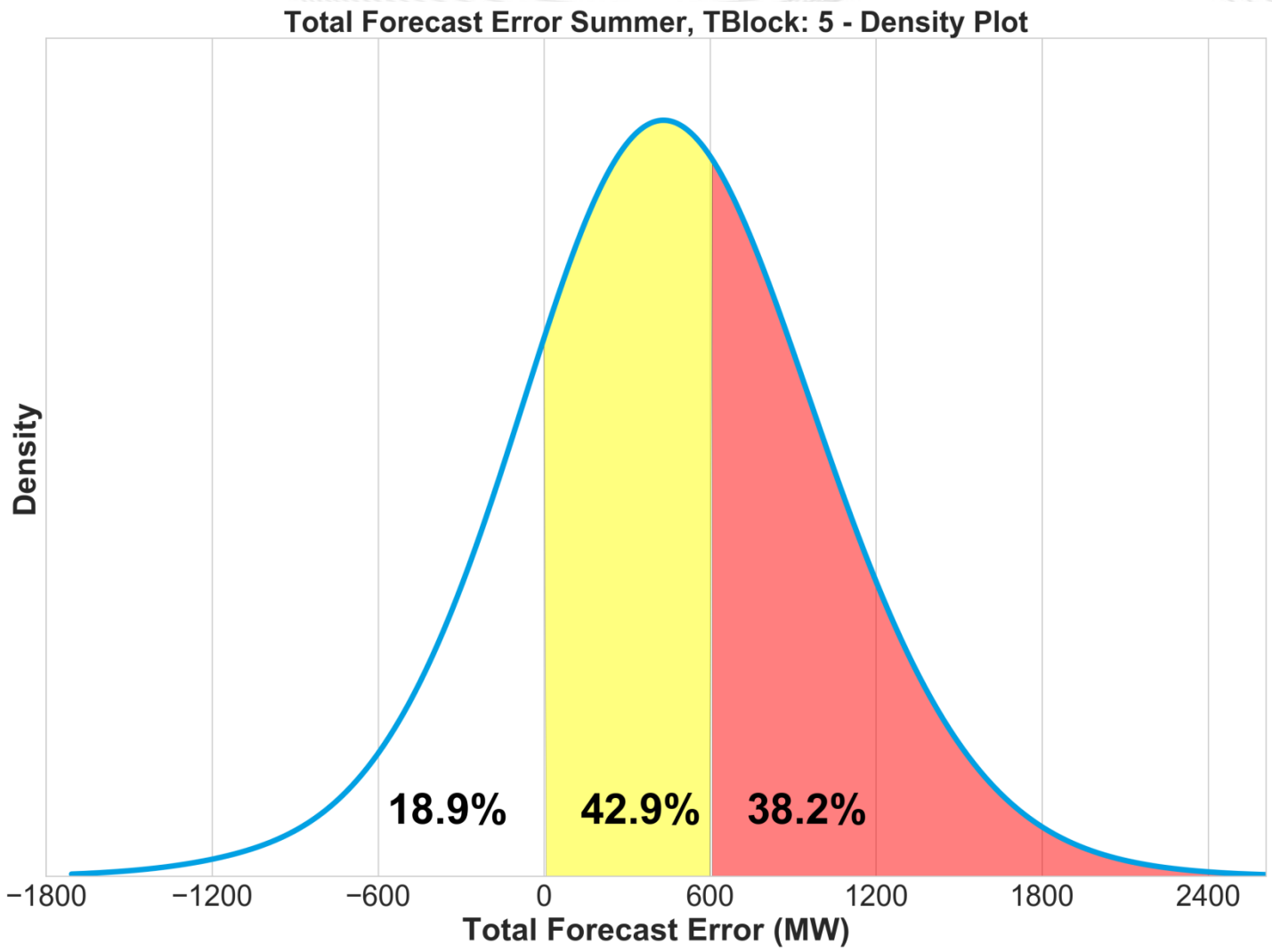
Why procuring reserves above the MRR?

- The MRR is 1,400 MW but PJM would procure 2,000 MW, 600 MW above the MRR. Why does this make sense?
- It makes sense because, during Summer TBlock 5 (1500 – 1800), the total forecast error is expected to be greater than 0 MW 81.1% of the time.

Total Forecast Error



Total Forecast Error



Scenarios

- If we procure 2,000 MW of SR, there are three types of scenarios that can be identified once we know the actual Total Forecast Error
  - Scenario Type A: If the actual Total Forecast Error is less than or equal to 0 MW (say, -100 MW), then the system is well above the SR MRR: 2,000 MW – (-100 MW) = 2,100 MW. Occurs 18.9% of the time.
  - Scenario Type B: If the actual Total Forecast Error is greater than 0 but less than or equal to 600 MW (say, 400 MW), then the system still has SR above the SR MRR: 2,000 MW – 400 MW = 1,600 MW. Occurs 42.9% of the time.
  - Scenario Type C: If the actual Total Forecast Error is greater than 600 MW (say, 800 MW), then the SR MRR is not met: 2,000 MW – 800 MW = 1,200 MW. Occurs 38.2% of the time.

Benefits of procuring reserves above the MRR

- The benefits of procuring reserves above the MRR are mostly concentrated on Scenarios Type B, which occur 42.9% of the time.
- By procuring reserves above the MRR, we prevent Scenarios Type B from becoming Scenarios Type C.
  - Because in Scenarios Type B the Total Forecast Error is greater than 0

Why is the price for 2000 MW of SR $325/MWh?

- We know that the penalty factor ($850/MWh) is triggered if the MRR (1,400 MW) is not met.
- If we consider the scenarios described in the previous slides, their frequency of occurrence, and the fact that they do or do not result in meeting the MRR.

Expected Penalty Factor = 18.9% x $0/MWh + 42.9% x $0MWh + 38.2% x $850 MWh

= $325/MWh

The price that the downward-sloping ORDC assigns to 2,000 MW of SR is the expected penalty factor given the distribution of the Total Forecast Error.