



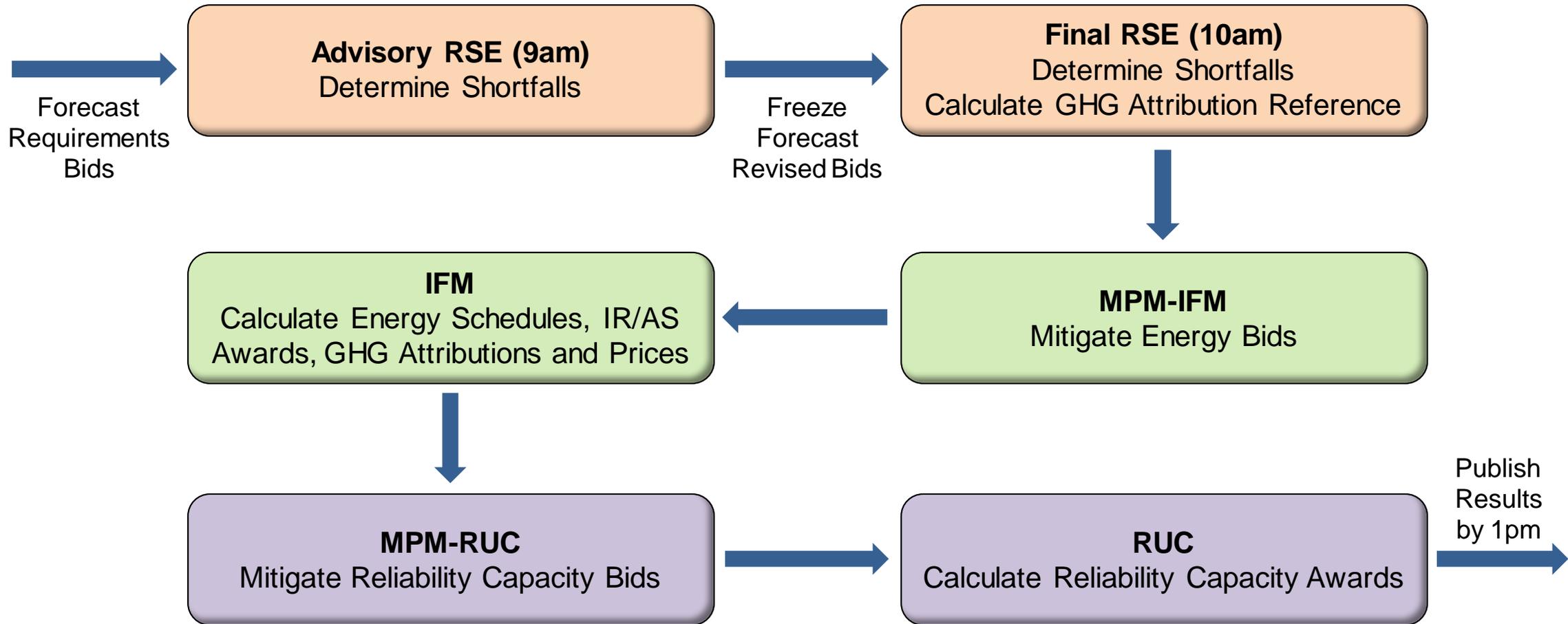
High Level EDAM Design

CAISO EDAM Team

EDAM Working Group 1:
Supply Commitment and Resource Sufficiency Evaluation

February 28, 2022

EDAM Pass Sequence



Resource Sufficiency Evaluation

- Uses the submitted resource energy/AS/IR bids (no RC bids)
 - ◆ Calculates for each EDAM BAA an hourly resource schedule profile over the Trading Day that meets demand forecast, and ancillary services and uncertainty requirements, as adjusted by bucket-1 transfers
 - ◆ Subject to all resource constraints
 - Inter-temporal unit commitment constraints
 - Operating limits and energy/AS/IR bid limits
 - Ramp rate capability limits
 - VER forecast, for VER
 - Daily energy limits, for hydro resources
 - State of charge limits, for storage resources
- Identify hourly shortfalls in meeting upward/downward requirements

Integrated Forward Market

- Uses mitigated resource energy bids and submitted AS/IR bids
 - ◆ Calculates hourly resource energy schedules, ancillary services and imbalance reserve awards, transfers, GHG attributions, and prices
 - ◆ Balances physical and virtual supply with virtual demand and load schedules
 - ◆ Subject to all network and resource constraints
 - Transmission constraints (base and IRU/IRD deployment scenarios and contingencies) and scheduling limits (ISLs, ITCs, and transfers)
 - Inter-temporal unit commitment constraints
 - Operating limits and energy/AS/IR bid limits
 - Ramp rate capability limits
 - VER forecast, for VER
 - Daily energy limits, for hydro resources
 - State of charge limits, for storage resources

Market Power Mitigation for Integrated Forward Market

- Trial IFM pass using submitted resource energy bids and AS/IR bids
 - ◆ Local Market Power Mitigation
 - Perform DCPA (RSI-3) to determine uncompetitive binding transmission constraints
 - Calculate resource marginal congestion component contributions from uncompetitive binding transmission constraints (using shift factors)
 - Identify recourses with a net positive uncompetitive marginal congestion component
 - Mitigate the energy bids for these resources above the competitive LMP
 - ◆ BAA Market Power Mitigation
 - Group BAAs in descending order of their power balance constraint shadow price
 - Calculate RSI-3 to determine uncompetitive conditions in serving the scheduled load in the BAA group
 - Mitigate physical energy bids for pivotal suppliers above the competitive energy price

Residual Unit Commitment

- Physical energy schedules, imbalance reserve and ancillary services awards, and GHG attributions are fixed at IFM solution
- Virtual and load schedules are ignored
- Uses mitigated reliability capacity bids
 - ◆ Calculates hourly reliability capacity awards, transfers, and prices
 - ◆ Balances energy schedules and reliability capacity with demand forecast
 - ◆ Subject to all network and resource constraints
 - Transmission constraints (base and IRU/IRD deployment scenarios and contingencies) and scheduling limits (ISLs, ITCs, and transfers)
 - Inter-temporal unit commitment constraints
 - No shut-down to resources with energy schedules, but additional start-ups and MSG transitions
 - Operating limits and energy/AS/IR bid limits, ramp rate capability limits, etc.

Market Power Mitigation for Residual Unit Commitment

- Trial RUC pass using submitted reliability capacity bids
 - ◆ Local Market Power Mitigation
 - Perform DCPA (RSI-3) to determine uncompetitive binding transmission constraints
 - Calculate resource marginal congestion component contributions from uncompetitive binding transmission constraints (using shift factors)
 - Identify recourses with a net positive uncompetitive marginal congestion component
 - Mitigate the reliability capacity bids for these resources above the competitive RCLMP
 - ◆ BAA Market Power Mitigation
 - Group BAAs in descending order of their RUC power balance constraint shadow price
 - Calculate RSI-3 to determine uncompetitive conditions in serving the demand forecast in the BAA group
 - Mitigate reliability capacity bids for pivotal suppliers above the competitive RC price

Why RUC?

- Load schedules may clear in IFM below or above demand forecast
 - ◆ Reliability capacity awards make up for the difference
- Virtual supply and demand schedules are liquidated in WEIM
 - ◆ Reliability capacity awards substitute for net virtual supply that clears IFM
- RUC has a longer time horizon (48-72 hours)
 - ◆ RUC can commit extra-long-start resources
- RUC can schedule reliability capacity transfers
 - ◆ Unused transfer capacity from IFM or counter flow on IFM energy transfers
 - To counter energy transfers scheduled in IFM due to virtual schedules, and load schedules that are different from the demand forecast

Residual Unit Commitment and Resource Sufficiency Evaluation

- If a BAA passes the EDAM RSE
 - ◆ Does it need RUC?
 - Yes, to procure reliability capacity for WEIM if not scheduled in IFM
 - Reliability capacity awards have a must offer obligation in WEIM
 - ◆ Can it fail RUC (RUC power balance constraint violation)?
 - Yes, if there are insufficient reliability capacity bids and transfer capacity
 - ◆ Can it lean on other BAAs in RUC?
 - Yes, through reliability capacity transfers
 - Can EDAM RSE test for that?
 - No, because the reliability capacity requirement is known only after IFM
 - How can this be prevented?
 - Make all capacity bid in IFM available to RUC with reliability capacity bids
 - Best outcome to pass the WEIM RSE