California ISO

Extended Day-Ahead Market

RUC Transfer Examples

Single interval example

BAA 1

Supply Capacity = 4000MW

Demand Forecast = 3000MW

Upward AS = 150MW

Upward Uncertainty = 300MW

✓ RSE Upward Capacity Test

BAA 2

Supply Capacity = 4000MW

Demand Forecast = 3500MW

Upward AS = 150MW

Upward Uncertainty = 300MW

✓ RSE Upward Capacity Test

Both BAAs have sufficient capacity to pass the day-ahead RSE upward capacity test

BAA 1

Physical Supply Bids = 4000MW

SS Load Bid = 2900MW

BAA 2

Physical Supply Bids = 4000MW

SS Load Bid = 3500MW

IFM

Energy = 3400MW

Upward AS = 150MW

Imbalance Reserve = 400MW

500MW Energy

100MW IRU

Energy = 3000MW

Upward AS = 150MW

Imbalance Reserve = 200MW

BAA 1 underbids their demand forecast by 100MW in IFM
IFM results in BAA1 transferring 600MW to BAA2

BAA 1

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3400MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 400MW

RUC Capacity = 50MW

BAA 2

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3000MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 200MW

RUC Capacity = 650MW

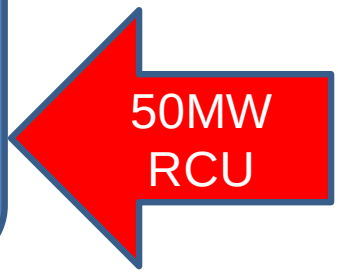
RUC w/transfers

BAA 1

Demand Forecast = 3000MW

Demand Forecast – Cleared Bid-in Load = 100MW

Reliability Capacity = 50MW



BAA 2

Demand Forecast = 3500MW

Demand Forecast – Cleared Bid-in Load = 0MW

Reliability Capacity = 50MW

There is a 50MW RCU transfer from BAA 2 to BAA 1 to ensure there is sufficient physical supply in BAA 1 to meet its demand obligations

BAA 1

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3400MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 400MW

RUC Capacity = 50MW

BAA 2

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3000MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 200MW

RUC Capacity = 650MW

RUC w/o transfers

BAA 1

Demand Forecast = 3000MW

Demand Forecast – Cleared Bid-in Load = 100MW

Reliability Capacity = 50MW

No RCU transfers

BAA 2

Demand Forecast = 3500MW

Demand Forecast – Cleared Bid-in Load = 0MW

Reliability Capacity = 0MW

There is insufficient supply in BAA 1 to solve its RUC power balance in without RCU transfers from BAA 2

BAA 1

Physical Supply Bids = 4000MW

Virtual Supply Bid = 100MW

SS Load Bid = 3000MW

BAA 1

Physical Supply Bids = 4000MW

SS Load Bid = 3500MW

IFM w/virtuals

Physical Energy = 3400MW

Virtual Supply = 100MW

Upward AS = 150MW

Imbalance Reserve = 400MW

500MW Energy

100MW IRU

Energy = 3000MW

Upward AS = 150MW

Imbalance Reserve = 200MW

BAA 1 bids their demand forecast in IFM but also bids 100MW of virtual supply that allows 100MW of additional energy to clear

BAA 1

Supply Capacity = 4000MW

IFM Physical Energy Schedule (fixed) = 3400MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 400MW

RUC Capacity = 50MW

BAA 2

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3000MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 200MW

RUC Capacity = 650MW

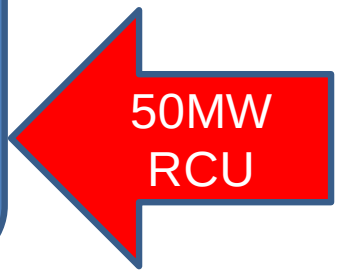
RUC w/transfers

BAA 1

Demand Forecast = 3000MW

Demand Forecast – Cleared Bid-in Load + Net Virtual Supply = 100MW

Reliability Capacity = 50MW



BAA 2

Demand Forecast = 3500MW

Demand Forecast – Cleared Bid-in Load = 0MW

Reliability Capacity = 50MW

There is a 50MW RCU transfer from BAA 2 to BAA 1 to ensure there is sufficient physical supply in BAA 1 to meet its demand obligations

BAA 1

Supply Capacity = 4000MW

IFM Physical Energy Schedule (fixed) = 3400MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 400MW

RUC Capacity = 50MW

BAA 2

Supply Capacity = 4000MW

IFM Energy Schedule (fixed) = 3000MW

Upward AS (fixed) = 150MW

Upward Uncertainty (fixed) = 200MW

RUC Capacity = 650MW

RUC w/o transfers

BAA 1

Demand Forecast = 3000MW

Demand Forecast – Cleared Bid-in Load + Net Virtual Supply = 100MW

Reliability Capacity = 50MW

No RCU transfers

BAA 2

Demand Forecast = 3500MW

Demand Forecast – Cleared Bid-in Load = 0MW

Reliability Capacity = 0MW

Same result; there is insufficient supply in BAA1 to solve RUC power balance without RCU transfers from BAA2