FERC Order 764 Settlements

Spring Release 2014

FERC Order 764 - Introduction

Background, Definitions

FERC Order 764 - overview

- "To remove barriers to the integration of variable energy resources:

    1. Offer an option to schedule energy with 15-minute granularity; and,

    2. Require variable energy resources to provide meteorological and forced outage data for the purpose of power production forecasting."

FERC Order 764 compliance

- FERC 764 provided ISO with an opportunity to enhance its markets
  - Introduction of a full 15 minute energy market for intertie and generation
  - Resolve existing real-time imbalance energy offset issues resulting from HASP and RTD optimizations
  - Address convergence bidding issues on the interties.
  - Meet the needs of VERs to self-schedule its' forecasts closer to financially binding interval

Time interval definitions changes

Current Term	Current Definition	Revised Term	Revised Definition
Ancillary Service Interval	The 15 min interval for HASP or RT for Trading Hour.	FMM Interval	The 15-min time period associated with the relevant Bill Determinant or Settlement Amount
Dispatch Interval	The time interval at which ISO Dispatch instructions are issued corresponding to a particular Settlement Interval and Trading Hour	Settlement Interval	The five-minute time period over which the ISO settles cost compensation amounts or deviations in Generation and Demand in RTM.
Settlement Interval	The 10-min time period associated with the relevant Bill Determinant or Settlement Amount	Ten Minute Interval	The 10-min time period associated with the relevant Bill Determinant or Settlement Amount.

- Daily, hourly or monthly charge codes, where applicable, will utilize same input bill determinant
- Variable description in BPM will only maintain those attributes definition which add value to the description
- Attribute definitions will be maintained in the SaMC Design Standard and Convention document
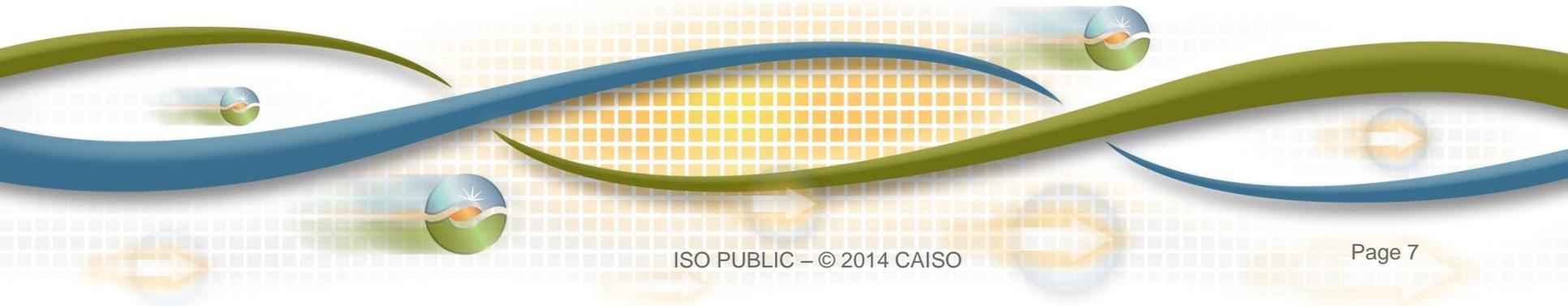
"Settlement Interval" redefinition

"The five-minute time period over which the ISO settles cost compensation amounts or deviations in Generation and Demand in RTM" (RTM = FMM and RTD)
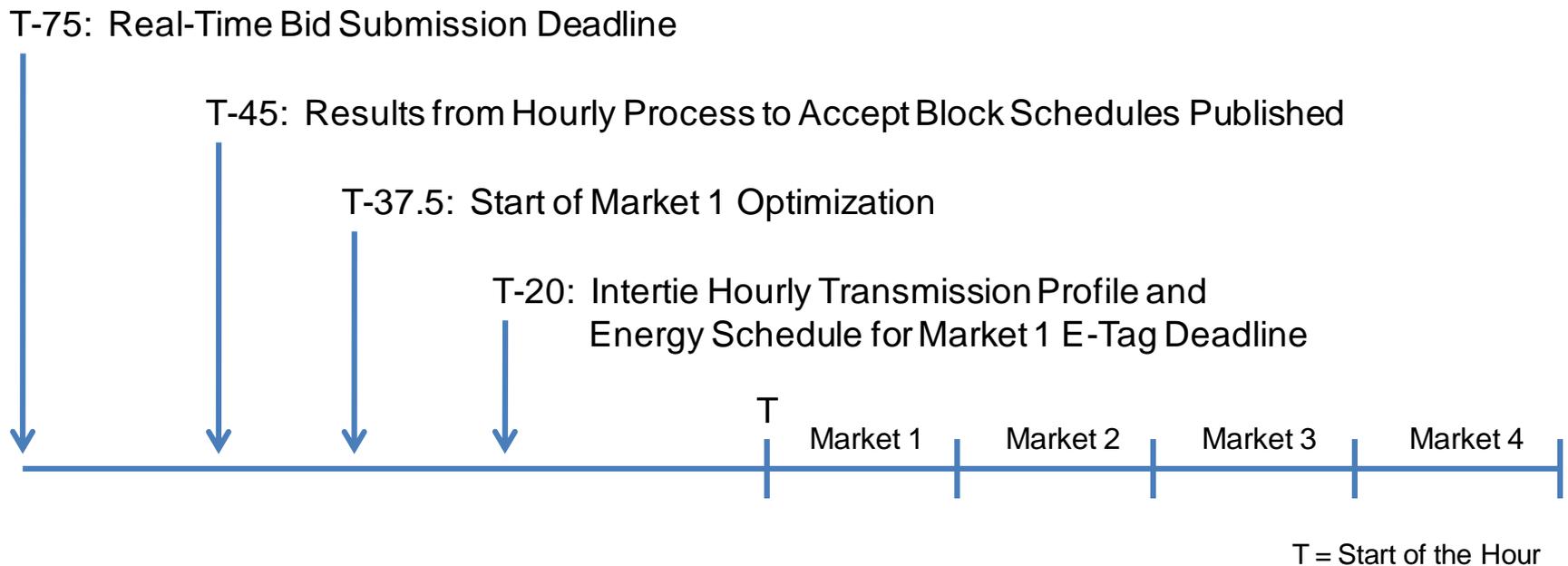
- This means:
  - Meter values are required at 5-minute granularity
  - Real-time based charge codes will settle at the new settlement interval definition
  - Real-time allocation charge codes will be converted to reflect new settlement interval definition
  - Time interval definitions have also been redefined.

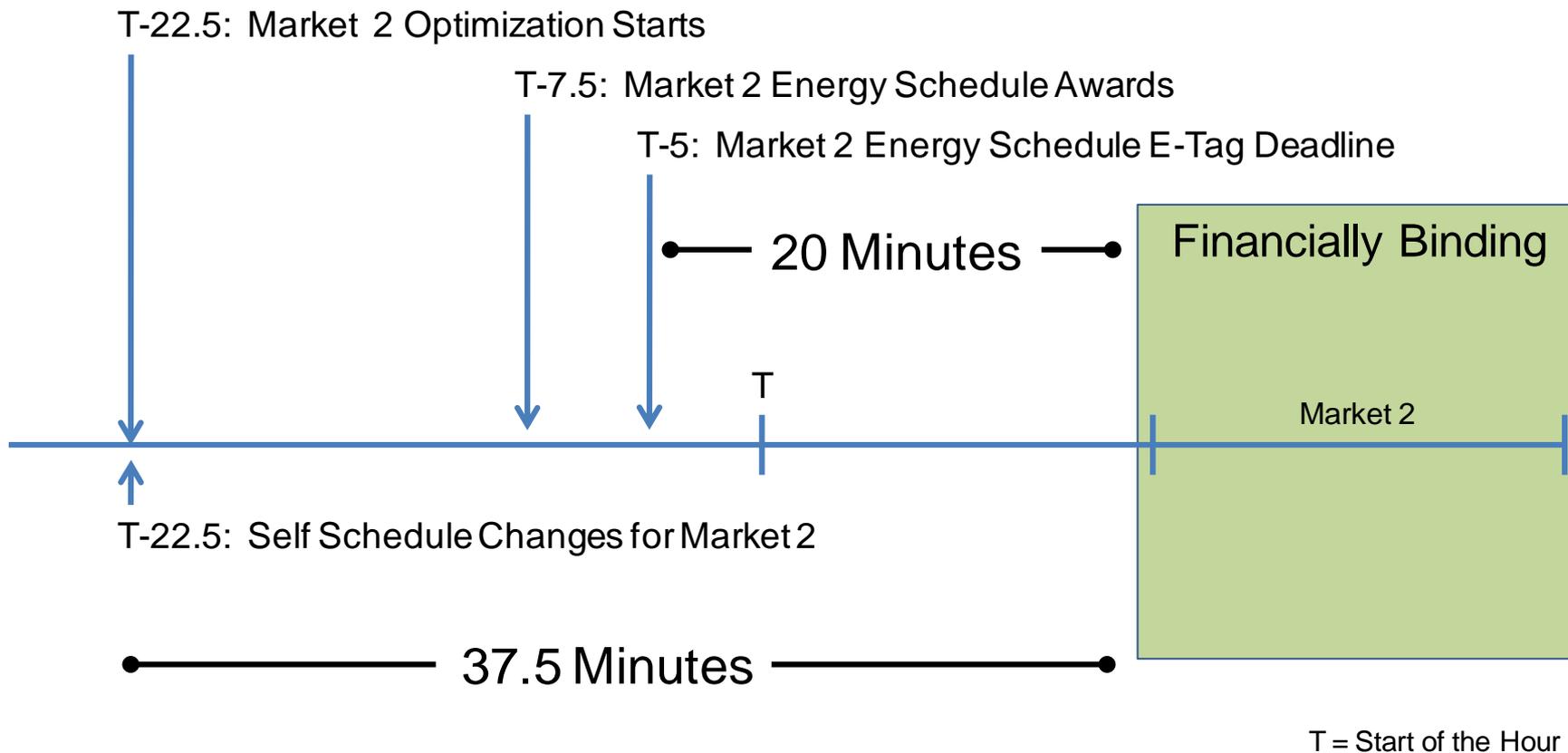# FERC Order 764

Timelines and processes

Hourly Real-Time Processes

T-75: Real-Time Bid Submission Deadline

T-45: Results from Hourly Process to Accept Block Schedules Published

T-37.5: Start of Market 1 Optimization

T-20: Intertie Hourly Transmission Profile and
Energy Schedule for Market 1 E-Tag Deadline

T

| Market 1 | Market 2 | Market 3 | Market 4 |

T = Start of the Hour

15-minute market (FMM) process

- ISO will leverage the existing real-time unit commitment process (fifteen-minute market) to co-optimize energy schedules and ancillary service awards
  - Financially binding 15-minute energy schedule for imports, exports, and generation
  - Financially binding ancillary service awards for specific imports and generation
  - FMM will be cleared against ISO real-time demand forecast.

15-Minute real-time process

T-22.5: Market 2 Optimization Starts

T-7.5: Market 2 Energy Schedule Awards

T-5: Market 2 Energy Schedule E-Tag Deadline

20 Minutes

Financially Binding

T

Market 2

T-22.5: Self Schedule Changes for Market 2

37.5 Minutes

T = Start of the Hour

FMM energy settlement – charge code 6460

- Incremental/decremental to day-ahead schedule

- Comprised of FMM Optimal Energy, FMM Minimum Load Energy, FMM Rerate Energy, FMM Pumping Energy, and FMM Exceptional Dispatch Energy

- FMM Exceptional Dispatch Energy Uplift will be settled in charge codes 3303, 6460, 6482, and 6488 dependent upon Exceptional Dispatch Type

- FMM Optimal Energy and FMM Minimum Load Energy will be eligible for bid cost recovery (like existing RTD)

- Financially binding settlement

5-Minute real-time dispatch

- No changes to 5-minute real-time dispatch timelines.

California ISO
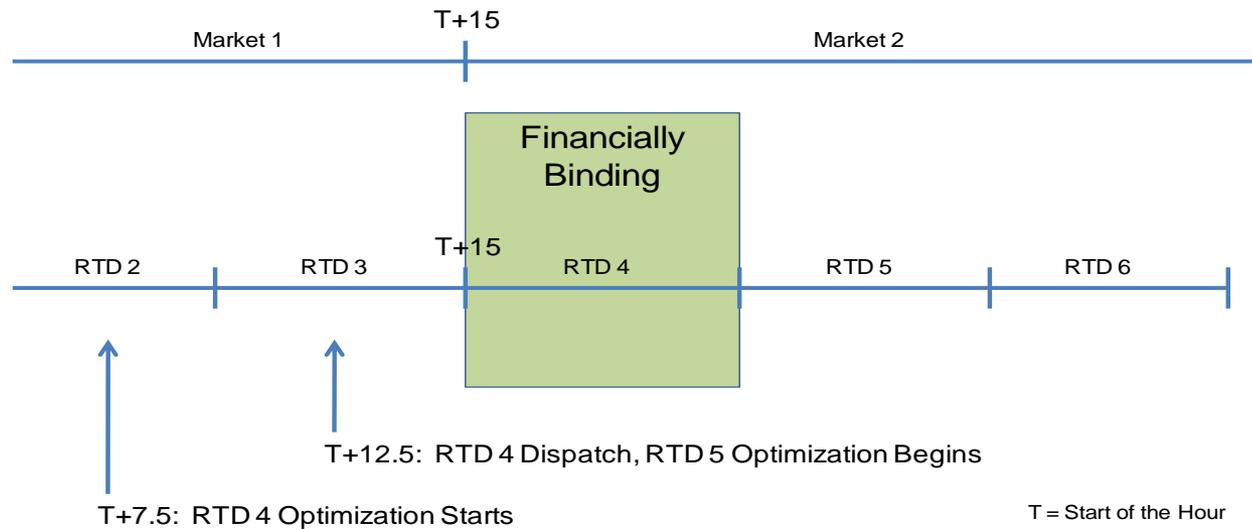
5-minute real-time dispatch settlement

- Key change - Incremental/decremental to <u>FMM schedules</u> for Imports, Exports, and Generation

- Comprised of RTD Optimal Energy, RTD Minimum Load Energy, RTD Rerate Energy, RTD Pumping Energy, Standard Ramping Energy, Ramping Energy Deviation, Residual Energy, MSS Energy, Regulation Energy, Operational Adjustment, and RTD Exceptional Dispatch Energy

- Will settle at the applicable settlement interval (5-Minute) RTD Price

- Will settle in Charge Code 6470 – IIE Settlement

- RTD Optimal Energy, RTD Minimum Load Energy will be eligible for bid cost recovery

FERC Order 764

Settlement changes and examples

FMM ancillary service settlement – Charge codes 6170, 6270, 6570, 6670

- 15-minute ancillary service awards are incremental to day-ahead market

- Settle at the real-time ancillary service marginal price (ASMP)

- HASP ancillary service calculations and charge codes will be terminated

- Dynamic transfer will introduce a resource specific ancillary service marginal constraint price for settlement of AS congestion

UIE and Operational Adjustments

- Uninstructed imbalance energy for <u>generating and dynamic resources</u> will be calculated as a single tier quantity (instead of two tiers) and settled at the applicable RTD price

- Uninstructed imbalance energy for <u>non-participating load</u> will be calculated as a single tier quantity and settled at weighted average hourly real-time market price
  - The weighted average price will be based upon the four FMM prices, the twelve RTD prices, the deviations between DAM load to FMM forecast, and the deviation between FMM forecast and RTD forecast.

- Operational Adjustment will be settled at RTD Price
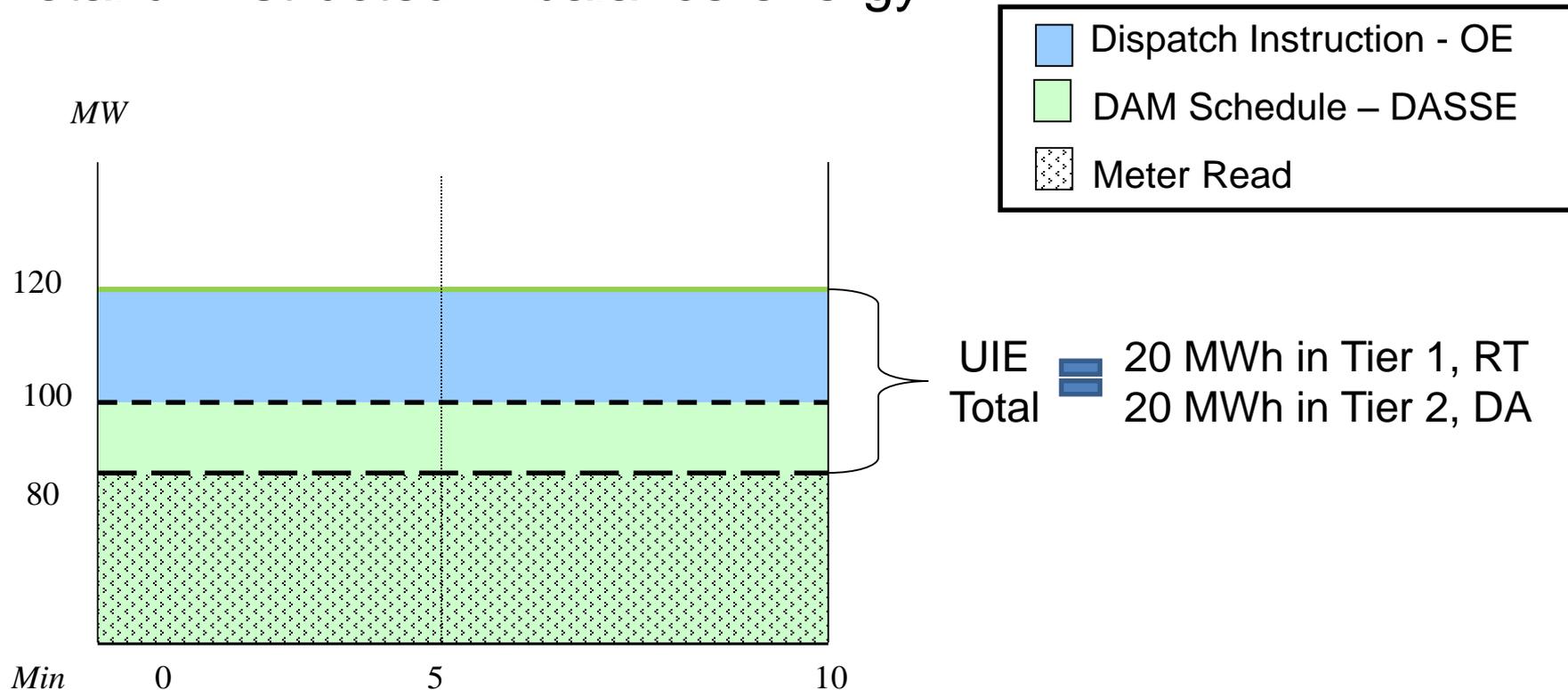
Uninstructed imbalance energy – charge code 6475

- Calculated as the difference between the meter read and the Total Expected Energy
  - payment for positive UIE – surplus energy
  - charge for negative UIE – replacement energy
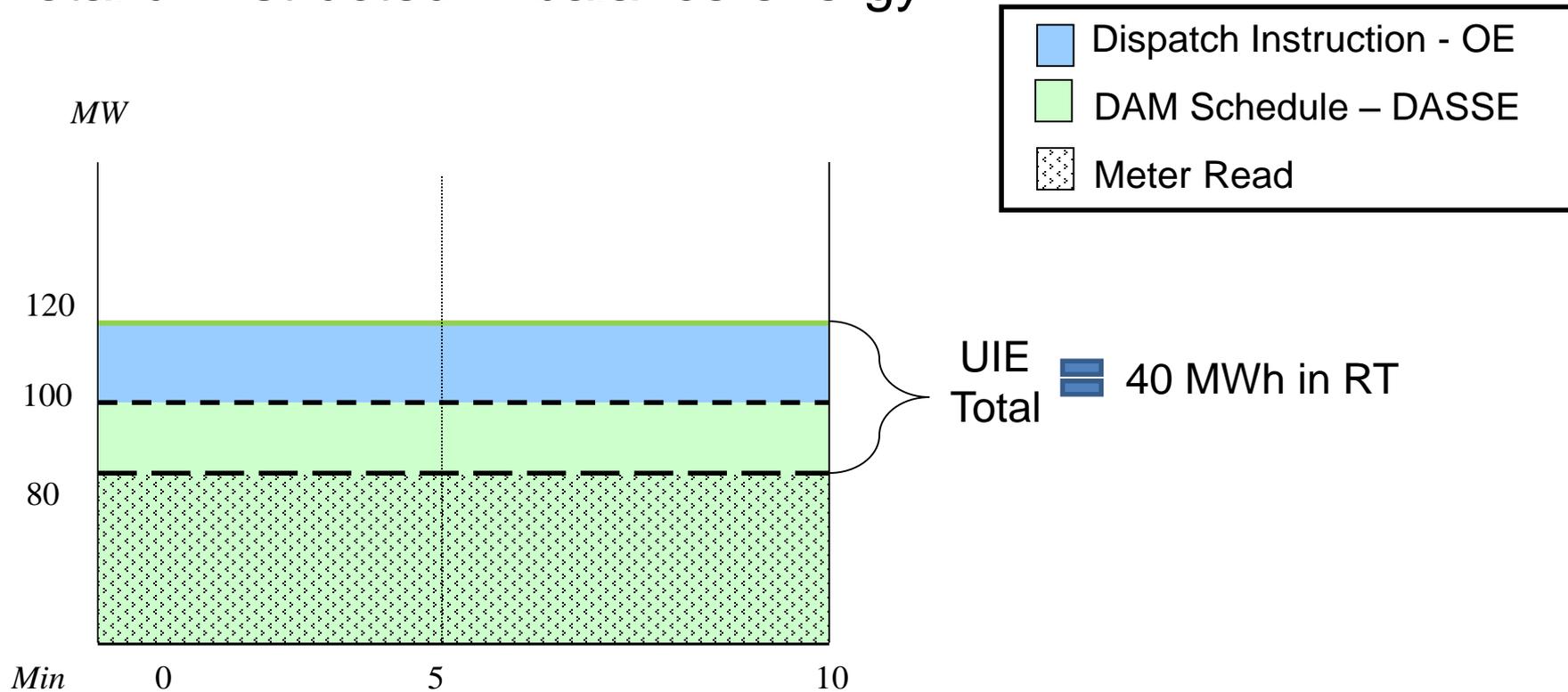
Charge Code 6475 – Uninstructed Imbalance Energy – OLD PROCESS

Total uninstructed imbalance energy

Legend:
- Dispatch Instruction - OE
- DAM Schedule – DASSE
- Meter Read

UIE Total = 20 MWh in Tier 1, RT
20 MWh in Tier 2, DA

Total uninstructed imbalance energy

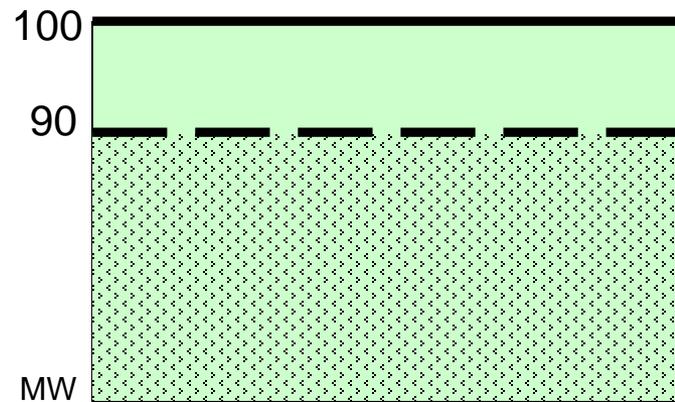Legend:
- Dispatch Instruction - OE
- DAM Schedule – DASSE
- Meter Read

UIE Total — 40 MWh in RT

Charge code 6470 - Operational adjustment example

If tagged MW is below DA schedule instruction
OA will be assessed the RT LMP in CC 6470

OA = Tag/meter – DA schedule

OA = 90MW – 100MW

OA = -10MW

| | DA schedule |
| | Tag amount or meter |

DAM LMP = $55.00

RT Price = $65.00

CC 6011 = (-1) * 100 MW * $ 55.00 = payment ($5,500.00)

CC 6470 = (-1) * -10 MW * $ 65.00 = charge $650.00

*Simplified example of CC 6470