Settlements & Billing

Configuration Guide: Real Time Energy Transfer Revenue Settlement

**CC 8470**

 Version 5.0

Table of Contents

1. Purpose of Document 3

2. Introduction 3

2.1 Background 3

2.2 Description 3

3. Charge Code Requirements 3

3.1 Business Rules 3

3.2 Predecessor Charge Codes 4

3.3 Successor Charge Codes 4

3.4 Inputs – External Systems 5

3.5 Inputs - Predecessor Charge Codes or Pre-calculations 6

3.6 CAISO Formula 7

3.7 Outputs 9

4. Charge Code References and Internal Comments 14

4.1 Charge Code Effective Date 14

*

# Purpose of Document

The purpose of this document is to capture the requirements and design specification for a SaMC Charge Code in one document.

# Introduction

## Background

Real Time Transfer Revenue for Energy occurs when the net Real Time Transfer scheduling limit is reached in the Real Time Market. This manifests as a separation of the Marginal Energy Cost (MEC) of the binding Balancing Authority Area (BAA) in the WEIM Area from the MEC of an adjacent BAA in the WEIM Area that is attributed to a Real Time Transfer System Resource.

## Description

The Real Time Energy Transfer Revenue CC will allocate WEIM Transfer revenue from Real Time Energy represented by Real Time Transfer System Resources equally between Balancing Authority Areas, except when notified of an agreement between WEIM Entities on either side of a Real Time Energy Transfer that a different allocation for some portion of the WEIM Transfer revenue is required. This charge code shall calculate by settlement interval.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | This charge code will calculate on a settlement interval basis. |
| 2.0 | Calculate the Real Time Transfer Revenue as the difference between transfer source and sink pairs with respective BAA LMP. |
| 2.1 | Real Time Transfer Revenue is calculated as the transfer schedule deviation between the transfer source and sink pairs. |
| 2.2 | Real Time Transfer Revenue shall be adjusted for RT Congestion revenue before allocation. |
| 3.0 | Consume WEIM Transfer Resource RTM five minutely CRN, awards and schedules of energy. |
| 3.1 | Corrections allowed for CRN, awards and schedules. |
| 4.0 | Allocation of transfer revenue shall be split under the following methods:  |
| 4.1 | Type 2 Transfer Revenue will be settled directly with SCs. |
| 4.1.1 | Except when CRN\_ID = ‘None’ in which case that portion will be allocated to the WEIM Entity. |
| 4.2 | For non CISO WEIM Entitites, directly settle with the Entity. |
| 4.3 | For CISO BAA, ETC/TOR will be allocated directly to transmission rights holders. |
| 4.3.1 | For CISO BAA, remainder sub-allocate pro-rata based on the SC measured demand to the CISO BAA measured demand. |
| 5.0 | PTB included to allow adjustments. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| PC Measured Demand Over Control Area |
|  |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
| 1 | BABAATransferSystemResourceDAEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh | Balancing Authority Area Transfer Quantity of DA Energy for resource r and Pricing Node p |
| 2 | BABAATransferSystemResourceBaseScheduleEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh | The final Base Schedule for Transfer System Resources in an EIM Balancing Authority Area (MWh) |
| 3 | BABAATransferSystemResourceFMMEnergyQty BrQ’AA’QpQ’’r’d’Nz’mdhcif | Balancing Authority Area Transfer Quantity of FMM Energy for resource r and Pricing Node p |
| 4 | BABAATransferSystemResourceRTDEnergyQty BrQ’AA’QpQ’’r’d’Nz’mdhcif | Balancing Authority Area Transfer Quantity of RTD Energy for resource r and Pricing Node p |
| 5 | BAATransferSystemResourceFMMLMPPrc rQ’AA’QpQ’’r’Nmphcif | Five minute LMP of TSR pairs for FMM Energy at resource location |
| 6 | BAATransferSystemResourceFMMMCCPrc rQ’AA’QpQ’’r’Nmphcif | Five minute MCC of TSR pairs for FMM Energy at resource location |
| 7 | BAATransferSystemResourceRTDLMPPrc rQ’AA’QpQ’’r’Nmphcif | Five minute LMP of TSR pairs for RTD Energy at resource location |
| 8 | BAATransferSystemResourceRTDMCCPrc rQ’AA’QpQ’’r’Nmphcif | Five minute MCC of TSR pairs for RTD Energy at resource location |
| 9 | WEIMTSRAllocationRatio rQ’Nmdh | Ratio for allocation of Transfer Revenue, with a default of 50:50 between associated Q’ BAAs to transfer resource r and CRN N |
|  |  |  |
|  |  |  |
| 10 | PTBRTEnergyTSRAdjustmentAmt BQ’Jmdhcif | PTB Adjustment for RT Energy TSR by Business Associate B, BAA Q’, PTB ID J and Trading Interval. |

## Inputs - Predecessor Charge Codes or Pre-calculations

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| 1 | BASettlementIntervalMeasuredDemandControlAreaQty Bmdhcif | PC Measured Demand Over Control Area |
| 2 | CAISOTotalSettlementIntervalMeasuredDemandControlAreaQty **mdhcif** | PC Measured Demand Over Control Area |

## CAISO Formula

### RealTimeEnergyTSRSettlement BQ’mdhcif =

BARealTimeEnergyTSRSettlement BQ’mdhcif +

BARealTimeEnergyTSRTORSettlement BQ’mdhcif +

RealTimeRTDTSRReleasedTransferSettlement BQ’mdhcif + RealTimeFMMTSRReleasedTransferSettlement BQ’mdhcif +

WEIMRealTimeEnergyTSRSettlement BQ’mdhcif

### BARealTimeEnergyTSRSettlement BQ’mdhcif = BA5MMeasuredDemandRatio Bmdhcif \* CAISORealTimeEnergyTSRExcludeTORAllocation Q’mdhcif

### BA5MMeasuredDemandRatio Bmdhcif = BASettlementIntervalMeasuredDemandControlAreaQty Bmdhcif / CAISOTotalSettlementIntervalMeasuredDemandControlAreaQty **mdhcif**

### BARealTimeEnergyTSRTORSettlement BQ’mdhcif = Sum (r,N,z’) CAISORealTimeEnergyTSRTORAllocation BrQ’Nz’mdhcif

### CAISORealTimeEnergyTSRExcludeTORAllocation Q’mdhcif = Sum (B,r,N,z’) CAISORealTimeEnergyTSRAllocation BrQ’Nz’mdhcif

Where z’ <> ETC,TOR

### CAISORealTimeEnergyTSRTORAllocation BrQ’Nz’mdhcif = CAISORealTimeEnergyTSRAllocation BrQ’Nz’mdhcif

Where z’ = ETC,TOR

### CAISORealTimeEnergyTSRAllocation BrQ’Nz’mdhcif= WEIMRealTimeBAAEnergyTSRAllocation BrQ’Nz’mdhcif

Where Q’ = CISO

### WEIMRealTimeEnergyTSRSettlement BQ’mdhcif = Sum (r,N,z’) WEIMRealTimeBAAEnergyTSRAllocation BrQ’Nz’mdhcif

Where Q’ <> CISO

### WEIMRealTimeBAAEnergyTSRAllocation BrQ’Nz’mdhcif = WEIMTSRAllocationRatio rQ’Nmdh \* ResourceRealTimeTSRTransferRevenue BrNz’mdhcif

ResourceRealTimeTSRTransferRevenue BrNz’mdhcif = Sum (Q’,A,A’,Q,p) ResourceRealTimeRTDTSRTransferRevenue BrQ’AA’QpNz’mdhcif + ResourceRealTimeFMMTSRTransferRevenue BrQ’AA’QpNz’mdhcif

**RTD**

ResourceRealTimeRTDTSRTransferRevenue BrQ’AA’QpNz’mdhcif = Sum(d’) RealTimeRTDTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif

Where d’ <> 2 or N = None

RealTimeRTDTSRReleasedTransferSettlement BQ’mdhcif = Sum(r,A,A’,Q,p,N,z’) RealTimeRTDTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif

RealTimeRTDTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif = Sum(d’) RealTimeRTDTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif

Where d’ = 2 and N <> None

RealTimeRTDTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif = Sum(Q’’,r’) RTDEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif - RTDEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

**FMM**

ResourceRealTimeFMMTSRTransferRevenue BrQ’AA’QpNz’mdhcif = Sum(d’) RealTimeFMMTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif

Where d’ <> 2 or N = None

RealTimeFMMTSRReleasedTransferSettlement BQ’mdhcif = Sum(r,A,A’,Q,p,N,z’) RealTimeFMMTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif

RealTimeFMMTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif = Sum(d’) RealTimeFMMTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif

Where d’ = 2 and N <> None

RealTimeFMMTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif = Sum(Q’’,r’) FMMEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif - FMMEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

**Real Time Congestion Calculations**

RTDEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = BAARTDEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif \* BAATransferSystemResourceRTDMCCPrc rQ’AA’QpQ’’r’Nmphcif

FMMEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = BAAFMMEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif \* BAATransferSystemResourceFMMMCCPrc rQ’AA’QpQ’’r’Nmphcif

**RTD Transfer Revenue Evaluation Calculations**

RTDEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = RTDEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif - RTDEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

RTDEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif =AttributeSwap (r,r’) RTDEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

RTDEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = BABAARTDEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif \* BAATransferSystemResourceRTDLMPPrc rQ’AA’QpQ’’r’Nmphcif

BABAARTDEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif = BABAATransferSystemResourceRTDEnergyQty BrQ’AA’QpQ’’r’d’Nz’mdhcif - BABAAFMMEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif -BABAATransferSystemResourceDAEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh - BABAATransferSystemResourceBaseScheduleEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh

Note:It is expected that Base Schedule and DA Energy quantities are mutually exclusive.

**FMM Transfer Revenue Evaluation Calculations**

FMMEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = FMMEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif - FMMEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

FMMEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif =AttributeSwap (r,r’) FMMEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif

FMMEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif = BABAAFMMEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif \* BAATransferSystemResourceFMMLMPPrc rQ’AA’QpQ’’r’Nmphcif

BABAAFMMEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif = BABAATransferSystemResourceFMMEnergyQty BrQ’AA’QpQ’’r’d’Nz’mdhcif -BABAATransferSystemResourceDAEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh - BABAATransferSystemResourceBaseScheduleEnergyTransferQty BrQ’AA’QpQ’’r’d’Nz’mdh

Note:It is expected that Base Schedule and DA Energy quantities are mutually exclusive.

## Outputs

Define the expected output(s) from this Charge Code/Pre-Calc. Please remember to list any intermediate output that would help the market participant understand the final outcome}

|  |  |  |
| --- | --- | --- |
| Output Req ID | Name | Description |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
| 1 | BABAAFMMEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif | FMM Transfer Quantity Difference from DA or Base Schedules for TSR pairs. |
| 2 | FMMEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | FMM Transfer Revenue Difference for TSR pairs. |
| 3 | FMMEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | FMM Transfer Revenue Difference for swapped TSR pairs. |
| 4 | FMMEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | FMM Transfer Revenue Net Amount for matched TSR pairs. |
| 5 | BABAARTDEnergyTSRDeviationQuantity BrQ’AA’QpQ’’r’d’Nz’mdhcif | RTD Transfer Quantity Difference from FMM for TSR pairs. |
| 6 | RTDEnergyTSRAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | RTD Transfer Revenue Difference for TSR pairs. |
| 7 | RTDEnergyTSRSwapAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | RTD Transfer Revenue Difference for swapped TSR pairs. |
| 8 | RTDEnergyTSRNetAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | RTD Transfer Revenue Net Amount for matched TSR pairs. |
| 9 | FMMEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | FMM Transfer System Resource Congestion Amount for matched pair. |
| 10 | RTDEnergyTSRMCCAmount BrQ’AA’QpQ’’r’d’Nz’mdhcif | RTD Transfer System Resource Congestion Amount for matched pair. |
| 11 | RealTimeFMMTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif | FMM Energy Transfer Revenue by Transfer System Resource. |
| 12 | RealTimeFMMTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif  | FMM Energy Transfer Revenue Amount due to Released Schedules on Type 2 Resources. |
| 13 | RealTimeFMMTSRReleasedTransferSettlement BQ’mdhcif | FMM Energy Transfer Revenue Settlement Amount due to Released Schedules on Type 2 Resources. |
| 14 | ResourceRealTimeFMMTSRTransferRevenue BrQ’AA’QpNz’mdhcif | FMM Energy Transfer Revenue for Type 1,3,4 TSRs and Type 2 TSRs with CRN of None. |
| 15 | RealTimeRTDTSRTransferRevenue BrQ’AA’Qpd’Nz’mdhcif | RTD Energy Transfer Revenue by Transfer System Resource. |
| 16 | RealTimeRTDTSRReleasedTransferRevenue BrQ’AA’QpNz’mdhcif  | RTD Energy Transfer Revenue Amount due to Released Schedules on Type 2 Resources. |
| 17 | RealTimeRTDTSRReleasedTransferSettlement BQ’mdhcif | RTD Energy Transfer Revenue Settlement Amount due to Released Schedules on Type 2 Resources. |
| 18 | ResourceRealTimeRTDTSRTransferRevenue BrQ’AA’QpNz’mdhcif | RTD Energy Transfer Revenue for Type 1,3,4 TSRs and Type 2 TSRs with CRN of None. |
| 19 | ResourceRealTimeTSRTransferRevenue BrNz’mdhcif | Total Real Time TSR Transfer Revenue. |
| 20 | WEIMRealTimeBAAEnergyTSRAllocation BrQ’Nz’mdhcif | Real Time Energy Allocation amount by B SC, r resource and Q’ BAA. |
| 21 | WEIMRealTimeEnergyTSRSettlement BQ’mdhcif | Real Time Energy Transfer Revenue amount for EDAM entity (not including CAISO). |
| 22 | CAISORealTimeEnergyTSRAllocation BrQ’Nz’mdhcif | Real Time Energy Transfer Revenue Allocation amount to the CAISO BAA. |
| 23 | CAISORealTimeEnergyTSRTORAllocation BrQ’Nz’mdhcif | Real Time Energy Transfer Revenue Allocation amount to transmission rights holders in CAISO BAA. |
| 24 | CAISORealTimeEnergyTSRExcludeTORAllocation Q’mdhcif | Real Time Energy Transfer Revenue Allocation amount to non-transmission rights holders in CAISO BAA. |
| 25 | BARealTimeEnergyTSRTORSettlement BQ’mdhcif | Real Time Energy Transfer Settlement amount to transmission rights holders in CAISO BAA. |
| 26 | BA5MMeasuredDemandRatio Bmdhcif | Ratio of Scheduling Coordinator’s Measured Demand vs CAISO BAA Measured Demand. |
| 27 | BARealTimeEnergyTSRSettlement BQ’mdhcif | Real Time Energy Transfer Sub-Allocation amount to SCs within CAISO BAA. |
| 28 | RealTimeEnergyTSRSettlement BQ’mdhcif | Real Time Energy Transfer Revenue Settlement Amount for Transfer Revenue by Scheduling Coordinator and BAA. |

# Charge Code References and Internal Comments

## Charge Code Effective Date

| Charge Code/Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
|  8470 Real Time Energy Transfer Revenue Settlement | 5.0 | 5/1/26 | Open | Initial Configuration |