: EIM

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Version 5.3

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# Purpose of Document

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

# Introduction

## Background

The CAISO calculates and accounts for Imbalance Energy for each Dispatch Interval and settles Imbalance Energy for each Settlement Interval for each resource within the EIM Area and all System Resources Dispatched in Real-Time.

Imbalance Energy consists of following:

* IIE – instructed imbalance energy
  + FMM Instructed Imbalance Energy Settlement (CC 6460)
  + FMM Instructed Imbalance Energy EIM Settlement (CC 64600)
  + RTD Instructed Imbalance Energy Settlement (CC 6470)
  + RTD Instructed Imbalance Energy EIM Settlement (CC 64700)
* UIE – Uninstructed Imbalance Energy
  + Real Time Uninstructed Imbalance Energy Settlement (CC 6475)
  + Real Time Uninstructed Imbalance Energy EIM Settlement (CC 64750)
* UFE – Unaccounted for Energy
  + Real Time Unaccounted for Energy Settlement (CC 6474)
  + Real Time Unaccounted for Energy EIM Settlement (CC 64740)

To the extent that the sum of the Settlement Amounts for IIE, UIE, and UFE does not equal zero within the CAISO Balancing Authority Area, the CAISO will assess Charges or make Payments in Real Time Imbalance Energy Offset (CC 6477) and in Real Time Imbalance Energy Offset EIM (CC 64770)for the resulting differences to all Scheduling Coordinators based on a pro rata share of their Measured Demand for the relevant Settlement Interval. To the extent that the sum of the Settlement Amounts for IIE, UIE, and UFEdoes not equal zero within the EIM Balancing Authority Area, the CAISO will assess Charges or make Payments in Real Time Imbalance Energy Offset EIM (CC 64770)for the resulting differences to EIM Entity Scheduling Coordinator ID, respectively.

In the Real-Time Market, the negative and positive Congestion Charges associated with a valid post-Day-Ahead TOR and ETC schedule change (including changes submitted to the Hour-Ahead Scheduling Process and changes submitted closer to Real-Time where allowed by the contract) will be reversed in CC 6788 RTM Congestion Credit Settlement. Because Congestion Charges are implicitly collected by the CAISO in the Real-Time settlement and there are no holders of rights to receive Real-Time Congestion revenues, all charges for Real-Time Congestion will be accumulated in special and separate Balancing Authority Area neutrality accounts. The CAISO Real-Time Congestion Charges less Virtual Bid Adjustment shall be distributed back to non-ETC Control Area metered Demand and exports in Real Time Congestion Offset (CC 6774). The EIM Balancing Authority Area Real-Time Congestion Charges shall be distributed to the applicable EIM Entity Scheduling Coordinator in Real Time Congestion Offset EIM (CC 67740).

## Description

The calculation of Real-Time Imbalance Energy Offset EIM also includes additional adjustments are calculated to subtract congestion and transmission losses, and adjust for participation in the Energy Imbalance Market.

To the extent that the sum of the Settlement Amounts for EIM Financial Transfer, IIE, UIE, and UFE, less the RT Energy Congestion revenues computed within Real-Time Congestion Offset (from CC 67740) less the Real-Time Marginal Cost of Losses Offset (from CC 69850) and EIM Transfer Adjustment does not equal zero, the CAISO will assess Charges or make Payments in Real Time Imbalance Energy Offset (CC 64770) for the resulting differences to the EIM Entity Scheduling Coordinator.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | This Charge Code shall be calculated and output on a 5-minute Settlement Interval basis. |
| 2.0 | The Initial Real-Time Imbalance Energy Offset for each EIM Balancing Authority Area in the EIM Area as the sum of the financial value of EIM Transfers and the Settlement amounts for FMM Instructed Imbalance Energy, RTD Instructed Imbalance Energy, Uninstructed Imbalance Energy, and Unaccounted for Energy, less Real-Time Congestion Offset and less the Real-Time Marginal Cost of Losses Offset. |
| 3.0 | The Financial Value of EIM Transfers shall be the product of the MWh, and the System Marginal Economic Cost. (Fact) |
| 3.1 | EIM Transfers from Base EIM Transfer System Resources that elected settlement, for both FMM and RTD (inclusive of updates after RTM schedules through e-tags) deviations with respect to their base schedules, will not be included in the computation of financial value of EIM Transfers as those are already settled RT Imbalance Energy charge code(s). (Fact) |
| 3.2 | A Master File – resident flag (Yes / No) shall indicate whether (Yes) or not (No) an ETSR has elected to participate in imbalance energy settlement. (Fact) |
| 5.0 | The allocation of the Real-Time Imbalance Energy Offset for EIM Entity Balancing Authority shall be to the EIM Entity Scheduling Coordinator. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| RT Energy Pre-calculation |
| CC 64600 - FMM Instructed Imbalance Energy EIM (FMM IIE) |
| CC 64700 - Real Time Instructed Imbalance Energy EIM Settlement (RTM IIE) |
| CC 64740 – Real Time Unaccounted for Energy EIM Settlement (UFE) |
| CC 64750 - Real Time Uninstructed Imbalance Energy EIM Settlement (UIE) |
| CC 67740 – Real Time Congestion Offset EIM |
| CC 69850 – Real Time Losses Offset EIM |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| None |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
|  | EIMEntitySCFlag BQ’ | A flag input that, when = 1, relates an EIM Balancing Authority Area (EIM BAA) with the associated Business Associate of the Scheduling Coordinator ID. |

## Inputs - Predecessor Charge Codes or Pre-calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
|  | RTBAACongestionRevenueAmount Q’mdhcif | Real Time Congestion PC |
|  | BA\_EIMBAA\_SettlementInterval\_UnaccountedforEnergy\_SettlementAmount BuQ’mdhcif | CC 64740 - Real Time Unaccounted for EIM Energy Settlement (UFE). |
|  | EIMSettlementIntervalUIESettlementAmount BrtuT’I’Q’M’mdhcif | CC 64750 - Real Time Uninstructed Imbalance Energy EIM Settlement (UIE) |
|  | EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif | CC 64600 – FMM Instructed Imbalance Energy EIM Settlement (FMM IIE) |
|  | EIMSettlementIntervalIIEAmount BrtQ’mdhcif | CC 64700 - Real Time Instructed Imbalance Energy Settlement (IIE) |
|  | EIMBAARTMarginalLossesOffsetAmount Q’mdhcif | CC 69850 - Real Time Loss Offset EIM. |

## CAISO Formula

EIMEntityRealTimeImbalanceEnergyOffsetAllocationAmount BQ’mdhcif

EIMEntityRealTimeImbalanceEnergyOffsetAllocationAmount BQ’mdhcif=

(-1) \* EIMBAATotalRTIEOSettlementAmount Q’mdhcif \* EIMEntitySCFlag BQ’

### EIMBAATotalRTIEOSettlementAmount Q’mdhcif

EIMBAATotalRTIEOSettlementAmount Q’mdhcif =

EIMBAAInitialRealTimeImbalanceEnergyOffsetSettlementAmount Q’mdhcif

Where Q’ <> ‘CISO’

### EIMBAAInitialRealTimeImbalanceEnergyOffsetSettlementAmount Q’mdhcif

EIMBAAInitialRealTimeImbalanceEnergyOffsetSettlementAmount Q’mdhcif =

EIMBAATotalRealTimeIIESettlementAmount Q’mdhcif +

EIMBAATotalFMMIIEAmount Q’mdhcif +

EIMBAATotalRealTimeUIESettlementAmount Q’mdhcif +

EIMBAATotalUFESettlementAmount Q’mdhcif-

EIMBAATotalRTEnergyCongestionAmt Q’mdhcif -

EIMBAATotalRTLossOffsetAmt Q’mdhcif

### EIMBAATotalRealTimeIIESettlementAmount Q’mdhcif

EIMBAATotalRealTimeIIESettlementAmount Q’mdhcif =

 EIMSettlementIntervalIIEAmount BrtQ’mdhcif

Note: This calculation is being performed in the hierarchy of Charge Code 64700

### EIMBAATotalFMMIIEAmount Q’mdhcif

EIMBAATotalFMMIIEAmount Q’mdhcif =

**EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif

Note: This calculation is being performed in the hierarchy of Charge Code 64600

### EIMBAATotalRealTimeUIESettlementAmount Q’mdhcif

EIMBAATotalRealTimeUIESettlementAmount Q’mdhcif =

**** EIMSettlementIntervalUIESettlementAmount BrtuT’I’Q’M’mdhcif

Note: This calculation is being performed in the hierarchy of Charge Code 64750

### EIMBAATotalUFESettlementAmount Q’mdhcif

EIMBAATotalUFESettlementAmount Q’mdhcif = BA\_EIMBAA\_SettlementInterval\_UnaccountedforEnergy\_SettlementAmount BuQ’mdhcif

Note: This calculation is being performed in the hierarchy of Charge Code 64740

### EIMBAATotalRTEnergyCongestionAmt Q’mdhcif

EIMBAATotalRTEnergyCongestionAmt Q’mdhcif =

RTBAACongestionRevenueAmount Q’mdhcif

Where Balancing Authority Area <> ‘CISO’

### EIMBAATotalRTLossOffsetAmt Q’mdhcif

EIMBAATotalRTLossOffsetAmt Q’mdhcif =

EIMBAARTMarginalLossesOffsetAmount Q’mdhcif

## Outputs

| Output ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
|  | EIMEntityRealTimeImbalanceEnergyOffsetAllocationAmount BQ’mdhcif | Total Real Time Imbalance Energy Offset Settlement Amount for an EIM Entity Scheduling Coordinator by Balancing Authority Area. |
|  | EIMBAATotalRTIEOSettlementAmount Q’mdhcif | Total Real Time Imbalance Energy Offset Amount for EIM Balancing Authority Area. |
|  | EIMBAAInitialRealTimeImbalanceEnergyOffsetSettlementAmount Q’mdhcif | Initial Calculation of EIM Balancing Authority Area’s Real Time Imbalance Energy Offset Amount. |
|  | EIMBAATotalRealTimeIIESettlementAmount Q’mdhcif | EIM Balancing Authority Area Real Time Instructed Imbalance Energy. |
|  | EIMBAATotalFMMIIEAmount Q’mdhcif | EIM Balancing Authority Area Fifteen Minute Market Instructed Imbalance Energy. |
|  | EIMBAATotalRealTimeUIESettlementAmount Q’mdhcif | EIM Balancing Authority Area Uninstructed Imbalance Energy. |
|  | EIMBAATotalUFESettlementAmount Q’mdhcif | EIM Balancing Authority Area Unaccounted for Energy. |
|  | EIMBAATotalRTEnergyCongestionAmt Q’mdhcif | EIM Balancing Authority Area Real-Time Energy Congestion. |
|  | EIMBAATotalRTLossOffsetAmt Q’mdhcif | EIM Balancing Authority Area Real-Time Energy Loss. |

# Charge Code Effective Dates

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.0 | 10/01/14 | 11/3/15 | Initial Version |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.1 | 11/4/15 | 4/3/18 | Configuration Impacted |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.1a | 4/4/18 | 7/31/19 | Documentation Only |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.2 | 8/1/19 | 7/31/19 | Configuration Impacted |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.2.1 | 8/1/19 | 12/31/2023 | Configuration Impacted |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.2.1a | 1/1/2024 | 4/30/26 | Documentation Only |
| CC 64770 – Real Time Imbalance Energy Offset EIM | 5.3 | 5/1/26 | Open | Configuration Impacted |