Settlements & Billing

FMM Instructed Imbalance Energy EIM Settlement

CC 64600

Version 5.5

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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 the following:

* IIE – Instructed Imbalance Energy
  + FMM Instructed Imbalance Energy EIM Settlement (CC 64600)
  + RTD Instructed Imbalance Energy EIM Settlement (CC 64700)
* UIE – Real Time Uninstructed Imbalance Energy EIM Settlement (CC 64750)
* UFE – Real Time Unaccounted for Energy EIM Settlement (CC 64740)

For each BAA, a Real Time congestion offset amount shall be created based on the contribution of marginal congestion component for LMP of resources located within the EIM BAA. This account is settled with the EIM Entity SC through Real Time Congestion Offset EIM (CC 67740). Also, for each BAA, a Real Time losses offset amount shall be calculated based on the contribution of marginal loss component for LMP of resources located within the EIM BAA. This account is settled with the EIM Entity SC through Real Time Losses Offset EIM (CC 69850).

For each BAA, to the extent that the sum of the Settlement Amounts for IIE, UIE, and UFE, less its RT Congestion Offset and RT Losses Offset, does not equal zero, the CAISO will assess Charges or make Payments in Real Time Imbalance Energy Offset EIM (CC 64770) for the resulting differences to the EIM Entity SC for the relevant Settlement Interval.

## Description

CC 64600, FMM Instructed Imbalance Energy EIM Settlement, will perform the calculations necessary to implement the business rules identified in the Business Rules section below.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | For each Settlement Interval, FMM IIE consists of the following types of Energy: (1) FMM Optimal Energy; (2) FMM Minimum Load Energy; (3) FMM Manual Dispatch Energy; (4) FMM Derate Energy; and (5) FMM Pumping Energy.  This applies to non-Load resources. |
| 1.1 | A positive Energy value indicates Incremental Energy. |
| 1.2 | A negative Energy value indicates Decremental Energy. |
| 1.3 | This Charge Code shall be calculated daily on a Settlement Interval basis. |
| 1.4 | Payments and charges for FMM IIE attributable to each resource in each Settlement Interval shall be settled by debiting or crediting, as appropriate, the specific Scheduling Coordinator’s FMM IIE Settlement Amount. |
| 1.5 | This charge code is applicable to an EIM participating resource, which is settled with the EIM SC, or to EIM non-participating resource, which is settled with the EIM Entity SC. |
| 1.6 | The FMM Manual Dispatch Energy considers any FMM EIM Auto-Matched Energy, and any Energy dispatched by the EIM Entity. |
| 2.0 | The IIE Settlement Amounts for FMM Optimal Energy, FMM Minimum Load Energy, FMM Derate Energy, FMM Manual Dispatch Energy, and FMM Pumping Energy, and shall be calculated as the product of the sum of all of these types of Energy and the FMM LMP. |
| 3.0 | For adjustments to the Charge Code that cannot be accomplished by correction of upstream data inputs/recalculation or operator override Pass Through Bill Charge logic will be applied. |
| 4.0 | The Settlement System shall support FMM Instructed Energy (IIE), including Operating Adjustment (OA), settlement for a BASE EIM Transfer System Resource (Base ETSR) that has elected to participate in imbalance energy settlement. |
| 4.1 | A Master File - resident flag (Yes / No) shall indicate whether (Yes) or not (No) an ETSR has elected to participate in imbalance energy settlement. |
| 4.2 | Base ETSR FMM IIE shall be settled as BAAResourceSettlementIntervalFMMTransferToQuantity and BAAResourceSettlementIntervalFMMTransferFromQuantity by applying the FMM LMP price at the financial node of the resource, where the energy is based on the resource’s Base Schedule and the tagged real-time base schedule changes submitted later than 40 minutes prior to the start of the Trading Hour. |
| 4.3 | The Base ETSR settled amounts for an ETSR that has elected to settle shall be excluded from the financial value of the real-time imbalance offset. (Fact) |
| 5.0 | For EDAM BAAs, Intertie Schedules that have been awarded an Energy Schedule in the Day-Ahead Market that subsequently have incremental or decremental FMM Schedule changes in the RTM, and did not submit an E-Tag prior to the HASP, will be subject to the HASP reversal rule, described below, applied through settlement. This rule applies only to EDAM BAAs. |
| 5.1 | The CAISO will take the following actions (through this charge code) regarding Schedules that clear the Day-Ahead Market at the Interties and that a Scheduling Coordinator or EDAM Entity wholly or partially reverses prior to HASP solution availability. This is identified as the HASP reversal settlement rule and it applies to any import or export that clear the Day-Ahead Market and is reduced prior to the HASP solution availability for which the Scheduling Coordinator or EDAM Entity has failed to submit an E-Tag consistent with its Day-Ahead Schedule. |
| 5.2 | For both imports and exports, the HASP reversal settlement rule shall not apply to Schedules that clear the Day-Ahead Market at the Interties and that a Scheduling Coordinator or EDAM Entity wholly or partially reverses in the HASP to the extent such Schedules are valid and balanced ETC and TOR Self-Schedules in the Day-Ahead Market. |
| 5.3 | The quantity of any imports or exports that clear the Day-Ahead Market that are reduced in the HASP for which the Scheduling Coordinator or EDAM Entity has failed to submit an E-Tag consistent with its Day-Ahead Schedule and WECC scheduling requirements is the “un-tagged” MW, with the exception identified in the previous business rule. |
| 5.4 | For Import, the “un-tagged” MW up to FMM Scheduled Energy quantity will be charged the positive price difference between the Day Ahead LMP and the FMM LMP for the import resource. |
| 5.5 | For Export, the “un-tagged” MW up to FMM Scheduled Energy quantity will be charged the positive price difference between the FMM LMP and the Day Ahead LMP for the export resource. |
| 5.6 | The amount from the HASP reversal settlement rule shall always be a charge to an SC or EDAM Entity, never a payment to an SC or EDAM Entity. |
| 5.7 | The tagged MW value per resource ID as of the time when HASP solution is available must be captured for implementation of the HASP reversal settlement rule. |
| 5.8 | HASP reversal settlement shall not apply to Pseudo Tie resources as these are not considered imports or exports. These resources are those resources that use the pseudo-tie functionality by which the output of a generating unit physically interconnected to the electric grid in a Native Balancing Authority Area is telemetered to and deemed to be produced in an Attaining Balancing Authority Area that provides Balancing Authority services for and exercises Balancing Authority jurisdiction over the Pseudo-Tie generating unit. Therefore, the output of such resources are not considered to be imports or exports to the applicable balancing authority area. |
| 6.0 | When an eligible resource has an interval with a negative MWh meter, CAISO will not charge for the energy of those intervals. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Real Time Energy Pre-calculation |
| Real Time Price Pre-calculation |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 64770 – Real Time Imbalance Energy Offset EIM |
| CC 4564 – GMC-EIM Transaction Charge |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
|  | PTBChargeAdjustmentEIMBA5MFMMEnergyAmt BJmdhcif | PTB settlement adjustment amount for this Charge Code |
|  | ResourceBaseETSRFlag BrtuQ’M’AA’Qpmd | Flag (1/NULL) that indicates (when = 1) that the ETSR is a Base ETSR. The input should = 1 for both Q’ values (To BAA and From BAA) that are associated with the resource r, where the Business Associate ID (B) attribute presents the BA ID value of the EIM Schedulting Coordinator for each of the two (2) BAAs. |
|  | FMMIntervalPnodeLMP AA’Qpmdhc | The FMM Interval Locational Marginal Price (LMP) for Pricing Node (Pnode) p. ($/MWh) |
|  | ResourceETSRElectSettlementFlag rmd | Flag (1/NULL) that indicates (when = 1) that the specified ESTR resource is an EIM Transfer System Resource (ETSR) that has selected to settle its ETSR IIE and OA at the real-time LMP |
|  | BAEDAMEntityFlag BQ’md | Flag indicating an EIM entity that specifically participates in EDAM. |

## Inputs - Predecessor Charge Codes or Pre-calculations

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
|  | SettlementIntervalTotalFMMPart1Qty BrtuT’I’Q’M’F’S’mdhcif | RT Energy Pre-calculation |
|  | BA5MResourceTotalFMMManualDispatchEnergyQuantity BrtuT’I’Q’M’F’S’mdhcif | RT Energy Pre-Calculation |
|  | FMMIntervalLMPPriceBrtuT’I’M’mdhc | RT Price Pre-Calculation |
|  | BAAResourceSettlementIntervalFMMEIMTransferFromQuantityBrQ’AA’Qpmdhcif | RT Energy Pre-Calculation |
|  | BAAResourceSettlementIntervalFMMEIMTransferToQuantity BrQ’AA’Qpmdhcif | RT Energy Pre-Calculation |
|  | ResourceWholesaleExemptionFlag *rmdhcif* | RT Energy Pre-Calculation |
|  | BAHourlyResourceImportHASPReversalMW BrtuQ’T’I’M’F’S’mdh | RT Energy Pre-Calculation |
|  | BAFMMIntervalResourceImportHASPReversalPrice BrtuQ’T’I’M’F’S’mdhc | RT Price Pre-Calculation |
|  | BAHourlyResourceExportHASPReversalMW BrtuQ’T’I’M’F’S’mdh | RT Energy Pre-Calculation |
|  | BAFMMIntervalResourceExportHASPReversalPrice BrtuQ’T’I’M’F’S’mdhc | RT Price Pre-Calculation |

## CAISO Formula

EIMBASettlementIntervalFMMIIEAmount Bmdhcif =

**EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif

Note: This is provided as part of reporting structure and is not configured as an individual charge type. This is shown as a reporting BD in the BD matrix file.

EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif =

IF

ResourceWholesaleExemptionFlag *rmdhcif* = 0

THEN

EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif = ((-1) \* FMMIntervalLMPPriceBrtuT’I’M’mdhc \* EIMBA5MResourceTotalFMMEnergyQuantity BrtuQ’M’mdhcif ) + BASettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif + BA5MResourceImportHASPReversalAmount BrtuQ’M’mdhcif +BA5MResourceExportHASPReversalAmount BrtuQ’M’mdhcif

ELSE

EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif = 0

Where EIMBA5MResourceTotalFMMEnergyQuantity BrtuQ’M’mdhcif =

 (SettlementIntervalTotalFMMPart1Qty BrtuT’I’Q’M’F’S’mdhcif *+* BA5MResourceTotalFMMManualDispatchEnergyQuantity BrtuT’I’Q’M’F’S’mdhcif )

where Q’ <> ‘CISO’

BASettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif

BASettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif = ResourceETSRElectSettlementFlag rmd \* EIMSettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif

EIMSettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif

EIMSettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif = **((-1) \* FMMIntervalPnodeLMP AA’Qpmdhc \* (BAAResourceSettlementIntervalFMMEIMTransferToQuantity BrQ’AA’Qpmdhcif - BAAResourceSettlementIntervalFMMEIMTransferFromQuantity BrQ’AA’Qpmdhcif))

### Where Q’ <> ‘CISO’

### **Note:**

### The same value of FMMIntervalPnodeLMP AA’Qpmdhc applies to each Settlement Interval (f) of FMM Interval (c).

### BASettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif

BASettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif = ResourceETSRElectSettlementFlag rmd \* EIMSettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif

### EIMSettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif

EIMSettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif = **((-1) \* FMMIntervalPnodeLMP AA’Qpmdhc\* (BAAResourceSettlementIntervalFMMEIMTransferToQuantity BrQ’AA’Qpmdhcif - BAAResourceSettlementIntervalFMMEIMTransferFromQuantity BrQ’AA’Qpmdhcif))

### Where Q’ <> ‘CISO’

### **Note:**

### The same value of FMMIntervalPnodeLMP AA’Qpmdhc applies to each Settlement Interval (f) of FMM Interval (c).

### The following equations below are created as reporting BDs that are not used in any charge code calculations but rather created to calculate the Current Quantity of the charge code’s hierarchy.

### EIMBA5MResourceTotalFMMEnergyAndETSRQuantity BrtuQ’M’mdhcif =

### EIMBA5MResourceTotalFMMEnergyQuantity BrtuQ’M’mdhcif + EIMSettlementIntervalFMMETSRQuantity BrtuQ’M’mdhcif

### EIMSettlementIntervalFMMETSRQuantity BrtuQ’M’mdhcif = ResourceETSRElectSettlementFlag rmd \* (BAAResourceSettlementIntervalFMMEIMTransferToQuantity BrQ’AA’Qpmdhcif - BAAResourceSettlementIntervalFMMEIMTransferFromQuantity BrQ’AA’Qpmdhcif)

### Where Exists ResourceBaseETSRFlag BrtuQ’M’AA’Qpmd

***HASP reversal settlement calculations:***

BA5MResourceImportHASPReversalAmount BrtuQ’M’mdhcif = Sum over (T’, I’, F’, S’)

(BAEDAMEntityFlag BQ’md \* (1- ResourcePseudoTieFlag rmd)\*(BAHourlyResourceImportHASPReversalMW BrtuQ’T’I’M’F’S’mdh \*

(BAFMMIntervalResourceImportHASPReversalPrice BrtuT’I’M’F’S’mdhc /4)))/12 WHERE Q’ <> ‘CISO’

Note: The division by 12 is a time interval conversion from hourly to five-minute.

BA5MResourceExportHASPReversalAmount BrtuQ’M’mdhcif = Sum over (T’, I’, F’, S’)

(BAEDAMEntityFlag BQ’md \* (1- ResourcePseudoTieFlag rmd)\*(BAHourlyResourceExportHASPReversalMW BrtuQ’T’I’M’F’S’mdh \*

( BAFMMIntervalResourceExportHASPReversalPrice BrtuQ’T’I’M’F’S’mdhc /4)))/12

WHERE Q’ <> ‘CISO’

Note: The division by 12 is a time interval conversion from hourly to five-minute.

## Output Requirements

| Output Req ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
|  | EIMBA5MResourceFMMIIESettlementAmount BrtuQ’M’mdhcif | FMM IIE settlement amount for a resource inside an EIM Entity BAA. **($)** |
|  | EIMBA5MResourceTotalFMMEnergyQuantity BrtuQ’M’mdhcif | Resource total FMM IIE quantity inclusive of manual dispatch energy |
|  | EIMBASettlementIntervalFMMIIEAmount Bmdhcif | The BA total FMM IIE Settlement Amount amount for all resources inside EIM Entity BAAs. **($)** |
|  | EIMSettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif | Settlement Interval FMM amount for an EIM ETSR Transfer associated with the specified BAA and a Base ETSR that has elected to settle its IIE at the FMM LMP. ($) |
|  | BASettlementIntervalFMMETSRSTLMTAmount BrQ’mdhcif | Settlement Interval FMM amount for a transfer associated with the specified EDAM BAA and an ETSR that has elected to settle its IIE at the FMM LMP. ($) |
|  | BASettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif | Settlement Interval FMM amount for a transfer associated with the specified EDAM BAA and an ETSR that has elected to settle its IIE at the FMM LMP. ($) |
|  | EIMSettlementIntervalFMMETSRAdvisorySTLMTAmount BrQ’mdhcif | Settlement Interval FMM amount for an EIM ETSR Transfer associated with the specified BAA and a Base ETSR that has not elected to settle its IIE at the FMM LMP, ($) |
|  | BA5MResourceImportHASPReversalAmount BrtuQ’T’I’M’F’S’mdhcif | The amount assessed for the FMM reversal settlement rule. This is for a resource of type t = “ITIE”. ($)  This will always be a charge to the SC. |
|  | BA5MResourceExportHASPReversalAmount BrtuQ’T’I’M’F’S’mdhcif | The amount assessed for the HASP reversal settlement rule. This is for a resource of type t = “ETIE”. ($)  This will always be a charge to the SC. |

# Charge Code Effective Dates

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Update Version Type |
| --- | --- | --- | --- | --- |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.0 | 10/01/14 | 11/3/15 | Configuration Impacted |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.1 | 11/4/15 | 4/3/18 | Configuration Impacted |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.2 | 4/4/18 | 9/30/20 | Configuration Impacted |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.3 | 10/1/20 | 10/31/22 | Configuration Impacted |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.4 | 11/1/22 | 4/30/26 | Configuration Impacted |
| CC 64600 – FMM Instructed Imbalance Energy EIM Settlement | 5.5 | 5/1/26 | Open | Configuration Impacted |