Settlements and Billing

Configuration Guide: Real Time Greenhouse Gas Offset

CC 495

Version 5.0

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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 GHG Settlements in respective GHG Regulation Areas for each Dispatch Interval and settles GHG for each Settlement Interval for each resource within the EIM Area and all System Resources Dispatched in Real-Time.

Real Time Greenhouse Gas Settlement consists of following:

* GHG - Greenhouse Gas Emission Cost Revenue (CC 491)

## Description

The calculation of Real-Time GHG Offset includes the settlement of Greenhouse Gas Compensation.

To the extent that the sum of the Real Time GHG Offset Amounts does not equal zero, the CAISO will assess Charges or make Payments in Real Time GHG Offset (CC 495) for the resulting differences to the Metered Demand of a GHG Regulation Area.

# 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 five-minute Real-Time Marginal GHG Cost Offset amount will equal the product of FMM IIE, RTD IIE, UIE and UFE within a GHG Regulation Area, including Schedules for Virtual Awards; GHG attributions associated with the GHG Regulation Area and the applicable Marginal GHG Cost. |
| 3.0 | The allocation of the Real-Time GHG Offset shall be to the GHG Regulation Area’s metered demand. |
| 4.0 | 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. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 491 – Greenhouse Gas Emission Cost Revenue |

## Successor Charge Codes

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

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
|  | FMMMarginalGHGPrc BrtQ’G’’mdhc | The GHG component of GHG Regulation Areas (+). Real Time Pre-Dispatch |
|  | RTDMarginalGHGPrc BrtQ’G’’mdhcif | The GHG component of GHG Regulation Areas (+). Real Time Dispatch |
|  | BARTBAAGHGRegAreaFlag BQ’G’’mdhcif | Flag that identifies relationship between BAA and GHG Regulation Area in Real Time. |
|  | PTB5mGHGOffsetAdjustmentAmount BQ’Jmdhcif | PTB Charge Adjustment for this charge code. |

## Inputs - Predecessor Charge Codes or Pre-calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
|  | BAHourlyDAVirtualAwardNodalQuantity BQ’AA’Qpay’mdh | 6013 Convergence Bidding DA Energy Congestion and Loss Settlement |
|  | EIMBAASettlementIntervalLAPUFEQuantity uQ’AA’mdhcif | 64740 Real Time Unaccounted for EIM Energy Settlement |
|  | UDCSettlementIntervalUFEQuantity uQ’M’mdhcif | 6474 Real Time Unaccounted for Energy Settlement |
|  | SettlementIntervalRealTimeUIE *BrtuT’I’Q’M’F’S’mdhcif* | Real Time Energy Quantity PC |
|  | SettlementIntervalTotalIIEPart1*BrtuT’I’Q’M’F’S’mdhcif* | Real Time Energy Quantity PC |
|  | SettlementIntervalTotalFMMPart1Qty BrtuT’I’Q’M’F’S’mdhcif | Real Time Energy Quantity PC |
|  | BABAAMeteredDemandQuantity BQ’mdh | MSS Netting PC |
|  | BAResourceEIMGHGPaymentAmount BrtQ’F’S’G’’mdhcif | 491 Green House Gas Emission Cost Revenue |

## CAISO Formula

RealTimeGreenhouseGasOffsetAllocationAmount BQ’G’’mdhcif

RealTimeGreenhouseGasOffsetAllocationAmount BQ’G’’mdhcif=

(-1) \* BARealTimeMeteredDemandRatio BQ’G’’mdhcif \* RealTimeGHGOffsetAmount G’’mdhcif

### BARealTimeMeteredDemandRatio BQ’G’’mdhcif = RTBAAGHGRegAreaMeteredDemandQuantity BQ’G’’mdhcif / RTGHGRegAreaMeteredDemandQuantity G’’mdhcif

### RTGHGRegAreaMeteredDemandQuantity G’’mdhcif =Sum (B,Q’) RTBAAGHGRegAreaMeteredDemandQuantity BQ’G’’mdhcif

### RTBAAGHGRegAreaMeteredDemandQuantity BQ’G’’mdhcif = BARTBAAGHGRegAreaFlag BQ’G’’mdhcif\* BABAAMeteredDemandQuantity BQ’mdh

### RealTimeGHGOffsetAmount G’’mdhcif

RealTimeGHGOffsetAmount G’’mdhcif =

FMMGHGRegAreaAmount G’’mdhcif +

RTDGHGRegAreaAmount G’’mdhcif +

UIEGHGRegAreaAmount G’’mdhcif +

UFEGHGRegAreaAmount G’’mdhcif +

DAVirtualAwardGHGRegAreaAmount G’’mdhcif +

RTMGHGRegAreaAmount G’’mdhcif

### FMMGHGRegAreaAmount G’’mdhcif

FMMGHGRegAreaAmount G’’mdhcif = Sum (B,r,t,u,T’,I’,Q’,M’,F’,S’)

SettlementIntervalTotalFMMPart1Qty BrtuT’I’Q’M’F’S’mdhcif \* FMMMarginalGHGPrc BrtQ’G’’mdhc

### RTDGHGRegAreaAmount G’’mdhcif

RTDGHGRegAreaAmount G’’mdhcif = Sum (B,r,t,u,T’,I’,Q’,M’,F’,S’)

SettlementIntervalTotalIIEPart1BrtuT’I’Q’M’F’S’mdhcif \* RTDMarginalGHGPrc BrtQ’G’’mdhcif

### UIEGHGRegAreaAmount G’’mdhcif

UIEGHGRegAreaAmount G’’mdhcif = Sum(B,r,t,Q’)

RealTimeGenUIEGHGRegAreaAmount BrtQ’G’’mdhcif + RealTimeLoadUIEGHGRegAreaAmount BrtQ’G’’mdhcif

#### RealTimeGenUIEGHGRegAreaAmount BrtQ’G’’mdhcif = RTDMarginalGHGPrc BrtQ’G’’mdhcif \* RealTimeGenUIEGHGRegAreaQuantity BrtQ’mdhcif

#### RealTimeGenUIEGHGRegAreaQuantity BrtQ’mdhcif = Sum(u,T’,I’,M’,F’,S’) SettlementIntervalRealTimeUIEBrtuT’I’Q’M’F’S’mdhcif

Where t in GEN

#### RealTimeLoadUIEGHGRegAreaAmount BrtQ’G’’mdhcif = RTDMarginalGHGPrc BrtQ’G’’mdhcif \* RealTimeLoadUIEGHGRegAreaQuantity BrtQ’mdhcif

##### RealTimeLoadUIEGHGRegAreaQuantity BrtQ’mdhcif = Sum(u,T’,I’,M’,F’,S’) SettlementIntervalRealTimeUIEBrtuT’I’Q’M’F’S’mdhcif

Where t in LOAD

### UFEGHGRegAreaAmount G’’mdhcif

UFEGHGRegAreaAmount G’’mdhcif = Sum (Q’) UFEEDAMGHGRegAreaAmount Q’G’’mdhcif + UFEBAAGHGRegAreaAmount Q’G’’mdhcif

#### UFEEDAMGHGRegAreaAmount Q’G’’mdhcif

### UFEEDAMGHGRegAreaAmount Q’G’’mdhcif *=* Sum(B,r,t,u,A,A’) EIMBAASettlementIntervalLAPUFEQuantity uQ’AA’mdhcif \* RTDMarginalGHGPrc BrtQ’G’’mdhcif

Where Q’ <> CISO

#### UFEBAAGHGRegAreaAmount Q’G’’mdhcif

### UFEBAAGHGRegAreaAmount Q’G’’mdhcif =Sum(B,r,t,u,M’) UDCSettlementIntervalUFEQuantity uQ’M’mdhcif \* RTDMarginalGHGPrc BrtQ’G’’mdhcif

Where Q’ = CISO

### DAVirtualAwardGHGRegAreaAmount G’’mdhcif

DAVirtualAwardGHGRegAreaAmount G’’mdhcif = Sum(B,r,t,Q’,A,A’,Q,p,a,y’)

BAHourlyDAVirtualAwardNodalQuantity BQ’AA’Qpay’mdh \* FMMMarginalGHGPrc BrtQ’G’’mdhc

### RTMGHGRegAreaAmount G’’mdhcif = Sum (B,r,t,Q’,F’,S’) BAResourceEIMGHGPaymentAmount BrtQ’F’S’G’’mdhcif

## Outputs

| Output ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
|  | RealTimeGreenhouseGasOffsetAllocationAmount BQ’G’’mdhcif | Total Real Time GHG Offset Allocation Amount for a Scheduling Coordinator by Balancing Authority Area and GHG Regulation Area. |
|  | BARealTimeMeteredDemandRatio BQ’G’’mdhcif | Metered Demand Ratio for GHG Attribution for a Scheduling Coordinator by Balancing Authority Area and GHG Regulation Area. |
|  | RTGHGRegAreaMeteredDemandQuantity G’’mdhcif | Metered Demand associated with a GHG Regulation Area. |
|  | RTBAAGHGRegAreaMeteredDemandQuantity BQ’G’’mdhcif | Metered Demand of Scheduling Coordinator by Balancing Authority Area and GHG Regulation Area. |
|  | RealTimeGHGOffsetAmount G’’mdhcif | Total Real Time GHG Regulation Area Offset Amount |
|  | FMMGHGRegAreaAmount G’’mdhcif | Real Time Market GHG Regulation Area Amount due to Fifteen Minute Imbalance Energy Quantity |
|  | RTDGHGRegAreaAmount G’’mdhcif | Real Time Market GHG Regulation Area Amount due to Five Minute Imbalance Energy Quantity |
|  | UIEGHGRegAreaAmount G’’mdhcif | Real Time UIE by GHG Regulation Area |
|  | RealTimeGenUIEGHGRegAreaAmount BrtQ’G’’mdhcif | Real Time UIE from generation by Scheduling Coordinator, Resource, Resource Type, and Balancing Authority Area |
|  | RealTimeGenUIEGHGRegAreaQuantity BrtQ’mdhcif | Real Time UIE from generation by Scheduling Coordinator, Resource, Resource Type, and Balancing Authority Area |
|  | RealTimeLoadUIEGHGRegAreaAmount BrtQ’G’’mdhcif | Real Time UIE from load by Scheduling Coordinator, Resource, Resource Type, and Balancing Authority Area |
|  | RealTimeLoadUIEGHGRegAreaQuantity BrtQ’mdhcif | Real Time UIE from load by Scheduling Coordinator, Resource, Resource Type, and Balancing Authority Area |
|  | UFEGHGRegAreaAmount G’’mdhcif | Real Time UFE by GHG Regulation Area |
|  | UFEEDAMGHGRegAreaAmount Q’G’’mdhcif | Real Time UFE by Balancing Authority Area and GHG Regulation Area for EDAM Balancing Authority Areas |
|  | UFEBAAGHGRegAreaAmount Q’G’’mdhcif | Real Time UFE by Balancing Authority Area and GHG Regulation Area for CAISO Balancing Authority Area |
|  | DAVirtualAwardGHGRegAreaAmount G’’mdhcif | GHG Regulation Area Amount attributable to Day Ahead Virtual Awards by GHG Regulation Area |
|  | RTMGHGRegAreaAmount G’’mdhcif | Real Time Market GHG Regulation Area attribution Amount |

# Charge Code Effective Dates

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CC 495 – Real Time Greenhouse Gas Offset | 5.0 | 5/1/26 | Open | Initial Version |