Settlements & Billing

Configuration Guide: IFM Bid Cost Recovery Tier 1 Allocation

**CC 6636**

Version 5.6

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# Purpose of Document

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

# Introduction

## Background

Bid Cost Recovery (BCR) is the process by which the CAISO ensures SCs are able to recover Start-Up Costs (SUC), Minimum Load Costs (MLC), MSG ResourceTransition Costs (TC) and Energy Bid Costs. In order to recover SUC and MLC, a Generating Unit, Pumped-Storage Unit, or resource-specific System Resource must be committed by the CAISO. Likewise, the CAISO must commit a Multi-Stage Generating Resource in order for it to receive TC compensation. Bid Cost Recovery for Energy and Ancillary Services (A/S) Bids applies to Bid Cost Recovery Eligible Resources in general (for example, Generating Units, Pumped-Storage Units, Proxy Demand Resources and resource-specific System Resources) scheduled or dispatched by CAISO, independent of whether they are CAISO-committed or instead are self-committed.

For purposes of determining BCR eligibility, CAISO uses a concept called Commitment Period. A Commitment Period consists of the consecutive time periods within a Trading Day when a resource is on-line, synchronized to the grid, and available for dispatch. A Commitment Period is comprised of two distinct sub-types – Self-Commitment Period and CAISO Commitment Period. The portion of a Commitment Period where a resource submits Energy Self-Schedule or A/S self-provision is called a Self-Commitment Period. A Self-Commitment Period may include time periods when a resource is not operating pursuant of an Energy Self-schedule or A/S self-provision, but must be on due to Ramping constraints or a Minimum Run Time or Minimum Down Time requirement. Resources are not eligible for BCR of SUC, MLC or TC during Self-Commitment Periods, but are eligible for BCR of awarded Energy and A/S. The portion of a Commitment Period that is not a Self-Commitment Period is called a CAISO Commitment Period. Resources are eligible to receive BCR for SUC, MLC, TC, awarded Energy and A/S during a CAISO Commitment Period.

SUC, MLC and TC for each market and resource are determined in Pre-calculation Start-Up and Minimum Load Cost. The commitment costs together with the energy and AS bid costs are then used as inputs to calculate a resource’s net difference between costs and revenues in separate Pre-calculations by market --- IFM Net Amount, RUC Net Amount, and RTM Net Amount. If the difference between the total costs and the market revenues is positive in the relevant market, then the net amount represents a Shortfall. If the difference is negative in the relevant market, the net amount represents a Surplus. For each resource or, in the case of a MSS entity that has elected net settlement, all MSS resources collectively, the IFM, RUC, and RTM Shortfalls and Surpluses are then netted over all hours of a Trading Day, with the IFM Shortfalls and Surpluses netted separately from the RUC and RTM Shortfalls and Surpluses. Thus, RUC or RTM surpluses over the entire Trading Day are used to offset a RTM or RUC shortfall, respectively, incurred over the entire Trading Day. For either IFM or the combined RUC and RTM netting, if the net amount over the Trading Day is positive (a Shortfall), then the resource or net-settled MSS entity receives a BCR Uplift Payment equal to the net Trading Day amount under CC 6620 – RUC and RTM Bid Cost Recovery Settlement (for a combined RUC and RTM shortfall) or CC 66200 – RUC and RTM EIM Bid Cost Recovery Settlement, or CC 6630 IFM Bid Cost Recovery Settlement (for an IFM shortfall).

While there is one IFM Bid Cost Recovery payment per resource per day, the methodology for allocation of IFM Bid Cost Uplift per Trading Hour occurs in two tiers. IFM Costs are first allocated in CC 6636 IFM Bid Cost Recovery Tier 1 Allocation based upon IFM Load Uplift Obligation, and any remaining costs are allocated pro rata to Measured Demand under CC 6637 IFM Bid Cost Recovery Tier 2 Allocation.

SCs with a net virtual Demand position (a situation defined to be when Virtual Demand Awards exceed Virtual Supply Awards) in their portfolio of Virtual Awards on behalf of a Convergence Bidding Entity may be charged for IFM Tier 1 uplift, if virtual Demand over the CAISO Control Area (i.e., system-wide virtual Demand) exceeds virtual Supply. The obligation will be based on how much additional unit commitment was driven by net virtual Demand that resulted in IFM clearing above what was needed to satisfy Measured Demand. If physical Demand plus virtual Demand minus virtual Supply is equal to or less than Measured Demand, SCs will not be charged for IFM Tier 1 Uplift. If physical Demand plus virtual Demand minus Virtual Supply is greater than Measured Demand, the IFM Tier 1 obligation due to net virtual Demand will increase proportionally with the quantity by which Virtual Demand results in an increase in IFM clearing above Measured Demand. The maximum IFM Tier 1 obligation due to virtual Demand would equal the system-wide net virtual Demand when Virtual Demand Awards exceed Virtual Supply Awards; the minimum IFM Tier 1 obligation due to virtual Demand would equal 0.

## Description

The CC 6636 configuration will perform the calculations necessary to implement the business rules identified in the Business Rules section below.

This charge code executes the IFM Bid Cost Recovery Tier 1 Allocation.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
|  | The CAISO Total IFM BCR allocation amount is done in two tiers. |
|  | The IFM Tier 1 allocation shall be performed per BA and Trading Hour. |
|  | The hourly Net IFM Bid Cost Uplift is allocated in the first tier as follows: |
|  | 1. The hourly amount of Net IFM Bid Cost Uplift allocated to each Scheduling Coordinator is equal to the product of the IFM Bid Cost Uplift rate and the IFM uplift obligation for the Scheduling Coordinator. |
|  | 1. The IFM Bid Cost Uplift rate is equal to the Net IFM Bid Cost Uplift divided by the sum of the positive IFM Load Uplift Obligations for all Scheduling Coordinators and the IFM system-wide Virtual Demand Award uplift obligation, subject to the condition that the IFM Bid Cost Uplift rate cannot exceed the ratio of the hourly Net IFM Bid Cost Uplift for the Trading Hour divided by the maximum of (a) the sum of all hourly IFM Load Uplift Obligations for all Scheduling Coordinators in that Trading Hour or (b) the sum of all hourly Generation scheduled in the Day-Ahead Schedule and IFM upward AS Awards for all Scheduling Coordinators from CAISO-committed Bid Cost Recovery Eligible Resources in that Trading Hour. |
|  | 1. The IFM uplift obligation for each Scheduling Coordinator is equal to the sum of the IFM Load Uplift Obligation for the Scheduling Coordinator and any IFM Virtual Demand Award uplift obligation for the Scheduling Coordinator. |
|  | 1. The IFM Load Uplift Obligation for each Scheduling Coordinator, including Scheduling Coordinators for Metered Subsystems regardless of their MSS optional elections (net/gross Settlement, Load following, RUC opt-in/out), is equal to the positive difference between the total Demand scheduled in the Day-Ahead Schedule of that Scheduling Coordinator and the sum of scheduled Generation and scheduled imports from the Self-Schedules in the Day-Ahead Schedule of that Scheduling Coordinator, adjusted by any applicable Inter-SC Trades of IFM Load Uplift Obligations. |
|  | 1. The IFM system-wide Virtual Demand Award uplift obligation is calculated for each hour in the IFM and is equal to maximum of zero (0) or the following quantity: the total system-wide Virtual Demand Awards from the IFM minus the total system-wide Virtual Supply Awards from the IFM, plus the minimum of zero (0) or the following quantity: the total amount of Scheduled Demand (which excludes Virtual Demand Awards), minus Measured Demand. |
|  | 1. For each Scheduling Coordinator with positive net Virtual Demand Awards, the IFM Virtual Demand Award uplift obligation is equal to the product of (a) the positive net Virtual Demand Awards for the Scheduling Coordinator divided by the sum of each Scheduling Coordinator’s positive net Virtual Demand Award and (b) the IFM system-wide Virtual Demand Award uplift obligation. For each Scheduling Coordinator with negative net Virtual Demand Awards, the IFM Virtual Demand Award uplift obligation is zero (0). |
|  | PTB logic does not apply. |
|  | Advisory settlement from NPM resources: NPM resources and hence the SC for these resources, will not be subject to IFM BCR Tier 1 Allocation. In other words, the Tier 1 settlement values will be zero or do not exist at all. However, there exists a Tier 2 allocation, and is allocated pro-rata based on NPM resource DA Load Schedules. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calculation – Bid Cost Recovery Sequential Netting |
| Pre-calculation – ETC/TOR/CVR Quantity |
| Pre-calculation – Measured Demand Over Control Area |
| Pre-calculation – Real Time Energy |
| CC 6013 -- Convergence Bidding DA Energy, Congestion, and Loss Settlement |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 6637 – IFM Bid Cost Recovery Tier 2 Allocation |

## Inputs – External Systems

| Row # | Variable Name | Description |
| --- | --- | --- |
|  | DASelfSchedule BrtQ’uT’I’M’VL’W’R’F’S’mdhcif | DA Self Schedule (in MWh as provided by MQS) for a given resource and Settlement Interval. |
|  | DAScheduleEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdhcif | DA Energy Schedule (in MWh as provide by MQS) that corresponds to the flat hourly Day-Ahead Schedule (DAS) for a given resource and Settlement Interval. The input quantity is composed of Day-Ahead Minimum Load Energy, Day-Ahead Self-Scheduled Energy, and Day-Ahead Bid Awarded. |
|  | DALoadSchedule BrtuT’I’Q’M’AA’R’pW’F’S’vVL’mdh | DA Load Schedule (in MW as provided by IFM) for a given resource and Trading Hour.  The input quantity is represented as a negative value. |
|  | DAAwardedSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Day Ahead Spinning Reserve Awarded Bid capacity (in MW) for a given resource and Trading Hour. |
|  | DAAwardedNonSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Day Ahead Non-Spinning Reserve Awarded Bid capacity (in MW) for a given resource and Trading Hour. |
|  | DAAwardedRegUpBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Day Ahead Regulation Up Reserve Awarded Bid capacity (in MW) for a given resource and Trading Hour. |
|  | IFMLoadUpliftObligationsInterSCTradeFrom Bsmdh | IFM Load Uplift Obligations Inter-SC trades (in MW BOUGHT as a positive value) for a given Business Associate, IST ID, and Trading Hour. |
|  | BAHrlyIFMLoadUpliftObligationsInterSCTradeFromQty BQ’smdh | IFM Load Uplift Obligations Inter-SC trades (in MW BOUGHT as a positive value) for a given Business Associate, IST ID, and Trading Hour. |
|  | BAHrlyIFMLoadUpliftObligationsInterSCTradeToQty BQ’smdh | IFM Load Uplift Obligations Inter-SC trades (in MW SOLD as a positive value) for a given Business Associate, IST ID, and Trading Hour. |
|  | SettlementIntervalIFMCAISOCommitPeriod BrtF’S’mdhcif | Flag (0/1) that indicates resource was committed ON by CAISO in IFM. 1: for ON, 0: for OFF or Self-Committed for a given resource and Settlement Interval. |
|  | IFMBCRTier1ExemptionFlag Bmd | Flag (0/1) indicating an exception to IFM Tier 1 Allocation for a given Business Associate and Trading Day. When the exception is true (represented by “1”), then the Business Associate shall be excluded from the calculation of IFMLoadUpliftObligation Bmdh. |
|  | DAMinimumLoadQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdhcif | Day Ahead Minimum Load Quantity (in MWh as provided by MQS) for a given resource and Settlement Interval. |
|  | DAPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | Day Ahead Pump Energy Quantity (in MWh as provided by MQS) for a given resource and Settlement Interval. |

## Inputs - Predecessor Charge Codes or Pre-calculations

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Predecessor Charge Code/  Pre-calc Configuration |
|  | BAATotalIFMUpliftAllocationAmount**Q’mdhcif** | Pre-calculation – Bid Cost Recovery Sequential Netting |
|  | BAHourlyResourceContractDADemandQuantity Brtz’mdh | Pre-calculation ETC/TOR/CVR |
|  | BAHourlyResourceContractDASupplyQuantity Brtz’mdh | Pre-calculation ETC/TOR/CVR |
|  | BAHourlyDAVirtualDemandAwardQuantity BQ’mdh | CC 6013 Convergence Bidding DA Energy, Congestion, Loss Settlement |
|  | BAHourlyDAVirtualSupplyAwardQuantity BQ’mdh | CC 6013 Convergence Bidding DA Energy, Congestion, Loss Settlement |
|  | BAATotalHourlyDAVirtualDemandAwardQuantity Q’mdh | CC 6013 Convergence Bidding DA Energy, Congestion, Loss Settlement |
|  | BAATotalHourlyDAVirtualSupplyAwardQuantity Q’mdh | CC 6013 Convergence Bidding DA Energy, Congestion, Loss Settlement |
|  | CAISOHourlyDAGrossMeasuredDemand mdh | Pre-calculation Measured Demand over Control Area  Represented as a negative value. |
|  | SettlementIntervalDayAheadEnergy BrtQ’uT’I’M’F’S’mdhcif | Precalculation Real Time Energy Quantity |

## 

## CAISO Formula

IFMBCRTier1Charge BQ’mdh =

IFMTier1UpliftObligation BQ’mdh \* IFMTier1UpliftRate Q’mdh

Where Q’ = “CISO”

### IFMTier1UpliftRateQ’mdh =

Min ( IFMPhysicalLoadRate Q’mdh, IFMObligationRateQ’mdh )

### IFMObligationRateQ’mdh =

BAAHrlyTotalIFMUpliftAmount Q’mdh /

BAATotalIFMLoadAndVirtualDemandObligation Q’mdh

### BAATotalIFMLoadAndVirtualDemandObligation Q’mdh =

BAATotalIFMLoadUpliftObligation Q’mdh +

IFMSystemWideVirtualDemandAwardUpliftObligationQ’mdh

### IFMPhysicalLoadRateQ’mdh =

BAAHrlyTotalIFMUpliftAmountQ’mdh /Max (BAATotalIFMLoadUpliftObligation Q’mdh, TotalIFMCapacity Q’mdh)

And

### BAAHrlyTotalIFMUpliftAmountQ’mdh =

Sum (c, i, f) BAATotalIFMUpliftAllocationAmount Q’mdhcif

### BAATotalIFMLoadUpliftObligationQ’mdh =

Sum (B) IFMLoadUpliftObligation BQ’mdh

### IFMTier1UpliftObligation BQ’mdh =

IFMLoadUpliftObligation BQ’mdh + IFMVirtualDemandAwardUpliftObligation BQ’mdh

### IFMLoadUpliftObligation BQ’mdh =

Max (0, DADemand BQ’mdh – DASource BQ’mdh)

### DADemand BQ’mdh =

Max (0, TotalLoadScheduleQuantity BQ’mdh +

BAHourlyDAPumpEnergyForIFMTier1Quantity BQ’mdh +

TotalExportSelfScheduleQuantity BQ’mdh +

TotalLoadUpliftObligationInterSCTradeToForIFMTier1 BQ’mdh –

TotalLoadUpliftObligationInterSCTradeFromForIFMTier1 BQ’mdh –

BAHourlyDABalancedTORQuantityBmdh)

Note: The business drivers are all of the inputs above except BAHourlyDABalancedTORQuantityBmdh .

### Where BAHourlyDABalancedTORQuantityBmdh =

Min (TotalDATORSourceQuantity Bmdh , TotalDATORSinkQuantity Bmdh )

### TotalDATORSinkQuantity Bmdh =

Sum (r, t, z’) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

( (-1) \* BAHourlyResourceContractDADemandQuantity Brtz’mdh )

Else

0

End If}

Where Contract Type z’ = ‘TOR’

### TotalDATORSourceQuantity Bmdh =

Sum (r, t, z’) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

BAHourlyResourceContractDASupplyQuantity Brtz’mdh

Else

0

End If}

Where Contract Type z’ = ‘TOR’

### TotalLoadUpliftObligationInterSCTradeToForIFMTier1 BQ’mdh =

Sum (s) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

BAHrlyIFMLoadUpliftObligationsInterSCTradeToQty BQ’smdh

Else

0

End If}

### TotalExportSelfScheduleQuantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, V, L’, W’, R’, F’, S’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

( ( -1) \* DASelfSchedule BrtQ’uT’I’M’VL’W’R’F’S’mdhcif )

Else

0

End If}

Where Resource Type t = ETIE

### BAHourlyDAPumpEnergyForIFMTier1Quantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, V, L’, R’, F’, S’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

( ( -1) \* DAPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif )

Else

0

End If}

### TotalLoadScheduleQuantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, A, A’, R’, p, W, F’, S’, v, V, L’) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

( ( -1) \* DALoadSchedule BrtQ’uT’I’M’AA’R’pW’F’S’vVL’mdh )

Else

0

End If}

### DASource BQ’mdh =

Max (0, TotalTieGenSelfScheduleQuantity BQ’mdh +

TotalGenerationSelfScheduleQuantity BQ’mdh +

TotalImportSelfScheduleQuantity BQ’mdh +

BAHourlyDASelfScheduledMinimumLoadQuantity BQ’mdh -

BAHourlyDABalancedTORQuantityBmdh)

Note: All except BAHourlyDABalancedTORQuantityBmdhwill be business drivers.

### TotalLoadUpliftObligationInterSCTradeFromForIFMTier1 BQ’mdh =

Sum (s) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

BAHrlyIFMLoadUpliftObligationsInterSCTradeFromQty BQ’smdh

Else

0

End If}

### TotalImportSelfScheduleQuantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, V, L’, W’, R’, F’, S’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

DASelfSchedule BrtQ’uT’I’M’VL’W’R’F’S’mdhcif

Else

0

End If}

Where Resource Type (t) = ITIE And Entity Component Type (F’) = INTERTIE

### TotalTieGenSelfScheduleQuantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, V, L’, W’, R’, F’, S’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

DASelfSchedule BrtQ’uT’I’M’VL’W’R’F’S’mdhcif

Else

TotalTieGenSelfScheduleQuantity BQ’mdh = 0

End If}

Where Resource Type (t) = ITIE and Entity Component Type (F)’ = TG or ‘HYBD’

### BAHourlyDASelfScheduledMinimumLoadQuantity BQ’mdh =

Sum (r, t, F’, S’) {

If IFMCAISOCommitPeriod BrtF’S’mdh= 1

Then

0

Else

TotalDAMinimumLoadQuantity BrtQ’F’S’mdh

End If}

### TotalDAMinimumLoadQuantity BrtQ’F’S’mdh =

Sum (u, T’, I’, M’, V, L’, W’, R’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

DAMinimumLoadQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdhcif

Else

0 End If}

### TotalGenerationSelfScheduleQuantity BQ’mdh =

Sum (r, t, u, T’, I’, M’, V, L’, W’, R’, F’, S’, c, i, f) {

If IFMBCRTier1ExemptionFlag Bmd <> True

Then

DASelfSchedule BrtQ’uT’I’M’VL’W’R’F’S’mdhcif

Else

0

End If}

Where Resource Type (t) = GEN

### IFMVirtualDemandAwardUpliftObligation BQ’mdh =

( BAHourlyDANetPositiveVirtualDemandAwardQuantity BQ’mdh /

BAATotalHourlyDANetPositiveVirtualDemandAwardQuantity Q’mdh ) \*

IFMSystemWideVirtualDemandAwardUpliftObligationQ’mdh

### BAATotalHourlyDANetPositiveVirtualDemandAwardQuantity Q’mdh =

Sum (B) {BAHourlyDANetPositiveVirtualDemandAwardQuantity BQ’mdh }

### BAHourlyDANetPositiveVirtualDemandAwardQuantity BQ’mdh =

Max (0,

( (-1) \* BAHourlyDAVirtualDemandAwardQuantity BQ’mdh ) –

BAHourlyDAVirtualSupplyAwardQuantity BQ’mdh )

### IFMSystemWideVirtualDemandAwardUpliftObligation Q’mdh =

Max (0,

( (-1) \* BAATotalHourlyDAVirtualDemandAwardQuantity Q’mdh ) -

BAATotalHourlyDAVirtualSupplyAwardQuantity Q’mdh +

BAAHourlyMeasuredDemandAbovePhysicalDemand Q’mdh)

### BAAHourlyMeasuredDemandAbovePhysicalDemand Q’mdh =

Min (0,

(BAAHourlyDAPhysicalDemandAward Q’mdh +

CAISOHourlyDAGrossMeasuredDemand mdh) )

Where Q’ = “CISO”

### BAAHourlyDAPhysicalDemandAward Q’mdh =

Sum (B, r, t, u, T’, I’, M’, F’, S’, c, i, f) { (-1) \* SettlementIntervalDayAheadEnergy BrtQ’uT’I’M’F’S’mdhcif }

Where Resource Type (t) = LOAD or ETIE

### TotalIFMCapacityQ’mdh =

Sum (B, r, t, u, T’, I’, M’, V, L’, W’, R’, F’, S’) {DACommittedGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh +

DACommittedTieGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh +

DACommittedSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh+

DACommittedNonSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh+

DACommittedRegUpBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh }

### DACommittedRegUpBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh =

DAAwardedRegUpBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh\*

IFMCAISOCommitPeriod BrtF’S’mdh

### DACommittedNonSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh =

DAAwardedNonSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh\*

IFMCAISOCommitPeriod BrtF’S’mdh

### DACommittedSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh =

DAAwardedSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh\*

IFMCAISOCommitPeriod BrtF’S’mdh

### DACommittedTieGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh =

 DAScheduleEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdhcif\*

IFMCAISOCommitPeriod BrtF’S’mdh

Where Resource Type t = ITIE and Entity Component Type F’ = TG or ‘HYBD’

### DACommittedGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh =

 DAScheduleEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdhcif\*

IFMCAISOCommitPeriod BrtF’S’mdh

Where Resource Type t = GEN

### IFMCAISOCommitPeriod BrtF’S’mdh =

If HourlyResourceIFMCAISOCommitPeriod BrtF’S’mdh> 1

Then

IFMCAISOCommitPeriod BrtF’S’mdh = 1

Else

IFMCAISOCommitPeriod BrtF’S’mdh = 0

### HourlyResourceIFMCAISOCommitPeriod BrtF’S’mdh =

SettlementIntervalIFMCAISOCommitPeriod BrtF’S’mdhcif

## Outputs

| Row # | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
|  | IFMBCRTier1Charge BQ’mdh | Tier 1 IFM Bid Cost Recovery Charge amount (in U.S. $) for a given Business Associate and Trading Hour. |
|  | IFMTier1UpliftRate Q’mdh | IFM Tier 1 Uplift rate (in U.S. $ per MWh) for a given Trading Hour. |
|  | IFMObligationRate Q’mdh | Ratio (in U.S. $ per MWh) of Net IFM Bid Cost Uplift divided by the Total IFM Load Uplift Obligations for all Scheduling Coordinators and IFM system-wide Virtual Demand Award uplift obligation for a given Trading Hour. |
|  | BAATotalIFMLoadAndVirtualDemandObligation Q’mdh | Per BAA, total IFM Load Uplift Obligations and IFM system-wide Virtual Demand Award uplift obligation (in MWh) for all Scheduling Coordinators for a given Trading Hour. |
|  | IFMPhysicalLoadRate Q’mdh | Per BAA ratio (in U.S. $ per MWh) of Net IFM Bid Cost Uplift divided by the maximum of a) sum of IFM Load Uplift Obligations or b) sum of DA generation and upward AS Awards from CAISO-committed resources for a given Trading Hour. |
|  | BAAHrlyTotalIFMUpliftAmount Q’mdh | The total IFM Bid Cost Uplift amount (in U.S. $) allocated between CC6636 and CC6637 for a given Trading Hour. |
|  | BAATotalIFMLoadUpliftObligation Q’mdh | Sum of all IFM Load Uplift Obligation quantities (in MWh) for a given Trading Hour. |
|  | IFMTier1UpliftObligation BQ’mdh | Tier 1 IFM Bid Cost Recovery bill quantity (in MWh), represented as IFM Load Uplift Obligations plus the IFM system-wide Virtual Demand Award uplift obligation, for a given Business Associate and Trading Hour. |
|  | IFMLoadUpliftObligation BQ’mdh | IFM Load Uplift Obligation quantity (in MWh) for a given Business Associate and Trading Hour. |
|  | DADemand BQ’mdh | Total scheduled Day Ahead Demand (in MWh), including load obligation trades, for a given Business Associate and Trading Hour. |
|  | BAHourlyDABalancedTORQuantityBmdh | Balanced DA TOR quantity (in MWh) for a given Business Associate and Trading Hour,represented as the lower of balance sink and balanced source quanitites. |
|  | TotalDATORSinkQuantity Bmdh | Total valid and balanced DA TOR Quantities (in MWh) associated with load and export resources for a given Business Associate and Trading Hour. |
|  | TotalLoadUpliftObligationInterSCTradeToForIFMTier1 BQ’mdh | Total IFM Load Uplift Obligation trades (in MWh SOLD) for a given Business Associate and Trading Hour. |
|  | TotalExportSelfScheduleQuantity BQ’mdh | Total Day Ahead Self-Schedule export quantity (in MWh) for a given Business Associate and Trading Hour. |
|  | BAHourlyDAPumpEnergyForIFMTier1Quantity BQ’mdh | Total Day Ahead Pumping Energy quantity for a given Business Associate and Trading Hour. |
|  | TotalLoadScheduleQuantity BQ’mdh | Total Day Ahead scheduled load quantity (in MWh) for a given Business Associate and Trading Hour. |
|  | DASource BQ’mdh | Total scheduled Day Ahead Generation Energy (in MWh), including load obligation trades, for a given Business Associate and Trading Hour. |
|  | TotalDATORSourceQuantity Bmdh | Total valid and balanced DA TOR Quantities (in MWh) associated with generation and import resources for a given Business Associate and Trading Hour. |
|  | TotalLoadUpliftObligationInterSCTradeFromForIFMTier1 BQ’mdh | Total IFM Uplift Load Obligation trades (in MWh BOUGHT) for a given Business Associate and Trading Hour. |
|  | TotalImportSelfScheduleQuantity BQ’mdh | Total Day Ahead Self-Schedule import quantity (in MWh) for a given Business Associate and Trading Hour. |
|  | TotalTieGenSelfScheduleQuantity BQ’mdh | Total Day Ahead Self-Schedule energy quantity (in MWh) attributed to Resource-Specific System Resources for a given Business Associate and Trading Hour. |
|  | BAHourlyDASelfScheduledMinimumLoadQuantity BQ’mdh | Day Ahead Minimum Load Energy (in MWh) attributed to Day Ahead Self-Schedule Energy for a given Business Associate and Trading Hour. |
|  | TotalDAMinimumLoadQuantity BrtQ’F’S’mdh | Total Day Ahead Minimum Load quantity (in MWh) for a given resource and Trading Hour. |
|  | TotalGenerationSelfScheduleQuantity BQ’mdh | Total Day Ahead Self-Schedule energy quantity (in MWh) attributed to Generator resources for a given Business Associate and Trading Hour. |
|  | IFMVirtualDemandAwardUpliftObligation BQ’mdh | The IFM Virtual Demand Award component (in MWh) of the IFM uplift obligation quantity for a given Business Associate and Trading Hour. |
|  | BAATotalHourlyDANetPositiveVirtualDemandAwardQuantity Q’mdh | The net positive difference (in MWh) between the total DA Virtual Demand Award quantity and the total DA Virtual Supply Award quantity (with both quantities being positive-valued) over the BAA for a given Trading Hour. |
|  | BAHourlyDANetPositiveVirtualDemandAwardQuantity BQ’mdh | The net positive difference (in MWh) between the total DA Virtual Demand Award quantity and the total DA Virtual Supply Award quantity (with both quantities being positive-valued) over the BAA for a given Business Associate and Trading Hour. |
|  | IFMSystemWideVirtualDemandAwardUpliftObligation Q’mdh | Total IFM Virtual Demand Award Uplift Obligation quantity (in MWh) over the BAA for a given Trading Hour. |
|  | BAAHourlyMeasuredDemandAbovePhysicalDemand Q’mdh | The net negative difference (in MWh) between the total DA Physical Demand quantity and the total Measured Demand quantity (with both quantities being positive-valued) over the BAA for a given Trading Hour. For MSS entities the CAISO Metered Demand component of Measured Demand is not netted with Supply, regardless of the MSS gross/net settlement option selection. |
|  | BAAHourlyDAPhysicalDemandAward Q’mdh | The total DA Physical Demand award (in MWh) over the BAA for a given Trading Hour. |
|  | TotalIFMCapacity Q’mdh | Total DA Schedule Energy and Upward AS Capacity (in MWh) committed by CAISO in the IFM for a given Trading Hour. |
|  | DACommittedRegUpBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Awarded DA Regulation Up capacity (in MW) attributed to a resource and Trading Hour for which the resource was committed by CAISO in IFM to provide the capacity. |
|  | DACommittedNonSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Awarded DA Non-Spinning Reserve capacity (in MW) attributed to a resource and Trading Hour for which the resource was committed by CAISO in IFM to provide the capacity. |
|  | DACommittedSpinBidCapacity BrtQ’uT’I’M’VL’W’R’F’S’mdh | Awarded DA Spinning Reserve capacity (in MW) attributed to a resource and Trading Hour for which the resource was committed by CAISO in IFM to provide the capacity. |
|  | DACommittedTieGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh | DA Schedule Energy (in MWh) attributed to a Resource-Specific System Resource and Trading Hour for which the resource was committed by CAISO in IFM to provide energy. |
|  | DACommittedGeneratorEnergyQuantity BrtQ’uT’I’M’VL’W’R’F’S’mdh | DA Schedule Energy (in MWh) attributed to a Generator resource and Trading Hour for which the resource was committed by CAISO in IFM to provide energy. |
|  | IFMCAISOCommitPeriod BrtF’S’mdh | Flag (0/1) indicating whether or not an IFM commitment period is an IFM CAISO Commitment for a given resource and Training Hour, where 1 represents CAISO commitment. |
|  | HourlyResourceIFMCAISOCommitPeriod BrtF’S’mdh | Summation (as an integer count) of SettlementIntervalIFMCAISOCommitPeriod BrtF’S’mdhcif flag for a given resource and Trading Hour. |

# Charge Code Effective Dates

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.0a | 04/01/09 | 04/30/10 | Documentation Edits Only |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.0b | 05/01/10 | 09/30/10 | Documentation Edits Only |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.0c | 10/01/10 | 01/31/11 | Documentation Edits Only |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.1 | 02/01/11 | 01/31/11 | Documentation Edits and Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.1a | 02/01/11 | 4/30/14 | Documentation Edits Only |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.2 | 05/01/14 | 9/30/14 | Documentation Edits and Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.3 | 10/01/14 | 6/30/15 | Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.4 | 7/1/15 | 12/31/20 | Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.4a | 1/1/21 | 6/30/23 | Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.5 | 7/1/23 | 4/30/26 | Configuration Impacted |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation | 5.6 | 5/1/26 | Open | Configuration Impacted |