Settlements & Billing

Configuration Guide: Wheel Export Quantity

Pre-calculation

 Version 5.6

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 5

3.3 Successor Charge Codes 5

3.4 Inputs - External Systems 5

3.5 Inputs - Predecessor Charge Codes or Pre-calculations 6

3.6 CAISO Formula 6

3.7 Outputs 11

4. Charge Code Effective Dates 15

# 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

The Wheeling export quantity pre-calculation calculates quantity for each low or high voltage export transaction at an Intertie in order to collect High Voltage Wheeling Access Charge allocation (CC 382) and Low Voltage Wheeling Access Charge allocation (CC 383). SCs that schedule Wheeling Out or Wheeling Through transactions to a Scheduling Point or Take-Out Point between the CAISO Controlled Grid and the transmission system of a Non-Participating Transmission Owner (Non-PTO), that is located within the CAISO Balancing Authority Area or another Balancing Authority Area provides the CAISO details of such transactions scheduled by them (other than transactions scheduled pursuant to Existing Contracts). The CAISO uses such information, which may be subject to review by the CAISO, to settle Wheeling Access Charges (WAC) and payments.

## Description

This calculation outputs the Wheeling export quantity for use in High Voltage Wheeling Access Charge allocation (CC 382) and Low Voltage Wheeling Access Charge allocation (CC 383). It considers both scheduled and Real-Time gross exports (excluding amounts exempted due to Existing Transmission Contracts (ETC) or resource specific exemptions) at an Intertie and is calculated daily based on hourly volumes, but aggregated, charged and allocated monthly in successor Charge Codes CC 382 and CC 383. All properly scheduled ETC, using the appropriate Contract Reference Number (CRN), are exempted from the Wheeling quantity based on exported volumes as are resource specific exemptions.

#  Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | WheelExportQuantity is calculated Daily byBusiness Associate IDB,Intertie ID Q, Resource Type t, PTO ID P, Trading Month m, Trading Day d, and Trading Hour h |
| 2.0 | Non PWT Schedules:WheelExportQuantity is defined as the maximum of either zero (0) or the difference between the BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity and NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity.Settlement for Priority-Wheeling-Through (PWT):Entities obtaining PWT pay the Wheeling Access Charges (WAC) for period across which ATC is reserved (i.e. allocated).* If the entity’s actual schedule (aka “usage”) is less than the allocated (i.e. awarded) PWT capacity, then the entity would pay WAC on the allocated capacity, rather than its actual schedule.
* If the entity’s actual schedule (aka “usage”) is greater than the allocated (i.e. awarded) PWT capacity, then the entity would pay WAC on actual schedule.
 |
| 3.0 | ResourceLayoffWheelExportQuantityExceptionFlag rt flags will only be created by RSRC\_ID and RSRC\_TYPE where exceptions exist and will be populated with an interval value of 1. It is further assumed that RSRC\_TYPE (t) will always be ‘ETIE’ |
| 4.0 | NonPTOMeteredLoadExceptionFlag Brt flags will only be created for BA/RSRC\_ID combinations where exceptions exist and will be populated with an interval value of 1. It is further assumed that RSRC\_TYPE (t) will always be ‘LOAD’ |
| 5.0 | Wheeling quantities for Take-Out Points are either:1. Submitted directly to Settlements from the SC via an interface utilizing the Pass Through Bill – calculation methodology. SCs submit values as one aggregated value for the month, per Take-Out Point. Settlements takes the aggregated monthly MW value and allocates it out equally to each Trading Day within the same Trading Month by creating daily PTB bill determinants
2. Metered and assessed a Wheeling charge against bill determinant BADispatchIntervalResourceNonPTOMeterLoadSubjectToWheelingQuantity
 |
| 6.0 | The CAISO accommodates daily submission of Wheeling Out and Wheeling Through data at the option of each Non-Participating TO. For the Non-Participating TOs that elect to participate in the early submission of this data, the CAISO will accept the submission of their Load data in the same manner as currently submitted, except on a daily rather than a monthly basis. Once received, the CAISO will manually process the data for Settlement purposes. SCs will need to submit data in accordance with the posted Non-PTO data submission calendar.  Any data received after the expected deadline will go into the next scheduled statement. For those Scheduling Coordinators that do not want to submit the data daily, the current monthly process will remain in effect. CAISO Tariff Section 26.1.4.4 sets the deadline for submitting the data at five days after the end of the Trading Month. These submittal deadlines are also specified in the Non-PTO submission calendar. The existing tariff language allows the data to be submitted earlier, but not later than the deadline. |
|  |  |
| 7.0 | Settlements receives both the original purchaser and the Wheeling Priority Quantity as well as the MW resold to purchaser.  Each of these MWs will be consumed by settlement but used differently. The Original Wheeling Priority SC should be charged WAC for the Maximum of  Wheeling Priority Quantity and scheduled export.  While the purchaser of the resale Wheeling Priority Quantity should be assessed WAC on the maximum of schedule export less purchased Wheeling priority MW and zero.  |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-Calculation / ETC Pre-Calc |
| System Resource Deemed Delivered Energy Quantity |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 383 – Low Voltage Wheeling Allocation |
| CC 382– High Voltage Wheeling Allocation |

## Inputs - External Systems

| Row # | Variable Name | Description |
| --- | --- | --- |
| 1 | VoltageLevelIndicator Q | Voltage level indicator by Intertie ID Q |
| 2 | TakeOutPointWheelExportQty BQPJmd | Take Out Point Wheeling export quantityby Business Associate B, Intertie ID Q, PTO ID P, PTB ID J, Trading Month m, Trading Day d |
| 3 | ResourceLayoffWheelExportQuantityExceptionFlag rt | Resource layoff Wheeling export quantity exception flag for Resource ID r, Resource Type t |
| 4 | BADispatchIntervalResourceNonPTOMeterLoadSubjectToWheelingQuantity BrtQPNmdhcif | Metered Non-PTO Load quantity subject to Wheeling charges  |
| 5 | NonPTOMeteredLoadExceptionFlag Brt | Non-PTO metered Load exception flag  |
| 6 | BAHourlyATCReservationIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh | Required for Settlement of Priority-Wheeling-Through (PWT). The ATC allocated (i.e awarded) at a specific intertie(-) |
| 7 | BAHourlyATCReservationResaleIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh | Reflects the resale of Priority-Wheeling-Through (PWT) MW resold to purchaser. BA ID reflects the purchaser of the resale Wheeling Priority Quantity (-) |

## Inputs - Predecessor Charge Codes or Pre-calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
| 1 | BASettlementIntervalFinalBalancedContractAtScheduleQuantity BrtNmdhcif | Pre-Calculation / ETC Pre-Calc |
| 2 | SettlementIntervalDeemedDeliveredInterchangeEnergyQuantity BrtEuT’I’Q’M’AA’F’R’pPW’QS’d’Nz’OVvHn’L’mdhcif | System Resource Deemed Delivered Energy Quantity |
| 3 | BASettlementIntervalFinalBalancedContractHVACMeterQuantityBrtNmdhcif | System Resource Deemed Delivered Energy Quantity |

## CAISO Formula

The ISO formula for Wheeling export quantity by Business Associate ID B, Intertie ID Q, Resource type t, Trading Month m, Trading Day d, and Trading Hour h is as follows:

#### IF

* + - 1. VoltageLevelIndicator Q = 0
			2. THEN
			3. BusinessAssociateDailyIntertieLowVoltageWheelExportQuantity BQmd =   WheelExportQuantity BtQPmdh
			4. ELSE
			5. BusinessAssociateDailyIntertieLowVoltageWheelExportQuantity BQmd = 0

#### IF

* + - 1. VoltageLevelIndicator Q = 0
			2. THEN

BusinessAssociateDailyTakeOutPointLowVoltageWheelExportQuantity BQmd =  (BADayIntertieTOPWheelExportNormalizedPTBQuantity BPQmd+ BADayNonPTOTakeOutPointMarketDataExportQtyLessETCQuantityBPQmd )

* + - 1. ELSE
			2. BusinessAssociateDailyTakeOutPointLowVoltageWheelExportQuantity BQmd = 0

BusinessAssociateDailyIntertieLowOrHighVoltageWheelExportQuantity BQmd = ** WheelExportQuantity BtQPmdh

BusinessAssociateDailyTakeOutPointLowOrHighVoltageWheelExportQuantity BQmd =  (BADayIntertieTOPWheelExportNormalizedPTBQuantity BPQmd+ BADayNonPTOTakeOutPointMarketDataExportQtyLessETCQuantityBPQmd )

* + - 1. WheelExportQuantity BtQPmdh = WheelExportPWTQuantity BtQPmdh + WheelExportPWTResaleQuantity BtQPmdh + ExistingWheelExportQuantity BtQPmdh
			2. WheelExportPWTQuantity BtQPmdh = sum(r,E,u,T’,I’,Q’,F’,M’,A,A’,R’,p,W’,S’,d’,N,z’,O,V,v,H,n’,L’,c,i,f)

Min(0, INTSUM(PWTWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif), BAHourlyATCReservationIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh)

Note: BAHourlyATCReservationIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh and PWTWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif will both be selected as business drivers

* + - 1. WheelExportPWTResaleQuantity BtQPmdh = 

min (0, (INTSUM(BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif) -BAHourlyATCReservationResaleIntertieQty BrtEuT’I’Q’ F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh))

Where Resource Type (t) =”ETIE”

Note: The following BD will be utilized as the sole business driver to ensure that this equation is derived only for the purchaser of the resale Wheeling Priority Quantity:

BAHourlyATCReservationResaleIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh

* + - 1. ExistingWheelExportQuantity BtQPmdh = sum(r,E,u,T’,I’,Q’,F’,M’,A,A’,R’,p,W’,S’,d’,N,z’,O,V,v,H,n’,L’,c,i,f) Min(0, BaseWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif - ResaleWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif - PWTWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif)
			2. PWTWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif =

min (0, BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif - NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif))

Where Resource Type (t) =”ETIE”

AND

ResourceLayoffWheelExportQuantityExceptionFlag rt <>1

Note1: Exception Flag will only be created for instances where resource specific exemptions exist.

Note2: The BAHourlyATCReservationIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh will be the sole matrix building business driver

* + - 1. NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif =
			2. BASettlementIntervalFinalBalancedContractAtScheduleQuantity BrtNmdhcif
			3. (BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcifwill not appear in the formula but will be used to build the matrix with required attributes)
			4. Where Resource Type (t) =”ETIE”
			5. BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif=ATTRIBUTESWAP(SettlementIntervalDeemedDeliveredInterchangeEnergyQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif)
			6. Where Q’ =”CISO”
			7. NOTE: The attributeswap function will be utilized in order to swap the PTO\_ID attribute position on the input over to the PTO\_ID attribute position on the output.
			8. BADayIntertieTOPWheelExportNormalizedPTBQuantity BPQmd= **** TakeOutPointWheelExportQty BQPJmd

#### BADayNonPTOTakeOutPointMarketDataExportQtyLessETCQuantity BPQmd=  BASettlementIntervalNonPTOTakeOutPointMarketDataExportQtyLessETCQuantity BPQmdhcif

#### BASettlementIntervalNonPTOTakeOutPointMarketDataExportQtyLessETCQuantity BPQmdhcif=Min (0, BADispatchIntervalResourceNonPTOMeterLoadSubjectToWheelingQuantity BrtQPNmdhcif - BASettlementIntervalFinalBalancedContractHVACMeterQuantity BrtNmdhcif )

* + - 1. Where
			2. NonPTOMeteredLoadExceptionFlag Brt <> 1
			3. ResaleWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif =

min (0, BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif - NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif))

Where Resource Type (t) =”ETIE”

AND

ResourceLayoffWheelExportQuantityExceptionFlag rt <>1

Note1: Exception Flag will only be created for instances where resource specific exemptions exist.

Note2: BAHourlyATCReservationResaleIntertieQty BrtEuT’I’Q’F’M’AA’R’pPW’QS’d’Nz’OVvHn’L’mdh

will be the sole business driver

* + - 1. BaseWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif =

min (0, BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif - NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif))

Where Resource Type (t) =”ETIE”

AND

ResourceLayoffWheelExportQuantityExceptionFlag rt <>1

Note1: Exception Flag will only be created for instances where resource specific exemptions exist.

Note2: BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif is the sole business driver

## Outputs

| Output ID | Name | Description |
| --- | --- | --- |
| 1 | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
| 2 | NormalizedETCPrecalcSettlementIntervalValueByContractReferenceNumberQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif | Normalized ETC pre-calculation By utilizing the deemed delivered quantity input as business driver, the ETC PC input quantity will be associated with all of the deemed delivered quantity attributes that it does not already carry.This way, when the ETC quantity is later subtracted from the deemed delivered quantity, they will share the same attribute set |
| 3 | BusinessAssociateSettlementIntervalResourceDeemedDeliveredSwapQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif | Business Associate Dispatch Interval resource deemed delivered swap quantity This formula exists to swap the PTO\_ID which the input from the System Resource PC carries at attribute position 28 to attribute position 20 where the Charge Group associated with this PC carries PTO\_ID |
| 4 | WheelExportQuantity BtQPmdh | Summation of the Wheeling Export quantities that will be assessed a Wheeling charge at the Intertie (not Take-Out Point)WheelExportPWTQuantity BtQPmdh will only reflect PWT transactions. WheelExportPWTResaleQuantity BtQPmdh will only ever reflect resale transactionsExistingWheelExportQuantity BtQPmdh will only reflect non-zero interval values for existing export transactions.  |
| 5 | BusinessAssociateDailyIntertieLowVoltageWheelExportQuantity BQmd | The Wheeling quantity that will be assessed charges at a specific low voltage Intertie. Per BA |
| 6 | BusinessAssociateDailyTakeOutPointLowVoltageWheelExportQuantity BQmd | The Wheeling quantity that will be assessed charges at a specific low voltage Take-Out Point. Per BA |
| 7 | BusinessAssociateDailyIntertieLowOrHighVoltageWheelExportQuantity BQmd | Total Wheeling quantity per BA that will be assessed a Wheeling charge at either high or low voltage Intertie (not Take-Out Point) |
| 8 | BusinessAssociateDailyTakeOutPointLowOrHighVoltageWheelExportQuantity BQmd | Total Wheeling quantity per BA that will be assessed a Wheeling charge at either high or low voltage Take-Out Point |
| 9 | BADayIntertieTOPWheelExportNormalizedPTBQuantity BPQmd | This formula processes the manually submitted PTB Non-PTO Wheeling quantity. This formula exists to sum over the PTB\_ID as this attribute will conflict with the attribute set of the metered Non-PTO Wheeling quantity which does not carry PTB\_ID. These two values will be summed in a later calculation. They actually never do 'sum' as they are both mutually exclusive. The 'sum' exists as a means to pass one or the other out to the output |
| 10 | BADayNonPTOTakeOutPointMarketDataExportQtyLessETCQuantity BPQmd | This formula exists to roll up the 5 minute Non-PTO Wheeling export quantity for the day |
| 11 | BASettlementIntervalNonPTOTakeOutPointMarketDataExportQtyLessETCQuantity BPQmdhcif | This formula subtracts Non-PTO ETC quantities from metered Non-PTO Load quantities. Since the metered Non-PTO Load quantity bill determinant is selected as the business driver, this ensures that the matrix will only be built for Non PTO Load quantities and not Interties. As a result, only ETCs tied to these same resources will be evaluated in the equation.Since both inputs are negative, the 'Min' function is used to ensure that a 'positive' value is never passed to the output.The exception flag excludes Non-PTO Loads with qualified exemptions. |
| 12 | WheelExportPWTResaleQuantity BtQPmdh | The purchaser of the resale Wheeling Priority Quantity will be assessed WAC on the maximum of schedule export less purchased Wheeling priority MW and zero. However, since all inputs are (-), the Min function will achieve the results required of the requirement.The output will only ever reflect Resale transactionsThis Wheeling quantity will in subsequent charge codes be assessed a Wheeling charge at the associated Intertie |
| 13 | WheelExportPWTQuantity BtQPmdh | The maximum of the ATC Reservation Quantity or the PWT Wheel Export Quantity results in the Wheeling quantity that will in subsequent charge codes be assessed a Wheeling charge at the associated IntertieHowever, since all inputs are (-), the Min function will achieve the results required of the requirement.Reflects only PWT transactions |
|  | BaseWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif | This formula derives Existing, Resale, and PWT Wheeling Export quantities. Since Export quantities associated with PWT and Resale transactions have already been accounted for separately in other calculations they will need to be subtracted out from this equation in a subsequent calculation so as to reflect only Existing Wheeling Export quantities |
|  | ResaleWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif | Equation determines which Wheeling export quantities were associated with Resale transactionsNote: For any Resale transaction there may possibly have been no associated scheduled export. Not likely, but possible.It is not expected that Resale transactions will be associated with ETCs or Layoffs. Absence of these inputs will have no detrimental impact on the equation.  |
|  | PWTWheelExportQuantity BrtEuT’I’Q’F’M’AA’R’pPW’S’Qd’Nz’OVvHn’L’mdhcif | Equation determines which Wheeling export quantities were associated with PWT transactionsNote: For any PWT transaction there may possibly have been no associated scheduled export. Not likely, but possible.It is not expected that Resale transactions will be associated with ETCs or Layoffs. Absence of these inputs will have no detrimental impact on the equation. |
|  | ExistingWheelExportQuantity BtQPmdh | The input BaseWheelExportQuantity *BtQPmdh* reflects Existing, Resale, and PWT Wheeling Export quantities. Since PWT and Resale transactions have already been accounted for separately in other calculations they will need to be subtracted out from this value in this equation so the output of this formula can reflect only Existing Wheeling Export quantities.This Wheeling quantity will in subsequent charge codes be assessed a Wheeling charge at the associated Intertie |

# Charge Code Effective Dates

| Charge Code/Pre-calc Name | DocumentVersion | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CG PC Wheel Export Quantity | 5.0 | 04/01/09 | 4/30/10 | Documentation Edits Only |
| CG PC Wheel Export Quantity | 5.1 | 05/01/2010 | 03/31/09 | Configuration and Documentation Edits |
| CG PC Wheel Export Quantity | 5.2 | 04/01/09 | 12/31/10 | Configuration and Documentation Edits |
| CG PC Wheel Export Quantity | 5.3 | 1/1/2011 | 4/30/2014 | Configuration and Documentation Edits |
| CG PC Wheel Export Quantity | 5.4 | 5/1/2014 | 10/31/2014 | Configuration and Documentation Edits |
| CG PC Wheel Export Quantity | 5.5 | 11/1/2014 | 05/31/2024 | Configuration Impacted |
| CG PC Wheel Export Quantity | 5.6 | 06/01/2024 | Open | Configuration Impacted |