



# Business Requirements Specification

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## Greenhouse Gas Emission Cost Model Enhancement in EIM

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## Revision History

Date	Version	Description
5/18/2018	2.0	Update BRS based on 3 <sup>rd</sup> Draft Final Proposal
9/10/2018	2.2	<i>Change in RED</i> <i>Clarification GHG_BRQ003 adjust UEL to exclude the capacity for AS</i>

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# 1. Introduction

## 1.1 Purpose

The purpose of this document is to capture and record a description of what the Users and Business Stakeholders of the project wish to obtain by providing high-level business requirements. This document establishes the basis for the agreement between the initiators and implementers of the project. The information in this document serves as input to determining the scope of projects and to all Business Process Modeling and System Requirements Specifications efforts.

## 1.2 References

[EIM Greenhouse Gas Enhancements 3<sup>rd</sup> Revised Draft Final Proposal](#)

# 2. Intellectual Property Ownership

Intellectual property covers a broad array of information and materials, including written works, computer programs, software, business manuals, processes, symbols, logos, and other work products. Determining ownership of intellectual property is very important in preserving rights of the California ISO and helps to avoid intellectual property infringement issues. In considering the business requirements or service requirements to be performed, the business owner of the project must determine intellectual property ownership.

## 2.1 Checklist

The California ISO assumes the ownership of

- Design of GHG model
- Related Business Practice Manual
- Software codes to implement the GHG model

# 3. Details of Business Need/Problem

## 3.1 Description

Energy generated in California or imported into the state to serve California load is subject to California's greenhouse gas (GHG) regulations adopted by the Air Resources Board (ARB). Under these regulations, the compliance obligations apply to first deliverers – generation owners or electricity importers. In the context of the western Energy Imbalance Market (EIM), participating resource scheduling coordinators are considered electricity importers if their resource(s) are

dispatched to serve load in the California ISO (CAISO). These entities have a GHG compliance obligation under California’s GHG regulations.

**The problem:**

The CAISO’s least-cost dispatch can have the effect of attributing transfers to serve CAISO load to lower-emitting EIM participating resources because these resources face fewer or no costs to comply with ARB’s regulations. In some instances, higher-emitting resources will need “to backfill” this dispatch to serve EIM load outside of the CAISO. The CAISO refers to this phenomenon as secondary dispatch.

**The proposed solution:**

The CAISO proposes to adjust its solution to address emissions associated with secondary dispatch. The CAISO will limit the GHG bid quantity of EIM participating resources to the MW value between the EIM participating resource’s base schedule and the resource’s upper economic limit (UEL). Since the GHG bid quantity is now limited, this will change the market dispatch to identify other EIM participating resources that have available capacity above their base schedule to support EIM transfers into CAISO to serve CAISO demand. The GHG emissions of these resources will now be appropriately reflected in the market attribution.

The CAISO decided to withdraw the two-pass solution previously proposed.

**Table A** reflects how the CAISO has addressed and proposes to address EIM participating resource’s GHG bid quantities and GHG bid prices.

	<b>GHG Bid Quantity</b>	<b>GHG Bid Price</b>
<b>At outset of EIM</b>	Pmax of resource	< \$1,000 less Energy bid
<b>Year One Enhancement</b>	0 MW to Pmax	< Resource daily GHG cost plus 10%
<b>Current Proposal</b>	0 MW to upper economic limit less base schedule	< Resource daily GHG cost plus 10%

## 4. Business Process Impacts

### 4.1 High Level Description of Business Process

<b>Process</b>	<b>Description of Impact(s)</b>
Manage Real Time Market	Change is in the market application. GHG allocation is limited by UEL-Base schedule.

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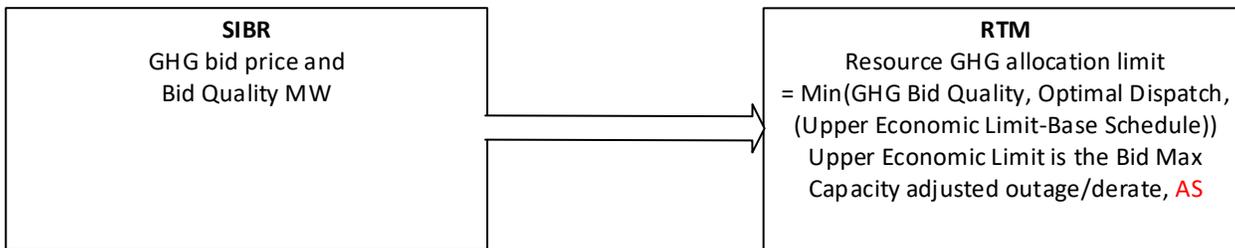
## 4.2 System:

System Impact:	Description:
RTM (RTPD, RTD, RTCD)	Yes:  Enforce Limit GHG MW Allocation = min ( GHG MW bid, Optimal Dispatch, Upper Economic Limit – base schedule)  Upper Economic limit shall consider the outages/derate, <b>Ancillary Services (AS) Capacity</b>
MF	No
SIBR	No
CMRI	No
Settlement	No

## 4.3 Business Practice Manual (BPM):

BPM	Description of Impact(s)
Energy Imbalance Market (EIM)	Yes: section 11.3.3.2

## 4.4 Visual Aides



## 4.5 Assumptions & Constraints

1	The proposal builds on existing GHG bid adder design and results in a more accurate attribution of EIM resource to serve CAISO demand.
2	The proposal limits EIM participating resources' GHG bid quantity to reduce the potential magnitude of secondary dispatch, but does not eliminate this potential.
3	Support for multiple GHG programs in the West will be discussed once another state places a GHG compliance obligation on supply resources.
4	Day-ahead GHG design will be discussed further in the CAISO's stakeholder initiative examining extension of the day-ahead market to EIM entities.

## 4.6 Justification

Modify GHG design for attributing which EIM participating resources serve CAISO load so that EIM more accurately reflects dispatch of resources to support CAISO demand.

## 5. Business Requirements

The sections below describe the Business Processes and the associated Business Requirements involved in the project. These may represent high level functional, non-functional, reporting, and/or infrastructure requirements. These business requirements directly relate to the high level scope items determined for the project.

Impact Systems:

**SIBR:**

- No change for Market Participants to submit GHG bid price and quantity,

**RTM:**

- EIM participating resource Upper Economic Limit (UEL) is adjusted according to the outage and derate, **Ancillary Services (AS) capacity**
- Enforce limit for EIM participating resource GHG allocation = min(GHG Bid MW, Optimal Dispatch, Upper Economic Limit-Base Schedule)

No change in Settlements.

### 5.1 Business Process: Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
GHG_BRQ001	System shall allow EIMPR resources to submit GHG Bid Price and Quality through SIBR existing function  System will not add new validation rule for the GHG bid quality.	Core Existing Function	SIBR

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
GHG_BRQ003	<p><b>System shall calculate UEL according to the outage and derate, and adjusted for the Ancillary Services Capacity</b></p> <ul style="list-style-type: none"> <li>System shall calculate the UEL adjust EIMPR energy bid max according to the outage and derate</li> <li><b>UEL shall be adjusted to exclude the capacity reserved for Regulation Up EIM Available Balancing Capacity(ABC), Spin and Non Spin Capacity</b></li> </ul>	Core	RTM, OMS
GHG_BRQ004	<p>Run the market normal optimization model for GHG allocation limited by the GHG bid capacity, the optimal dispatch, and the difference between the upper economic limit and the base schedule:</p> $0 \leq \hat{G}_i \leq \min(G_{GHGi}, G_i, UEL_i - BS_i), \forall i \notin CA$ <p> <math>\hat{G}_i</math> GHG allocation of resource <math>i</math>  <math>G_{GHGi}</math> GHG bid capacity of resource <math>i</math>  <math>G_i</math> optimal dispatch of resource <math>i</math>  <math>UEL_i</math> Upper Economic Limit of resource <math>i</math>  <math>BS_i</math> Base Schedule of resource <math>i</math>  <math>\forall i \notin CA</math> Resource <math>i</math> not belong to CA         </p>	Core	STUC, RTPD, RTD, RTCD