



California ISO

Greenhouse Gas: Accounting and Reporting Straw Proposal

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California Independent System Operator

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Executive Summary

In August of 2023, the Greenhouse Gas (GHG) coordination working group began work to evolve the current Extended Day Ahead Market (EDAM) and Western Energy Imbalance Market (WEIM) GHG design. The working group reached consensus that a solution for states and utilities that have climate policies or corporate commitments not based on a price of carbon is ready to move forward from the working group phase to policy development. The approach suggested by stakeholders is to account for the energy and emissions for which an entity is responsible termed as the “Accounting and Reporting” approach.

This Straw Proposal outlines the background of the issue as well as the approach suggested by the GHG coordination working group, and refined by a sub-group of volunteers from the working group. This approach does not affect market dispatch, rather it is an after-the-fact report of generation an entity owns and contracts for that ultimately was dispatched. It also includes market purchases. Such a report can provide greater transparency into the emissions associated with the dispatch of an entity’s portfolio, and facilitate the calculation of a residual market emissions rate associated with unowned or unallocated resources. Ultimately, reporting entities can use this report to demonstrate how a combination of their ownership and contracting decisions along with market dispatch resulted in a given emission inventory.

This initiative will incorporate stakeholder input to inform either subsequent iterations of a Straw Proposal or a Draft Final Proposal, depending on the scale and scope of feedback received. The ISO plans to take this for a board briefing in September 2025 and aims to implement this report after EDAM go-live.

Background

Rather than setting a price on carbon, some states or local governments simply require that load serving entities (LSEs) rely on resources that meet lower emissions targets over time. Utilities may also have their own targets for emissions reductions goals. However, market participants do not currently have a way to reflect this limitation in the ISO's market.

Relatedly, some market participants do not have a more granular method than applying an unspecified source emissions rate to transfers to understand what constitutes the emissions intensity of the electricity serving their load. These unspecified rates are usually established by state regulations. This can result in emissions reports that assume all transfers are at an unspecified rate.

This straw proposal outlines the Accounting and Reporting approach as a potential way to calculate MW and emissions an entity is responsible for based on market dispatch to serve their load. This draft approach is intended as a tool for entities, regulators, and others for informational or compliance purposes and state or local regulators will determine whether or not it meets applicable requirements. This report is not intended to supplant or replace applicable regulatory requirements.

Current Challenges Faced by Entities with Non-priced Based Climate Policies

Leading up to the development of the problem statement, stakeholders discussed the challenges for entities facing a non-price based climate policy. Some of these challenges arise in states with climate policies not based on price; others encompass utility-specific climate goals. Challenges arise with relying on unspecified transfers to meet emissions reduction targets, the absence of a market mechanism to ensure supply does not exceed an emissions threshold, and relying solely on system energy to meet residual supply needs.

Unspecified transfers may make it difficult for some LSEs to show progress towards state climate goals which may result in self-scheduling

During the working group, stakeholders shared that participating in the ISO's market could undermine efforts to demonstrate their progress towards state climate goals. There are three drivers for this issue. First, for states and entities that do not have a price on carbon, there is not a way for the market optimization to incorporate their climate goal. Second, the unspecified source emissions rate assigned to energy imbalance purchases from the market under state rules may not accurately reflect the emissions profile of generation that serves that entity's load in all intervals. In the future, some stakeholder expressed concern that uncontracted low-emitting resources may receive attributions through the market optimization to serve load in areas with GHG pricing, thereby leaving higher emitting resources to support unspecified imports to a non-priced GHG area. This may cause state regulators to insist on a higher unspecified source emissions rate. Third, entities in states with GHG prices cannot limit the MWh of unspecified sources transfers that are economic to serve their area, outside of forward contracting. This concern may cause affected entities to reduce economic bidding

from market resources and instead self-schedule generation to ensure market dispatch in order to support compliance with the emissions targets. Reduced incentives to economically bid generation into the market could reduce the benefits of participating in EDAM or WEIM.

There is not a market mechanism to ensure that a state or LSE is only served by generation that does not exceed their emissions threshold

The market uses a least cost security constrained economic dispatch; it dispatches resources based on costs and constraints. Today there is neither a cost nor a constraint to reflect in the market for either states with climate policies not based on a price of carbon or for utilities to meet their own goals. Moreover, market participation occurs through Scheduling Coordinators (SCs) that submit bids for supply resources and load depending on the resources and LSEs they represent. The market settles transactions with SCs for metered supply resources and load but does not map specific resources to specific loads based on their bids. As a result, the market today cannot guarantee that a state or LSE is only served by generation that does not exceed their established emissions threshold on either a resource or aggregate basis.

The ISO's system looks at system energy

In a bilateral market, energy and associated attributes are bought and sold by counterparties and can be tracked. A key challenge with emissions tracking and a centralized electricity market is that some overlay is necessary to match supply and demand. The EDAM and WEIM GHG design does not determine what specific resource is serving what specific load. Instead, it determines only if a dispatched resource receives an attribution to serve a GHG Regulation Area through the use of bids. Pairing market results with contracts can be one way to link the financial and legal arrangements associated with market dispatch.

Stakeholder Drafted Problem Statement

In light of the challenges described above the working group developed the following problem statement:

The market lacks a mechanism that enables Load-Serving Entities and energy users to accurately account for energy and associated emissions used to serve load under regulatory and voluntary GHG reduction and clean energy goals. Sub-issues include:

- a. There is not a market mechanism in states with a declining cap on emissions for utilities to ensure load is served by generation and wholesale market transfers that meet those emissions reduction targets.*
- b. There is currently not a way to optimize a portfolio of resources at the EDAM Entity/ WEIM Entity/BAA/LSE level annually from a pre-market, in-market, or post-market perspective over the course of the year to adhere to state emissions targets.*

- c. *There is not a market mechanism in states with a declining cap on emissions to reflect both the declining cap and a price on carbon in the market for states that have both requirements.*

Objectives of the Accounting and Reporting Approach

During the working group phase, Stakeholders developed and discussed the following possible objectives for the Accounting and Reporting approach. The ISO is working to balance these objectives with the design of the Accounting and Reporting approach, and seeks feedback on the extent the straw proposals meets balancing these objectives.

Standardized tracking over time

A key objective of the Accounting and Reporting approach is to standardize emissions tracking to allow an entity, such as a market participant, to track progress towards its climate goals over time. This means associating the market dispatch with the entity's owned and contracted resources based on the market footprint the entity operates in. It also enables, to the extent practicable, attribution and assignment of energy from specific resources and associated emissions to states and/or individual market participants.

Accurately assign energy and associated emissions

The accuracy objective is to ensure the methodology only assigns energy and associated emissions to one entity and prevents any under or over counting of emissions.

More precisely account for transfers to a non-GHG regulation area

This objective seeks to have a more precise method to assign an emissions factor to transfers. For regions without GHG-pricing, the emissions rate of transfers is based on the state policies. For example, although Oregon is not a GHG region, it also assumes transfers occur at an unspecified resource rate.

In light of stakeholder requests, the ISO has also published an average emissions factor, which calculates on a five minute basis the emissions intensity of all resources operating in the market.¹

Accommodates different approaches for accounting for clean energy accounting

The report seeks to be modular enough to allow entities to tailor the market data they receive in alignment with state requirements or corporate goals.

No imposition on non-GHG regions

A key objective of overall GHG market design is not to unduly impact non-GHG regions with the policies of a GHG region (priced or non-priced). A benefit cited by proponents of the Accounting and Reporting approach is that as it is out-of-market. The approach does not impact merit order or costs. Additionally it does not impose requirements on states or entities without GHG reduction goals.

¹ CAISO. Average Emissions Rate Reports. Available at: <https://www.caiso.com/library/average-emissions-rate-reports>

Stakeholder Suggested Solution: Accounting and Reporting Approach

The objective of the Accounting and Reporting approach is to total the megawatts and greenhouse gas emissions a reporting entity is accountable for based on market dispatch in an emissions inventory report. Reporting entities² can use this report to demonstrate how a combination of their ownership and contracting decisions along with market dispatch resulted in a given emissions inventory. The approach also allows reporting entities choice in how MW and emissions are allocated³, during periods when their generation exceeds their own load. Options for allocating excess are either to the residual rate or, if applicable, to either the GHG pricing region or voluntary GHG region they are operating in. This sharing of excess is by design. If a reporting entity operates in either a GHG reporting region or voluntary climate region that has excess, and the reporting entity is a net purchaser for that market interval, it can first add in MW and emissions from the GHG pricing region or voluntary climate region before using the residual rate. This residual rate represents all unowned or unallocated MW and emissions. This can be visually represented in the calculation below:

Figure 1: Summary of the Accounting and Reporting Approach:

Approach: On a 5 minute basis, calculate:	
	Dispatched owned resources
+	Dispatched contracted resources
-	Attributed owned/contracted
+/-	Priced region GHG area adjustment
+/-	Voluntary climate region area adjustment
<hr/>	
Total	
If Total > Load	
-	Allocate excess to the residual rate
If Total < Load	
+	Add in @ residual rate
	<i>(considerations for null)</i>
<hr/>	
FINAL TOTAL	

For every five-minute market interval, the ISO will calculate the MW and emissions of what resources have been associated with a reporting entity (owned and contracted) were dispatched. The ISO will then

² Reporting Entities is a flexible term representing market participants (i.e., LSEs, federal power marketing administrations, etc.) that choose to use the Accounting and Reporting approach.

³ An allocation is an assignment of MW and emissions. This could be an allocation to a reporting entity, to a pricing region, to a voluntary climate region, or to the residual rate.

remove any resources that were attributed (i.e., receive a GHG award) as these resources are serving a GHG pricing region and not the entity's own load. There are then adjustments to allow sharing of excess depending on if the entity is in a GHG pricing region (i.e., modeled as either in California or Washington). This total will then be compared with the reporting entity's load. If the market has dispatched more of the reporting entity's portfolio as compared to load, any excess emissions are allocated to either the residual rate, GHG pricing region, or voluntary climate region. If load is greater than what the market has dispatched of the reporting entity's generation, then the MW and associated emissions are added to the reporting entity's account.

The accounting and reporting approach can be divided into three phases. First, in registration a reporting entity reflects their unique characteristics and resources that are owned and contracted. This enables the ISO to know what resources should be associated with the reporting entity, both owned and contracted, and over what period of time. Second, during the calculation phase the ISO calculates what MW and emissions a reporting entity is responsible for based on resources dispatched that were associated with their account. Third, in the reporting phase the ISO publishes, either privately to the reporting entity or publicly, information as a result of dispatch. These phases are discussed in greater detail below.

I. Registration

Reporting Entity Registration

Registration will allow a reporting entity to reflect their unique characteristics to the ISO. Registration will be an ongoing process ahead of the calculation process, in which the reporting entity will have the option to continually update the ISO with regards to which resources should be associated to their account, over what period of time, and with the characteristics of those resources. In addition, the ISO will perform calculations on a monthly basis to reflect how the given portfolio and dispatch information results in a given emissions inventory.

The reporting entity will share with the ISO what resources should be associated with their account. This includes owned and contracted resources. These resources will need to be registered in the ISO's Master File which contains fields to include possible applicable unit-specific information. The reporting entity will also reflect the time period of association for owned and contracted resources as well as if this is a resource that is partially owned or contracted.

For any partially owned or contracted resource associated with the reporting entity's account, the reporting entity will indicate their capacity ownership (MW) and dispatch assignment assumptions (i.e., what energy should be associated with a reporting entity). This can be updated on a daily basis. The reporting entity will either include the % that should be allocated or a fixed MW number. For example if a 100 MW resource is dispatched to 60MW, below are the allocations looking at an example of % allocation and MW allocation:

Figure 2: Partially owned capacity % allocation for energy dispatch

Assumptions:

- Entity A and B each have a 50% allocation for any energy dispatch
- A 100 MW shared capacity resource receives a 60MW award

	Entity A	Entity B
Capacity Assignment (MW)	50	50
Energy Assignment for the Accounting and Reporting Approach (MW)	30	30

Figure 3: Partially owned capacity MW allocation for energy dispatch

Assumptions:

- Entity A always receives the first 50MW of dispatch, Entity B is always allocated any remainder of dispatch
- A 100 MW shared capacity resource receives a 60MW award

	Entity A	Entity B
Capacity Assignment (MW)	50	50
Energy Assignment for the Accounting and Reporting Approach (MW)	50	10

The ISO will assume that the attribution allocation matches the energy allocation selected. This is relevant in the case the resource that is dispatched is serving a GHG region and receives a GHG attribution. Using the % allocation example above, the ISO will assume that if a resource had a 60 MW dispatch that Entity A is allocated 30 MW of energy; however, if that is attributed to a GHG pricing region, those 30 MW will be assigned to the GHG pricing region and thus 30 MW will be subtracted from their report, as those MW were serving a GHG pricing region. This ensures there is not double counting between in-market attribution and the energy allocation introduced in this accounting and reporting approach.

If the reporting entity has any out-of-market purchases or any WEIM non-participating resources that should be included, it will be up to the reporting entity to separately report these to the ISO. A WEIM non-participating resource is a resource that is in a WEIM BAA but does not participate in the WEIM's real time market. Both of these resource types are examples of resources that not reflected in the ISO's Master File. In these cases, the reporting entity will either indicate MW of dispatch and emissions factor

(EF) or indicate the MW of dispatch and the ISO will assume a default EF (*e.g., using eGRID⁴ state level data*).

If the reporting entity has any resources that should be considered null power, the reporting entity will flag these during the registration process. Null power is any generation from renewable resources that does not have a renewable energy credits (RECs) associated with it. The status may be updated if the resource is associated with a REC later on. Please also refer to Appendix A and CRS' proposal for null power reporting. The ISO is interested in stakeholder feedback on if null power reporting should be required or not.

Each reporting entity will also indicate assumptions for excess generation. The excess generation assumption identifies which resources will be associated with their account in instances of excess generation versus the residual rate or the GHG pricing region or voluntary climate region they operate in, if applicable. Options for excess generation include:

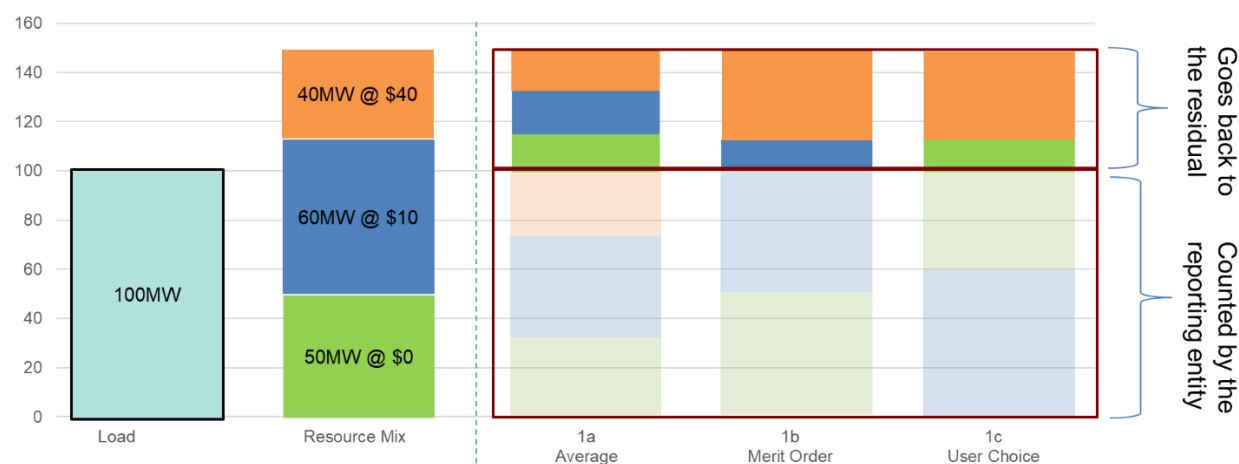
- i) Option A: Average;
- ii) Option B: Merit order / least cost dispatch (based on the combination of energy and GHG bids);
- iii) Option C: User Choice/Rank Order: In this option the reporting entity would provide the list of resources in order that should be associated with their report rather than the excess rate (*e.g., start with Resource A, then Resource B, then Resource C, etc.*)

For example, using Figure 4 below, if a reporting entity's load is 100 but the market dispatches their portfolio of resources that is associated with their account to 150 MW, the entity will have a choice of what is allocated to the reporting entity versus what goes back to the residual rate.

⁴ The Emissions & Generation Resource Integrated Database (eGRID) is a comprehensive source of data from EPA's Clean Air Power Sector Programs on the environmental characteristics of almost all electric power generated in the United States. As an example of the state level data please see:

https://www.epa.gov/system/files/documents/2025-01/egrid2023_summary_tables_rev1.xlsx

Figure 4: Reporting entity Allocation for Own Report vs. Residual Rate



The example above assumes the following MW of dispatch, bid prices, and emission factors of the resources.

	MW	\$/MWh	MT CO ₂ e/MWh
Load	100		
Generation	150		
*Hydro @ ACS	60	\$10	0.03
*Gas	40	\$40	0.4
*Solar	50	\$0	0
Residual Rate	1,000		0.5

If the reporting entity is in a GHG pricing region or voluntary climate region⁵, they will also flag what should be associated with the relevant region versus the residual rate, if energy dispatch exceeds energy demand within the voluntary climate region as a whole. If the reporting entity is in a voluntary climate region, they will flag that for the ISO, and also indicate which other reporting entities are participating in that voluntary climate region. They will also share assumptions for how excess generation in the GHG pricing region and/or voluntary climate region should be allocated within the applicable region and to the residual rate (i.e., which resources will be associated with the GHG pricing region's residual rate versus which resources will be associated with the general residual rate). Options available for the allocation could include:

- i) Option 1: Average;
- ii) Option 2: Merit order / least cost dispatch (based on the combination of energy and GHG bids)

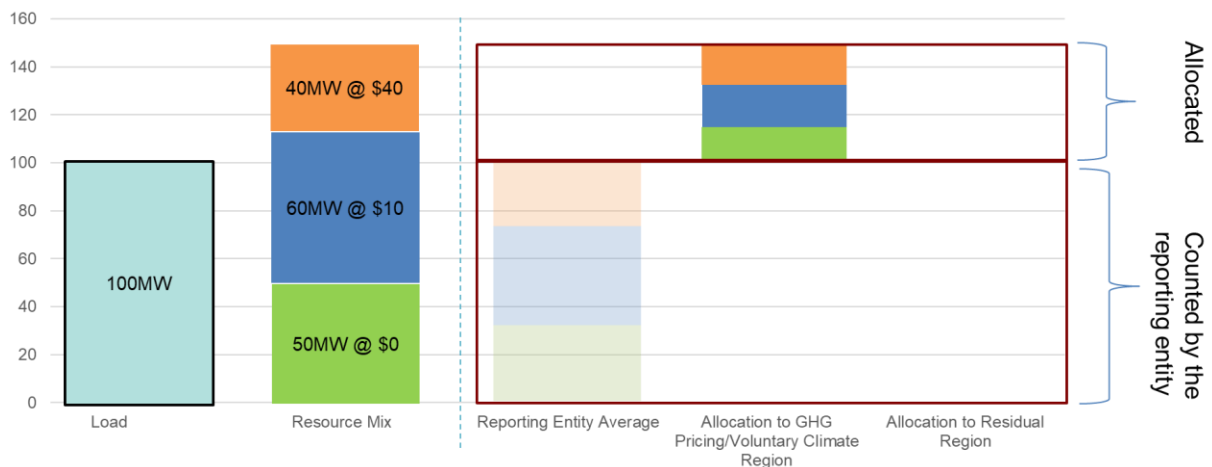
⁵ A self-defined set of reporting entities that elects to share excess MW and the associated emissions with other voluntary climate region reporting entities that have a shortfall in the same market interval. A voluntary climate region can share with a GHG pricing region, so long as the pricing region is in total net exporting for that five minute interval (and thus not sharing any allocation of attributed emissions, which would only occur when the pricing region was a net importer).

iii) Option 3: User Choice

All of the examples below again assume the following MW of dispatch, bid prices, and emission factors of the resources.

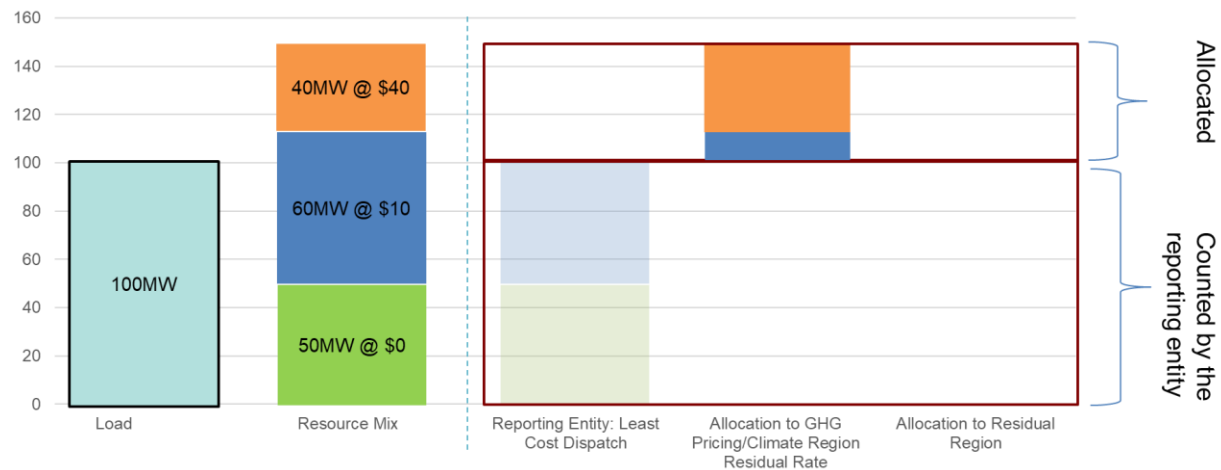
	MW	\$/MWh	MT CO ₂ e/MWh
Load	100		
Generation	150		
*Hydro @ ACS	60	\$10	0.03
*Gas	40	\$40	0.4
*Solar	50	\$0	0
Residual Rate	1,000		0.5

Figure 5: Option 1: Allocation of Excess Generation to either GHG Pricing Region/Voluntary Climate Region or Residual Rate Based on Average of Dispatched Resources



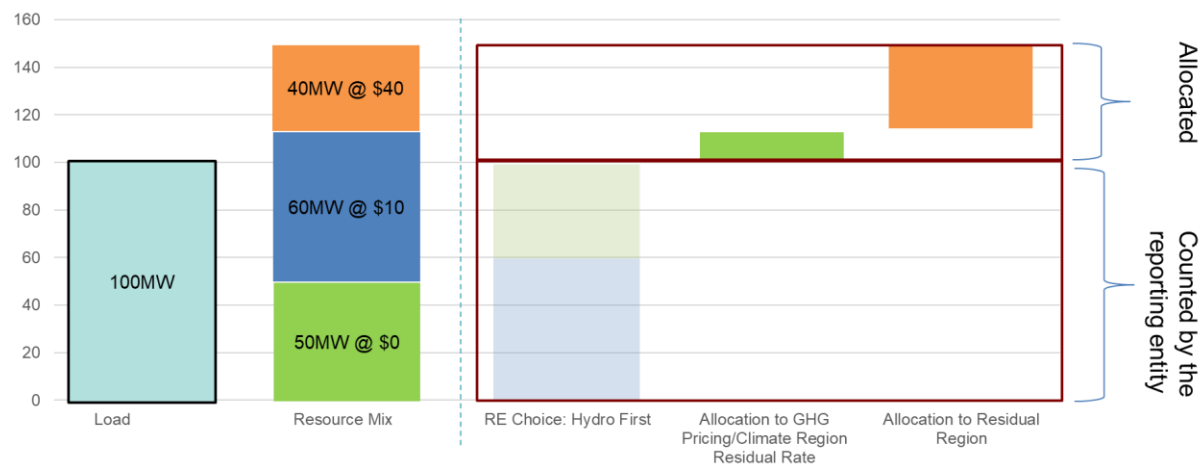
The figure above highlights an example of how under Option 1 using an average emissions intensity approach, a reporting entity could decide to allocate their excess generation, as compared to load, to any applicable GHG pricing region or voluntary climate region they are a part of or to the residual rate. This would be based on the average emissions intensity of resources that were dispatched. At this time the ISO does not see a use case for why a reporting entity would want to use the average option to split the MW and emissions they are allocating between the residual rate and either the GHG pricing region or voluntary climate region. The ISO would like to hear feedback from stakeholders on if and/or why there should be a sharing between both regions when using an average.

Figure 6: Option 2: Least Cost Dispatch Merit order / least cost dispatch (based on the combination of energy and GHG bids)



The figure above provides an example of how under Option 2 the allocation is based on least cost dispatch. To be clear, while this choice may ascribe higher-cost generation to other entities, this does not affect locational marginal prices. Any excess MW and emissions are allocated to either the applicable GHG pricing region or voluntary climate region – or to the residual rate. In this example the reporting entity's choice of excess allocated to their applicable GHG pricing region/voluntary climate region results in the excess hydro and gas serving that region.

Figure 7: Option 3: User Choice



The figure above provides an example of how under Option 3 the reporting entity could decide what resource's MW and emissions are allocated to their own portfolio versus either the applicable GHG pricing region or voluntary climate region – or to the residual rate. This would require a rank order on what resources should be allocated a reporting entity's emissions inventory, allocated to any applicable GHG pricing region/voluntary climate region, or allocated to the residual rate. In this scenario the reporting entity has decided to allocate all hydro to their own emissions inventory, which results in this

five minute interval of the excess solar being allocated to the GHG pricing region/voluntary climate region, and their gas resources being allocated to the residual rate.

During the registration process, there will be a confirmation of ownership and contracted resources. The ISO is interested in feedback on the merits of this as either a blanket attestation or an in-application confirmation by both parties. A blanket attestation would be a self-submitted confirmation that all information reported is true and accurate. An in-application confirmation would require both parties to confirm who the buyer and seller is and the MW exchanged along with the energy dispatch assumptions for excess power. The ISO is also interested in feedback on how to treat resources that do not have in-application confirmation. Options could range from not assigning these MW to simply marking them separately in the reporting entity's report as "unconfirmed" MW and emissions.

ISO Registration for Non-Participating BAAs

There is an inherent challenge in how to allocate MW and emissions from non-participants. Non-participants are those entities who choose not to use the report and thus their MW and emissions are unassigned. The ISO previously proposed simply allocating these emissions to the residual rate. Stakeholders had requested that instead the ISO develop methods to assign large emitting resources as reported in Integrated Resource Plans and/or EIA Form 860 information to better estimate the assignment of resources and thus a more accurate residual rate. The ISO raised concerns about its ability to do this accurately based on lack of access to contract data for non-participants. In response, the GHG Accounting and Reporting sub-group suggested that non-participant generation first be allocated on a BAA basis, based on an assumption that anything dispatched to serve the BAA was intended to serve that BAA's load.

The purpose of this allocation is to reflect a more accurate residual emissions rate. As a result, in the case that resources assigned to a BAA generate less than BAA load, the ISO does not plan on adding in MW and emissions at the residual rate as it does not change the residual rate used by others and the ISO has not heard a use case to obtain information on BAA emission inventories for non-participants.

For any non-participating BAA that does not overlap with a GHG pricing area, the ISO will compare on a five-minute basis the BAAs generation to load. An amount of generation equal to the BAA's load is assumed to be "assigned" to serve that BAA. Any excess MW and associated emissions is assumed to serve the broader region and assigned to the residual rate. The average emissions intensity will be used to assign excess generation to the residual rate for simplicity.

For any non-participating BAA that overlaps with a GHG pricing area, the ISO will compare BAA generation to load. In cases where the non-participating BAA has generated more than its load, those excess MW will be allocated to the GHG pricing region.

Figure 8: Assumption for Non-Participant: Excess Generation serves Market Footprint as Residual Rate



	MW	\$/MWh	MT CO ₂ e/MWh
Load	100		
Generation	150		
*Hydro @ ACS	60	\$10	0.03
*Gas	40	\$40	0.4
*Solar	50	\$0	0
Residual Rate	1,000		0.5

For any BAA that is a mix of reporting entities and non-participants, the ISO will take the difference of non-participating BAA load and generation. Any excess will be the residual contribution from the non-participating entity in the BAA, and will be based on the average emissions rate of what served that BAA in that market interval. This formula for determining the Non-Participant Residual Mix for a BAA Comprised of Reporting Entities and Non-Participants can be summarized as:

Residual Contribution for a BAA Comprised of Reporting Entities and Non-Participants =

$$(\text{Gen}_{\text{BAA}} - \text{Gen}_{\text{Reporting Entity}} = \text{Gen}_{\text{non-participating BAA}}) - (\text{Load}_{\text{BAA}} - \text{Load}_{\text{Reporting Entity}} = \text{Load}_{\text{non-participating BAA}})$$

II. Calculations

On a monthly basis, the ISO will sum the MW and emissions a reporting entity is responsible for. The calculation will be based on five-minute interval market data but will be aggregated at an hourly level. This will total energy that has been associated to each participating reporting entity, net of energy attributed to a GHG pricing region.

The ISO will compare dispatch data of the resources the reporting entity associated with their account (*i.e.*, owned and contracted) to the reporting entity's load data. If the reporting entity had excess generation, the ISO will use the excess generation option selected to separate what is associated with the entity's emissions rate versus what is associated with the residual rate. If the reporting entity is in a GHG pricing region or voluntary climate region – and there are other entities in the GHG pricing region or voluntary climate region using the Accounting and Reporting approach—the ISO will allow excess generation to be shared among reporting entities in the same respective region. After considering if the resource was in a GHG pricing region or voluntary climate region, the ISO will again compare the entity's dispatch to load. If the reporting entity's dispatch was less than their load, the ISO will add in the MW and associated emissions using the residual rate.

Fuel Assignments

Each resource ID will be assigned an emissions factor associated with the resource's technology type, as indicated by ISO registration. For a given technology type, the ISO will identify an emissions factor based on either publicly available information or as assigned by a reporting entity.

The ISO and stakeholders have considered multiple available sources of information: ISO Masterfile data, publicly available data, and a self-reported option.

- **ISO Master File:** Data stored in the ISO's Master File, submitted to the ISO by the responsible SC, includes prime mover technology, fuel type, and market participation model⁶. The ISO will use this information to determine the resource's technology type for the report but not the resource's specific emissions factor.⁷
- **Publicly reported data:** The U.S. Environmental Protection Agency (EPA) and Energy Information Administration (EIA) collect and report data useful for determining resource-level emissions factors. This information is available and accessible publicly and is widely used for state reporting purposes.
- **Assigned by the reporting entity:** A reporting entity may assign an emissions factor to the resources it has assigned to itself. This functionality supports cases where a reporting entity uses a methodology to determine the emissions factor for a portfolio of resources.

⁶ For full list of resource level data, see BPM for Market Instruments Attachment B.

⁷ Master File information is precise to the specific resource, and there's a built-in validation process because the tariff requires, as standard practice, all information submitted to the Master File to be correct. However, using this information may limit reporting transparency where information needed to determine the emissions factor is sensitive or confidential.

Summarized in Figure 9 and discussed further below, the emissions factor options for each technology type offer reporting entities the flexibility to ensure that the report’s emissions assumptions align with, and can be understood by, relevant audiences.

Figure 9: Technology types and emissions factor options

Technology type	Details registered with the ISO	Emissions Factor Options
Fuel-based generation	Prime mover technology, fuel type, BA	EIA/EPA data
Intermittent renewable generation	Fuel type (wind, solar)	Report as 0 emitting
Hydro	Participation model (generating, non-generating, pumped hydro)	Option to treat as stand-alone storage, 0 emitting, or self-reported.
Storage only	Participation model (aggregated, stand-alone)	Treat as load adjustment
Hybrid	Resource components including storage and generating components	Use fuel assumptions associated with non-storage resource components
Co-located	Off-grid charge indicator (OGCI)	When OGCI is active, treat as hybrid.
Demand Response (DR)	Participation model	Treat as load adjustment for all participation models

Fuel-based generation

The ISO will match the applicable, registered resource parameters with a reporting methodology using EIA and EPA data. For example, the ISO can attempt to match a resource with plant level emissions data reported by EIA⁸. If the EIA information is not available or not a match, the ISO can match a generator’s prime mover technology and energy source to a heat rate and carbon dioxide emissions coefficient reported by the EIA.⁹

While SC-reported operating parameters in the Master File could be used to determine a resource’s emissions factor, this information was not submitted for this purpose and may create discrepancies where entities use information submitted in a different format. For example, SCs for fuel-based generation may report a generator’s heat rate measured at different operational levels to indicate differences in fuel efficiency that depend on a generator’s output, whereas EIA data is measured as an average across a generator’s output.

Intermittent renewable generation

The ISO will reflect an emissions factor of zero for intermittent renewable generation.

Hydro

Hydro resources’ participation model captures how the resource is managed in the market (e.g., generating resource, limited energy storage, pumped hydro), and could impact how the ISO determines a resource’s emissions factor. The ISO will provide flexibility and allow the reporting entity to decide what emissions factor to use for its hydro resources.

⁸ EIA. Emissions by plant and by region: <https://www.eia.gov/electricity/data/emissions/>

⁹ EIA. Table 8.2. Average Tested Heat Rates by Prime Mover and Energy Source, 2013 – 2023: https://www.eia.gov/electricity/annual/html/epa_08_02.html

Stand-Alone Storage

The ISO recommends treating stand-alone storage as a load modification. The ISO and the Accounting and Reporting sub-group compared modeling storage resources as either a supply or load modification. Both approaches ultimately yield the same outcome for emissions at a portfolio level and with respect to the market residual rate. The Accounting and Reporting sub-group found that the load modification is preferable, and the suggestion for the Straw proposal is to treat storage as a load modification.

While modeling storage as a supply resource more closely reflects how they are operated in the market, it may also add unnecessary complexity. If the ISO were to model storage as a supply resource, the ISO would assign an emissions factor to MWhs of storage based on supply in that interval when net charging, and reflect an emissions factor for net discharge capacity. This implicit emissions factor may not be useful if states currently have, or plan to develop, rules for accounting for storage emissions themselves. These types of conflicts can be avoided by modeling storage as a load modification.

Hybrid

Hybrid resources are modeled and operate as a single resource, but may be made up of multiple different resources, including storage. In general, hybrid resources with a storage component may opt to exclusively charge from on-site generation. When the resource exclusively charges from on-site generation, the ISO will use the emissions factor of the on-site resource. Some hybrid resources will have the ability to charge from the grid and appear as a net buyer. In instances when the resource is a net buyer, the ISO will treat the resource as a load modification.

Co-located

Unlike hybrid resources, co-located resources are modeled as two different resources. Co-located resources use an off grid charge indicator (OGCI) which is an hourly parameter that tells the ISO when the resource cannot charge from the grid (OGCI is active) or can charge from the grid (OGCI is inactive). As a result, when OGCI is active, the ISO will use the co-located resources' emissions factor. In intervals when the OGCI is inactive the ISO will treat the resource as a load modification.

Demand Response (DR)

The ISO will treat demand response as a load modification.

Example: Putting the Pieces Together

As an example to highlight the calculation and allocation, below in Figure 10 we can see the scenarios through the lens of a non-participant (Entity 1), those operating in a GHG pricing region (Entity 2, 3 and 4), and those operating in a voluntary climate region (Entity 5 and 6). This example highlights how on a 5 minute basis reporting entities are able to share excess in a voluntary climate region or GHG pricing region ahead of using the residual rate.

Figure 10: Inputs and Outputs of the Example in Figure 11

	Emission factor (MT/MWh)	Bid price (\$/MWh)	MW
Inputs			
Gas	0.4	40	
Hydro	0.03	10	
Solar	0	0	
Residual Starting Rate (from entities outside of Entities 1-4)	0.5		1000
Outputs			
Residual Updated (Excess from Entity 5)	0.49		1100
Residual Pricing Region (Excess from Entity 2 and 3)	0.246		100
Residual Voluntary Climate Region (Excess from Entity 5)	0		100

Figure 11: Allocation Calculation Example

		Entity 1	Entity 2	Entity 3	Entity 4	Entity 5	Entity 6
Registration	Location—GHG	Outside	Pricing Region	Pricing Region	Pricing Region	Voluntary Climate	Voluntary Climate
	Location—State	NV	WA	WA	WA	OR	OR
	Participant	Non-participant	Participant	Non-Participant	Participant	Participant	Participant
	Excess Option	Average	Least Cost	Average	Least Cost	Clean to climate/ Emitting to residual	Clean to climate/ Emitting to residual
Dispatch Data (MW)	Dispatched Resources						
	Gas	100^	50*	50^	0	100^	50^
	Hydro	100^ (50 for own load/50 attributed to Entity 4)	100^	100*	50**		50*
	Solar	0	100^	100^	0	300^	
	Total Dispatch, net attribution	150	250	250	50	400	100
	Load	150	200	200	100	200	200
Allocation (MW and EF)	Long/Short Compared to Load	Equal (due to attribution)	Long	Long	Short	Long	Short
	<u>Excess Added</u>						
	- Pricing Region		50 MW @ 0.4	50 MW @0.092			
	- Voluntary Climate Region					100 MW @ 0	
	- Residual Rate					100 MW @ 0.4	
	<u>Shortfall Added</u>						
	- From Pricing Region				50 MW @0.246		
	- From Voluntary Climate Region						100 MW @ 0
	- From Residual						
	Total Assigned MW that serve Load	150	200	200	100	200	200
	Total Assigned Emissions (MT)	32.3	3.0	18.4	13.8	0.0	21.5

* contracted capacity

** committed capacity attributed

^ owned

III. Reporting

Data Reported to a Reporting Entity

Based on updated registration information throughout the year, the ISO will calculate the results on a monthly basis so the entity can verify what is being produced is correct. These “advisory reports” will inform contracting and re-designation (the ISO would not calculate the residual or do full reporting until the end of the year).

- a) Registration features:
 - i) Resources associated with the reporting entity’s account, registered capacity for each resource, registered energy association option selected, registered or default emission factors associated with each resource
 - ii) Reporting preferences:
 - (1) Excess energy option selected
 - (2) Option for providing the ISO data (i.e., load, associated resources, residual rate resources)
- b) Depending on the reporting entity’s preference: Either residual rate OR emissions year totals at an hourly granularity
 - i) IF Residual Rate
 - (1) Hourly residual rate data set
 - ii) IF Emissions Year Totals:
 - (1) Total dispatch of owned and contracted resources
 - (a) Each resource that was dispatched by the ISO and associated with the entity’s report including MWh and total emissions
 - (b) Attributed MWh and GHG emissions for each resource
 - (2) Total load
 - (3) Total allocation of allocated residual rate transfers, depending on applicability: 1.) voluntary climate region MWh and residual rate, 2.) GHG pricing region MWh and residual rate 3.) MWh of residual rate transfers
 - (4) Null power MWh
 - (5) Weighted average of emissions for each hour both for own portfolio and residual rate

Publicly Reported Data¹⁰

- Fuel Type Report: Publish on an annual basis a public GHG report with aggregated volumes and emissions by fuel type
- Null Power: On a quarterly basis, report hourly volumes of null power without the underlying fuel type and emissions profile and on an annual basis aggregated volumes of null power by fuel type
- Reporting entity option selected for excess power.

¹⁰ Please see Appendix A for CRS’s proposal for reporting to WREGIS. The ISO seeks feedback to the extent that the public reporting proposal should be updated to also include reporting to WREGIS.

Next Steps

The ISO will host a working group meeting on May 22, 2025 from 1-4PM to review the proposal. Feedback on this straw proposal and the meeting are requested by June 12, 2025. Comments will inform the development of either a revised Straw Proposal, or if there is general agreement on the direction of the Accounting and Reporting approach, the ISO will produce a draft final proposal. The ISO anticipates a next draft of the proposal and next meeting will occur in July 2025. The goal is to take this item for board informational briefing by September 2025. There will be a continued need for coordination with stakeholders on the implementation timeframe and costs associated with implementing any Accounting and Reporting approach.

Decisional Classification

The Accounting and Reporting approach is an after-the-fact report that utilizes the results of market dispatch. ISO staff does not expect that any market rules change will be required, and therefore does not anticipate seeking approval from the Western Energy Markets Governing Body or the CAISO Board of Governors.

As IT changes may be necessary to support this effort and, depending on the extent of such changes and the expenditure requires, the ISO may seek to amend tariff rules about allocation of the Grid Management Charge (GMC) to ensure that the costs are allocated equitably. Such changes are not currently part of this initiative, but if they are added at a later date, the ISO will propose an appropriate decisional classification for them.

Feedback Requested

The comment template that will be available after the meeting will include, but may not be limited to the following questions:

- Please provide your overall feedback and/or recommended enhancements to the Accounting and Reporting approach and to the extent you believe it meets the objectives as identified by the working group.
- Please provide your organization's feedback on the ability for a reporting entity to allocate MW and emissions by choice to their own inventory, to the residual rate, and if applicable the GHG pricing region or voluntary climate region.
- Please provide your organization's feedback on if the validation and verification of buyer and seller arrangements as either a blanket attestation or an in-application agreement. For any unconfirmed MW, if or how should these be flagged in the final report?
- Please provide your organization's feedback on the flexibility of allowing choice on using: EIA/EPA emissions factors, registered Master File emission factors, or other self-reported emission factors.
- Please provide your organization's recommendations on how to stage implementation work on the Accounting and Reporting approach and any comments associated with the costs of this effort.

- Please provide your organization's feedback on the CRS proposals and the extent to which you recommend these proposals should modify the Accounting and Reporting approach. These proposals are located in Appendix A of this straw proposal.

Glossary of Terms

- Attribution: An in-market GHG award to serve demand in a GHG regulation area in the GHG design of both EDAM and the WEIM.
- Allocation: An assignment of MW and emissions. This could be an allocation to a reporting entity, to a pricing region, to a voluntary climate region, or to the residual rate.
- GHG Pricing Region/GHG Regulation Area: A geographic area that has a GHG pricing policy in place, such as California's cap-and-trade program or Washington's cap-and-invest.
- Non-Participant: An entity located in the WEIM or EDAM area that chooses not to use this report.
- Null Power: Any generation from renewable resources without RECs.
- Out-of-market purchase: A purchase from a resource not located in either a WEIM or EDAM BAA.
- REC (Renewable Energy Credit): A REC represents the environmental attributes, but not the electrons, of 1 megawatt hour (MWh) of renewable energy generation on the electricity grid. They are used to track when and where renewable energy is generated, who it is sold to, and who is using it.
- Residual rate: The emissions associated with the MW of unowned or unclaimed energy delivered to customers on the electricity grid
- Reporting entity: Encompasses any market participant (i.e., LSEs, federal power marketing administrations, etc.) that elect to have a report produced using the Accounting and Reporting approach.
- Voluntary climate region: A self-defined set of reporting entities that elects to share excess MW and the associated emissions with other voluntary climate region reporting entities that have a shortfall in the same market interval.
- WEIM non-participating resource: A resource that is in a WEIM BAA but does not participate in the WEIM's real time market.

Appendix A: CRS Proposal to CAISO for Reporting to WREGIS and Reporting of Null Power under an Accounting & Reporting Approach



CRS Proposal to CAISO for Reporting to WREGIS and Reporting of Null Power under an Accounting & Reporting Approach

Proposal for Reporting to WREGIS

- CAISO provides to WREGIS, for each WREGIS-registered generating unit, the quantity of electricity in a given month (for each hour of the month) that was bid into the market and allocated on a resource-specific basis to:
 - a reporting entity and the name of that reporting entity,
 - a non-participating BAA and the name of the BAA,
 - a GHG pricing zone residual mix and the name of the zone,
 - a voluntary climate region residual mix and the name of the region, or
 - the market residual mix.¹¹
- To facilitate this data sharing, we recommend a monthly report to WREGIS that provides, for each WREGIS-registered generator, the total hourly allocated volume for a given month by reporting entity, non-participating BAA, GHG pricing zone residual mix, voluntary climate region residual mix, or market residual mix.
- WREGIS should be consulted on details related to the format and transfer of the data.
- Allocations to reporting entities, non-participating BAAs, a GHG pricing zone residual mix, a voluntary climate region residual mix, or the market residual mix are in alignment with the attribution (“deeming”) to GHG pricing zones, where applicable, such that generation attributed to a zone cannot be allocated to reporting entities, non-participating BAAs, GHG pricing zone residual mixes, or voluntary climate region residual mixes outside of that zone, or to the market residual mix.

Proposal for Null Power Reporting

¹¹ At the Monday, April 21, 2025 meeting of the Accounting and Reporting Approach Subgroup, potential resource-specific allocations were expanded to include non-participating BAAs, a GHG pricing zone residual mix, and a voluntary climate region residual mix.

Option 1 (preferred)

- *REC information is required by CAISO and REC ownership or retirement is required for allocation of WREGIS-registered generation and emissions on a specified basis. Otherwise, the generation is reported as null power.*
 - For renewable generation allocated on a specified basis to a reporting entity (e.g., associated with owned or contracted generation), CAISO requires that the reporting entity own the associated REC in WREGIS.
 - For renewable generation allocated on a specified basis to either a GHG pricing zone residual mix, a voluntary climate region residual mix, or the market residual mix, CAISO requires that the associated REC has been retired in WREGIS on behalf of that residual mix.
 - For generation from a renewable resource allocated to a non-participating BAA, the generation is reported as null power.
- Reporting entities provide proof of REC ownership and/or retirement in WREGIS to CAISO monthly.
- Null power volumes are removed for residual rate calculations.
- Null power volumes are assigned the residual rate for calculations of reporting entity allocated emissions.
- Total generator emissions for a reporting period equal the sum of aggregated reporting entity emissions and non-participating BAA emissions without null power emissions (emissions from specified power only) and residual mix total emissions.¹²

Option 2 (in the case that Options 1 and 3 cannot be implemented)

- *REC information is not required by CAISO and there is optional reporting of null power by reporting entities.*
 - CAISO enables reporting entities to report null power that is (1) a part of their owned and contracted generation, (2) excess generation that is allocated to a GHG pricing region residual mix, a voluntary climate region residual mix, or the market residual mix, or (3) unowned and uncontracted generation allocated to the market residual mix. CAISO identifies null power volumes in these places.
- Reporting of REC ownership and null power to CAISO by reporting entities is done monthly.
- Null power volumes are removed for residual rate calculations.
- Null power volumes are assigned the residual rate for calculations of reporting entity allocated emissions.

¹² This may not equal the total allocated emissions to reporting entities and non-participating load during the reporting period depending on the volume of RECs banked or held over longer periods of time and the volume of RECs transacted to entities outside the market (i.e., emissions from renewables not allocated to reporting entities during the reporting period). Total allocated emissions (the load-based GHG emissions account) may be greater because it accounts for clean energy transactions outside of the boundary and assigns emissions to LSE null power. These emissions occur outside the reporting boundary (temporally, geographically, or both) and will be matched with the transacted/held clean energy elsewhere or later such that total system emissions are correct over the period of time during which transactions can occur. For more explanation, see CRS's *Guide to Electricity Sector Greenhouse Gas Emissions Totals* (2022), available at: <https://resource-solutions.org/document/110322/>.

- Total generator emissions for a reporting period equal the sum of aggregated reporting entity emissions and non-participating BAA emissions without null power emissions (emissions from specified power only) and residual mix total emissions.¹³

Option 3

- *Option 1 for residual mixes (RECs required) and Option 2 for owned and contracted (optional).*
 - For renewable generation allocated on a specified basis to either a GHG pricing zone residual mix, a voluntary climate region residual mix, or the market residual mix, CAISO requires that the associated REC has been retired in WREGIS on behalf of that residual mix. Otherwise, the generation is reported as null power.
 - For generation from a renewable resource allocated to a non-participating BAA, the generation is reported as null power.
 - For renewable generation allocated to a reporting entity associated with owned or contracted generation, REC information is not required by CAISO and there is optional reporting by reporting entities of null power that is a part of their owned and contracted generation.
- Reporting of REC retirement, REC ownership, and null power to CAISO is done monthly.
- Null power volumes are removed for residual rate calculations.
- Null power volumes are assigned the residual rate for calculations of reporting entity allocated emissions.
- Total generator emissions for a reporting period equal the sum of aggregated reporting entity emissions and non-participating BAA emissions without null power emissions (emissions from specified power only) and residual mix total emissions.¹⁴

¹³ See note 2. For Option 2, the difference between total emissions from dispatched resources and total emissions allocated to load will also depend on the amount of null power optionally reported. Specifically, there may be less of a difference because some emissions associated with renewable resources were allocated without the REC (i.e., allocated twice, double counted).

¹⁴ See notes 2 and 3.

Table of Reporting Options for WREGIS-registered Generation by Scenario

Scenario	Option 1	Option 2	Option 3
Owned and contracted generation	<ul style="list-style-type: none"> If REC ownership information is reported to CAISO by the reporting entity, then reported as specified and allocated to the reporting entity by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC ownership information <u>is not</u> reported to CAISO by the reporting entity, then reported as null power by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> If REC ownership information is reported to CAISO by the reporting entity, then reported as specified and allocated to the reporting entity by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC ownership information <u>is not</u> reported to CAISO by the reporting entity, may be reported as specified and allocated to the reporting entity by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. If REC ownership information <u>is not</u> reported to CAISO by the reporting entity, may be reported as null power by CAISO due to optional designation by the reporting entity. No reporting to WREGIS. 	Same as Option 2.
Excess owned and contracted generation in a GHG pricing zone	<ul style="list-style-type: none"> If REC retirement on behalf of GHG pricing zone residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the GHG pricing zone residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of GHG pricing zone residual mix <u>is not</u> reported to CAISO by the reporting entity, then reported as null power by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> If REC retirement on behalf of GHG pricing zone residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the GHG pricing zone residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of GHG pricing zone residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as specified and allocated to the GHG pricing zone residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. If REC retirement on behalf of GHG pricing zone residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as null power by CAISO due to optional designation by the reporting entity. No reporting to WREGIS. 	Same as Option 1.

Scenario	Option 1	Option 2	Option 3
Excess owned and contracted generation in a voluntary climate region	<ul style="list-style-type: none"> If REC retirement on behalf of voluntary climate region residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the voluntary climate region residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of voluntary climate region residual mix <u>is not</u> reported to CAISO by the reporting entity, then reported as null power by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> If REC retirement on behalf of voluntary climate region residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the voluntary climate region residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of voluntary climate region residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as specified and allocated to the voluntary climate region residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. If REC retirement on behalf of voluntary climate region residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as null power by CAISO due to optional designation by the reporting entity. No reporting to WREGIS. 	Same as Option 1.
Excess owned and contracted generation (not in a GHG pricing zone or voluntary climate region)	<ul style="list-style-type: none"> If REC retirement on behalf of market residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the market residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of market residual mix <u>is not</u> reported to CAISO by the reporting entity, then reported as null power by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> If REC retirement on behalf of market residual mix is reported to CAISO by the reporting entity, then reported as specified and allocated to the market residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of market residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as specified and allocated to the market residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. If REC retirement on behalf of market residual mix <u>is not</u> reported to CAISO by the reporting entity, may be reported as null power by CAISO due to optional designation by the reporting entity. No reporting to WREGIS. 	Same as Option 1.

Scenario	Option 1	Option 2	Option 3
Generation attributed to a GHG pricing zone, not allocated to a specific reporting entity	<ul style="list-style-type: none"> If REC retirement on behalf of GHG pricing zone residual mix is reported to CAISO (e.g., by the generator), then reported as specified and allocated to the GHG pricing zone residual mix. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of GHG pricing zone residual mix <u>is not</u> reported to CAISO, then reported as null power in the GHG pricing zone residual mix by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the GHG pricing zone residual mix. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as Option 1.
Non-participating generation	<ul style="list-style-type: none"> Reported as null power by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the BAA by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as option 1.
Excess non-participating generation (BAA-level exports/excess) in a GHG pricing zone	<ul style="list-style-type: none"> Reported as null power in the GHG pricing zone residual mix by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the GHG pricing zone residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as Option 1.
Excess non-participating generation (BAA-level exports/excess) in a voluntary climate region	<ul style="list-style-type: none"> Reported as null power in the voluntary climate region residual mix by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the voluntary climate region residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as Option 1.
Excess non-participating generation (BAA-level exports/excess) (not in a GHG pricing zone or voluntary climate region)	<ul style="list-style-type: none"> Reported as null power in the market residual mix by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the market residual mix by CAISO. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as Option 1.
Unowned and uncontracted generation	<ul style="list-style-type: none"> If REC retirement on behalf of market residual mix is reported to CAISO (e.g., by the generator), then reported as specified and allocated to the market residual mix. CAISO shares with WREGIS data related to allocation of energy and ownership of RECs. RECs tagged in WREGIS. If REC retirement on behalf of market residual mix <u>is not</u> reported to CAISO, then reported as null power in the GHG pricing zone residual mix by CAISO. No reporting to WREGIS. 	<ul style="list-style-type: none"> Reported as specified and allocated to the market residual mix. CAISO shares with WREGIS data related to allocation of energy. RECs tagged in WREGIS. 	Same as Option 1.

Explanation and Additional Information

Reporting to WREGIS

For WREGIS renewables allocated on a resource-specific basis through the CAISO A&R framework, WREGIS should receive generator-specific allocation data and tag the associated RECs with that information to ensure transparency. This transparency is essential because the allocation data pertains to the same attributes included in the certificates and may impact the claims of certificate holders. Each state or voluntary program that uses WREGIS can then determine for itself whether those RECs are eligible, ideally ensuring that the RECs are distributed or transferred in alignment with the allocations under the A&R framework to prevent double counting.

To support this process, WREGIS needs generator-specific allocation data from CAISO on a monthly basis, prior to REC issuance. WREGIS mints RECs on an ongoing basis—typically two weeks after data is reported, or earlier if the data is approved by the customer. Importantly, WREGIS does not alter RECs once they have been issued. Although QREs, including CAISO, can submit data adjustments for up to two years, once certificates are transferred or retired, they cannot be revoked. As a result, WREGIS will be asked to change its issuance rules such that if the generator participates in CAISO markets, then the issuance must wait for monthly CAISO allocation data. If not, it can continue to use the two week or sooner issuance policy.

Hourly tracking is also coming to WREGIS, which underscores the need for allocation data to be reported at least monthly and with hourly granularity.

Null Power Reporting

CAISO should enable reporting on null power (generation from renewable resources without RECs) within its A&R framework to make it as accurate as possible and to avoid conflicts with programs that allocate generation and emissions using RECs. Null power may be present in:

1. Owned and contracted generation allocated to a reporting entity,
2. Excess generation from a reporting entity that is allocated to:
 - a. a GHG pricing zone residual mix,
 - b. a voluntary climate region residual mix,
 - c. the market residual mix
3. Generation attributed to a GHG pricing zone, not allocated to a specific reporting entity, that is allocated to a GHG pricing zone residual mix,
4. Non-participating generation allocated to a BAA,
5. Excess non-participating generation (BAA-level exports/excess) allocated to:
 - a. a GHG pricing zone residual mix,
 - b. a voluntary climate region residual mix,
 - c. the market residual mix, and

6. Unowned and uncontracted generation that is allocated to the residual mix.

We present three options for reporting null power in these areas. The first and preferred option is that CAISO requires REC information and REC ownership by a reporting entity for owned and contracted generation or REC retirement on behalf of a residual mix in order to allocate renewable generation resources on a specified basis. Otherwise, this generation is reported as null power.

The second, less preferred option, is that REC information is not required by CAISO and null power reporting is optional and self-reported. In this case, there is a risk that some null power will go unreported—due to a reporting entity choosing not to report null power or because it cannot be optionally reported as null by a participating reporting entity. As a result, null power data in the market would not be entirely accurate—it would not match the total null power that could be calculated using WREGIS certificate data. However, in the case that the generation is either not voluntarily reported as null power to CAISO or the RECs are transacted after A&R accounting, WREGIS will have the data for the allocation of registered renewables on a specified basis (per Reporting to WREGIS). For WREGIS-registered renewables that are designated as null power and not allocated by CAISO on a resource-specific basis, WREGIS will not receive that information, and the RECs will not be tagged, since their attributes remain unaffected.

The third option, preferred over the second but not the first, is that REC information and retirement is required for generation allocated to a residual mix (of a GHG pricing zone, voluntary climate region, or the market residual mix) or a non-participating BAA, but REC information is not required and null power reporting is optional for generation allocated to a participating reporting entity. While participating reporting entities can choose to report null power for their owned and contracted generation, the default assumption for renewables in the residual mixes and non-participants is that the RECs are being kept by the generator, and, unless proven otherwise, it is treated as null power by the market. This option would avoid a situation wherein there is renewable generation in the residual mix that could be allocated to unfulfilled load and assigned to unspecified power on a specified basis, while the associated RECs could be retained or sold to a specific entity.

Renewable generation attributed (“deemed”) to a GHG pricing zone but not allocated to a specific entity is allocated to the residual mix for the zone. Options 1 and 3 would require retirement of RECs on behalf of the residual mix of the GHG pricing zone (e.g., by the participating generator) in order for the generation to be allocated to the residual mix for the zone on a specified basis. Otherwise, it is reported as null power in the zone’s residual mix. Under Option 2, since it cannot be optionally reported as null by a reporting entity, it will be allocated as specified to the residual mix of the zone and (per Reporting to WREGIS above) reported to WREGIS as such.

Since a non-participating BAA will not provide REC information to CAISO, under Options 1 and 3, any renewables in the generation allocated to a non-participating BAA will be reported as null power. Under Option 2, it will not be optionally reported as null, and it will be allocated as specified to the non-participating BAA and (per Reporting to WREGIS above) reported to WREGIS as such.

For the market residual mix, providing a null power-adjusted residual rate would deliver a more accurate emissions rate under a load-based GHG accounting framework. This adjustment would account for other specified transactions outside the market and support states and consumers who need to factor REC transactions into their emissions accounting from purchased electricity. We recommend that null power volumes be removed from the residual mix rather than assigned emissions. While this would undercount generation in the residual mix, it is preferable to assigning a positive emissions value to that generation.

All generation associated with unbundled RECs must be reported as null power in the CAISO framework in order not to infringe on the REC and in order for those RECs to be used in state and voluntary programs. Those programs could verify this either:

- In the framework itself, if generator-specific information is provided for reported null power, or if not¹⁵
- Using WREGIS, since (per Reporting to WREGIS) it will be transparent in WREGIS if generation associated with a REC has been allocated by CAISO on a resource-specific basis and not reported as null power.

Finally, it is unnecessary for CAISO to share null power data with WREGIS.

Policy Neutrality

CAISO's A&R framework should provide allocation data in a transparent way, without giving preference to a certain market participant, state, or type of policy. Coordination and data sharing with WREGIS does not set policy for any state or program or affect the ability of any state or market participant to do with that information what it wants, even if market allocation information were to be added to WREGIS certificates. It would simply provide information to enable each state or program to make its own decision regarding the eligibility of WREGIS Certificates on the basis of market attribution to different reporting entities and the value that it assigns to this information. It may, however, affect state and participant decision-making in response to this information. The provision of additional and better data may also lead to future changes, such as all-generation certificate tracking.

¹⁵ For example, because a state determines that reporting of fuel type for null power would itself represent a claim on the REC.

Similarly, our recommendation to require attribute ownership for allocation to reporting entities on a resource-specific basis would not constrain state requirements—market allocation data can be used for state programs or not—and in fact provides the flexibility to the most states. Where attribute ownership is required for allocation by CAISO but not required by a particular state program, LSEs could report specified procurement without attributes/RECs and use the residual mix. In this case, the LSE-specific report/allocation simply would not be used for state reporting, and while the residual mix would account for RECs (i.e., has null power volume removed), this is still preferable to using a default emissions factor for these programs. Meanwhile, CAISO’s A&R framework would not double count for states that do require the RECs/attributes. On the other hand, if the framework allocates to reporting entities regardless of REC ownership, that will permit double counting for states and programs that do require RECs for GHG accounting. In other words, requiring attribute ownership for allocation to reporting entities would not deny entities in states that do not require REC ownership any information they require from the markets to calculate emissions, whereas not requiring ownership of attributes would deny to stakeholders in states that do require REC ownership vital data required to accurately calculate emissions.

Providing a null power-adjusted residual mix also would not represent a policy position. Again, state policy that does not use/require RECs for load-based GHG accounting typically does not prohibit the provision of data that account for RECs and null power, and a residual mix that is adjusted for null power (i.e., has null power volume removed) is preferable to a default emissions factor.

Confidentiality

Information provided by CAISO to WREGIS and potentially used by WREGIS to “tag” RECs with CAISO allocation data would be seen by the individual account holders of those RECs and program administrators. Furthermore, the WREGIS-registered generators that have already agreed to use CAISO as the qualified reporting entity (QRE) for generation data that is used for certificate issuance in WREGIS could simply agree to have CAISO share allocation data with WREGIS as well.

In the future, if there is all-generation tracking in WREGIS, there may be other generators that would not agree to have their generation and allocation data shared with WREGIS. In other all-generation tracking systems, generators register for an account if they wish to have certificates created and issued to them, and they agree to have the market provide their generation data. Again, only they and program administrators can see their account. For generators that are not registered, market data is still provided to the tracking system, but certificates are placed into the system administrator’s account, and at the end of the trading period, those certificates are used for residual mix calculations. There does not appear to be a perceived confidentiality issue in that case for those non-registered generators even though their generator-specific data is being shared with the tracking system.

Additional Resources

- CRS Background Report (2024): <https://resource-solutions.org/document/112124/>
- CRS Blog Post (2025): <https://resource-solutions.org/02202025/>