



## Background Report: GHG Allocation and RECs in Western Markets

November 2024

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This background report explores how new market frameworks for greenhouse gas (GHG) accounting and allocation impact renewable energy credits (RECs) in the Western U.S. These frameworks aim to meet state-specific emissions requirements but face challenges around double counting and REC tracking. Recommendations are provided to increase transparency and alignment between market frameworks and WREGIS for accurate and consistent GHG and renewable energy accounting.

### 1. GHG Attribution and Allocation in CAISO and SPP Markets

Both the California Independent System Operator (CAISO) and the Southwest Power Pool (SPP) have launched new voluntary organized wholesale electricity markets in the Western interconnection. These include CAISO's real-time Western Energy Imbalance Market (WEIM), launched in 2014, and SPP's real-time Western Energy Imbalance Service (WEIS), launched in 2021. CAISO is also launching a regional day-ahead market called the Extended Day Ahead Market (EDAM) that expands CAISO's day-ahead energy market to include entities in the WEIM. Tariff language and amendments for EDAM received approval from the Federal Energy Regulatory Commission (FERC) in 2023 and it is planned for deployment in October 2025 with activation by May 2026. SPP is also developing its Markets+ day-ahead market offering for the Western region. Markets+ is still in development, with SPP now drafting the market protocols, tariff language, and governing documents with stakeholder groups. The go-live date for Markets+ is anticipated for early 2027.

These short-term markets are being developed with mechanisms and accounting frameworks that “deem” and allocate generation and emissions to load on a resource-specific basis. This is to serve the

needs of participants in states that regulate delivered or procured electricity serving retail load and/or associated emissions or “bundled” energy and attributes sold to customers, e.g., through Renewable Portfolio Standards (RPS), Clean Electricity Standards (CES), GHG reporting/compliance programs for load-serving entities (LSEs), or GHG compliance or reporting rules for imported electricity. These state program requirements would otherwise present a challenge for market participation. That makes the West different from other regions with organized wholesale markets (e.g., the Northeast and Mid-Atlantic) where, historically, all power transactions have happened through the organized market, all attribute transactions have happened using certificates, and allocation to load has been entirely outside the market. An out-of-market-only allocation system based on certificates will not meet state requirements in the West that require delivery of the energy or regulate emissions from the energy serving load. As a result, there is a need for resource-specific tracking and accounting by organized wholesale markets in the West as they grow to compete with bilateral markets.

Tracking generation to load has taken two forms in these markets.

a. Attribution

These regional real-time and day-ahead markets have introduced mechanisms for GHG attribution to states or zones with GHG pricing programs (e.g., cap-and-trade) that cover emissions associated with electricity imports, e.g., California and Washington. This is referred to as “Attribution.” SPP’s definition of Attribution is “[the] market clearing process [that] ascribes megawatts to load within a GHG Pricing Zone.”<sup>1</sup>

In CAISO’s WEIM, generators located outside of California include a “GHG bid adder” in their market bids to indicate their willingness to serve California load (a GHG pricing/compliance region) and account for the cost of California’s GHG compliance program.<sup>2</sup> This affects market optimization—allowing the dispatch of resources to reflect the cost of carbon in states with GHG pricing—and maintains accurate pricing within the market where there are transactions between states with a carbon price and other Western states. The market “deems” that out-of-state generation to be serving California load, the emissions associated with which are subject to the state’s GHG regulations. One outcome is that renewable and clean resources are deemed before more carbon-intensive resources as the optimization model minimizes costs. The result is Attribution of the GHG emissions associated with deemed resources to California load in accordance with the state’s GHG regulations.

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<sup>1</sup> SPP Markets+ GHG Tracking and Reporting Protocol Language, Approved 9/26/2024, pg. 7. Available at: <https://www.spp.org/Documents/72451/MGHGTF%2020240926%20Meeting%20Materials%20as%20Revised%20During%20Meeting.zip>

<sup>2</sup> Generators located in GHG Pricing States automatically incorporate carbon costs into their market bids, reflecting the price of allowances. However, generators located outside of those states, which are not subject to the same regulations, do not face those costs directly when selling electricity into those states. To address this, CAISO introduced the GHG bid adder, which gets applied to the dispatch of resources outside of California that serve California’s load.

These existing market mechanisms in WEIM and EDAM for resource-specific Attribution of generation and emissions to load in states with GHG pricing programs (e.g., California and Washington) do not require transfer and/or retirement of any RECs associated with that generation.

The GHG Attribution mechanism proposed for SPP's Markets+ is similar. It will also attribute resources on a resource-specific basis to GHG pricing areas by minimizing cost, using a GHG bid adder to incorporate the cost of GHG compliance. However, whereas all Attribution in EDAM is resource-specific, Markets+ will also enable additional unspecified imports to a GHG pricing zone at a default emissions rate set by the GHG pricing program.<sup>3</sup>

Like CAISO, the proposed GHG Attribution mechanism for SPP's Markets+ does not require REC transfers and/or retirement to accompany or correspond to in-market resource-specific GHG Attribution to states with GHG pricing programs.

#### b. Allocation

This current market Attribution mechanism favors GHG pricing policies and does not provide LSEs in states with non-pricing GHG regulations with a way to meet requirements or information that can be used for GHG reporting. Even in states without GHG regulations, various energy consumers are also in need of retail GHG emissions information from LSEs participating in these markets and potentially the markets themselves to meet emissions targets or requirements to participate in federal disclosure and incentive programs.

Two problem statements identified by stakeholders in CAISO's GHG Coordination Working articulate this issue:<sup>4</sup>

Problem Statement 6a: Entities with annual reporting obligations or corporate goals associated with emissions reduction targets require data provided by the ISO to fulfill voluntary or non-voluntary reporting obligations with state policy, such as market imports to serve load or total emissions to serve load.

Problem Statement 7: 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.

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<sup>3</sup> There are other differences between GHG Attribution in CAISO's WEIM/EDAM and SPP's Markets+ (as proposed) as well in terms of how resources located outside of the GHG pricing zone that are either contracted to supply LSEs inside the zone ("Type 1A" or "Type 1B" imports) or that have surplus generation can be attributed to a GHG pricing zone ("Type 2" imports). In addition, there are different rules around resource eligibility for Attribution and flexibility to accommodate different state GHG rules and parameters around import eligibility. There are different leakage mitigation mechanisms, including validation of Attribution against expected actual incremental dispatch to serve GHG zone demand in Markets+ and a limit on total GHG attributions to the quantity of net exports from the balancing authority area in EDAM.

<sup>4</sup> CAISO. Greenhouse Gas Coordination Discussion Paper: Stakeholder Recommendations for Policy Development, September 16, 2024, Pg. 5-9. Available at: <https://stakeholdercenter.caiso.com/InitiativeDocuments/Discussion-Paper-Greenhouse-Gas-Coordination-Sep-16-2024.pdf>.

Addressing these problems requires wholesale markets to adopt new comprehensive GHG accounting policies. One proposal was for emission constrained dispatch that would give non-pricing states control of the emissions associated with generation serving load in the state. But both SPP and CAISO expressed concern that a new in-market emission constraint could introduce significant complexity and affect the efficiency of the market. For the time being, they both prefer an accounting system with emissions tied to energy that includes a pre-dispatch designation of resources and a post-dispatch allocation of energy to load based on transfers through the market. This is referred to as “Allocation.” SPP’s definition of Allocation is: “The post-market process of allocating all owned and contracted Energy produced to Reporting Entities, Non-Reporting Entities, and Residual Energy for purposes of the Market Operator producing the Reporting Entity GHG Report and Public GHG Report.”<sup>5</sup>

SPP has completed a draft market protocol for its Allocation framework in Markets+ called “GHG Tracking and Reporting.” The main elements of the SPP Tracking and Reporting framework are:

- Pre-dispatch “mapping” of owned and contracted generating and storage resources to load-reporting entities (LREs).
- Optional reporting and designation of “Null Power,” energy from which the RECs have been separated, before or after market run, which is reported differently in reports for LREs, public reports, and Residual Energy calculations.
- Allocation of Attributed generation to LREs in a GHG Pricing Zone, either to the LRE to which the energy is contracted (“Type 1A” or “Type 1B” Energy) or on a pro-rata basis among LREs (“Type 2” Energy).
- Post-dispatch Allocation of all generation to LREs or Residual Energy. Storage resources are used to adjust LRE load values.
- Calculation of “Residual Energy” (i.e., a market residual mix), which includes energy that is not mapped and Excess Energy (energy that exceeds an LRE’s load), based on market participants’ selected resource stacking methodology (Average Resource Portfolio, Economic Resource Stack, or Manual Stack).
- Reporting: a Reporting Entity GHG Report for each participating LRE containing detailed LRE-specific data, and a Public GHG Report containing aggregated GHG emissions and Residual Energy data that is published monthly, quarterly, and annually.

SPP is not proposing to share allocation data with WREGIS and has not included reports to WREGIS in the protocols.

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<sup>5</sup> SPP Markets+ GHG Tracking and Reporting Protocol Language, Approved 9/26/2024, pg. 7. Available at: <https://www.spp.org/Documents/72451/MGHGTF%2020240926%20Meeting%20Materials%20as%20Revised%20During%20Meeting.zip>

CAISO, on the other hand, is just beginning a policy initiative to consider a similar “Accounting and Reporting Approach” for the WEIM and EDAM, which “aims to enable LSEs and/or energy users to more accurately account for energy and associated emissions used to serve load under both regulatory and voluntary GHG reduction and clean energy goals.”<sup>6</sup> CAISO restates that its objective is to: “Allow entities to after the fact, outside of the market, account for the emissions they are responsible for,” for both compliance and voluntary purposes.<sup>7</sup> Details of its Approach will be discussed as a part of the policy initiative.

While there is clearly resource-specific allocation to load by the markets, it is not clear whether Attribution or Allocation are equivalent to resource-specific transactions or sales, bilateral transactions of attributes, or bundled renewable energy. Rather, Attribution is a resource-specific state or zonal load designation, which the seller controls using the GHG bid adder, and Allocation is a post-dispatch resource-specific designation to individual LSEs, which the seller does not control except through contractual arrangements outside of the market and indirectly through Attribution to a GHG pricing state.

## **2. Effect on RECs and WREGIS**

GHG Attribution and Allocation in CAISO and SPP markets affect the RECs associated with Attributed and Allocated renewable energy. The proposed Allocation frameworks track fuel type and emissions with energy to load using contracts for and transactions of power as a proxy for delivery of specified generation attributes. For renewable energy, the same generation attributes have been recorded in certificates issued by the Western Renewable Energy Generation Information System (WREGIS) (i.e., WREGIS certificates), which can be transacted separately from the power and tracked and allocated to load by account holders.

WREGIS is an electronic tracking system for the Western interconnection and a division of the Western Electricity Coordinating Council (WECC). It defines RECs and attributes as follows:

Certificate: A WREGIS Certificate (also called a Renewable Energy Credit (REC)) represents all Renewable and Environmental Attributes of MWh of electricity generation from a renewable energy Generating Unit registered with WREGIS. The WREGIS system will create exactly one Certificate per [megawatt-hour] MWh of eligible generation.<sup>8</sup>

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<sup>6</sup> CAISO. Greenhouse Gas Coordination Discussion Paper: Stakeholder Recommendations for Policy Development, September 16, 2024, Pg. 6. Available at: <https://stakeholdercenter.aiso.com/InitiativeDocuments/Discussion-Paper-Greenhouse-Gas-Coordination-Sep-16-2024.pdf>

<sup>7</sup> CAISO. Greenhouse Gas Coordination Presentation Slides. Working Group 12. September 19, 2024. Slide 15. Available at: <https://stakeholdercenter.aiso.com/InitiativeDocuments/Presentation-Greenhouse-Gas-Coordination-Working-Group-Sep-19-2024.pdf>.

<sup>8</sup> WECC. October 2022. *WREGIS Operating Rules*. Pg. 9. Available at: <https://www.wecc.org/sites/default/files/documents/program/2024/WREGIS%20Operating%20Rules%20October%202022%20Final.pdf>.

Renewable and Environmental Attributes: Any and all credits, benefits, emissions reductions, offsets, and allowances—however titled—attributable to the generation from the Generating Unit, and its avoided emission of pollutants. Renewable and Environmental Attributes do not include (i) any energy, capacity, reliability, or other power attributes from the Generating Unit; (ii) production tax credits associated with the construction or operation of the Generating Unit and other financial incentives in the form of credits, reductions, or allowances associated with the Generating Unit that are applicable to a state, provincial, or federal income taxation obligation; (iii) fuel-related subsidies or “tipping fees” that may be paid to the seller to accept certain fuels, or local subsidies received by the generator for the destruction of particular pre-existing pollutants or the promotion of local environmental benefits; or (iv) emission reduction credits encumbered or used by the Generating Unit for compliance with local, state, provincial, or federal operating and/or air quality permits.<sup>9</sup>

WREGIS electronically serializes and issues certificates to registered renewable generators with accounts—one certificate for each megawatt-hour (MWh) of renewable energy added to the grid—based on monthly verified generation data. Each REC is linked to a specific generator, with static information such as resource type, size, and location, and contains dynamic generation data like the quantity and vintage of the energy produced. RECs can be transferred and tracked between account holders, such as LSEs or individual consumers, and ultimately permanently retired electronically. Account holders indicate whether the RECs have been retired for a particular compliance or state reporting program, voluntary program, individual voluntary sale or purchase, or specific retail end-use claim.

RECs are consistently used to allocate renewable energy generation to load and verify delivery and retail use of renewable energy in voluntary and compliance programs across the West and the country.<sup>10</sup> All state RPS programs in the West require that a certain percentage of electricity sales is met or supplied with renewable resources, or that a certain percentage of renewable electricity generation is sold to customers. They all require verification of compliance using RECs.

RECs are also consistently used for load-based GHG emissions programs in the West, including the Oregon Clean Fuels Program,<sup>11</sup> the Washington Clean Fuels Program,<sup>12</sup> the California Low Carbon Fuel Standard,<sup>13</sup> California’s SB 100,<sup>14</sup> the California Power Source Disclosure program,<sup>15</sup> and the Washington

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<sup>9</sup> *Ibid.* Pg. 10-11.

<sup>10</sup> CRS. 2023. *The Legal Basis for Renewable Energy Certificates*. v2.0. Available at: <https://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>

Weinstein, J. Jan 2021. *What are Renewable Energy Certificates?* Futures and Derivatives Law Report, Volume 41, Issue 1. Thomson Reuters.

<sup>11</sup> OAR 340-253

<sup>12</sup> WAC 173-424

<sup>13</sup> 17 CCR 95480-95503

<sup>14</sup> California’s “zero-carbon” resources for 100% of retail electricity sales to California end-use customers will be enforced and verified in part using the existing RPS and RECs. See Section 1(c) of SB 100. See CAL. PUB. UTIL. CODE § 454.53(a) and (b)(4).

<sup>15</sup> 20 CCR 1393(b)(1), 20 CCR 1393(c)(1)(B)

Clean Energy Transformation Act.<sup>16</sup> In these programs, RECs are respectively used to assign an emissions rate to load in the transportation sector and to verify compliance with emissions reduction requirements for retail electricity sales or electricity serving load. As such, the function of RECs is the same in an emissions accounting context as it is in an RPS and voluntary renewable energy context—to verify use and delivery of specified power to load.

In addition, all options for voluntarily delivering, purchasing or otherwise using renewable electricity in the U.S., including onsite generation, include RECs to substantiate a renewable energy use claim.<sup>17</sup>

Consensus is also growing around the use of energy attribute certificates (EACs), of which RECs are one type, for attribution of specified emissions to load in federal programs, including federal procurement directives, tax credits, federal clean transportation policy, and production of fuels used by regulated generators to comply with the U.S. Clean Air Act.<sup>18</sup>

In these programs, the REC alone conveys generation attributes and the specified use claim. Electricity from which RECs have removed and sold separately must be reported as “null” or unspecified.<sup>19</sup> Moreover, use of “unbundled” RECs—RECs procured separately from the associated power—is generally permitted in these programs for all or a portion of compliance or transactions. These programs may nevertheless have different rules regarding procurement of the associated power (e.g., “bundling”) or energy transaction data to meet other objectives, or to account for attributes (e.g., emissions) from certain facilities that have sold electricity to the state.<sup>20</sup> As a result, contractual delivery/distribution of RECs may be different than contractual distribution of electricity. But only distribution of the RECs determines distribution of renewable electricity for compliance or voluntary claims.

Decoupling GHG attribution from RECs would result in attribute “disaggregation.” According to WREGIS, disaggregation is, “a process by which attributes are separated from a Certificate for specific uses,” and “WREGIS does not functionally support Certificate Disaggregation, but instead requires such

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<sup>16</sup> RCW 19.405.040(1)(c).

<sup>17</sup> 16 C.F.R. § 260.15, *Guides for the Use of Environmental Marketing Claims*, US Federal Trade Commission.

<sup>18</sup> US EPA. July 24, 2023. *Interested Party Comment from the U.S. Environmental Protection Agency is response to Oregon No. 23-194 and the June 29, 2023, Commission Workshop on Renewable Energy Certificates*. OPUC Docket No. UM 2273. Available at: <https://edocs.puc.state.or.us/efdocs/HAC/um2273hac9745.pdf>.

Also, see US DOE. 2023. *Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit*. Available at: [https://www.energy.gov/sites/default/files/2023-12/Assessing\\_Lifecycle\\_Greenhouse\\_Gas\\_Emissions\\_Associated\\_with\\_Electricity\\_Use\\_for\\_the\\_Section\\_45V\\_Clean\\_Hydrogen\\_Production\\_Tax\\_Credit.pdf](https://www.energy.gov/sites/default/files/2023-12/Assessing_Lifecycle_Greenhouse_Gas_Emissions_Associated_with_Electricity_Use_for_the_Section_45V_Clean_Hydrogen_Production_Tax_Credit.pdf).

<sup>19</sup> CRS. 2023. *The Legal Basis for Renewable Energy Certificates*. v2.0. Available at: <https://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>

<sup>20</sup> 16 C.F.R. § 260.15, *Guides for the Use of Environmental Marketing Claims*, US Federal Trade Commission.

<sup>20</sup> Still other state programs regulating electricity, associated emissions, or LSEs, may not be accounting for/regulating generation attributes delivered to customers (“load-based”) and may not require RECs. These programs do not affect load-based programs that do use RECs. For more information, see CRS. 2022. *Guide to Electricity Sector Greenhouse Gas Emissions Totals*. Available at: <https://resource-solutions.org/wp-content/uploads/2022/11/Guide-to-Electricity-Sector-Greenhouse-Gas-Emissions-Totals.pdf>.

Certificates to be removed from the system by transfer into a WREGIS Reserve Account.”<sup>21</sup> In other words, disaggregation of the fuel/resource type, direct emissions, and/or emissions rate associated with generation for separate use, e.g., Allocation by electricity markets for LSE reporting to states, “consumes” the REC.<sup>22</sup> This avoids factual inconsistencies and discrepancies between attributes (e.g., between fuel type and emissions) that would affect the integrity of the instrument and the programs and retail claims that rely on it.

We are left with a situation in which there may be two different systems for retail attribution of generation (claims on specified generation) operating simultaneously in the West—the REC system and these new market Allocation frameworks. This creates a risk of double counting.

If CAISO and SPP do not require certificate transfer or ownership for WREGIS-registered resources, Attribution and Allocation to load by the markets (and the GHG reporting programs for which this information is used) may conflict with the attribution of renewable generation to load using WREGIS (and the voluntary and compliance programs for which it is used). Double counting of generation occurs when energy is attributed to California or Washington load in the market or allocated to an LSE under a market tracking framework, while the associated REC is retired for load in a different state or by another LSE for a retail emissions claim under various retail programs. This can happen when RECs are transacted to another entity either before or after the resource-specific energy transaction, leading to two different retail claims on the same unit of generation. This double counting risk pertains to market Attribution in California and Washington; retail programs in California, Washington, Oregon, Nevada, Utah, Arizona, Colorado, and New Mexico; and voluntary renewable energy programs in all Western states. It relates to both existing GHG Attribution for GHG pricing programs and proposed GHG market design that includes Allocation for LSEs.

Where resource-specific Attribution is inconsistent with REC tracking, double counting may occur where the associated RECs are used for compliance or voluntary programs outside of the GHG pricing area/zone. For example, generation and associated emissions from a wind generator located in Wyoming participating in EDAM are attributed and deemed to serve load in the California GHG compliance area in EDAM, while the RECs associated with this generation are sold and transferred in WREGIS to an LSE in Colorado and retired for compliance with Colorado’s RPS program. In this case, the same generation and associated emissions are reported as serving load in two different states. Avoiding double counting associated with Attribution requires that any associated RECs stay in the GHG state or zone to which resources or resource-specific emissions were attributed by the market. It does not require that the RECs be retired for Attribution in the market or any specific utility load or

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<sup>21</sup> WECC. October 2022. *WREGIS Operating Rules*. Pg. 9. Available at: <https://www.wecc.org/sites/default/files/documents/program/2024/WREGIS%20Operating%20Rules%20October%202022%20Final.pdf>

<sup>22</sup> For further discussion, see Weinstein, J. Jan 2021. *What are Renewable Energy Certificates?* Futures and Derivatives Law Report, Volume 41, Issue 1. Thomson Reuters.



customers inside the state/zone at the time of the market transfer. If, for example, the California cap-and-trade and the Washington Climate Commitment Act programs are linked and generation is attributed to a combined WA-CA GHG compliance area (i.e., if the zone to which generation/GHG are attributed includes multiple states), then RECs associated with transactions to the combined GHG compliance area could be used in either California or Washington, provided there is no other more precise allocation of the renewable source by the market.

Where proposed market Allocation frameworks are used by LSEs to report the generation and emissions serving their load/customers, including renewable energy registered in WREGIS, without the associated REC, double counting may occur where the RECs are retained by or sold to a different LSE or customer for compliance or voluntary programs in the same or a different state, to claim/report zero-emissions generation, renewable generation, or both. For example, generation and associated emissions from a Colorado wind generator owned by a Colorado utility participating in SPP's Markets+ are mapped and allocated to the Colorado utility by the market, while the RECs associated with this generation are sold and transferred in WREGIS to an Oregon utility and retired on behalf of the Oregon RPS. In this case, the same generation and associated emissions are reported as serving the customers of two different LSEs. Avoiding double counting associated with LSE-specific Allocation requires that any associated RECs are retired by the LSE to which generation and emissions were allocated by the market.

Double counting resulting from either Attribution and Allocation of WREGIS-registered generation to retail load by the markets without WREGIS certificates would damage the integrity of renewable energy markets and GHG programs and infringe on the rights and claims of WREGIS certificate holders.

### **3. Consideration of RECs in Proposed Market Allocation Frameworks**

While RECs are not currently considered in market Attribution by either CAISO or SPP, they may be in the future and in proposed Allocation frameworks. CAISO's GHG Coordination Working Group has recommended the development of additional GHG-related metrics to address the following problem statements:<sup>23</sup>

Problem Statement 5: When there are multiple unlinked GHG regulation areas or different reporting requirements by different states, market participation may result in double counting, undercounting, or inconsistent counting of emissions. Variations of this issue include: [...] b. Using both total WEIM attribution and systems to allocate generation and associated emissions to retail load (i.e., RECs).

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<sup>23</sup> CAISO. Greenhouse Gas Coordination Discussion Paper: Stakeholder Recommendations for Policy Development, September 16, 2024, Pg. 7. Available at: <https://stakeholdercenter.caiso.com/InitiativeDocuments/Discussion-Paper-Greenhouse-Gas-Coordination-Sep-16-2024.pdf>

Problem Statement 6b: There is no requirement that the generation/tag data reported to WREGIS and the data arising from the ISO's GHG attribution be consistent with each other. This leads to the potential for double-counting of the same MWh of energy when jurisdictions deem GHG attribution as a claim on MW attributes. This might have negative implications for state energy programs.

CAISO will continue working group discussions on these problems statements.

RECs are considered in the proposed SPP Markets+ protocol for GHG Tracking and Reporting. The protocol includes definitions of a REC and null power:<sup>24</sup>

Renewable Energy Certificate ("REC"): A tradeable instrument representing the renewable and environmental attributes of 1 MWh of Energy from a renewable Resource.

Null Power: Energy designated by a Reporting Entity indicating that the Renewable Energy Certificates and/or nonpower attributes have been separated from the Energy and retained by the Reporting Entity or sold to a third party. Nothing in these protocols requires a Reporting Entity to designate power as null.

In the protocol, null power is optional and self-reported by LREs. But where it is reported, it is accounted for in Allocated generation to LREs, meaning null power is unspecified (reported without emissions) in LRE Allocated MWh and GHG totals. The null power volumes and emissions of each resource of the LRE are included in LRE GHG Reports and the sum of the Allocated Null Power volume is included in the Public GHG Report from the market. Null power is not accounted for in Residual Energy (the market residual mix), meaning Excess Energy (energy in excess of what gets Allocated to an LRE's load) and energy that is not mapped to an LRE that is designated as null power is nevertheless included in the residual mix at the emissions rate associated with the underlying resources. But null power volumes in the residual mix are reported, so that they can be removed to calculate a "null power-adjusted residual mix." Hourly volumes of Null Power in Residual Energy are included in the monthly Public GHG Report without underlying fuel type, and quarterly aggregated volumes of Null Power in Residual Energy are included in the quarterly and annual Public GHG Report by fuel type.

Finally, the protocol includes disclaimer language stating that data in the Public GHG Report does not constitute a claim to any non-power attributes for energy designated as null power, that REC owners may be affected by participation in these Tracking and Reporting protocols, and that reporting and treatment of null power in the residual mix may affect the accuracy of reporting under programs that use RECs.<sup>25</sup>

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<sup>24</sup> SPP Markets+ GHG Tracking and Reporting Protocol Language, Approved 9/26/2024, pg. 8. Available at: <https://www.spp.org/Documents/72451/MGHGTF%2020240926%20Meeting%20Materials%20as%20Revised%20During%20Meeting.zip>

<sup>25</sup> *Ibid.* pg. 19.

#### 5.8.7 Public GHG Report Disclaimers

A Public GHG Report is for informational purposes only and does not constitute or convey to a Market Participant any claim to any non-power attributes (including fuel type and associated emissions rate) for energy designated as Null Power.

- (a) If a Public GHG Report is used as the basis for a claim to any non-power attributes for Energy designated as Null Power, it could jeopardize the ability of the owner of the associated Renewable Energy Credits (RECs) or other non-power attributes to use its RECs or other non-power attributes for voluntary or compliance program purposes. Each Reporting Entity is responsible for ensuring that participation in these tracking and reporting protocols is compatible with any and all related compliance obligations the Reporting Entity may have. The Market Operator does not have a compliance or monitoring obligation associated with this disclaimer. Each state within the Markets+ Footprint may have different regulations and definitions that apply to the terms used in this disclaimer.
- (b) Including Null Power at the emissions rate associated with the underlying Resources for Residual Energy may understate emissions for purposes of calculating an emissions rate that is consistent with the claims to RECs and on non-power attributes.
- (c) Excluding Null Power from the calculation of an emission factor for Residual Energy for purposes of determining total emissions associated with serving load under accounting systems that are not based on claims to RECs or nonpower attributes may overstate emissions relative to actual emissions of generating Resources in that hour.

#### **4. CRS's Recommendations**

CRS has recommended to both CAISO and SPP that they coordinate and share data with WREGIS under these frameworks, such that allocation of generation by the markets and certificates can be aligned to the extent possible and otherwise information about the Attribution and Allocation of generation by the markets can be incorporated into WREGIS and used by WREGIS account holders and program administrators.

Specifically, we have recommended that CAISO and SPP provide to WREGIS, for each generating unit registered in WREGIS, the quantity of electricity in a given period that was bid into the market and either Attributed to load on a resource-specific basis in certain states or zones (e.g., a “deemed” import to the California GHG compliance area) or Allocated on a resource-specific basis to an LSE. We recommended that SPP add two new reports to WREGIS in its Markets+ protocol for GHG Tracking and Reporting (on top of the existing Reporting Entity GHG Reports that only go to the LREs and the public GHG report that only includes residual mix and other aggregated market data). The first would share information from LRE GHG Reports, where the LRE elects to share that information with WREGIS. The

second would aggregate Allocation information by WREGIS-registered resource and would not require LRE or resource permission to be shared. Our specific recommended protocol language was as follows:

“With the permission of a Reporting Entity, Allocated MW and Null Power volume information by Load Reporting Entity and Resource for all resources registered with the Western Renewable Energy Information System (WREGIS) will be shared with WREGIS.”

“For each Resource that is registered with WREGIS, the sum of Allocated MW for that Resource in a given month to Reporting Entities by state will be shared with WREGIS before REC issuance for that month.”

This would enable WREGIS to reflect Attribution and Allocation by these markets in its system. We have suggested that WREGIS could be asked to put this information on an equivalent quantity of WREGIS Certificates from each such unit, e.g., the state of market Attribution. The markets should collaborate with WREGIS on the timing of the reporting to ensure that WREGIS receives it before issuance for that month, enabling RECs to be “tagged” when issued to the generator. With that transparency, each state or voluntary program using WREGIS could make its own decision about the eligibility of those RECs. Ideally, those RECs would be distributed/transferred in alignment with Allocations under these market frameworks to avoid double counting.

These recommendations focus on the near-term effect of GHG Attribution and Allocation by markets on existing REC systems and programs. In the future, expanding tracking in WREGIS to include all resources (“all-generation certificate tracking”) could facilitate the development of simpler and more comprehensive fuel type and emissions reporting for all transacted power in Western markets. In other regions, regional all-generation certificate tracking is used to produce an accurate region-wide residual mix and emissions factor based on the distribution of certificates, for comprehensive accounting of all generation regionally without double counting, such that everyone knows what they are getting. That residual mix of unsold certificates is assigned to unfulfilled LSE load—load not met with specified attributes—at the end of defined trading periods. This could work in cooperation with market Allocation frameworks, again to address state requirements for delivered energy and enable specified resource transactions for market participants, as well as to produce a market-specific residual mix. In that case, CAISO would share all market Attribution and Allocation data for all generators in the market with WREGIS for all-generation tracking.

In addition to data sharing with WREGIS, we have recommended that CAISO and SPP require LSE ownership of the associated RECs for Allocation of renewable generation resources, as opposed to optional null power reporting. To avoid double counting of renewable generation, market Allocation frameworks should not allocate renewable generation to an LSE if the RECs are not owned by that LSE. Ultimately, permanent retention and retirement of RECs by LREs will be required for credible retail claims. But, so as not to restrict wholesale transactions, we have recommended attribute ownership at

the time of Allocation. States and other GHG programs could still set their own compliance or reporting requirements regarding RECs.<sup>26</sup>

Finally, we have recommended that the markets calculate and provide a “null power-adjusted residual mix” figure by removing null power in the residual mix, rather than just providing the sum of null power volumes in the residual mix and allowing entities to do the calculation themselves.<sup>27</sup> A null power-adjusted figure is most accurate for a load-based GHG accounting framework since it would account for other specified transactions outside of the market, and this would again serve the needs of states and consumers that need to account for REC transactions in emissions from purchased electricity.

## 5. Status of Requests for Coordination with WREGIS

CAISO has decided not to share EIM/EDAM Attribution data with WREGIS, at least for now. According to the final EDAM proposal: “The ISO makes no claim to a resource’s environmental attributes, either for itself or on behalf of its market participants, as a result of a dispatch in its markets.”<sup>28</sup> Despite the fact that environmental attributes are being attributed to state load now and potentially allocated to individual LSEs by the market in the future, and that the purpose of these mechanisms is to serve state reporting and regulatory needs,<sup>29</sup> this statement suggests that states, market participants, and other stakeholders must determine that these mechanisms and use of market data for load-based state and voluntary programs affects RECs and REC claims. The proposal also suggested that REC-based policies that allow unbundled procurement and compliance would support market participation and emissions reductions: “[policies that] require deliverability to the service territory of the purchasing utility for a utility to claim the REC [...] can prohibit market participation and, consequently, efforts to lower emissions in the west.”<sup>30</sup>

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<sup>26</sup> Where attribute ownership is required for Allocation by the market 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 Allocation simply would not be used for state reporting. Meanwhile, the frameworks would not double count for states that do require the RECs/attributes. On the other hand, if the frameworks allocate to LSEs regardless of REC ownership, that would allow double counting of non-excess generation for states and programs that do require RECs for GHG accounting. In other words, requiring attribute ownership for Allocation to LSEs 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.

<sup>27</sup> While removing the null power generation from the residual mix would undercount MWh in the residual mix, this is preferable to assigning a positive emissions value to that generation, which would over count emissions.

<sup>28</sup> CAISO. Dec 7, 2022. *Extended Day Ahead Market Final Proposal*. Pg. 110. Available at: See <https://stakeholdercenter.caiso.com/InitiativeDocuments/FinalProposal-ExtendedDay-AheadMarket.pdf>.

<sup>29</sup> *Ibid*: “For regulatory purposes, the proposal is to for [sic] the ISO to provide total WEIM and EDAM transfers to states with GHG pricing programs. For voluntary clean energy programs, with market enhancements, the ISO could also provide emissions intensity information for in-state generation and the total MW of BAA-level transfers. This effort will depend on the data set needed by states to assess how dispatch of resources in a centralized market informs the GHG intensity of power serving its demand. The ISO is open and willing to begin longer term efforts to provide states with and without carbon pricing programs data on centralized market transactions. To support such reporting efforts, the ISO will work with state representatives to assess what type of data would best support their requirements and the frequency they would like it provided.”

<sup>30</sup> *Ibid*. See <https://stakeholdercenter.caiso.com/InitiativeDocuments/FinalProposal-ExtendedDay-AheadMarket.pdf>.

CAISO has not made a decision about data sharing or coordination with WREGIS as a part of a potential broader GHG Accounting and Reporting approach for CAISO markets (i.e., Allocation). We expect that this will be discussed through the upcoming policy initiative.

SPP is not proposing to share Markets+ Attribution or Allocation (GHG Tracking and Reporting) data with WREGIS. SPP has not included our recommended reports to WREGIS in its GHG Tracking and Reporting protocol. Leaders of the SPP Markets+ GHG Task Force have stated that coordination with WREGIS, and determining the nature of that coordination, does not fall within its purview.

## **6. Objections to Coordination with WREGIS**

The following objections to data sharing and coordination with WREGIS have been raised at various times in discussions with both CAISO and SPP working groups.

### **a. Policy Neutrality for the Markets and WREGIS**

Leaders and participants in these discussions have objected to coordination with WREGIS on the basis of maintaining policy neutrality for the markets, WREGIS, or both, suggesting that such coordination would amount to taking a policy position on the role of RECs in GHG accounting and reporting.

Once they choose to provide Allocation data, the role of the markets is to do it in a transparent and efficient way, without giving preference to a certain market participant, state, or type of policy. Coordination and data sharing with WREGIS would 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 and Attribution 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 or Allocation to different states or entities and the value that it assigns to this information. It may, however, change state and participant decision-making in response to this information. Neither would coordination and data sharing necessarily change market or WREGIS functionality. Though the provision of additional and better data may lead to future changes, such as all-generation certificate tracking. It is also not required that all parties or states agree that coordination is necessary or that market Attribution and Allocation affects WREGIS. It is relevant to jurisdictions and programs that do.

Similarly, our recommendation to require attribute ownership for Allocation of specified generation to LSEs 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.<sup>31</sup> Providing a null power-adjusted residual mix also would not represent a policy position. In providing both adjusted and non-adjusted residual

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<sup>31</sup> See footnote 26.

mix figures, the markets would not be espousing any one number over any other. Again, state policy that is inconsistent on the use of RECs for load-based GHG accounting does not prohibit the provision of data that account for RECs and null power.

b. Confidentiality

Some participants in discussions with CAISO and SPP have expressed confidentiality concerns with sharing Allocation data with WREGIS. We believe that these concerns are largely addressed by aggregating Allocation by generator and by month. To the extent that WREGIS could tag RECs with market Allocation information, that information would be seen by the individual account holders of those RECs and program administrators. We do not expect that WREGIS would issue public reports that include market Allocation information. Furthermore, WREGIS-registered generators that have already agreed to use CAISO as the qualified reporting entity (QRE) for generation data used for certificate issuance in WREGIS could simply agree to have CAISO share Attribution/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, Attribution, or 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.

c. Lack of Interest from WREGIS and REC-based Programs

Leaders of the SPP Markets+ GHG Task Force have noted that there has been no request by WREGIS, states, or anyone other than CRS to share Allocation data with WREGIS, and a general lack of interest and participation by WREGIS and REC program administrators other than CRS.

d. Lack of Agreement on the Effect of Attribution/Allocation on RECs

Certain market stakeholders do not acknowledge that RECs allocate renewable energy generation to load, either consistently across states or even where they are required. As a result, they do not acknowledge a fundamental conflict between these Allocation frameworks and RECs as an existing and separate mechanism for allocating the same generation attributes in the same region, or the mathematical error (double counting) that results. Rather, they view RECs as compliance instruments required for certain compliance and voluntary programs (REC-based programs) only. They cite

disagreement and inconsistency among the states on the definition of RECs, the attributes included in a REC, the purpose of REC-based programs, and requirements for RECs in load-based emissions programs. As a result, they see no implicit need for coordination with WREGIS.

This perspective disagrees with the information under Section 2 of this Appendix, *Effect on RECs and WREGIS*, above and is intellectually inconsistent with the current recognition of RECs and treatment of null power in the SPP GHG Tracking and Reporting protocol.

e. Data Format

Some participants have expressed concern that the hourly format of market Attribution and Allocation data and the monthly format of WREGIS data might represent a challenge for coordination. We believe that this concern is addressed by aggregating market Allocation quantities by my month for designation of an equivalent quantity of certificates by WREGIS.

f. Allocation Timing Difference

However, a related (and the most recent) argument from market participants for why RECs are not de facto affected by Allocation frameworks in markets (and why coordination with WREGIS is not necessary) has to do with the timing difference between Allocation in markets and allocation of RECs. They argue that because day-ahead and real-time market transactions are recorded on an hourly basis, allocation of generation and emissions to load in the market should be hourly, while RECs are transacted and often banked or held over longer periods of time, e.g., for multi-year or annual compliance and reporting. This causes problems for allocation on an hourly basis: generation and emissions associated with transacted or held RECs cannot be allocated to load and become lost. In a hypothetical scenario where all the transacted generation during a trading period was reported as null power and the RECs were held by the generators, a residual mix for the market could not be calculated. Consequently, in their view, using or accounting for RECs would misrepresent “actual” generation and consumption (Allocation) in markets. Another version of this argument is that “RECs are divorced from the economic and physical realities of reliability and transmission constraints that govern utilities’ operational decisions (as well as the consequent GHG emissions from the dispatched power plants).”<sup>32</sup>

States and utilities may or may not wish measure the emissions from dispatched power plants based on utilities’ operational decisions. But RECs do represent the attributes of renewable energy generation and are used to verify allocation of renewable energy and associated emissions to load in existing compliance and voluntary programs. Of course, there is no “actual” allocation of generation to load, and transactions of specified power occur over different timeframes, using different market instruments, and the attributes of generation can be transacted separately from the power outside of wholesale

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<sup>32</sup> Spees, K. et al. 2023. *Greenhouse Gas and Clean Energy Accounting Methodology Catalog*. Brattle Group. Pg. 21. Available at: [https://www.brattle.com/wp-content/uploads/2023/07/2023-06-27-GHG-Accounting-Catalog\\_v2.pdf](https://www.brattle.com/wp-content/uploads/2023/07/2023-06-27-GHG-Accounting-Catalog_v2.pdf).



markets. Failing to account for all transactions in load- or consumption-based programs would be inaccurate. Therefore, neither the timing of actual generation on the grid nor energy transactions in wholesale markets should determine the timeframe of Allocation.

Absent a single closing/trading period for the region at the end of which generation and emissions can be allocated (which the West does not have), the timeframe for allocation to load for the purposes of load-based accounting (i.e., accounting for the generation and emissions serving load, accounting for the emissions associated with purchased or sold or delivered electricity, etc.) must either expand to include all transactions or “true up” at different points. Otherwise, it will appear to those assuming a narrower timeframe that generation and emissions are lost, and RECs will be viewed as incompatible. In fact, perhaps the opposite is true, that an hourly timeframe is ill-suited to load-based accounting because transactions do occur over longer timeframes.

Ultimately, if the market allocates generation to load, that Allocation must be consistent with the distribution of certificates in order to be accurate. Since the timeframes for allocation under these two systems are different, accuracy demands adjusting for null power in the markets’ Allocations and residual mix (to account for REC transactions that have already happened) and sharing market Allocation data with the WREGIS (to account for REC transactions that will happen in the future).

## **7. Previous Actions and Investigations into the Effect of Western Wholesale Market Attributions on RECs**

CRS has raised the issue of market GHG Attribution and “deeming” in Western wholesale markets, particularly in the WEIM, and its effect on REC systems many times in the past, to individual states, regional market stakeholder forums and working groups, and to WREGIS.<sup>33</sup> Often the issue has been presented in the context of double counting that may arise from California’s (and Washington’s) imports accounting policy under the cap-and-trade program, which does not require import or retirement of the associated REC for specified renewable imports.

In particular, questions about the effect of GHG Attribution in the WEIM on RECs led to a memo from WREGIS in April 2017, stating that RECs are affected and that RECs associated with energy bid into the

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<sup>33</sup> In particular, CRS has given two presentations to the WEIM Regional Issues Forum, on Sept 7, 2017 and June 18, 2019 (materials and records for those meetings available here: <https://www.westerneim.com/Pages/Governance/RegionalIssuesForum.aspx>). CRS has provided written and oral comments to CAISO as a part of its EDAM Working Group 3 on Greenhouse Gas Accounting and Costs (records available here: <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Extended-Day-Ahead-Market-Working-Group-3-Greenhouse-Gas-Accounting-Costs>). CRS filled several written comments and presented to the Washington CETA carbon and electricity markets work group (MWG) (records available under UTC Case Docket Document Sets for Filing UE - 190760 here: [https://www.utc.wa.gov/fa/casedocket/2019/190760/docsets?utm\\_medium=PANTHEON\\_STRIPPED&utm\\_source=PANTHEON\\_STRIPPED](https://www.utc.wa.gov/fa/casedocket/2019/190760/docsets?utm_medium=PANTHEON_STRIPPED&utm_source=PANTHEON_STRIPPED)). CRS has provided oral and written comments to the California Independent Emissions Market Advisory Committee (IEMAC). CRS has filled many written comments on imports accounting policy for cap-and-trade under various regulatory proceedings by CARB, CEC, WA UTC, WA COM, ODOE, and ODEQ, as well as letters to the Oregon Office of the Governor. CRS written comments can be found at: <https://resource-solutions.org/publications/>. Finally, CRS has raised the issue with WREGIS Staff and the WREGIS Stakeholder Advisory Committee on several occasions.

WEIM should be retired since they would otherwise be disaggregated. It further stated that this interpretation was supported by WREGIS Operating Rules and agreed on by WREGIS Committee consensus. That memo was later rescinded. This was followed by an investigation by Oregon Department of Energy in June 2017 into zero-emissions claims on RECs associated with renewable electricity imported into California via the WEIM and the eligibility of those RECs for the Oregon RPS.<sup>34</sup> The investigation was inconclusive.<sup>35</sup>

In 2018 and 2019, the California Independent Emissions Market Advisory Committee (IEMAC) considered “mounting concerns about how low- or zero-carbon renewable energy imports are tracked and managed in California’s cap-and-trade program” and RECs associated with these imports, not limited to wholesale market imports or Attributions. The IEMAC’s 2019 Annual Report states, “If a neighboring state associates a REC with a low- or zero-carbon resource when California also counts the low- or zero-carbon resource with the associated energy delivery, there is the potential to ‘count’ (albeit using different metrics) the same low- or zero-emissions attribute twice.” The IEMAC recommends “that CARB share available data on the RECs that were retired or ‘bundled’ with California imports.”<sup>36</sup>

In Washington, the eligibility of RECs associated with reported California renewable energy imports was evaluated for the state’s Clean Energy Transformation Act (CETA). Regulators adopted rules in 2022 that RECs associated with energy imported into California with specified emissions (and counted under cap-and-trade) without RECs are not eligible to be counted toward CETA, again not limited to wholesale market Attributions.<sup>37</sup> This determination was made with agreement from all parties that counting the emissions attribute for imported electricity in California affects the eligibility of the REC in Washington and that use of that REC under CETA would constitute double counting, which is prohibited under CETA.<sup>38</sup>

These questions have now expanded from in-market Attribution to proposed out-of-market Allocations of generation to LSE load.

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<sup>34</sup> See <https://www.oregon.gov/energy/energy-oregon/Pages/RECs-EIM-Stakeholder-Meetings.aspx>.

<sup>35</sup> For more information, see Weinstein, J. Jan 2021. *What are Renewable Energy Certificates?* Futures and Derivatives Law Report, Volume 41, Issue 1. Thomson Reuters. Pg. 20-22.

<sup>36</sup> 2019 Annual Report of the Independent Emissions Market Advisory Committee. Pg. 16-7. Available at: [https://calepa.ca.gov/wp-content/uploads/sites/6/2020/01/Final\\_2019\\_IEMAC\\_Annual\\_Report\\_2019\\_12\\_06.a.pdf](https://calepa.ca.gov/wp-content/uploads/sites/6/2020/01/Final_2019_IEMAC_Annual_Report_2019_12_06.a.pdf).

<sup>37</sup> See WAC 194-40-420 (2)(b), (4), and (5): <https://app.leg.wa.gov/WAC/default.aspx?cite=194-40-420>

<sup>38</sup> At a workshop on “interpretations of use” in August 2021, the joint utilities proposed to put “strong double counting protections in place” requiring that specified source sales to other states and RECs associated with specified sales for programs that do not require RECs are excluded from compliance. Use of RECs associated with nonemitting energy sold into California was provided as an example of double counting. See Slide 4 of Multi-year Compliance with Annual Surplus Accounting, Joint Utility Compromise Compliance Proposal, August 12, 2021, available at: <https://www.commerce.wa.gov/wp-content/uploads/2021/08/Multi-year-Compliance-with-Annual-Surplus-Accounting-Presentation-8-11-21-Final-CLEAN1-Read-Only.pdf>.

## **8. Conclusion**

There are new voluntary regional wholesale electricity markets in the West. By all accounts, these markets provide significant cost and environmental benefits to the region. These markets attribute and allocate generation and emissions to load to meet Western state requirements. But this allocation is not being coordinated with the REC system, which also allocates generation to load and provides significant benefits to the region. This creates a risk of double counting, which jeopardizes the benefits of both.

WREGIS and states must engage in the development of market allocation frameworks and request that market allocation data be shared with WREGIS in order to maintain exclusive retail claims and regionally consistent renewable energy and GHG emissions accounting.