GHG Coordination Discussion Paper

April 15, 2024

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California Independent System Operator

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Executive Summary

This paper provides stakeholders with an overview of the upcoming ISO-hosted and stakeholder-driven greenhouse gas (GHG) Coordination Working Group. Specifically, the paper discusses the background on the working group effort, offers a strawman for the structure of the GHG Coordination Working Group, and provides a synthesis of the GHG stakeholder survey results on the recommended topics the working group should consider. This paper is also a tool to assist the GHG Coordination Working Group in organizing discussions and a means of accelerating collaboration between stakeholders.

As part of the policy initiative stakeholder process, the ISO has launched this GHG Coordination working group to follow up on the commitment the ISO made to continue working collaboratively with stakeholders and regulatory agencies to explore how GHG accounting functionality could evolve after the ISO implements and gains experience with the Extended Day Ahead Market (EDAM). A recommended output of this working group is a "GHG Action Plan", containing recommendations informing and supporting GHG policy design(s) that are durable and can reflect an array of western climate policies.

This document outlines proposed topics for the working group based on the results of the ISO's GHG Coordination Working Group survey. The ISO issued this survey in June 2023 and requested feedback from stakeholders on GHG topics the working group should address as well as a recommended prioritization of those topics.[1] Survey results coalesced around four themes, including a need to: 1.) review the ISO market operations and GHG design 2.) coordinate with state air regulators on climate policies 3.) discuss data needs for emissions tracking and accounting and 4.) re-examine how the market could reflect climate policies that do not explicitly price carbon. These survey results do not preclude the discussion of other topics, but rather offer a starting point for working group discussion, collaboration, and continued refinement.

[1] See the Appendix for a more detailed summary of the survey results.

Introduction

Background

In the ISO's EDAM initiative process, stakeholders focused on developing a market model that could accommodate the price-based GHG emissions policies of multiple states. In addition, stakeholders questioned how participation in ISO's market could support the objectives of non price-based climate related policies like renewable portfolio standards (RPS) and GHG emission reduction goals. The ISO committed to continue working collaboratively with stakeholders and regulatory agencies to explore how the ISO market's GHG accounting functionality could evolve after it implements the EDAM and gains operational experience.

To date, GHG market design has reflected price-based emissions policies, like those adopted by California and Washington. These policies increase the marginal cost of electricity from fossil-fueled resources. An objective of the market design in the WEIM, and now in the EDAM, is to account for GHG costs associated with day ahead and real time transfers consistent with state policy. However, climate policies are in place and developing that will not price carbon. The working group is an opportunity for stakeholders to discuss if the ISO's market should also account for non-price based policies, and if so, how. The ISO hopes the GHG Coordination working groups can focus on design(s) that are durable and can reflect an array of western climate policies.

The GHG Coordination working groups will enhance the quality of proposal development by offering diverse stakeholders opportunities for engagement and alignment. The working groups offer stakeholders new to the conversation an opportunity to gain a better understanding of current ISO market design and processes, and introduce new scope items for consideration. The ISO acknowledges the effort that stakeholders put into the EDAM process and envisions the working groups to be an opportunity to build on that momentum.

GHG Coordination Working Group Process

The ISO is continuously working with stakeholders to create a dynamic environment for engagement prior to proposal development. The ISO welcomes feedback on the process at any time.

The working group process reflects general stakeholder feedback and input received during working group discussions prior to developing policy initiative proposals. This process can lead to more alignment on the scope of an initiative and proposed design.

The GHG Coordination working group will focus on possible future GHG accounting design(s) evolution including potential enhancements to the current EDAM design. However, the ISO will not immediately consider proposed alternatives to the GHG design approved by ISO Board of Governors and WEIM Governing Body for EDAM go-live. Doing so could conflict with, or impose delays on, planned implementation and concurrent state rulemakings.

During the working group process, the ISO expects stakeholders will focus on three essential components necessary for future proposal development:

1. **Problem Statements and Principles:** Establish principles and problem statements. The principles can be used to evaluate problem statements and any proposals developed.

2. **Prioritization:** Determine topic priorities timing for review in order to balance stakeholder bandwidth.

3. [17] **Analysis and Evaluation:** Illustrate problem statements through review and assessment of current or proposed market solutions, data analysis, and/or agreed upon modeling.

In instances where the subject matter is complex and/or majority agreement or disagreement does not exist for a proposed approach, the ISO suggests hosting additional stakeholder working groups to discuss key elements of the proposal that need further development.

[1] Stakeholder-suggested enhancements to the process include:
1. Engaging regional and state regulators in working group discussions
2. Dedicating sufficient time upfront for data analysis, with the flexibility to revisit principles and problem statements as new information becomes available
3. Implementation of a phased approach, with Phase 1 focusing on data collection, analysis, and identification of problem statements, and Phase 2 focusing on evaluation of the impacts of identified problems and the prioritization of efforts to develop solutions

Working group deliverables

Discussion Paper

This Discussion Paper will serve as a resource for stakeholders by tracking the decision making process. After working group meetings, ISO facilitators and scribes will provide notes, key decisions, and action items identified by stakeholders. The ISO will post these notes for review as needed between working group meetings.

[2] At the request of stakeholders, the ISO has added of a revision and action item log to the appendix of the discussion paper as a way to track changes made to future iterations of the paper, and view the status of action items identified through the working group.

The purpose of the working group process is to identify and evaluate measurable market outcomes and trade-offs associated with problem statements. The ISO and stakeholders will work to provide quantitative measures of comparison where practical. However, consensus may not be reached on all topics discussed during the working groups. The discussion paper and Action Plan will note where items need further discussion or analysis to inform next steps, and will reflect how stakeholder input to date was accounted for. The ISO is dedicated to continuing discussions on issues and topics that are not included in the policy initiative proposal resulting from this working group.

GHG Action Plan

The intended end state of the Discussion Paper is a “GHG Action Plan” that reflects the outcome of stakeholder discussions had during the working group process. The recommendations in the GHG Action Plan will bridge the working group effort and proposal development phase of the stakeholder process.

[3] The GHG Action Plan does not require a decision from the ISO Board of Governors or WEIM Governing Body. The document is to be utilized as a resource in the scoping of the formal policy initiative that results from the working group effort.

Discussion Paper Summary

Working Group Topics

The topics proposed in this Discussion Paper synthesize stakeholder feedback from the GHG survey results, and written and verbal comments from working group meetings.

1. Review of ISO Market Operations and Existing GHG Market Design
2. State Coordination
3. Emissions Tracking and Accounting
4. Beyond GHG Pricing Policies
5. Other

[4] Stakeholders generally agree with the above list of proposed topics. There is general consensus that items 1 and 3 require additional review to facilitate common understanding of how GHG policies interact with market design. Following the review of items 1 and 3, stakeholder feedback indicates that data analysis related to Emissions Tracking and Accounting is of high priority, as well as discussion surrounding Beyond GHG Pricing Policies.

Stakeholders have also suggested additional topics to be discussed during the working group, which are listed in the Proposed Discussion Topics and Related Concepts section of this document.

Principles

The following principles reflect a starting point for GHG working group discussions. Throughout the working group process, stakeholders will consider how problem statements relate to principles to facilitate assessment of prioritization and potential trade-offs. The ISO encourages continuous feedback on these principle topics:

1. Efficiency
2. Simplicity
    - [5] In response to stakeholder feedback, the simplicity principle was eliminated. The concept of broad applicability is captured under the non-discrimination principle, and the concept of using existing systems, instruments methods, and frameworks when possible is captured under the feasibility principle.
3. Transparency
4. Non-discrimination
    - [6] Although one stakeholder suggested renaming this principle to “competitive participation of resources inside and outside a GHG zone,” but the working group generally agrees that the revised principle description reflected in the table below already captures the concept of competitive market participation.
5. Jurisdictional roles and responsibilities
    - [7] In response to stakeholder feedback, this principle has been renamed to “congruency with state policy.” However, working group participants request further clarity on the roles and responsibilities of the ISO, state

regulators, and complying utilities as they pertain to utility compliance reporting of EDAM market transactions.

6. Feasibility

As background, the EDAM GHG Working Group developed the following GHG Design Objectives which could serve as a springboard for future principle discussions:

1. No inappropriate or unacceptable GHG impact in non-GHG zone.
2. Leakage should be minimized.
3. Enable similarly situated/similar technology resources in non-GHG zone to compete on a level playing field with resources inside GHG zone and vice versa (objective not fully finalized).
4. Do not inadvertently undermine RPS and CES policies.
5. Allow for market efficiency by accurately reflecting relevant including GHG compliance costs.
6. Seeking simple solutions where possible while balancing precision and implementation feasibility to support state policy objectives.
7. Durable market design including but not limited to allowing for future policy designs and potential linkage

[8] The stakeholder community largely agrees with the revised principles provided in the table below, and believe they adequately incorporate the foundational principles that the GHG Coordination working group should keep in mind while it works through the definition of problem statements.

Proposed descriptions of each principle, based on working group discussion and written comments to date, are provided in the below table. The GHG Coordination principles will continue to evolve and be developed throughout the working groups.

Principle	Description
[18] Efficiency	• Efficient dispatch of resources that accurately capture emissions and result in accurate GHG price formation, while minimizing production costs of power generation and costs incurred for allowances in GHG zones.

[19] Transparency	• Sufficient information exists in order to:
	  ○ Make sufficient bidding and procurement decisions
	  ○ Maintain market compliance with state GHG regulations and programs
	  ○ Accurately perform GHG accounting and reporting
	  ○ Distinguish between available resources and resources that have been scheduled and accounted for
	  ○ [19A] Quantify emissions leakage in order to determine if efforts to reduce leakage are warranted
	• Market prices, design, and performance are transparent and known to participants
	• Costs to market participants coming directly from GHG emissions and any set program requirements, beyond the GHG price required for importing electricity into states with

	price-based programs, are transparent and known to participants • [19B] Data is accurate and usable
Non-discrimination	• No inappropriate or unacceptable GHG or cost impact on a non-GHG regulation area or resource • No penalty under a GHG pricing requirement through unreasonable uplift charges or any dispatch decision that unreasonably increases costs to customers in states with price-based programs • All resources can compete on a level playing field • Participants within GHG and non-GHG areas should have equal access to residual supply • Non-prohibitive; states selling output of GHG pricing to those without GHG costs should not be hindered
[20] Congruency with state policy	• Market design should support or align with state greenhouse gas regulation policies, to the extent practicable • Coordination with state regulators and stakeholders to identify design and reporting needs, and which entity is responsible for each of those needs, required to support state policies and programs • [20A] Design should be broadly applicable, scalable, and accommodate many participants
[21] Feasibility	• Operationally feasible; the market can solve within prescribed timelines • Feasible implementation • Feasible timelines; must consider short and long-term prioritizations • Feasibility should be evaluated through coordination between the ISO and the DMM on the workability of proposed solutions, including modeling and example scenarios where applicable. • [21A] Design complexity should be evaluated and considered • [21B] Design should use existing systems and instruments for tracking generation and emissions where available • [21C] Design should leverage existing accounting methods where possible

[9] Stakeholders also suggested the addition of the following 4 principles:

1. Accuracy
2. Environmental justice
    a. [9A] Stakeholders request further discussion on what this principle would be intended to capture. One suggestion is to define environmental justice as “reducing the burdens, primarily pollution, of the power system on overburdened communities.”
3. Minimizing leakage

4. Durability
    a. [9B] One stakeholder requests further discussion on what this principle would capture.

Problem Statements

[22] Identified problem statements should offer a clear path toward analysis and proposal development. The September 13th working group discussed how to use the following framework to formulate effective problem statements:

1. Identify a root cause[2] in terms of existing market design policy or processes.[3]
    a. If the root cause is not known:
        i. Explore how current ISO market policy and processes reflect principles and support market objectives
        ii. Determine how these policies and processes may not meet their intended goals.
2. Determine possible tradeoffs associated with principles.[4]
3. Illustrate how problems create a measureable impact on market outcomes.[5]

During an exercise to evaluate incomplete draft problem statements formulated based on a selection of prior stakeholder commentary, the group identified ways to clarify, inform, and evaluate potential problems in order to identify what issues should be prioritized to move forward to the proposal development phase of the stakeholder process.

Takeaways from the problem statement building exercise include:

- Statements should read as a problem rather than a consequence
- Statements should remain neutral and fact-based
- Statements should specify information needed to analyze and monitor the potential problem

Stakeholder Proposed Problem Statements

[23] This section is intended to capture proposed problem statements under discussion, track the topics and principles related to each problem statement, and help identify action items that will help develop and refine each statement. Stakeholders are encouraged to submit feedback on these proposed problem statements by helping identify what sub-problems or root causes may exist, which policy or process is relevant, and describing the market outcomes and principles. Stakeholders are also encouraged to submit or evaluate action items that will help develop and refine each statement.

ISO Market Operations and GHG Design:

Problem statement #1: It is unclear if the CAISO's market correctly identifies available surplus on resources that may be attributed to a GHG zone.

[2] Root causes describe the failure of an existing policy to help achieve market outcomes.
[3] Policy or processes describe an existing CAISO market policy or process that supports market outcomes.
[4] Principles describe how market design policy achieves a market outcome.
[5] Market outcomes or functions of a regional centralized electricity market that reflect the role of the CAISO as an independent system operator.

Problem statement #2: The current attribution process still results in secondary dispatch, and the market lacks sufficient transparency into the degree of secondary dispatch occurring as a result.

Problem statement #3: It is unclear if the CAISO's market has correctly balanced minimizing leakage and costs.

- Initial feedback: The Western Power Trading Forum (WPTF) suggested rewording the above problem statement to read more "fact-based" to facilitate more discussion on the intent. They propose rewording the statement to, "The CAISO's least-cost dispatch optimization results in secondary dispatch which does not capture the full emissions and leads to inaccurate price signals."

Problem statement #4: The current price formation does not provide full transparency into the total marginal GHG cost, leading to inaccurate price signals and reduced price transparency.

- Initial feedback: WPTF suggests that for resources within a GHG regulation area which embed the GHG cost of serving load in their own area in the energy offers, the total marginal GHG cost is the GHG component plus some portion of the SMEC, which results in a lack of transparency of the true marginal GHG cost to serve load.

State Coordination:

Problem statement #5: GHG attribution in ISO markets creates a risk of double counting of attributed generation in compliance and voluntary retail GHG programs.

- Initial stakeholder feedback: The Center for Resource Solutions (CRS) identified a potential root cause of this problem; the GHG attribution mechanism is divorced from existing systems for allocating generation and associated emissions to retail load. CRS also identified a potential impact or market outcome as double counting of generation and emissions. This damages the integrity of retail programs and instruments, which could limit market participation and slow grid de-carbonization.

Problem statement #6: Under the WEIM, there are known instances of double counting of emissions between Washington and California GHG regulation areas for emitting resources physically located in Washington and deemed delivered to California, in the absence of program linkage.

Problem statement #7: LSEs subject to a state GHG reduction mandate do not have the ability to affect dispatch to ensure that the emissions of energy deemed to serve their load is within their regulatory limits.

- Initial feedback: The Oregon Public Utilities Commission (OPUC) suggests that a potential sub-problem or root cause of the above statement is that the dispatch algorithm lacks a price signal that LSEs subject to a GHG reduction mandate can use to indicate their preference for clean electricity. OPUC asserts that this problem results in an inability to effectively compete against LSEs subject to GHG pricing programs for low-cost clean energy from the market.

Emissions Tracking and Accounting:

Problem statement #8: The ISO's market does not provide the complete reporting metrics desired by all market participants.

- Initial feedback: In addition to the ISO's proposed sub-problem that it does not have a current understanding of all data required or desired by participants, the rationale for providing that data, the frequency of providing that data, or the granularity of data desired by market participants, CRS proposes another sub-problem that may exist: There is a disagreement among states and other stakeholders about whether and how attribution in wholesale markets affects retail GHG claims, load-based state programs, and the systems for allocating generation and associated emissions to retail load.

Problem statement #9: LSEs subject to GHG reduction mandates do not receive data about market imports indicating which resources were deemed to have served their load.

- Initial feedback: Oregon Public Utility Commission (OPUC) suggests that a root cause or sub-problem of this statement is that GHG attribution has been designed solely around GHG pricing programs that require generators to retire allowances. OPUC asserts that without access to data about market imports indicating which resources were deemed to have served their load, it is challenging for the LSE to demonstrate compliance with the state GHG regulation.

Problem statement #10: It is unclear if the treatment of GHG used in the optimization accurately reflects actual costs of GHG to end-use customers.

Problem statement #11: Current emissions tracking and accounting metrics do not demonstrate the impact of the market on decarbonization and renewable curtailment, or provide requisite data at the greatest feasible granularity for market participants, state regulatory compliance programs, and energy buyers.

Problem statement #12: If the methodology for PacifiCorp's compliance reporting of EDAM transactions with the CCA is not congruent with existing regulations and guidance for imports for bilateral transactions and retail, then the GHG regulation area's reporting will be incomplete or inaccurate.

Problem statement #16: The current GHG accounting design based on attribution to the lowest cost individual generating resources, allows for emissions leakage. Leakage is caused by not capturing GHG emissions from all the generating resources actually dispatched to support the transfer of electricity from a non-GHG regulation area into a GHG regulation area.

Beyond GHG Pricing Policies:

Problem statement #13: If policies (such as CETA's delivery-based renewable compliance paradigm, and prohibitions on coal) base compliance on data from the market operator [data intended to inform market settlements] -- and use that data to represent energy flow serving retail load -- a number of adverse effects would result. These effects include (a) a disconnect would appear between costs and benefits of the resources paid for by retail customers in retail rates and their compliance benefits; (b) it would discount long range clean energy plans developed by utilities to comply with state policies, and (c) it would ultimately disincentivize market participation.

Problem statement #14: There is not a market mechanism to reflect state climate policies that are not based on the cost of carbon. Participating in the CAISO's market could undermine efforts to decarbonize as the unspecified emissions rate used by states fails to reflect the accuracy of generation and consumption at a local level.

- Initial feedback: PGE and OPUC suggest that while it is appropriate that the ISO has focused early EDAM design efforts on accommodating California and Washington's price-based GHG regulations, it is now appropriate for the ISO and prospective EDAM participants to explore how EDAM can accommodate non-price based GHG regulation in the near future. However, WPTF suggests that the goal of the ISO's GHG market design is to ensure the market captures the additional GHG cost of serving load in GHG regulation areas, and incorporating non-priced based policies into the optimization was not part of the goal of the GHG design.

Problem statement #15: There is no policy or process that defines how the market can handle both price and non-price based GHG programs and within a state simultaneously.

[25] The Oregon Department of Environmental Quality (DEQ) and PacifiCorp presented during working group session 5 to provide additional context related to problem statements 7 and 9, and 12 and 13, respectively. The Oregon DEQ presented an overview of its GHG reporting program, while PacifiCorp presented on the complexities it faces as a multi-jurisdictional utility by walking the working group through a case study for a multi-state BAA under multiple clean energy and GHG regulations in the context of EDAM participation.

Consolidated Problem Statements

[26] Following working group sessions 3 and 4, the general consensus was to consolidate the 16 problem statements listed above into fewer, more specific statements. The consolidated statements listed below were derived from the original 16 problem statements, in addition to written and verbal feedback received throughout the working groups.

Market Operations and GHG Design

1. The optimization does not take the explicit cost of secondary dispatch into account, and therefore may not balance optimized attribution with constraints to limit secondary dispatch.

Reflects former problem statement 3.

2. The current GHG design does not limit attribution to only capacity above the baseline which results in the potential for secondary dispatch.

Reflect former problem statement 1.

3. Attribution is not scale-able because it creates the potential for secondary dispatch. This secondary dispatch could increase with market expansion.

Reflects former problem statement 2.

[30] In response to feedback received from working group participants and the sponsors for problem statements 1-3, the above statements have been further consolidated to the following:

The potential limitations affecting the optimization may include whether the optimization is: 1) correctly identifying available surplus on resources that may be attributed to a GHG zone, 2) accurately pricing the GHG value for purposes of determining optimal dispatch between internal and external resources, and 3) taking the explicit cost of secondary dispatch into account, and therefore not balancing optimized attribution with constraints to limit secondary dispatch. The potential limitations described above may lead to persistent results that inefficiently displace internal GHG resources in a way that leads to secondary dispatch.

4. The current price formation does not provide full transparency into the total marginal GHG cost, leading to inaccurate price signals and reduced price transparency.

Reflects former problem statement 4.

State coordination

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:
   a. Using both total WEIM transfer data and cost based accounting
   b. Using both total WEIM attribution and systems to allocate generation and associated emissions to retail load (i.e., RECs)
   c. Between unlinked jurisdictions if one area uses generation based accounting and another area uses load based accounting

Reflects former problem statements 5 and 6.

Emissions Accounting and Reporting

6. The ISO does not provide all metrics desired by market participants. This includes:
   a. Demonstration of the impact of the market on decarbonization and renewable curtailment.
   b. Information is lacking to LSEs in jurisdictions with non-priced emissions reduction policies to fulfill reporting obligations with state policy such as market imports to serve load. This could undermine efforts to decarbonize as the unspecified emissions rate used by states with an absolute reduction program fails to reflect the accuracy of generation and consumption at a local level.
   c. Costs of GHG to end-use customers

Reflects former problem statements 8-13.

[31] During working group session 6, the ISO and stakeholders further discussed metrics requests received during working group session 5 and in the associated written comments. In an effort to synthesize the feedback and suggestions received from stakeholders, the ISO created a refined set of metrics-focused problem statements. The

following set of problem statements were reviewed and refined by working group participants during working group sessions 7 and 8, and supplant the former problem statement 6 outlined above. Stakeholders are encouraged to support discussions on these problem statements by illustrating the size and scope of problems described through data or experience, and suggest alternative metrics or solutions, given that not all metrics suggested may be feasible to develop.

6. The ISO does not provide all metrics desired by market participants.
    a. Entities with annual reporting obligations or corporate goals associated with emissions reduction targets require data provided by the ISO to fulfill voluntary or nonvoluntary reporting obligations with state policy, such as market imports to serve load or total emissions to serve load.
    b. 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.
    c. Entities with jurisdictional compliance obligations or corporate emissions goals fulfilled through retail claims may not cover 100% of their real-time load obligation with owned or contracted power. In areas where LSEs are responsible for both owned/contracted power and real-time imbalance transfers, entities may experience challenges meeting jurisdictional requirements or corporate goals when they do not have sufficient information to report on the emissions intensity of net transfers.
    d. There is a lack of transparency into the emissions intensity of the marginal resource. Publication of a marginal emissions rate for the GHG area and EDAM footprint may provide insight on the cost of emitting resources, which can be used to help shape how organizations bid resources into the market.
    e. Backfilled dispatch is defined as potentially higher-emitting resources backfilling to serve load in non-GHG areas because clean resources that would otherwise be serving those areas are instead attributed to GHG areas. There is no current metric that accurately assesses whether the ISO's GHG attribution process leads to resource backfilling and/or secondary dispatch. Using base schedules to estimate backfilled and/or secondary dispatch may be inaccurate and misleading, because resources' base schedules are not optimized and are not reflective of optimized transfers between non-GHG areas. As a result, stakeholders are unable to assess the relative benefit of reducing secondary dispatch via the optimized counterfactual compared to using base schedules as the baseline.
    f. There is currently not a metric to quantify the financial and emissions impacts of the ISO's GHG design.

Beyond Price-based GHG policy

7. [32] 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.
    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 emission 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 emission 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.

Reflects former problem statements 7, 14, and 15, and verbal feedback.

[33] Working group session 8 on March 14, 2024 included discussions on three proposed approaches for states with climate policies not based on a price. First, the State Climate Action MOU group presented two proposed market approaches for states with a declining cap on emissions to ensure that generation serving its state does not exceed its clean energy goals. Next, the Western Power Trading Forum presented their proposed after the fact reporting approach for enabling LSEs/end users to accurately account for energy and associated emissions used to serve load under regulatory and voluntary GHG reduction and clean energy goals. Key areas of discussion included: if or when such approaches would be needed, if the approaches met the needs of the states based on various regulations, and either the implementation consideration and/or implementation interactions with the existing EDAM GHG design. A summary comparison of the 3 approaches are outlined on the following page in Figure 1: Market vs. Reporting Approaches Compared.

Stakeholders have prioritized discussion on these consolidated problem statements in the following order: PS 6, PS 5, PS 1, PS 2, PS 7, PS 3. This initial prioritization was determined by the November 27, 2023 Slido Poll[6] results and written comments submitted on December 11, 2023. However, prioritization will continue to evolve based on working group discussions and stakeholder interest level in issues.

[6] November 27, 2023 working group Slido Poll Results: http://www.caiso.com/InitiativeDocuments/PollingResults-GHGCoordinationWorkingGroup-Nov27-2023.pdf

Figure 1: Market vs. Reporting Approaches Compared

	Market: Emission Constrained Dispatch ***PUC MOU Group Proposal***	**Market: Import Constrained Dispatch** ***PUC MOU Group Proposal***	**Reporting Approach WT*PF Proposal***
Objective	Enable a state to ensure that generation serving its state does not exceed its clean energy goals	Enable a state to ensure that generation serving its state does not exceed its clean energy goals. *Also remove challenges with opt in provisions and what to do with GHG costs.*	Enable LSEs/End Users to accurately account for energy and associated emissions used to serve load under regulatory and voluntary GHG Reduction and Clean Energy goals.
Mechanics	Reflect policy in the market Hourly and Real Time constraint on generation to ensure that generation used to serve load does not exceed a given emissions threshold	Reflect policy in the market Hourly and Real Time constraint to ensure that emissions [internal emissions + imported emissions – exported emissions] meet a predetermined target	Allow for accounting of purchases Allow LSEs/End Users to count their bilateral contracts • When dispatch of committed energy > load: deduct @ LSE system EF • When dispatch of committed energy < load: add @ residual EF
Policy Considerations	- Are opt in provisions necessary? - Cost/reliability off ramps - Revenue reward	- Cost/reliability off ramps - Revenue distribution	- Competing claims/attribution/RECs - MJR Issues - Metrics and EFs
Data Source	ISO Market	ISO Market	Contracts and ISO Market
Compatibility	Compatible with the resource-specific approach and with the WTPF proposal	Compatible with the resource-specific approach and with the WTPF proposal	Compatible with the resource-specific approach and with the PUC MOU Group proposals

Work Streams

[34] In comments received from Public Generating Pool (PGP), and supporting comments received from Puget Sound Energy (PSE), a need was identified to more concisely consolidate issues discussed by the working group to date and determine work streams and action items. The work streams outlined below are informed by comments received from PGP and PSE and verbal and written comments from working group session 8. The intent of the work streams is to organize the existing problem statements into categories that can be discussed discretely or in order, depending on the degree of interrelated issues within the work streams.

Work Stream #1: ISO Market Operations & GHG Design – Current Approach to GHG Pricing Programs in WEIM

Problem Statements 1-3) The potential limitations affecting the optimization may include whether the optimization is: 1) correctly identifying available surplus on resources that may be attributed to a GHG zone, 2) accurately pricing the GHG value for purposes of determining optimal dispatch between internal and external resources, and 3) taking the explicit cost of secondary dispatch into account, and therefore not balancing optimized attribution with constraints to limit secondary dispatch. The potential limitations described above may lead to persistent results that inefficiently displace internal GHG resources in a way that leads to secondary dispatch.

Problem Statement 4) The current price formation does not provide full transparency into the total marginal GHG cost, leading to inaccurate price signals and reduced price transparency.

Problem Statement 6e) Backfilled dispatch is defined as potentially higher-emitting resources backfilling to serve load in non-GHG areas because clean resources that would otherwise be serving those areas are instead attributed to GHG areas. There is no current metric that accurately assesses whether the ISO's GHG attribution process leads to resource backfilling and/or secondary dispatch. Using base schedules to estimate backfilled and/or secondary dispatch may be inaccurate and misleading, because resources' base schedules are not optimized and are not reflective of optimized transfers between non-GHG areas. As a result, stakeholders are unable to assess the relative benefit of reducing secondary dispatch via the optimized counterfactual compared to using base schedules as the baseline.

Work Stream #2: Addressing Non-Pricing and Clean Energy Policies, and Voluntary Goals

Problem Statement 6c) Entities with jurisdictional compliance obligations or corporate emissions goals fulfilled through retail claims may not cover 100% of their real-time load obligation with owned or contracted power. In areas where LSEs are responsible for both owned/contracted power and real-time imbalance transfers, entities may experience challenges meeting jurisdictional requirements or corporate goals when they do not have sufficient information to report on the emissions intensity of net transfers.

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.

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 emission 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 emission 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.

Work Stream #3: GHG and Related Metrics

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:

a. Using both total WEIM transfer data and cost based accounting
b. Using both total WEIM attribution and systems to allocate generation and associated emissions to retail load (i.e., RECs)
c. Between unlinked jurisdictions if one area uses generation based accounting and another area uses load based accounting

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 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.

Problem Statement 6d) There is a lack of transparency into the emissions intensity of the marginal resource. Publication of a marginal emissions rate for the GHG area and EDAM footprint may provide insight on the cost of emitting resources, which can be used to help shape how organizations bid resources into the market.

Problem statement 6f) There is currently not a metric to quantify the financial and emissions impacts of the ISO's GHG design.

Problem Statement Sponsors

[35] In written comments submitted by Southern California Edison (SCE) on working group session 5, the formation of problem statement sponsors or co-sponsors was proposed to increase collaboration and efficiency during discussions on specific problem statements.

In response to this suggestion, the ISO brought forth the proposal to the working group where it received significant support. The following table outlines entities that have volunteered to sponsor or co-sponsor specific problem statements.

Problem statement	Sponsor or co-sponsor
PS 1-3	PG&E, Vistra
PS 4	WPTF
PS 5	No sponsor/co-sponsor
PS 6	PGE
PS 7	PGE, WRA, PNM

Sponsors or co-sponsors may support problem statement discussions through any or all of the following approaches, as appropriate:

1) Ensuring that a problem statement is sufficiently defined and illustrated
2) Proposing or providing illustrative data or information needed to inform or assess the problem statement
3) Identifying milestones relevant to prioritization
    a. i.e. regulatory deadlines, market changes, etc.
4) Proposing a solution to the problem statement

While the ISO emphasizes that working group discussions on problem statements remain stakeholder-driven, it offers its support to sponsors and co-sponsors by providing necessary data analysis or expertise where feasible.

If your organization is interested in becoming a problem statement sponsor or co-sponsor, please contact ISOStakeholderAffairs@caiso.com.

Proposed Discussion Topics and Related Concepts

As part of ISO's role facilitating these discussions, the ISO gathered proposed discussion topics through a survey sent out in June. This section synthesizes those survey results into four themes, and incorporates additional stakeholder feedback received through written comments and working group discussions.

[27] Stakeholders have prioritized discussion on topics in the following order:

1. Emissions Tracking and Accounting
2. ISO Market Operations & GHG Design
3. State Coordination
4. Beyond Price-based GHG policy

This initial prioritization was determined by the November 27, 2023 Slido Poll[7] results and written comments submitted on December 11, 2023. However, prioritization will continue to evolve based on working group discussions and stakeholder interest level in issues.

[7] See above footnote.

Emissions Tracking and Accounting

This topic reflects stakeholder interest in considering issues related to how emissions are tracked and monitored, accounted for, and reported to various entities. Stakeholders expressed concern over leakage, resource shuffling, and secondary dispatch. Stakeholders also expressed a need to illustrate and verify these impacts with data prior to the consideration of enhancements or alternative approaches.

This topic allows stakeholders to align on common definitions and expected impacts of identified issues. It can also promote discussion on how the current market functionality intends to address these issues, explore what data the ISO can provide to inform an assessment of these issues, and receive consensus on the appropriate metrics or methodology for analysis moving forward.

Stakeholders suggested the working group consider the following concepts and scope items to identify problem statements:

1. The emissions related data the ISO has access to and could provide, including emissions attributes of system capacity
2. A methodology to more accurately track the emissions from generating resources dispatched both to serve a GHG and non-GHG areas
3. Consideration of possible technical or legal constraints involved with reporting emissions beyond what is available for the purpose of reporting and compliance with state regulations
4. The role of contracts as it relates to the wholesale market (e.g., renewable energy certificates, resource adequacy, etc.)

[12] Comments received on the August 16th working group and associated discussion paper identify this topic as a high-priority item.

[24] During the September 13th working group meeting, the ISO provided an overview of the current GHG accounting process in the Western Energy Imbalance Market and Extended Day-Ahead Market, to provide additional background prior to identifying problem statements related to the current process. Stakeholders found this overview helpful, and have requested further discussion on specific topics from the presentation. These requests are reflected in the Action Item log available in the appendix.

Additional stakeholder-suggested concepts to consider within this topic:

- Development of a more robust tracking and accounting framework that includes granular emissions related data necessary for compliance with state laws and regulations, increased transparency, and GHG accounting among western market participants
- Consideration of various states' clean energy and emissions programs in which Western market participants must comply
- Consideration of how resources may be attributed to serving load in and out of a GHG zone and how GHG transfers are settled
- Review of look-ahead data regarding resources that are already committed vs. data about residual supply in the market
- Consideration of the potential benefits of and development of hourly marginal and average emissions rate data

Current and Proposed GHG Metrics

[28] In support of problem statement 6, the ISO presented current and potential GHG metrics it publishes or could publish as a result of working group discussions. Current metrics published by the ISO include:

Metric	Description	Public/Non-public
Today's Outlook (emissions)	Reports the emissions associated with energy serving load in the CAISO BAA using metered energy	Public
GHG Emission Tracking Report	Reports the emissions associated with energy serving load in the CAISO BAA using 5-minute market awards	Public
GHG Attributions by Fuel Type	Reports only the percentage of MWh transfers of GHG attributions into California BAAs, grouped by fuel type	Public
WEIM GHG attributions through CMRI	Reports the resource-specific GHG attributions for the 15-minute and 5-minute market	Non-public

[28A] During working group session 5, the ISO discussed publishing an average emissions rate (AER) in an effort to increase transparency and assist market participants with compliance and reporting requirements. Since working group 5, the ISO has published average emissions rate data to its website. For more information on what is reflected in the AER data, please see slides 20-23 of the February 22, 2024 working group presentation.

The ISO notes that this AER metric does not replace or supplant the marginal unspecified factor emissions rate used by other state reporting or compliance programs, unless approved by the appropriate regulatory bodies.

Stakeholders are generally supportive of the AER metric, but seek to further inform and refine the formulation and use-case(s) for emissions related data that the ISO can provide. The AER data as currently provided is a necessary first step, and is intended to allow stakeholders to become familiar with the dataset, explore opportunities and limitations of certain metrics and methodologies, and better inform the evolution of ISO reported data.

Review of ISO Market Operations and GHG Design

This topic reflects stakeholder feedback expressing the importance of a common understanding of ISO market operations and GHG design. Stakeholders requested more transparency and comprehension of the current and planned GHG design to prepare for EDAM go-live, to inform ongoing state rulemaking processes, and to facilitate deeper engagement with future proposal development. Stakeholders expressed concern that conflicting processes and concurrent opportunities would put a strain on resources and limit participation in ISO discussions.

This topic offers an opportunity for alignment over the current and planned GHG market design to inform analysis and create a benchmark for comparison for future proposal development. The ISO intends to meet stakeholders where they are by offering a venue for stakeholders to decide what opportunities for review would best suit their needs (e.g., presentations from the ISO), at what cadence, and with input from appropriate subject matter experts.

Stakeholders suggested the following scope items be considered for problem statement formation:

1. A deeper understanding of:
    a. The optimized attribution process to assess how the results (price and emissions impacts) reflect state policy goals.
    b. Market GHG price signals, and how GHG marginal revenue allocation settles the intended cost and benefits of GHG policy.
    c. The GHG counterfactual, and the impact of attributing resource capacity below that resource's counterfactual
2. Further consideration of the scalability of the planned GHG market design with multiple distinct GHG areas and prices.
3. Further discussion of the possible reliability and price impacts under scarce or insufficient GHG bids.
4. Development of GHG rules to account for dispatch from storage resources

[10] Comments received to date identify this topic as a high-priority item, specifically focusing on market efficiency and the topics outlined under item #1. In addition, stakeholders request discussion on the benefits and drawbacks of the ISO's current GHG emissions counterfactual method, and alternatives considered during the initial EDAM market design process.

[29] Following working group session 4, stakeholders indicated that a greater understanding of the current EDAM and WEIM GHG design is needed in order to inform and refine future problem statements. Specific additional topics stakeholders would like to understand include:

- How does the EDAM and WEIM baseline/counterfactual work?
- How is attribution determined?
- Is attribution determined by the optimization or does it occur after the fact?
- What energy does the WEIM and EDAM consider to be eligible to be attributed to serve demand in a GHG regulation area?
- How much secondary dispatch is occurring both in the WEIM and EDAM?
- What is the associated cost of secondary dispatch?
- What tradeoffs occur between limiting secondary dispatch and the GHG costs in the WEIM and EDAM?
- Is there sufficient transparency in the total marginal GHG cost?
- Does the GHG cost in the market reflect actual cost of GHG to end use customers?

[36] During working group session 6, the ISO provided an overview of GHG attribution in EDAM and WEIM. The presentation focused on 1) how the ISO has implemented the current WEIM GHG attribution mechanism, 2) key terms such as GHG marginal cost and secondary dispatch, and 3) why resources may be dispatched below their base schedule. The intent of this presentation was to further develop the working group's

understanding of the ISO's GHG attribution mechanism to facilitate more productive discussion when identifying problem statements and metrics needs. The full presentation is available on the GHG Coordination webpage.

State Coordination

This topic reflects stakeholder feedback related to state agency decisions, rules, and processes. Stakeholders expressed a need for greater consistency and coordination across state GHG program administrators. Stakeholders requested more ISO leadership in ensuring program rules align with market processes and functionality.

While the working group process is intended to expand, not limit, the scope of discussion, the ISO is cognizant that its markets operate across multiple states who have authority over GHG emission policies. The working group process is a mechanism to support but not intrude on that state authority.

Stakeholders suggested the following concepts and scope items be considered for problem statement formation. The ISO highlights these here, but recognizes these issues will be addressed in the other topic areas for working group consideration:

1. The role of the ISO in fostering consistency for GHG reporting programs, and reducing the administrative burden for market participants
2. The role of the ISO in addressing the double counting of emissions between state programs
3. The market's ability to accommodate linkage between state GHG programs, and consideration of the prospective impacts of linkage
4. The role of the ISO in facilitating and informing state processes, including the calculation of metrics for reporting

[11] In written comments submitted on August 30th, one stakeholder suggests removing this topic, and instead incorporating an action item within each of the other topics to identify the level of state coordination necessary. Stakeholders have emphasized that coordination between the ISO and regional and state GHG regulators is key in developing market designs that support or are in alignment with state policy.

Beyond GHG Pricing Policies

This topic reflects stakeholder interest in considering concepts related to policy frameworks other than GHG policies that assign an explicit cost to carbon (i.e., Cap-and-Trade or cap-and-invest). Stakeholders with obligations under these non-priced programs expressed concern that participation in ISO's markets would put them at a disadvantage or prevent compliance. Stakeholders also requested consideration of metrics, monitoring and reporting methods to accommodate a broad range of GHG policies.

This topic allows stakeholders to consider if, how, and when distinct policies can be reflected by the ISO's markets. This could also be a venue to discuss what data or metrics the ISO can produce to facilitate reporting and compliance with these policies.

Stakeholders suggested the following concepts and scope items be considered for problem statement formation:

1. Meeting targets for GHG policies that set an emissions budget with no explicit cost obligation
2. Current 'Unspecified' rates may not accurately reflect the average emissions rate of the system
3. Reporting and determining compliance with load-based GHG policies require tracking flows of power with more granularity than net imbalance transfers allow for
4. Some stakeholders have compliance obligations with GHG policies that require tracking of attributes, like Renewable Portfolio Standards, RECs, and Clean Energy Standards

[13] Comments received on the August 16th working group and associated discussion paper identify this topic as a high-priority item, specifically, coordinating with state regulators and prioritizing methods to incorporate the needs of states with non-price based GHG reduction policies.

In addition, stakeholders suggest that this topic could instead be categorized under Emissions Tracking and Accounting.

Other

[14] Stakeholders propose the following topics be discussed during a future working group and in the development of problem statements:

1. Complexity of bringing renewables online and impacts associated with compliance obligations and current GHG pricing policies
2. Los Angeles Department of Water and Power's (LADWP) load-based accounting proposal
3. Affordability of electricity in the market
4. Eliminating leakage associated with electricity transfers from a non-GHG zone into a GHG zone
5. Environmental attributes and renewable energy credits
6. Data requests

Working Group Schedule and Next Steps

The ISO will host a public working group meeting on April 17, 2024, which will include facilitated discussions on work stream 1, and continued discussions on problem statement 7. Written comments on the working group meeting and discussion paper are due by end of day May 1, 2024.

Upcoming working group meetings*:

- April 17, 2024
- May 29, 2024
- June 26, 2024

Please contact Isabella Nicosia at inicosia@caiso.com or ISOStakeholderAffairs@caiso.com with any questions or if you are interested in presenting at a future GHG Coordination working group meeting.

**All meetings are considered tentative until confirmed through a notice in the ISO's Daily Briefing.*

Appendix

Revision Tracking

[15] The table below summarizes the changes made to this document based on working group discussions and written comments.

Working Group 1 – August 16, 2023		
Revision #	**Category**	**Revision summary**
1	Process	Initial stakeholder feedback on the GHG Coordination working group process
2	Deliverables	Initial stakeholder feedback on the process for revising the GHG Coordination working group Discussion Paper, and how the ISO will measure and reflect consensus on issues discussed during the working group.
3	Action Plan	Initial stakeholder feedback on items to be included in the Action Plan, and clarification on how the document fits into the ISO's joint governance structure.
4	Topics	Summary of initial stakeholder feedback received on the prioritization of working group discussion topics.
5	Principles	Stakeholder feedback to eliminate the "simplicity" principle and capture the concept of broad applicability under the "non-discrimination" principle, and the concept of using existing systems, instruments methods, and frameworks when possible under the "feasibility" principle.
6	Principles	Stakeholder feedback on renaming the "non-discrimination" principle to "competitive participation of resources inside and outside a GHG zone"
7	Principles	Stakeholder feedback on renaming the "jurisdictional roles and responsibilities" principle to "congruency with state policy"
8	Principles	Addition of the principle descriptions discussed during the 8/16 WG meeting and through written comments received on 8/30.
9	Principles	Additional principles requested through written comments received on 8/30.
10	Topics	Stakeholder feedback on the Review of ISO Market Operations and GHG Design topic.
11	Topics	Stakeholder suggestion to remove State Coordination topic from the scope of the working group, and include it as an action item for each topic instead.
12	Topics	Additional concepts to be considered within the Emissions Tracking and Accounting topic.
13	Topics	Stakeholder feedback on the Beyond GHG Pricing Policies discussion topic.

14	Topics	Additional topics stakeholders have requested to discuss as part of the GHG Coordination Working Group.
15	Appendix	Addition of the revision log
16	Appendix	Addition of the action items log
Working Group 2 – September 13, 2023		
9A, 9B	Principles	Stakeholder feedback on the proposed addition of "environmental justice" and 'durability" principles.
17	Process	Component 3 of the working group process updated to include the evaluation of current or proposed solutions.
18	Principles	Updated to reflect stakeholder feedback received on the revised description of the "efficiency" principle.
19, 19A, 19B	Principles	Updated to reflect stakeholder feedback received on the revised description of the "transparency" principle.
20, 20A	Principles	The "jurisdictional roles and responsibilities" has been renamed to "congruency with state policy", and a concept originally listed under the former "simplicity" principle has been moved to this principle.
21, 21A, 21B, 21C	Principles	Updated to incorporate concepts originally listed under the former "simplicity" principle.
22	Problem statements	Includes problem statement building framework discussed during the September 13, 2023 working group, and takeaways from the problem statement building exercise.
23	Problem statements	Stakeholder proposed problem statements received through written comments submitted on September 27, 2023.
24	Topics	Topics discussed during the September 13, 2023 working group.
Working Groups 3-5 – Oct-Nov 2023		
25	Problem statements	Summary of Oregon DEQ and PacifiCorp's working group session 5 presentations.
26	Problem statements	New section outlining consolidated problem statements, which were informed by previous stakeholder proposed problem statements and working group feedback.
27	Topics	Discussion topic prioritization results from 11/27 Slido Poll and 12/11 written comments.
28	Topics	New section summarizing working group 5 discussion on current and potential GHG metrics published by the ISO.
29	Topics	Additional topics related to the current EDAM and WEIM GHG design that stakeholders are seeking a greater understanding of.
Working Groups 6-8 – Jan-Mar 2024		
28A	Topics	Updates related to the Current and Proposed GHG Metrics section, specifically surrounding the recently published AER data.

30	Problem statements	Proposed consolidation of problem statements 1-3.
31	Problem statements	Revised metrics-focused problem statements derived from stakeholder comments and discussions from working group sessions 7 and 8.
32	Problem statements	Revised problem statement 7
33	Problem statements	Summary of working group 8 discussion related to problem statement 7 and the State Climate Action MOU group and WPTF's proposed market and reporting approaches.
34	Problem statements	New section outlining GHG Coordination work streams which aim to more concisely consolidate issues discussed by the working group to date and determine action items.
35	Problem statements	New section describing the role of problem statement sponsors, and a list of sponsor volunteers received to date.
36	Topics	Summary of working group session 6 discussion on the current GHG attribution process in WEIM and EDAM.

Action Items

[16] The table below reflects action items resulting from working group discussions and written comments.

Working Group 1 – August 16, 2023		
Action item	**Assigned party**	**Resolution Date/Process**
Vistra requested the ISO complete the data request they submitted as a part of the February 2023 EDAM Board Meeting	The ISO	TBD: The ISO suggests that all data analysis be tied to problem statements. Any data analysis will be comprehensively addressed through the problem statement and supporting analysis discussion.
Working Group 2 – September 13, 2023		
Action item	**Assigned party**	**Resolution Date/Process**
CRS requests the ISO report the following types of market data on a monthly basis: 1) Hourly resource mix and average emissions from participating generators for the whole market and potentially by injection point/node for some narrower geographies. 2) Hourly attributed generation data for GHG compliance zones or states including: all generation attributed in the timeframe; attributed non-	The ISO	The ISO is evaluating this request, and encourages CRS to present at a future working group on market data useful to states with load-based programs and consumers making retail claims.

WREGIS generation; and attributed WREGIS generation. 3) Hourly unallocated generation data including total unallocated generation, and unallocated non-WREGIS generation, for the whole market and potentially by injection point/node for some narrower geographies.		
In written comments received on September 27th, stakeholders expressed that the addition of "accuracy" and "minimizing leakage" principles is not needed, as the concepts can be captured as an element of the transparency principle. One stakeholder suggests accuracy is needed in order for information to be truly transparent and usable, and another stakeholder suggests that having access to sufficient information to quantify emissions leakage in order to determine if efforts to reduce leakage are warranted will address the issue of minimizing leakage.	The ISO	Accuracy and minimizing leakage have been reflected as concepts of the transparency principle.
OPUC requests that Doug Howe, a consultant to the PUCs in western states with GHG regulations, be invited to present for discussion a concept for introducing an emissions constraint into the market dispatch algorithm.	The ISO	During the March 14, 2024 working group meeting, Doug Howe presented the State Climate Action MOU group's two proposed market approaches for states with a declining cap on emissions to ensure that generation serving its state does not exceed its clean energy goals.
PacifiCorp requests the ISO to include a description in the formerly titled "jurisdictional roles and responsibilities" principle of who is responsible for reporting what data, and at what frequency, under the "reporting needs" as conveyed in the proposed principles descriptions.	The ISO	This additional description request has been reflected under the recently renamed "congruency with state policy" principle.
SCE recommends that regional and state GHG regulators, such as CARB, be invited to a working group meeting to engage with stakeholder	The ISO	The ISO is evaluating this request.

to further understand stakeholder compliance obligations within the context of the EDAM GHG design and design proposals.		
SCE requests further discussion on: 1) Construction and use of the counterfactual optimization in establishing a dispatch benchmark 2) Formulation and implications of the GHG Net Export Constraint, as well as details on how the optimization determines the least cost solution, and how specific units are “deemed” to provide power to CA and WA 3) Determination of the attribution of non-committed resources between GHG regulation areas. a. Requests examples of provided and awarded bids where a resource offers GHG bid adders for multiple GHG regulation areas.	The ISO	The ISO is evaluating this request and will identify an appropriate working group meeting for discussion on these topics.
SRP requests further discussion on how resource surplus is determined, and clarity on the GHG allocation limit (BPM for WEIM, pg. 83) and alternatives to this approach.	The ISO	The ISO is evaluating this request and will identify an appropriate working group meeting for discussion on these topics.
SRP requests the ISO dedicate time to exploring examples of: 1) Redesignation and how that impacts resources and/or prices both inside and outside of a GHG zone 2) WEIM energy optimization and how that compares to GHG accounting to better understand the algorithms used to determine resource dispatch and how that could differ from GHG attribution.	The ISO	The ISO is evaluating this request and will identify an appropriate working group meeting for discussion on these topics.
Washington Agencies request further discussion on how the	The ISO	The ISO is evaluating this request and will identify an

proposed principle of durability relates to topics not addressed in the EDAM tariff, specifically issues of reporting, double counting, and reducing burdens on impacted communities.		appropriate working group meeting for discussion on these topics.
WPTF requests the working group walk through an example of how resources (internal and external to GHG regulation areas) reflect GHG costs, are attributed, prices generated, and revenues received.	The ISO	The ISO discussed the attribution process under EDAM and WEIM during the January working group meeting.
WRA requests further discussion on: 1) GHG design to support regulatory compliance with both CA and WA carbon pricing programs and other states' non-pricing GHG reduction requirements. a. Recommend a conversation with the "Western Climate PUC Group" and RAP, who have identified a potential "emissions constraint" solution to support non-pricing state compliance. 2) Post-market reporting metrics that the ISO can provide that market participants, regulators, energy buyers, and other stakeholders may need for compliance or to measure market performance.	The ISO	The ISO presented the current and potential GHG metrics it currently publishes or could publish during the November working group meeting. Since then, it has published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics. During working group session 8, the State Climate Action MOU group and WPTF presented proposed market and after the fact reporting approaches, respectively, as potential solutions for supporting non-pricing state compliance.
WRA requests the working group identify a timeline with action item steps for continued examination of emissions tracking and accounting, including identifying the needs of states with GHG reduction requirements.	GHG Coordination working group participants	The working group created 3 discrete work streams to more concisely consolidate issues and determine action items.
Working Group 3 and 4 – October 19, 2023 and October 30, 2023		
Action item	**Assigned party**	**Resolution Date/Process**
Consolidation of problem statements	GHG Coordination	The ISO consolidated the original 16 problem statements

	working group participants	into 7 problem statements, which are now categorized under 3 discrete work streams. The consolidated statements are derived from the original 16 stakeholder-proposed statements and verbal and written feedback.
Working Group 5 – November 27, 2023		
Action item	**Assigned party**	**Resolution Date/Process**
Six Cities requests the working group take the following actions: • Distinguish problem statements that address current market operations from those that relate to future operations under EDAM • Defer consideration of problem statements that relate to future operations under EDAM • For consolidated problem statements that identify concerns under current market operations, identify data available to analyze the scope of the problem and potential solutions under current market operations	GHG Coordination working group participants	The ISO discussed this request with stakeholders during the January working group meeting.
CRS requests the following metrics: • GHG attributions by fuel type broken down into attributions from generators registered/not registered in WREGIS • Attributed generation by zone • Unallocated generation	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and have since published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics.
LADWP requests the following metrics for each financially binding time interval in EDAM, RTPD, and RTD that quantify the financial and emission impacts of the ISO's GHG design and attributions in WEIM and EDAM: • Net import into the GHG regulation zone and marginal cost of GHG (or marginal GHG emission rate) for electricity deemed delivered to serve load in the GHG zone.	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and has reflected this feedback in problem statement 6f.

• For resources deemed as supporting an import into a GHG zone, the total MWH of GHG attribution separately above base schedules/GHG references and below base schedules/GHG references. • Total MWH and GHG emissions of emitting resources outside of GHG zones dispatched above the base schedule/GHG reference and not deemed for delivery into a GHG zone. • The dollar amount of GHG revenue distributed to zero-emitting resources within GHG and non-GHG zones. • The dollar amount that would be paid to emitting resources if paid highest as-bid GHG for resources wrongly deemed beneath the base schedule.		
PSE requests enhancements to emissions data on Today's Outlook and the ISO's Emissions Tracking Report.	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and have since published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics.
SCE suggests consideration of what data is available on marginal emitting units, and how that data could be provided and utilized	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and have since published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics.
WRA requests discussion on feasibility, frequency and granularity of: • Market total average emissions • Total emissions by jurisdiction	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and have since published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics.
Working group participants request the following metrics: • Market average marginal emissions rate	The ISO	The ISO discussed this request with stakeholders during the January working group meeting, and have since

• Market residual emissions rate		published Average Emissions Rate data as a first step in providing stakeholders with additional desired metrics.
Working groups 6-8 – January 11, 2024, February 22, 2024, March 14, 2024		
Working group participants seek continued discussions on attribution under the current GHG accounting design, specifically surrounding secondary dispatch, surplus, leakage and costs.	GHG Coordination working group participants	PG&E and Vistra will provide presentations related to Problem Statements 1-3, which focus on addressing these topics.
Working group participants seek continued discussions on GHG metrics and permutations to the recently published AER data.	The ISO	The AER data as currently provided is a necessary first step, and is intended to allow stakeholders to become familiar with the dataset, explore opportunities and limitations of certain metrics and methodologies, and better inform the evolution of ISO reported data.
WPTF requests a "data dictionary" accompanying the AER reports to explain how the data is calculated and its source. They also request the ISO publish the AER for individual BAAs, and a plan for publishing other discussed metrics in the working group process.	The ISO	The ISO is evaluating this request.
WPTF requests additional discussions related to Problem Statement 4 (GHG pricing).	GHG Coordination working group participants	WPTF will present on problem statement 4 during the April 17, 2024 working group session.
Working group participants seek additional discussions on a post-dispatch accounting framework for enabling LSEs/end users to accurately account for energy and associated emissions used to serve load under regulatory and voluntary GHG reduction and clean energy goals.	GHG Coordination working group participants	WPTF presented its after-the-fact reporting and accounting approach during the March 14, 2024 working group meeting and will present examples related to the approach at the April 17 working group.
Working group participants seek additional discussions on the State Climate Action MOU group's proposals for states with climate policies not based on a price.	GHG Coordination working group participants	The ISO is coordinating with the State Climate Action MOU group to identify time at a future working group to continue discussions on this topic.

Topic Log

The table below categorizes the sub-topics within the four themes described in this paper. In some cases a topic may appear in multiple areas due to the cross-cutting nature of topics.

Topic	Count of Comments
Beyond GHG Pricing Policies	
Average Emissions Factor	4
Certificate Tracking	4
Load-based Accounting	4
Non Price-based Emissions Reduction Policy	19
RPS	4
Voluntary Emissions Reduction	1
Emissions Tracking and Accounting	
Accuracy	4
Average Emissions Factor	7
Capacity Attribution Tracking	3
California	2
Consistent Reporting	4
Leakage	3
Load-based Accounting	3
Public Emissions Reporting	8
Secondary Dispatch	4
Review of ISO Market Operations	
Attribution	4
Dynamic Transfers	1
Efficiency	2
GHG Reference Pass	4
Monitoring	4
Multijurisdictional BAAs	1
Non-discrimination	2
Secondary Dispatch	3
Storage Operations	2
State Coordination	
California	4
Compliance and Reporting	4
Data	2
Double Counting	4
Free Allowances	1
Linkage	4
Regional Coordination	5
Reporting and Compliance	4
Seams	5
Unspecified Rate	4
Washington	5
Uncategorized	**5**