



California ISO

Greenhouse Gas Coordination


Working Group 8

March 14, 2024

Housekeeping reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- These collaborative working groups are intended to stimulate open dialogue and engage different perspectives.
- Please keep comments professional and respectful.

Instructions for raising your hand to ask a question

- If you are connected to audio through your computer or used the “call me” option, select the raise hand icon  located on the bottom of your screen.
Note: #2 only works if you dialed into the meeting.
 - Please remember to state your name and affiliation before making your comment.
- You may also send your question via chat to all panelists.

Notice to Participants

Please be reminded, Commissioners and advisors from state public utility commissions may be in attendance.

Agenda

Time	Topic	Presenter(s)
9:00 - 9:15	Welcome & Introductions	Isabella Nicosia
9:15 - 10:30	Proposal for Non-Priced GHG Programs	Doug Howe (State Climate Action MOU Group)
10:30 - 10:45	Break	
10:45 - 12:00	WPTF Proposal	Clare Breidenich (WPTF)
12:00 - 1:00	Lunch	
1:00 - 1:45	PS 7: Market vs. Reporting Approaches	Anja Gilbert
1:45 - 2:45	Working Group Updates <ul style="list-style-type: none"> • PS sponsor updates • Refined metrics problem statements 	Isabella Nicosia
2:45 – 3:00	Break	
3:00 – 3:45	Proposal to re-categorize issues	Isabella Nicosia Mary Wiencke (PGP) Jessica Zahnow (PSE)
3:45 - 4:00	Next Steps	Isabella Nicosia

Working group progress to date



Doug Howe, State Climate Action MOU Group

PROPOSAL FOR NON-PRICED GHG PROGRAMS



December 2023

Non-Priced GHG Programs Tracking, Accounting & Control

On Behalf of the State Climate Action MOU group

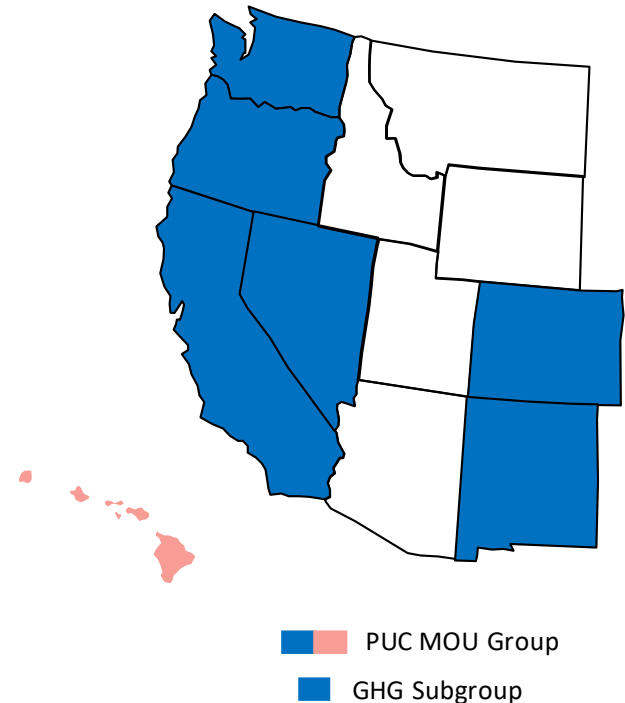
Douglas Howe, Ph.D

CAISO GHG CG

March 2024

The State Climate Action MOU Group

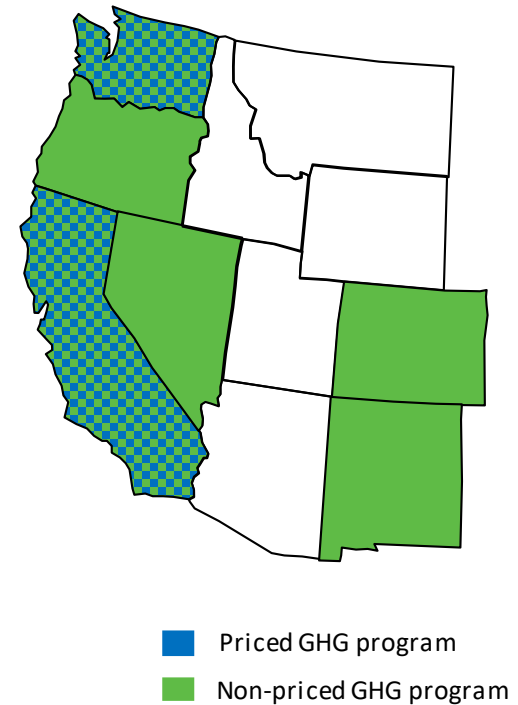
- Western Public Utility Commissions' Joint Action Framework on Climate Change.
- Organized in 2003 by founding members California PUC, Oregon PUC and Washington UTC.
- The GHG Subgroup consists of a commissioner from each member commission, except Hawaii, to engage in the treatment of state GHG standards in Day-Ahead Markets under development.



US map provided by yourfreetemplate.com

Non-Priced GHG Programs in WECC

- Excluding RPS's
- Non-priced GHG programs mandate progressive reductions in GHG emissions from electric energy used to meet load.
- Different types, timeframes, phasing
- All can be re-framed as: In year XXXX, GHG emissions to meet utility's load must not exceed Y mtons/MWH.
- Compliance is longer-term



US map provided by yourfreetemplate.com

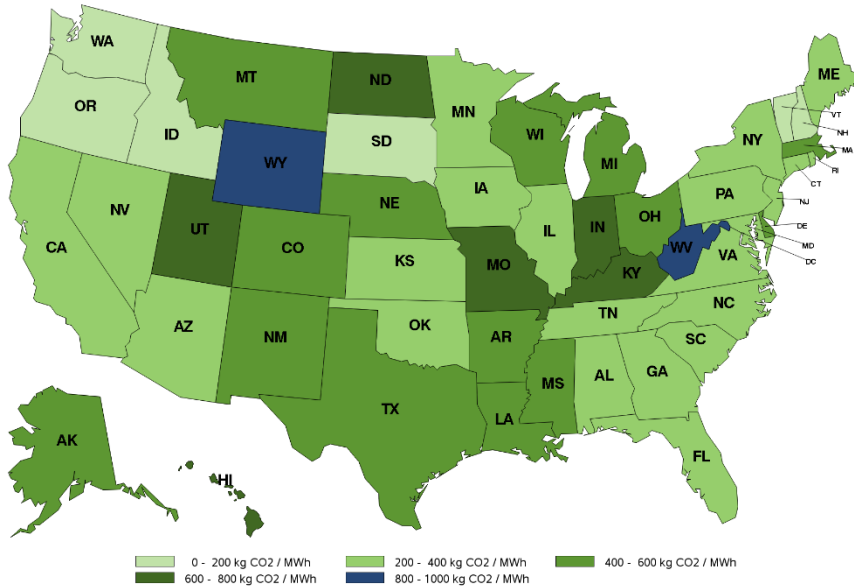
Problem Statement

Can Non-Priced GHG Programs Function in a DAM?

- Straightforward in a non-DAM context
- Tracking and Accounting:
 - How to attribute market flows for compliance purposes.
 - Avoid over- and under-counting
 - Designating resources: how to do it and the policy implications
 - Tells utility if it is compliant or not
- Control:
 - Depending on the utility, sooner or later, it must have ability to control market flows in/out of its territory.
 - Pricing to ensure dispatch (e.g. self-scheduling) is a solution, but undesirable

The Control Aspect is Important

CO2 Rates (kg/MWh) During 2022



Sources: U.S. Energy Information Administration, Form EIA-923, Power Plant Operations Report; U.S. Energy Information Administration, Form EIA-860, 'Annual Electric Generator Report'; and Calculations made by the Office of Electricity, Renewables, and Uranium Statistics, U.S. Energy Information Administration.

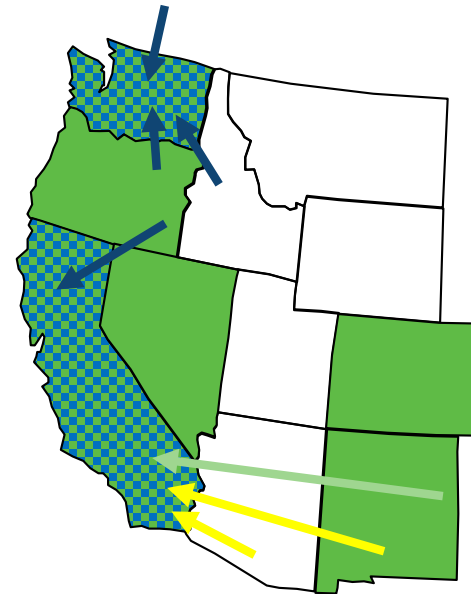
In a market, control of dispatch is not the hands of the compliant entity.

In a market, imports and exports will be important to the compliance

Region	mtons/MWh
CA	0.219
OR, WA, ID	0.108
CO, WY, MT	0.624
AZ, NM, UT, NV	0.4

GHG Competition will Impact Non-Priced GHG Programs

- Undesignated low-emitting resources will be pulled into priced GHG zones.
- Undesignated import to non-priced GHG zones will consist of higher-emitting resources.



■ Priced GHG program
■ Non-priced GHG program

US map provided by yourfreetemplate.com

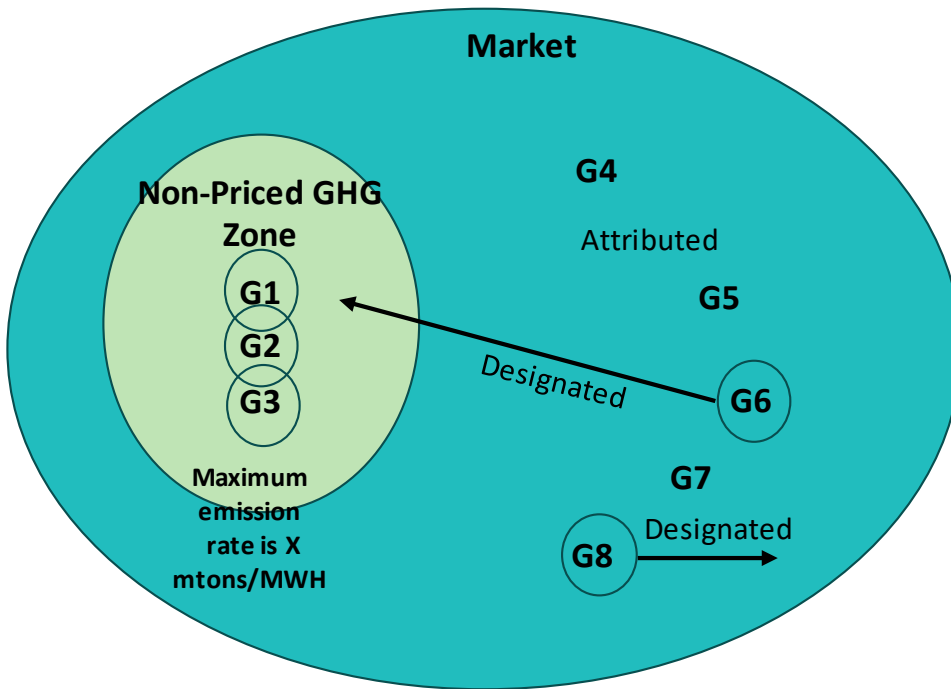


Control Mechanisms

For Non-Priced GHG Programs

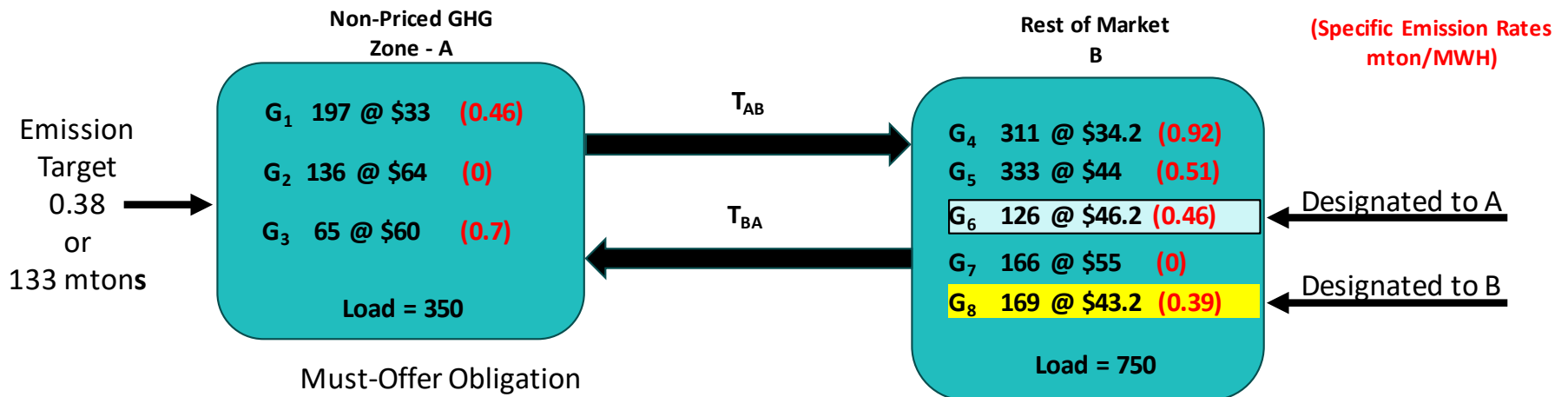


Emission Constrained Dispatch



- Non-Priced GHG Zone establishes the maximum emission rate for the dispatch interval
- Optimization chooses which resources' energy and emissions will be attributed to GHG Reduction Zone
 - Must-offer obligation
 - Lowest system cost while meeting maximum emission limit in GHG Reduction Zone
 - **Designated** resources are attributed to their designated load.
- Attribution of external resources is voluntary. Opt-in resources could be partially or entirely attributed to Non-Priced GHG Zone.
- Produces energy marginal cost, GHG Marginal Cost (like priced GHG optimization).

Simple Example: Emission Constrained Dispatch



Emission Target 0.38 or 133 mtons

$$197+136+65+126 = 524 \geq 350$$

$$\frac{197*0.46+65*0.7+126*0.46}{197+136+65+126} = 0.37 \leq 0.38$$

Example: "24.03.05.10.01.41.88"

Simple Example: Emission Constrained Dispatch

Generator	Emission Rate (mton/MWH)	Dispatch (MWH)	Energy Attributed to A	Emissions Attributed To A (mtons)
G ₁	0.46	197	197	90.6
G ₂	0	0	0	0
G ₃	0.7	0	0	0
G ₄	0.92	311	0	0
G ₅	0.51	333	63	32.1
G ₆ (Designated to A)	0.46	22.3	22.3	10.2
G ₇	0	67.7	67.7	0
G ₈ (Designated to B)	0.39	169	0	0
Total		1100	350	133
T _{AB}		0		
T _{BA}		153	153	

Energy MC-A: \$ 45.24
Energy MC-B: \$ 45.24
GHG MC: \$ 9.76

Must-Offer Obligation means that GHG MC will often be \$0

Load in A would pay the Energy MC and the GHG MC: \$55

Load in B would pay the Energy MC only.

Generation attributed to A gets paid energy+GHG: \$55

Other generation gets paid energy

Example: 24.03.02.14.02.28.87689

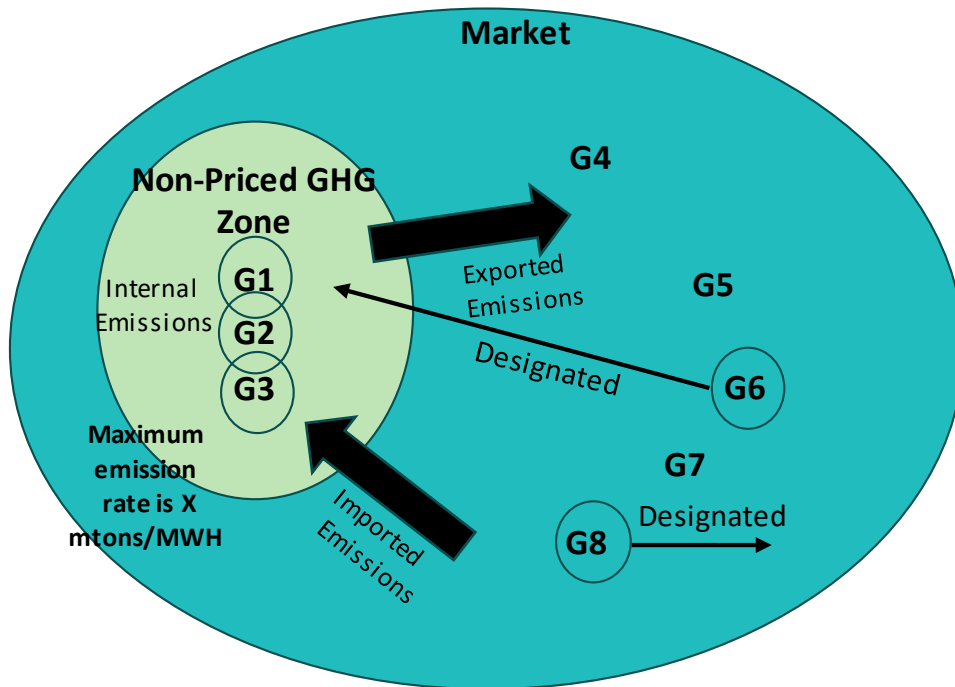
Policy Implication

- Should the GHG MC be paid to generators attributed to non-priced GHG zone and be paid by the load in the non-priced GHG zone?
 - Does not reimburse a cost.
 - If GHG MC not paid, creates and uplift requirement for external resources
- Should the attribution of energy and emissions from an external resource be voluntary?
 - Yes implies GHG marginal cost must be paid.
- Would FERC approve?

Emission Constraint Summary

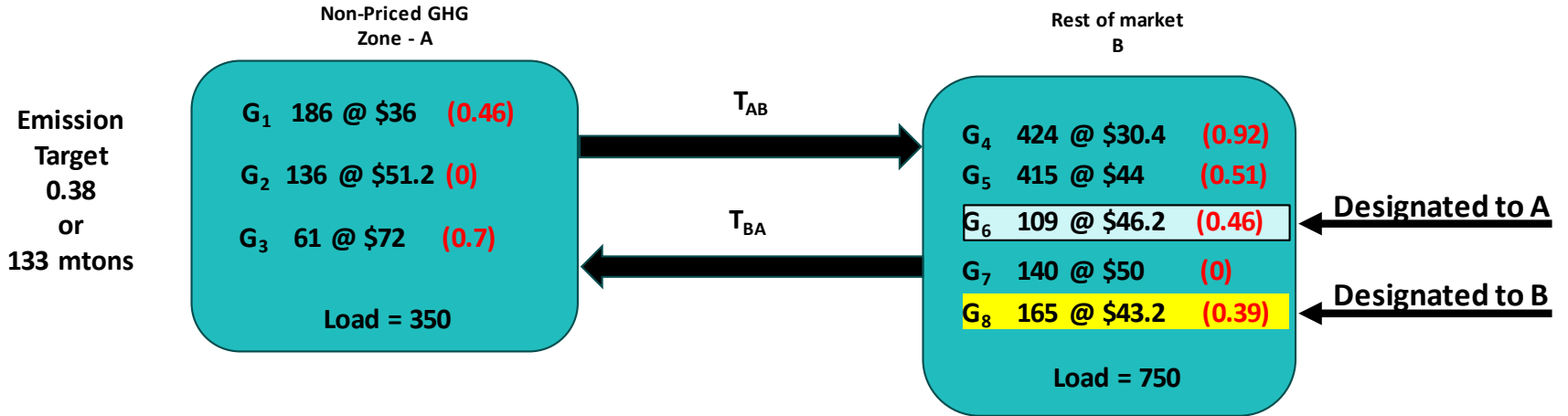
- Dispatch method that limits emissions attributed to a non-priced GHG zone in the market
- Will not exceed the maximum emission target set.
- Need not be enabled in every interval: reliability and cost off-ramp.
- Produces energy and GHG marginal cost.
- Policy questions concerning voluntary participation, payment of GHG marginal cost and FERC approval.

Import Constrained Dispatch



- Utility specifies maximum and has must offer obligation.
- Does not attribute specific external resources, except designated resources.
- Lowest system cost while meeting maximum emission limit in GHG Reduction Zone
- **Internal Generation Emission + Imported Emissions – Exported Emissions ≤ Maximum Emission Target**
- Requires a calculation of Imported Emissions Rate and Exported Emissions Rate.
 - Imported Emissions = $T_{BA} * \text{Imported Emission Rate}$
 - Exported Emissions = $T_{BA} * \text{Exported Emission Rate}$
- Does not produce a GHG marginal cost
 - Implied in energy marginal cost

Simple Example: Import Constrained Dispatch



Emission Target
0.38
or
133 mtons

A Portfolio Emission Rate
(includes G_6)
0.363 mton/MWH

Pre-Dispatch Export Emission Rate
0.363/MWH

Pre-Dispatch Import Emission Rate
(excludes G_6, G_8)
0.615 mton/MWH

Example: "24.03.05.10.02.04.247836."

Simple Example: Import Constrained Dispatch

Generator	Emission Rate (mton/MWH)	Dispatch (MWH)	Emissions Attributed To A (Pre-Dispatch Rate)	Actual Emissions Attributed to A (Post-Dispatch Rate)
G ₁	0.46	186	85.56	85.56
G ₂	0	86.8	0	0
G ₃	0.7	0	0	0
G ₄	0.92	424		
G ₅	0.51	238.2		
G ₆ (Designated to A)	0.46	0		
G ₇	0	0		
G ₈ (Designated to B)	0.39	165		
T _{AB}	0.314	0		
T _{BA}	0.615	77.2	47.48	59.6
Total		1100 (350)	133	145.2

Energy Marginal Costs
 Zone A: \$ 51.20
 Zone B: \$ 44.00

Pre-Dispatch Import Rate
 0.615

Post-Dispatch Import Rate
 0.773

← 12.2 mtons over target

Example: 24.03.02.14.02.28.87689

Import Constraint Summary

- Dispatch method that limits emissions attributed to a non-priced GHG zone in the market
- Need not be enabled in every interval: reliability and cost off-ramp.
- Post-dispatch true-up can exceed the maximum emission target set but is manageable over compliance period.
- Produces only energy marginal cost.
- Policy questions concerning revenue distribution and FERC approval.

Emission Constraint vs Import Constraint

Emission Constrained method	Import Constrained Method
Pros	Pros
Always less than or equal to emission constraint	Avoids direct competition with priced states
	Voluntary participation not an issue
Cons	Cons
Voluntary participation	May exceed the emission constraint in any particular interval.
GHG marginal cost just and reasonable?	
GHG competition with priced states	

Conclusion

- Control mechanisms that offer benefits of DAM do exist which can assist utilities subject to non-priced GHG programs in complying.
- For some of these impacted utilities, joining a DAM may depend upon whether the market offers adequate tracking, accounting and control to meet compliance.
- Ultimately, it is up to the utilities subject to these programs to make the case to their air and energy regulators that by joining a particular DAM, they will not only be able to accurately report on their compliance but can assert that they can comply with the non-priced program while reaping benefits of a DAM.



Thank You

Import and Export Rates for Import Constraint Method

Illustrative

Pre-Dispatch

$$ImportRate = \frac{[\sum_{i \in EG} O_i * E_i]}{[\sum_{i \in EG} O_i]}$$

$$ExportRate = \frac{[\sum_{i \in EG} O_i * E_i]}{[\sum_{i \in EG} O_i]}$$

Post-Dispatch True-Up

$$ImportRate = \frac{[\sum_{i \in EG} D_i * E_i]}{[\sum_{i \in EG} D_i]}$$

$$ExportRate = \frac{[\sum_{i \in EG} D_i * E_i]}{[\sum_{i \in EG} D_i]}$$

IG = Internal generation including generation designated to non-priced GHG Zone

EG = External generation excluding generation designated to non-priced GHG Zone and generation designated outside non-priced GHG zone.

O_i = Offer of Generator i .

E_i = Specific emission rate of Generator i .

D_i = Actual dispatch of Generator i .

BREAK

WPTF PROPOSAL

Towards A Comprehensive Energy and GHG Accounting and Reporting System

Clare Breidenich
Western Power Trading Forum
March 14, 2024

Presentation Outline

- Problem Statement
- Terminology
- Objective of Accounting and Reporting System
- Components
 - Mechanism to Record Committed energy
 - Accounting Rules
 - Accounting Database
 - Reporting & Publication of data
- Illustration of Approach
- Examples of Entity Level Accounting
- Benefits of this approach
- Additional Considerations

Problem Statement (Revision of #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.

Terminology

- Assignment: Designation of committed energy to market participants (LSEs & energy users)
- Attribution: Designation by the dispatch engine of energy to a GHG Regulation Area
- Designation: Collective term for assignment and attribution of dispatched energy
- Committed Energy: Energy dispatched from resources that are owned by or contracted to an LSE or energy user
- GHG Reduction Area: Market participants subject to state regulations or voluntary goals formulated as load-based GHG targets relative to historic baseline (e.g., Oregon and Colorado programs)
- GHG Regulation Area: Jurisdiction subject to GHG Pricing (cap and trade)
- Clean Energy Areas: Market participants subject to state regulations or voluntary goals formulated as clean energy procurement targets set as percentage of load (e.g., New Mexico, Washington CETA)
- Residual Market Supply: Energy not committed to market participants or attributed to GHG Regulation Areas
- Non GHG area: Market participants not subject to state GHG pricing, GHGs reduction or Clean Energy procurement regulations, or voluntary GHG or Clean Energy goals
- Residual emission rate: Dispatch-weighted average emission rate of the residual market supply

Objective of Energy & GHG Accounting & Reporting System

- To create a tracking mechanism and reporting system that
 - Enables attribution & assignment of energy from specific resources and associated emissions to states and/or individual market participants (load-serving entities and energy users)
 - Completely accounts for all dispatched energy and associated emissions within the market footprint
 - Prevents double-counting of energy and under and overcounting of emissions
 - Accommodates different approaches for accounting for clean energy by states and market participants (e.g. dispatch designation to GHG Regulation Areas, contractual claims, RECs)
 - Supports compliance with state GHG reduction or Clean Energy targets
 - Enables market participants with voluntary goals to track progress toward those goals
 - Does not impose costs or tracking requirements on states or entities without GHG Reduction or Clean Energy targets or goals

Energy, GHG Accounting & Reporting System Components

- Mechanism to record committed energy prior to dispatch
- Accounting Rules
 - Designation of Dispatched Energy
 - Calculation of Emission Rate of Residual Market Supply
- Database for tracking designated energy and associated emissions
- Reporting and Publication System for energy and GHG metrics

Pre-Dispatch Accounting

- Mechanism to Record Committed Energy
 - Assignment of all resources owned by LSEs in footprint to those LSEs
 - By CAISO
 - Interface for voluntary registration of contracted energy
 - By LSE or Energy User to CAISO
 - Validation of contracted energy
 - Seller 'handshake' to CAISO via interface?
 - Verification of contractual claims
 - After the fact by appropriate regulator, where applicable
- Emission factors for all resources in footprint
 - Determined by state regulators, where applicable
 - Otherwise, determined according to market protocol, i.e. EPA data or using resource heat rates

Accounting – Assignment of Energy to Market Participants

- LSEs (and energy users, where applicable):
 - Dispatched energy and associated emissions from committed resources assigned to each LSE's account
 - Any energy & associated emissions attributed to a GHG Regulation Area from resource owned by LSE located outside GHG Regulation Area deducted from that LSE's account
 - Any energy & associated emissions from energy sold from LSE owned resource under specified contract or attributed to GHG Regulation area as surplus energy deducted from LSE's account
 - Energy & associated emissions from energy purchased under specified contract from other market participants added to LSE's account
 - If energy assigned to LSE < LSE load, incremental energy from market supply added to LSE account at emission rate of residual market supply
 - If energy assigned to LSE > LSE load, excess energy assigned to residual market supply at LSE's system *average* emission rate (i.e. all energy assigned to that LSE)

Accounting - Attribution to GHG Regulation Areas

- Energy and associated emissions from energy attributed to GHG Regulation Area is not considered Residual Market Supply
- Energy and associated emissions dispatched from resources within the GHG Regulation Area and contracted as specified to a market participant outside area is designated for that market participant is deducted from energy attributed to the GHG Regulation Area
- Attribution of energy and associated emissions to LSEs in GHG Regulation Areas
 - If attributed energy is contracted to an LSE within a GHG Regulation Area, that energy and associated emissions are assigned to that LSE's account
 - If attributed energy is not contracted to an LSE within a GHG Regulation Area, (i.e. surplus specified energy not dispatched in GHG reference pass), energy and associated emissions is assigned to individual LSEs proportional to their incremental market purchases

Accounting - Residual Market Supply

- Market supply is a residual mix in that it represents energy that is NOT designated to specific entities or states
 - Energy from IPP owned resources not committed to specific LSEs or energy users, or attributed to GHG regulation area
 - Energy assigned to specific LSEs or energy users in excess of each entity's load
- Residual emission rate for market supply:

$(\sum \text{GHG associated with dispatch of non-designated resources} + \sum \text{of emissions associated with excess LSE assigned energy})$

$(\sum \text{MWh of non-designated resources} + \sum \text{MWh of excess LSE assigned energy})$

Energy and Emissions Database

- Accounts
 - All LSEs within market footprint
 - For LSEs in non-GHG Area, energy is attributed on entity specific basis to enable accurate and comprehensive emission accounting
 - Energy Users that elect to account
 - Each GHG Regulation Area
 - Non-GHG Area in Aggregate
 - Residual Market Supply
 - Market Footprint as a whole
- Data recorded for each accounting interval (e.g., hourly)

Energy and Emissions Database – Market Participant Accounts

- Dispatched energy and associated emissions from owned resources (all LSEs)
- Dispatched energy and associated emissions from contracted resources (entities that elect to account)
- Any pro rata assignment of surplus energy (LSEs in GHG Regulation Areas only)
- Incremental volume of residual market supply (all LSEs)
 - if dispatch of committed energy > load, energy and associated emissions deduction at LSE system emission rate
 - if dispatch of committed energy < load, energy and associated emissions addition at Residual Emission rate
- LSE ‘system’ average emission rate of designated energy (all LSEs)

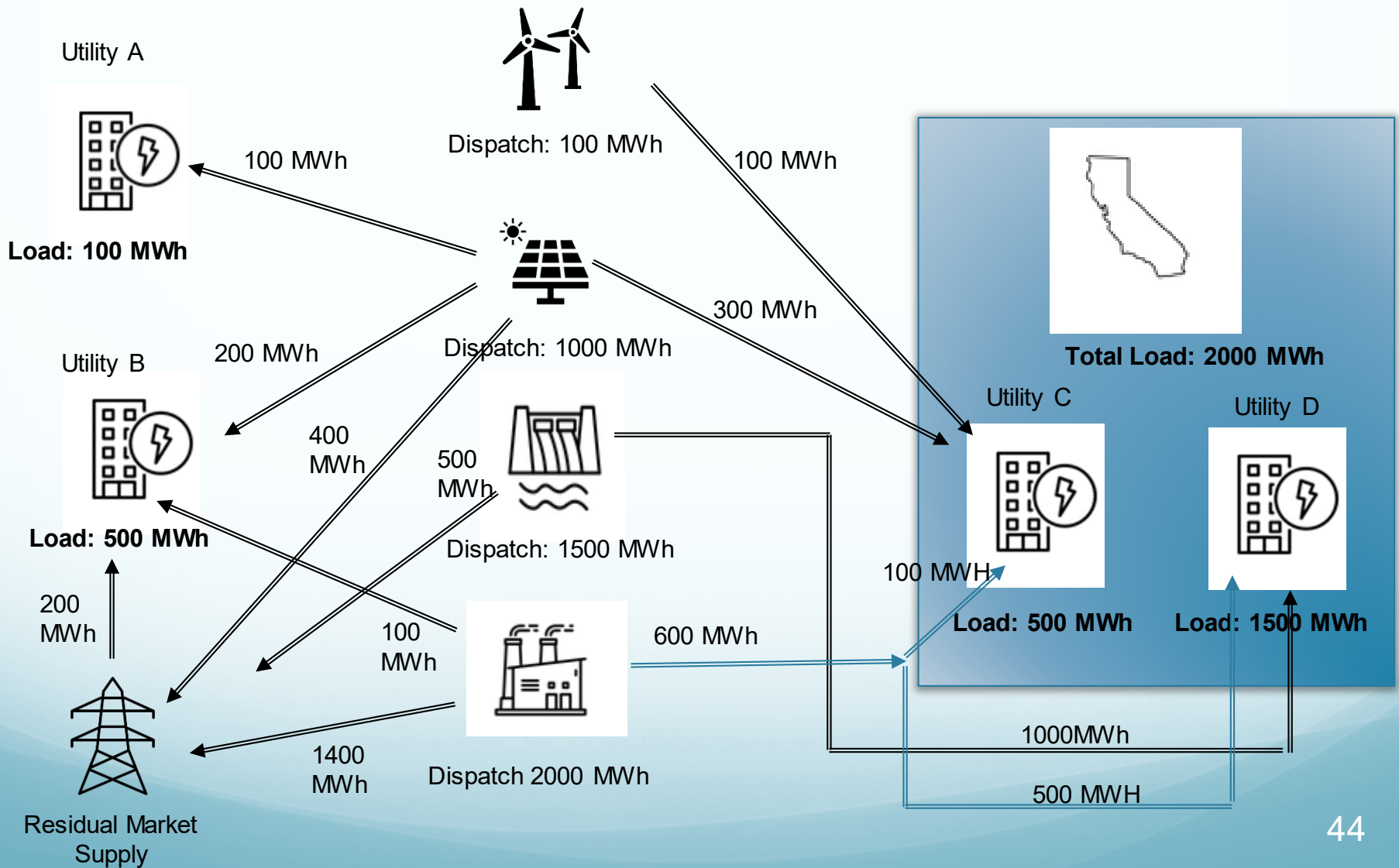
Energy and Emissions Database – Market Area Accounts

- GHG Regulation Areas
 - Energy, emissions and average emission rate from resources within the area
 - Energy and associated emissions of any resource committed to market participant outside GHG Regulation Area
 - Energy, emissions and average emission rate attributed to Area
- Non-GHG Area
 - Energy, emissions and average emission rate from resources within the area
 - Energy and associated emissions of any resource committed to market participant outside GHG Regulation Area
- Residual Market Supply for each accounting interval
 - Dispatched energy from uncommitted energy and associated emissions
 - Contributions of excess system energy by LSEs and associated emissions
 - Residual Emission rate
- Market Footprint as a Whole
 - Total energy and associated emissions
 - Average emission rate

Reporting and Publication of GHG Metrics

- Provide reports to individual LSEs and Energy Users that are subject to regulatory programs or request accounting on that entity's designated energy and emissions
- Provide reports to regulators in GHG Reduction or Clean Energy states upon request on energy and emissions designated to individual LSEs subject to those regulations
- Regularly publish metrics for market transparency
 - Energy, emissions and average emission rate for within region generation for each market subdivision
 - Energy, emissions and average emission rate of energy attributed to GHG Areas
 - Energy, emissions and average emission rate of energy attributed in aggregate to LSEs and Energy Users
 - Average emission rate of Residual market supply

Illustration



Entity Level Accounting: Purchase from Residual Market Supply

	MWh	Emission Rate (MT/MWh)	Emissions Accounting (MT)	REC/Clean Energy Accounting
	Dispatch of Assigned Generation			
Solar	200	0	0	200
Wind	100	0	0	100
Hydro	300	0	0	300
Gas	300	0.5	150	--
Total Assigned Energy	900			600
Purchase of Residual Market Supply	100	0.4	40	--
Load	1000	0.19	190	60%

* Market supply energy added to entity's account at residual emission rate

Entity Level Accounting: Contribution to Residual Market Supply

	MWh	Emission Rate (MT/MWh)	Emissions Accounting (MT)	REC/Clean Energy Accounting
	Dispatch of Assigned Generation			
Solar	200	0	0	200
Wind	300	0	0	300
Hydro	300	0	0	300
Gas	300	0.5	150	--
Total Assigned Energy	1100			800
Net Contribution to Residual Market Supply	100	0.136	-13.6	--
Load	1000	0.136	136.4	80%

* Contribution of emissions to market supply is at average emission rate of LSE's assigned energy, and reduces the emissions associated with serving that LSE's load.

Benefits of This Approach

- Provides comprehensive accounting of all energy and emissions within the market footprint
 - Can be rolled-up from more granular levels (e.g. hourly) to less granular (e.g. annually) without compromising accuracy
- Ensures that all entities subject to GHG Reduction or Clean Energy regulations, or with voluntary goals, can account for energy, and as needed emissions, from resources in their portfolio
- Does not impose any requirements or costs on LSEs and energy users in Non-GHG areas
 - Energy and associated emissions assigned to LSEs and energy users without regulatory or GHG goals is reported only as aggregated energy and emissions designated for Non-GHG area
- Results in accurate and dynamic emission rate for residual market supply
 - Enables state programs to use more accurate emission factor for unspecified imports or market purchases
- Does not require an additional market dispatch constraint

Additional Considerations

- Designation of energy and emissions to particular state loads for multijurisdictional utilities with service territory in GHG Reduction & Clean Energy Areas and in the Non-GHG Areas
- Resolution of competing claims to same energy, e.g.
 - Accounting for energy from resources with more than one off-taker
 - Attribution of energy to GHG Regulation Area with recordation of committed energy by other market participant claims
 - Unbundled RECs
- Subdivisions, temporal granularity and frequency for accounting, reporting and publication of energy and GHG metrics
- Interface with WREGIS?

Returning at 1:00pm Pacific Time

LUNCH BREAK

MARKET VS. REPORTING APPROACHES – PS 7

Market vs. Reporting Approaches Compared

	Market: Emission Constrained Dispatch <i>PUC MOU Group Proposal</i>	Market: Import Constrained Dispatch <i>PUC MOU Group Proposal</i>	Reporting Approach <i>WTPF Proposal</i>
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. <i>Also remove challenges with opt in provisions and what to do with GHG costs.</i>	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 <ul style="list-style-type: none"> • When dispatch of committed energy > load: deduct @ LSE system EF • When dispatch of committed energy < load: add @ residual EF
Policy Considerations	<ul style="list-style-type: none"> - Are opt in provisions necessary? - Cost/reliability off ramps - Revenue reward 	<ul style="list-style-type: none"> - Cost/reliability off ramps - Revenue distribution 	<ul style="list-style-type: none"> - 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

WORKING GROUP UPDATES

Problem statement sponsor/co-sponsor volunteers

Problem statement	Sponsor or co-sponsor
PS 1-3 (attribution, optimization, secondary dispatch)	PG&E, Vistra
PS 4 (GHG price formation)	No sponsor/co-sponsor
PS 5 (reporting requirements)	No sponsor/co-sponsor
PS 6 (metrics)	PGE
PS 7 (emissions reduction policies)	PGE, WRA, PNM

Average Emissions Rate (AER) Data

Stakeholders requested greater clarity and context around the recently announced AER data

- We look forward to working with stakeholders to 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
- This data is intended to be a tool for stakeholders to
 - Become familiar with the dataset
 - Explore the opportunities and limitations of certain metrics and methodologies
 - Better inform the evolution of ISO reported data

How the ISO calculated the AER metric published on the ISO website

- 1) Which resources the AER would reflect:
 - Supply resources - **Included**
 - Demand response resources - **Excluded**
 - Energy storage resources - **Included**
 - Resources that were attributed to serve California (or, post-EDAM, Washington) - **Included**
- 2) Whether the AER would measure all schedules or only those schedules relative to the WEIM base schedule – **All schedules were included**
- 3) How bilateral transactions between BAs would be treated – **Bilateral transactions were included**
- 4) How missing data would be treated – **CAISO filled in missing data by using weighted averages from existing data**

Problem statement 6: The ISO does not provide all metrics desired by market participants.

- 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.
- 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 6: The ISO does not provide all metrics desired by market participants.

- 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.
- 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 6: The ISO does not provide all metrics desired by market participants.

- 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.

Problem statement 6: The ISO does not provide all metrics desired by market participants.

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

BREAK

Mary Wiencke (PGP) and Jessica Zahnow (PSE)

PROPOSAL TO RE- CATEGORIZE ISSUES

Proposal to further consolidate and re-organize issues

- Proposal from PGP, with support from PSE
- Proposal identifies a need to more concisely consolidate issues identified by the working group thus far, and determine work streams and action items.
- Intent of reorganization is to streamline content that has already been developed and discussed by the working group
- Many problem statements are related and interdependent
 - For example, PS 6 includes a series of issues related to other existing problem statements
- PGP proposal identifies four categories that can be discussed discretely, but recommends some categories be addressed prior to others since some issues overlap.

Proposed Issue Category #1: ISO Market Operations & GHG Design – Current Approach to GHG Pricing Programs in WEIM

- **Problem statement:** Market participants and stakeholders do not have enough information to evaluate whether the WEIM design works as intended, **or desire modifications to the design.**
 - Identifying available surplus for attribution to a GHG zone
 - How much secondary dispatch is occurring
 - Relationship between how leakage is addressed and price signals/cost
 - Understanding marginal GHG costs
 - Documentation of additional metrics to enable stakeholders to better evaluate the design
 - **Need for coordination with other markets in the west to address accounting seams**
 - **Consider whether modifications to the design are necessary to enable entities to direct attribution of clean resources to loads, to honor forward commitments, or to address other state policy objectives**

Proposed Issue Category #2: Addressing Non-Pricing and Clean Energy Policies, and Voluntary Goals

- **Problem statement:** The current WEIM and proposed EDAM GHG designs only address GHG pricing programs and do not facilitate the needs of other types of GHG or clean energy state policies or voluntary utility or customer GHG or clean energy goals.
 - Metrics and accounting frameworks are needed to facilitate mandatory and voluntary reporting of emissions and clean energy
 - Calculating unspecified or market mix emissions rates
 - Addressing double-, under-, or over-reporting and areas where different accounting frameworks cannot be reconciled
 - Identifying emissions intensity and/or specified resource transfers or imports and/or total emissions/specified imports used to serve load
 - Does a transparent accounting framework sufficiently meet the need, or is a market mechanism needed?
 - Interaction with GHG pricing program design

Proposed Issue Category #3: Exploring Mechanisms for Addressing Non-Pricing and Clean Energy Policies, and Voluntary Goals

- **Problem statement:** No market mechanism currently exists to reflect policies that require emissions reductions but do not establish a GHG price.
 - Ensuring load is served by resources that meet emission reduction requirements or goals
 - Minimizing impacts to efficient economic market dispatch
 - Understanding interaction with GHG pricing program design

Proposed Issue Category #4: Other GHG & Policy Metrics – Stakeholders desire additional metrics not currently available related to emissions and renewable energy

- **Problem statement:** Granular information regarding emissions rates, renewable curtailment, and GHG cost data is not uniformly available
 - Average emissions rates (different permutations)
 - Other as suggested

NEXT STEPS

Working group schedule

Date	Topic(s)
April 17, 2024	<ul style="list-style-type: none">• Problem statements 1-3, 4• Continued discussion of solutions to problem statement 7
May 29, 2024	Stakeholder determined
June 26, 2024	Stakeholder determined

Note: Working group topics will be informed by problem statement readiness, stakeholder feedback, staff bandwidth, and stakeholder presentation timing.

Next steps

- Comments due by end of day March 28.
 - Submit using the template provided on the working group webpage
- Next working group:
 - Date: April 17, 2024
 - Time: 9 a.m. – 4 p.m.
 - Location: Attendees may choose to participate in-person at the ISO, or virtually.
- Submit requests to present to ISOStakeholderAffairs@caiso.com
- Relevant information:
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Greenhouse-gas-coordination-working-group>



- Welcome reception for all attendees the evening of Oct. 29.
- Additional information, including event registration and sponsorship opportunities, will be provided in a future notice and on the ISO’s website.

Please contact Symposium Registration at symposiumreg@caiso.com with any questions.