WEIM Body of State Regulators Monthly Meeting

Thad LeVar

Woori Lee

Bonnie Lamond

Teleconference
July 8, 2022

Agenda

- **Welcome Remarks and Announcements**
  Chair Thad LeVar, WEIM-BOSR Chair

- **GRC Update**
  Commissioner Letha Tawney, WEIM-BOSR Representative on GRC

- **GHG Accounting – Zonal Approach**
  Mary Wiencke, Executive Director, Public Generating Pool

- **Next Steps**
  Bonnie Lamond, Program Manager – Wholesale Electricity Markets, WIEB

Governance Review Committee Update

Commissioner Tawney, WEIM-BOSR Representative on GRC

WESTERN ENERGY IMBALANCE MARKET (WEIM)

WEIM Governance Review Committee Public Meeting

WEIM Governance Review Committee
General Session
April 29, 2022

WEIM Governance Review Committee - members

Michele Beck	Utah Office of Consumer Services
Tony Braun	Braun Blaising Smith Wynne, PC
Andrew Campbell	Energy Institute at Haas, UC Berkeley
Suzanne Cooper	Bonneville Power Administration
Eric Eisenman	Pacific Gas and Electric Company
John Prescott*	WEIM Governing Body
Angelina Galiteva*	ISO Board of Governors
Therese Hampton	Consultant representing public power
Amanda Ormond	Ormond Group LLC
Commissioner Letha Tawney	Body of State Regulators
Rob Taylor	Salt River Project
Pam Sporborg	Portland General Electric
Rebecca Wagner	Independent consultant
Cameron Yourkowski	EDP Renewables North America LLC

** non-voting member*

Summary of GRC options for EDAM under consideration

- **Type of Delegation of Authority**: Primary or Joint Authority with some evaluation of other decision-making process changes
- **Scope of Delegation of Authority**: Rules that apply to WEIM and EDAM market participants, rules that impact EDAM market participants, all real-time and day-ahead rules, or all real-time and day-ahead rules with exception for rules that apply uniquely to full ISO market participants in the CA BA
- **Stakeholder Role in Market Design**: Modification of RIF into a stakeholder advisory body to the ISO Board of Governors and WEIM Governing Body on market design and policy prioritization
- **ISO Board of Governors and WEIM Governing Body Nomination Process**: Better align Board selection processes to support regional representation
- **ISO Board of Governors and WEIM Governing Body Mission Statements**: Similar to the WEIM Governing Body mission statement, ensure consideration of all market participants in mission statements for both bodies

Definition: Type of delegation of authority

Primary Authority	Joint Authority
• Governing Body approval is required • Decision is placed on ISO Board of Governors consent agenda • Majority vote of Board of Governors required to remove from consent agenda • ISO Board of Governors can only remand; cannot alter decision or approach	• Both WEIM Governing Body and ISO Board of Governors approval is required • Each body must have a majority of members to support for approval • Recommended that approval process take place in a joint meeting of both bodies

**Advisory authority is informed by what has been defined under primary authority or joint authority.*

Definition: Dispute resolution

Current Approach

If the ISO Board of Governors and WEIM Governing Body do not jointly pass a proposal:

- Remand to a stakeholder process
- If the revised proposal cannot achieve joint approval, the two bodies may decide to have:
  - Additional remand, or
  - The ISO Board of Governors submits a filing to FERC that includes the WEIM Governing Body's position, written with the support of outside legal counsel
- The ISO Board of Governors is also provided the ability to file more quickly in time-critical circumstances

Definition: Scope of delegated authority

Rules that "apply to"	Rules that "impact"	All market rules
Delegated decision authority is provided on all market rules that apply to WEIM/EDAM participants in their capacity as WEIM/ EDAM participants	Delegated decision authority is provided on all market rules that impact WEIM/EDAM participants in their capacity as WEIM/ EDAM participants	Delegation decision authority is provided on all real-time and day-ahead market rules

Previous recommendation: Scope of delegated authority

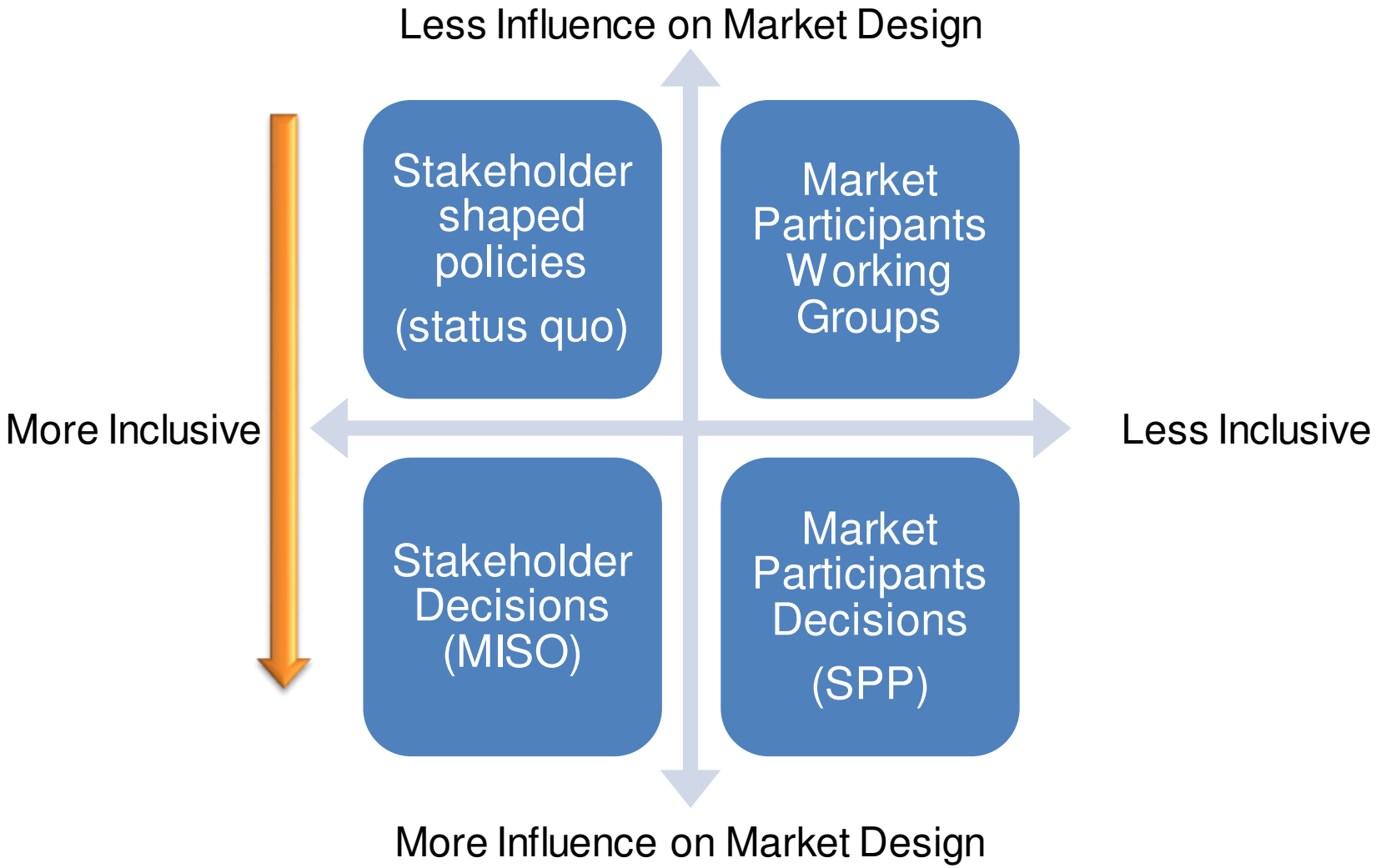
For WEIM, the GRC recommended and the ISO Board of Governors and WEIM Governing Body jointly approved a scope of delegated authority for all rules that "apply to" WEIM entities in their capacity as WEIM participants for the following reasons:

- It expanded the WEIM Governing Body's previous advisory authority to approval authority on all issues that apply to WEIM Entities
- It maintains the WEIM Governing Body's advisory authority on other issues that impact WEIM Entities
- It provides for a clear rule for which decisional classification can be determined
- After section-by-section review of the tariff, it was determined to appropriately assign decision authority

Options for EDAM: Scope of delegation of authority

- GRC is exploring:
  - All scopes of delegation of authority previously evaluated
  - In addition, GRC is exploring a scope that includes all day-ahead and real-time market rules but with notable exceptions that apply uniquely to full ISO market participants in the ISO Balancing Authority Area.
- Key Questions:
  - Does the EDAM market structure impact the GRC's previous evaluation? If so, in what way?
  - What other options would you recommend the GRC consider?
  - Are there any day-ahead and real-time market rules that apply uniquely to full ISO market participants in the ISO Balancing Authority Area?

Option for EDAM: Include stakeholders more in market design



GHG Accounting - Zonal Approach

Mary Wiencke, Executive Director, Public Generating Pool

An Approach for Greenhouse Gas Pricing in a Day-Ahead Organized Market

July 8, 2022
WEIM-BOSR Meeting

Mary Wiencke, Public Generating Pool

TOPICS

1. Background
2. Principles for Incorporating GHG-pricing Programs into a Day-Ahead Market
3. Key Objectives
4. Design Proposal
5. Discussion Questions
6. Additional Topics

BACKGROUND: GHG PRICING PROGRAMS

- The purpose of a GHG-pricing program is generally to reduce GHG emissions by imposing a cost of emissions from electricity generated within the GHG-pricing program's footprint

- GHG programs are intended to make low- or non-emitting resources relatively more economic than resources that emit high amounts of GHG emissions

- May also include rules applicable to imports in order to prevent "leakage"
  - Leakage occurs when electricity production shifts from GHG-emitting generating resources located within a jurisdiction applying GHG pricing to GHG-emitting generating resources located outside the jurisdiction (instead of reducing overall GHG emissions)

BACKGROUND: POLICY FRAMEWORK IN CALIFORNIA & WASHINGTON

- California Cap and Trade in place since 2013, Washington Cap and Invest begins 2023

- Both programs apply to energy **generated** in the state or **imported** into the state
  - Both state program separate imports into ‘specified’ and ‘unspecified’ buckets
  - Specified imports are where the source of the import is known and unspecified imports are where the source of the import is not known

- Both programs regulate the “first jurisdictional deliverer” (FJD)
  - Whoever first delivers energy into the state (either the in-state generator or the importer) has a compliance obligation
  - Megawatt-hours and emissions associated with imports are reported and quantified (includes non-emitting imports)
  - Importers with a compliance obligation must purchase and retire allowances
    - One allowance per ton of GHG

PRINCIPLES FOR INCORPORATING GHG PROGRAMS INTO A DAY-AHEAD MARKET

- It is up to each state or province to determine whether to implement a GHG-pricing program
  - Market design must not encroach upon state autonomy to adopt a GHG-related program and determine its associated rules

- Market design should accurately apply the provisions of each state or province's GHG-pricing program
  - But also recognize that market design can help to inform policy choices and vice versa, and harmonization of certain aspects of state GHG programs could enable improved efficiencies

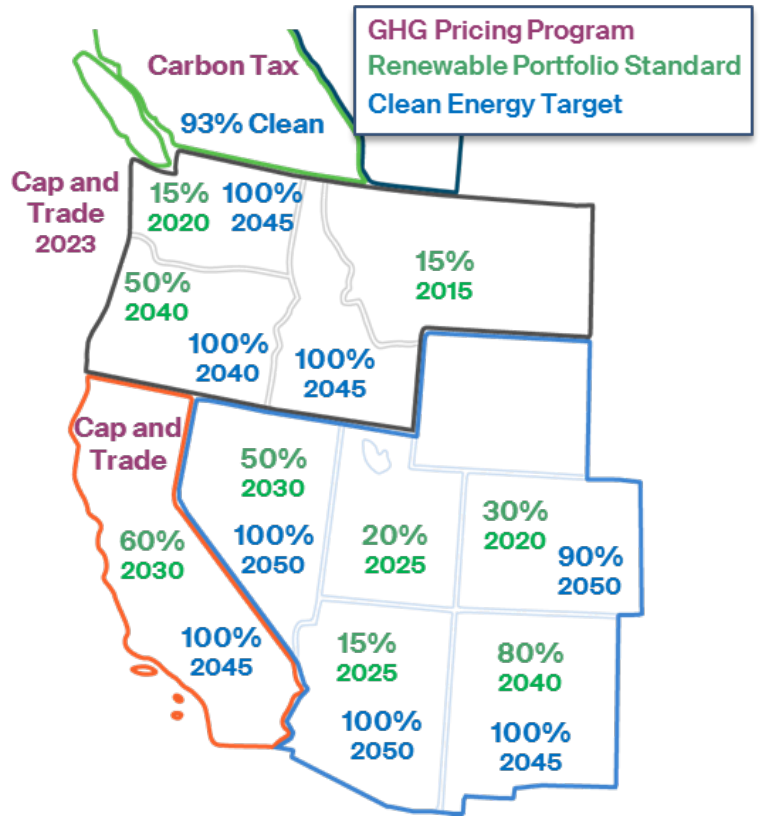
- The organized market design should anticipate growing number of GHG-pricing programs, and that all GHG-pricing programs will likely evolve over time
  - Designing flexibility into the organized market will reduce the need for significant changes to the organized market design as GHG-pricing programs grow and evolve
  - A flexibly designed program may also be more able to accommodate clean energy or GHG policy frameworks that are not explicitly based on GHG pricing

PRINCIPLES FOR INCORPORATING GHG PROGRAMS INTO A DAY-AHEAD MARKET

- Resources have multiple regions where their generation can be delivered and their associated clean attributes applied

- Includes committing supply to meet a variety of environmental programs
  - RPS, clean energy standards, product content disclosure, GHG pricing programs

- A durable market design must allow the seller to determine the quantity – if any – that *it wishes to* commit to deliver to another region (Seller Autonomy)



Graphic represents simplified summary of targets and commitments for each State/Province. Includes voluntary targets from large load serving entities within the region

KEY OBJECTIVES FOR APPLYING GHG PRICING TO A DAY-AHEAD MARKET

Within A GHG Zone

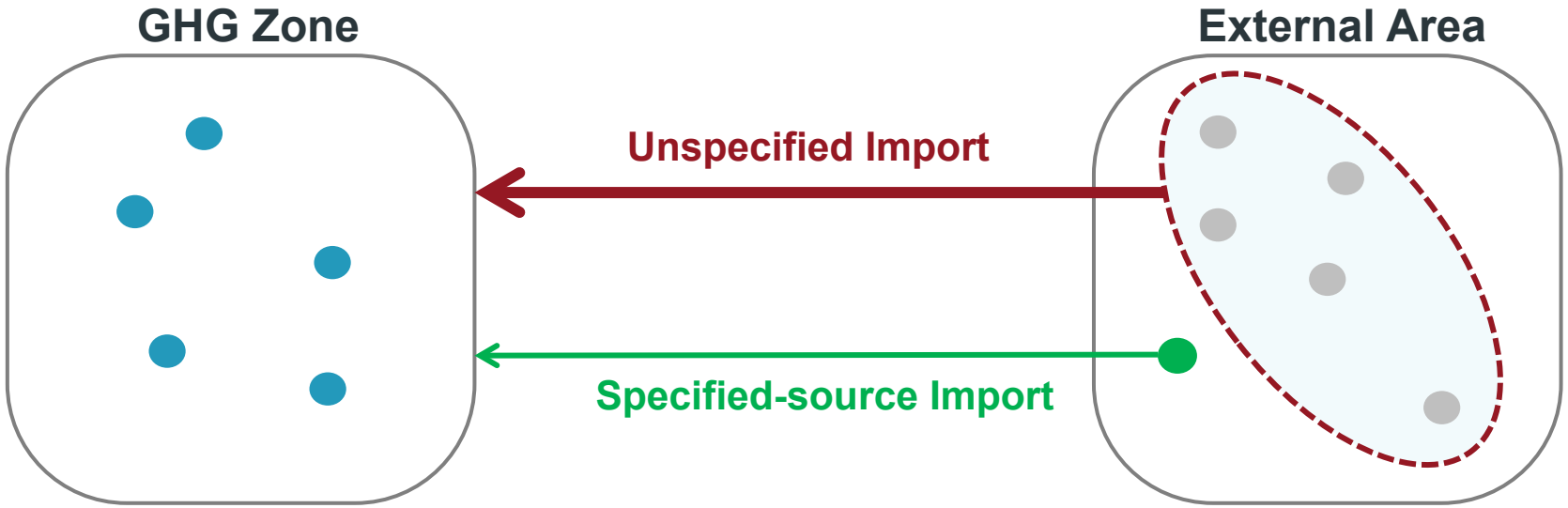
- **Include the cost of GHG emissions in the dispatch of generation** resources inside the GHG zone
- **Include the cost of GHG emissions associated with imports** into the GHG zone;
- **Enable market access** for low- or non-emitting resources outside a GHG zone to compete to sell their low- or non-emitting output into a GHG zone;
- **Ensure market prices in the GHG zone reflect the cost of GHG emissions**, encouraging low and non-emitting resources to be developed and available when they provide greatest value.

Outside A GHG Zone

- **Ensure the cost of GHG emissions are *not* included in the dispatch of generation** outside of GHG zones;
- **Ensure the cost of GHG emissions are *not* included in transfers** that occur entirely outside of GHG zones;
- **Ensure that market prices for electricity do *not* include costs of GHG emissions of resources outside the GHG zone**.

DESIGN PROPOSAL

GHG PRICING GENERALLY APPLIES TO THREE CATEGORIES OF ACTIVITY



Generation within a GHG zone

1. **Internal resources** include their GHG costs in their offer prices

Imports into a GHG zone

2. **Specified-source Imports** are transfers of specific resources to the GHG zone at a resource-specific GHG rate

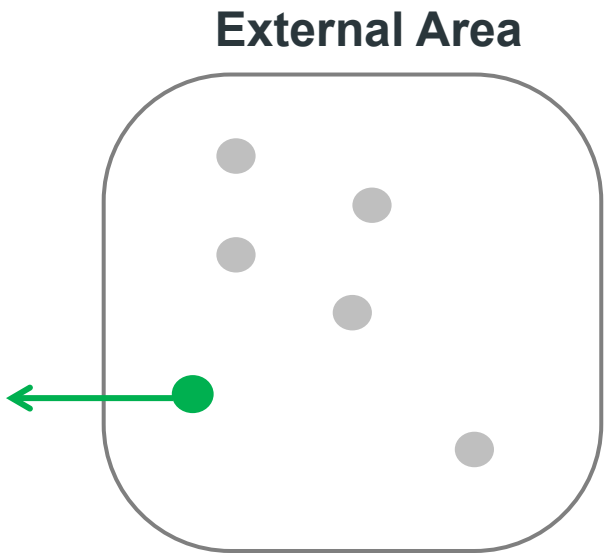
3. **Unspecified Imports** are assigned a default GHG emissions rate associated with the aggregate surplus generation in the external region

SPECIFIED-SOURCE IMPORTS

- Specified-source imports allow external resources to contribute toward meeting environmental goals and to access market opportunities to compete, on a non-discriminatory basis, to sell to the GHG zone

- Two important considerations for supporting for Specified-source imports
  - Identification of the specific resource (and its emissions rate)
  - Verification that the specified resource was imported to the GHG zone

- Once specified-source treatment is established, the market software dispatches the resource based on its costs (including GHG) in tandem with scheduling a corresponding quantity of specified-source imports into the GHG zone



PROPOSED APPROACH FOR ENABLING SPECIFIED-SOURCE IMPORTS

Prior to DA Market	Market Optimization and Settlement	GHG Reporting and Compliance
Participant communicates intent to import its resource to a GHG zone	Specified resource supporting the import includes its GHG cost in its energy offer	Market Operator records final delivered quantities that result from the market optimization
This establish the *maximum* potential quantity of the Specified-source Import	Market optimizes the specified resource in tandem with scheduling a corresponding quantity of specified-source imports into the identified GHG zone	Data supports public reporting of aggregate and individual results • Quantity of specified-source imports (MWh), which can be broken down by technology, source region, importer, etc. • Quantity of GHG emissions (MT)
Actual deliveries can be lower based on resource availability (e.g., wind output) or as result of the market optimization	Resource receives the LMP at its location plus the GHG "shadow price" in the relevant GHG zone	Each market participant is responsible for reporting and compliance of its specified imports with the applicable GHG program

VERIFYING SPECIFIED-SOURCE IMPORTS

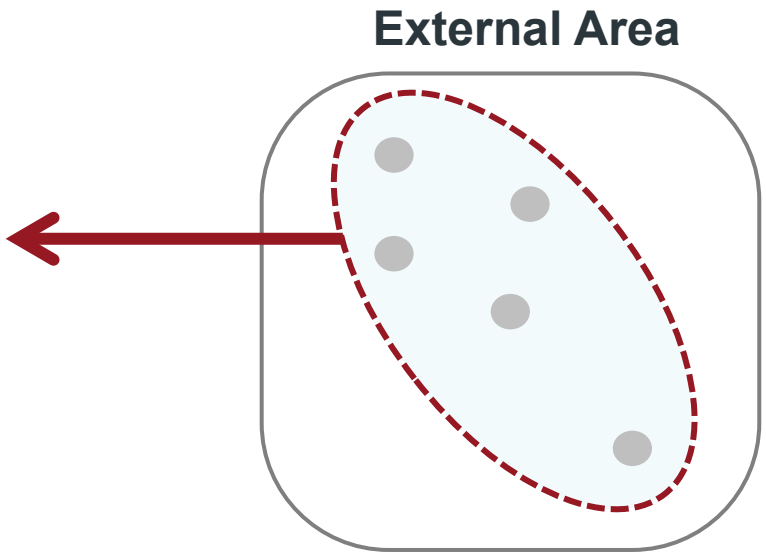
- GHG-Pricing programs are intended to reduce emissions associated with internal generation and with energy imported into the GHG zone

- It is therefore critically important to establish that the specified resource was imported into the GHG zone

- The market must enable participants to communicate key information regarding the transaction
  - Has implications for other elements of market design including whether transmission is required to very specified-source imports

UNSPECIFIED IMPORTS

- Unspecified Imports are imports that do not meet the GHG program requirements for Specified-source
  - Unspecified imports are not linked to any particular resource



- Existing GHG programs apply a single emissions rate to unspecified imports based on historical information regarding the type of generation that tends to be marginal in the region
  - *e.g., 0.428 MTCO2/MWh*

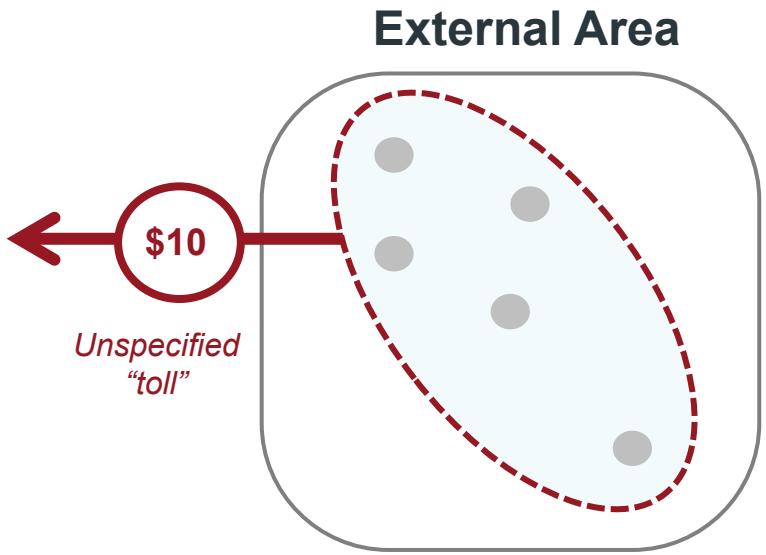
- Market optimization will use the relevant GHG program's default emission rate when evaluating unspecified imports into the GHG zone

UNSPECIFIED IMPORTS

- The default GHG emissions rate is multiplied by the cost of GHG allowances to determine a “toll” for scheduling Unspecified Imports through the market optimization

- Example:
  - Assume unspecified rate = 0.5 MTCO2/MWh
  - Assume $20 allowance cost
  - 0.5 MTCO2/MWh * $20 allowance cost = **$10/MWh toll**

- Unspecified imports will only occur when the market price inside the GHG zone (which includes GHG costs) is higher than the market price in the non-GHG zone (which does not include GHG costs) by at least as much as the “toll” (e.g., $10/MWh)

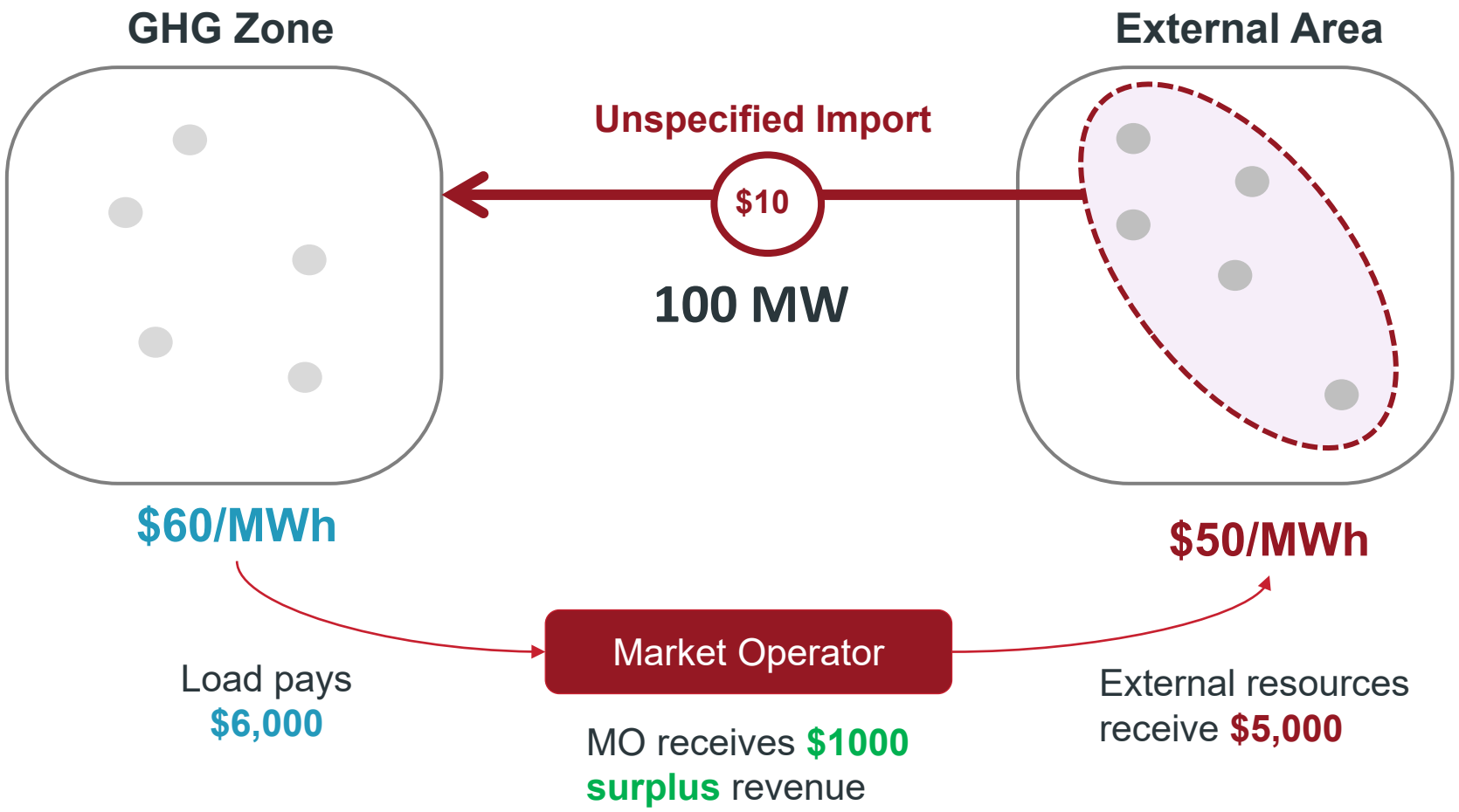


MARKET OPTIMIZATION OF UNSPECIFIED IMPORTS

Internal generation: **$60/MWh** >= **$10** + External generation: **$50/MWh** ✓ Import occurs

Internal generation: **$55/MWh** < **$10** + External generation: **$50/MWh** ✗ No Import

MARKET SETTLEMENT OF UNSPECIFIED IMPORTS

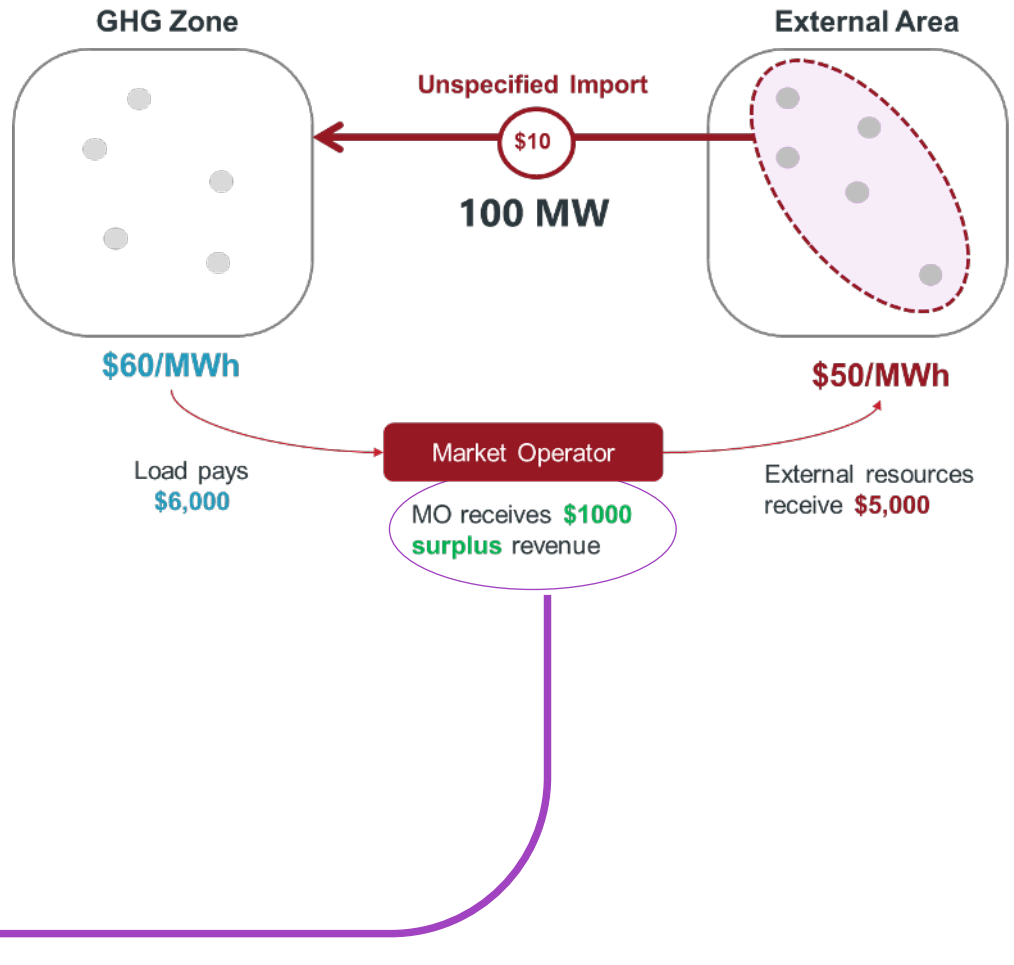


COMPLIANCE FOR UNSPECIFIED IMPORTS

- Unspecified Imports are not linked to any particular resource and there is no GHG price paid to external resources

- When GHG zone is a net importer, price separation between zones will reflect the unspecified rate
  - Generators in non-GHG zone will receive a (lower) price that does not reflect GHG costs
  - Load in the GHG zone will pay a (higher) price that reflects GHG costs

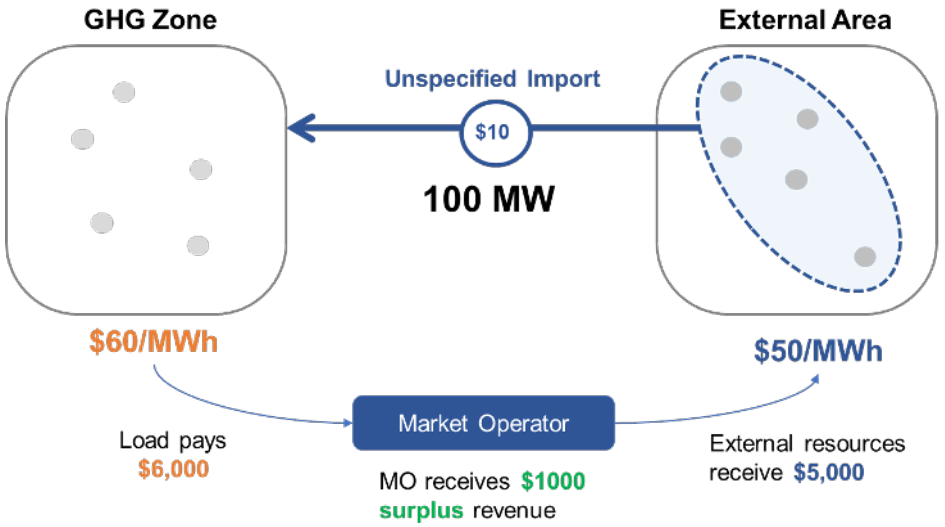
- Surplus revenue collected by Market Operator fully funds GHG compliance requirements
  - 100 MW * 0.50 MTCO2/MWh = 50 allowances required
  - 50 allowances * $20 per allowance = **$1000**



COMPLIANCE FOR UNSPECIFIED IMPORTS

- Must define the entity that will assume responsibility for reporting and compliance for unspecified imports

- Entity will also receive the surplus market revenues associated with unspecified imports
  - Allowance obligation is fully funded by market revenue received from Market Operator



FJD FRAMEWORK IN AN ORGANIZED MARKET

- A market based on locational marginal pricing (LMP) produces a set of independent injections and withdrawals at individual nodes
  - There is generally no specific link between where resources inject and where loads withdraw
  - The entity “responsible for delivering electricity” from resources to loads is the market operator
- Under a full organized market (e.g., RTO), the output from an individual resource is generally sold at its physical location (e.g., busbar) and the aggregate output from all resources across the entire footprint is simultaneously “delivered” by the market operator to all load locations
  - Energy delivered to any particular location is not easily tied to a specific resource or entity
  - Approaches that require the market dispatch to accurately “link” resources to loads have faced significant challenges (e.g., EIM “deeming” algorithm)
- The zonal approach eliminates the need for the market operator to allocate specific resources to specific loads for unspecified imports
  - Avoids a substantial expansion of the EIM “deeming” approach to EDAM
  - Increases the overall accuracy of imported emissions

FJD FRAMEWORK FOR ZONAL APPROACH IN EDAM

- EDAM is a hybrid market that retains certain elements of the existing bilateral markets and physical OATT transmission framework
- The zonal approach for GHG pricing is also a hybrid that reflects the overall market design
  - Reporting of specified imports uses a similar approach to CARB's existing approach for bilateral markets if certain criteria are met
  - Compliance for unspecified imports reflects the realities of a simultaneous organized market dispatch
- Under EDAM, the market operator could be functionally considered the FJD for unspecified imports:
  - The market operator is responsible to deliver unspecified energy from the external area to the GHG zone
  - The market operator is responsible for determining the total quantity of unspecified imports that will occur each interval and will collect the surplus revenue associated with GHG emissions of unspecified imports
  - The purchase and retirement of allowances could become an administrative function performed by the market operator itself
  - While the market operator does not own generating assets and therefore is not a "source" of emissions, it is the administrator of the dispatch of those sources of emissions and could potentially administrator compliance for those sources
- Other solutions may also be possible, such as using a third party or assigning the responsibility to load within the GHG zone

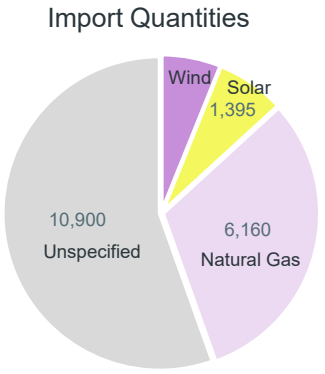
GHG APPROACH ENABLES COMPREHENSIVE REPORTING

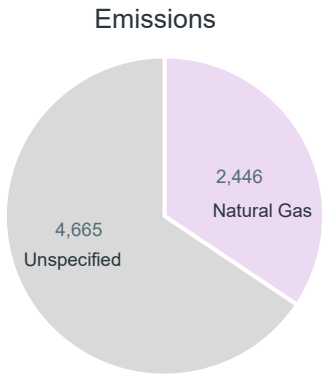
Import Summary (MWh)

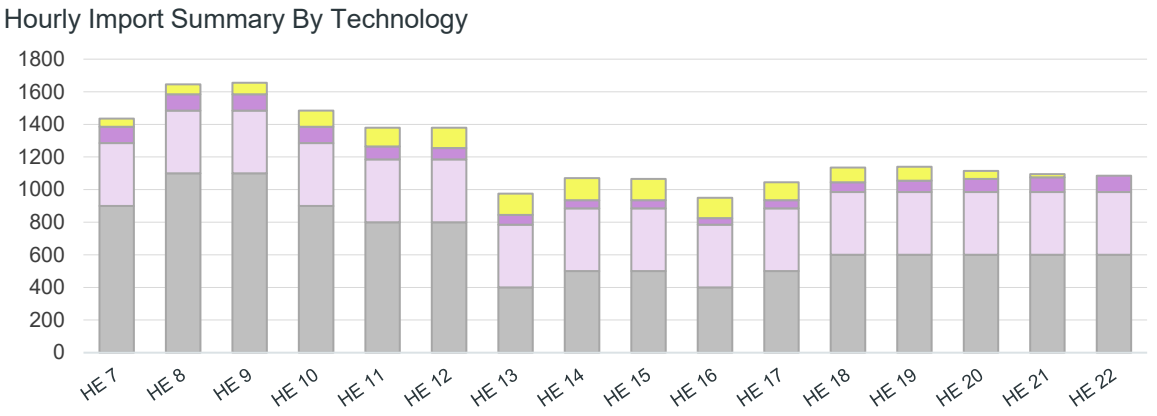
Type	Resource Name	Technology	Emissions Factor	Source Location	Importer	HE 7	HE 8	HE 9	….	HE 19	HE 20	HE 21	HE 22	Total
Specified-Source	Resource A	Wind	0	Oregon	Seller X	100	100	100	100	70	80	90	100	1200
Specified-Source	Resource B	Solar	0	Nevada	Seller Y	50	60	70	100	85	50	20	0	1395
Specified-Source	Resource C	Natural Gas	0.397	Arizona	Seller Z	385	385	385	385	385	385	385	385	6160
Unspecified	n/a	Unspecified	0.428	Unspecified	n/a	900	1100	1100	900	600	600	600	600	10900
Total Imports to GHG Zone						1435	1645	1655	1485	1140	1115	1095	1085	19655

Emissions Summary (MTCO2)

Type	Resource Name	Technology	Emissions Factor	Source Location	Importer	HE 7	HE 8	HE 9	…	HE 19	HE 20	HE 21	HE 22	Total
Specified-Source	Resource A	Wind	0	Oregon	Seller X	0	0	0	0	0	0	0	0	0
Specified-Source	Resource B	Solar	0	Nevada	Seller Y	0	0	0	0	0	0	0	0	0
Specified-Source	Resource C	Natural Gas	0.397	Arizona	Seller Z	153	153	153	153	153	153	153	153	2446
Unspecified	n/a	Unspecified	0.428	Unspecified	n/a	385	471	471	385	257	257	257	257	4665
Total Emissions						538	624	624	538	410	410	410	410	7111







ACCURATELY DETERMINING THE GHG RATE FOR IMPORTS
UNSPECIFIED IMPORTS

- Under an organized market design, all generation simultaneously dispatched (at bus bar) to serve all load
  - Unspecified imports can be generally expected to reflect the aggregate excess generation in the external area
  - Cannot be accurately “linked” to any particular generation resource(s)

- The Import GHG Rate for unspecified imports generally seeks to represent the generation expected to marginal in the region

- The Import GHG rate is defined by the GHG program, and is generally a single rate
  - A more finely-tuned calculation of Import GHG Rates could be developed, provided that the increased granularity does not compromise accuracy

ACCURATELY DETERMINING THE GHG RATE FOR IMPORTS
UNSPECIFIED IMPORTS

Inaccurately Low
Import GHG Rate

e.g. all imports treated as clean generation

- GHG "leakage" as electricity production (and emissions) shift outside the GHG zone.
- Clean and low-emitting generators outside GHG zone receive suppressed value for GHG attributes.
- Higher-emitting generators outside GHG zone benefit from increased opportunity to sell into GHG zone.
- Market prices in GHG zone do not accurately reflect GHG costs, weakening incentives for clean resources

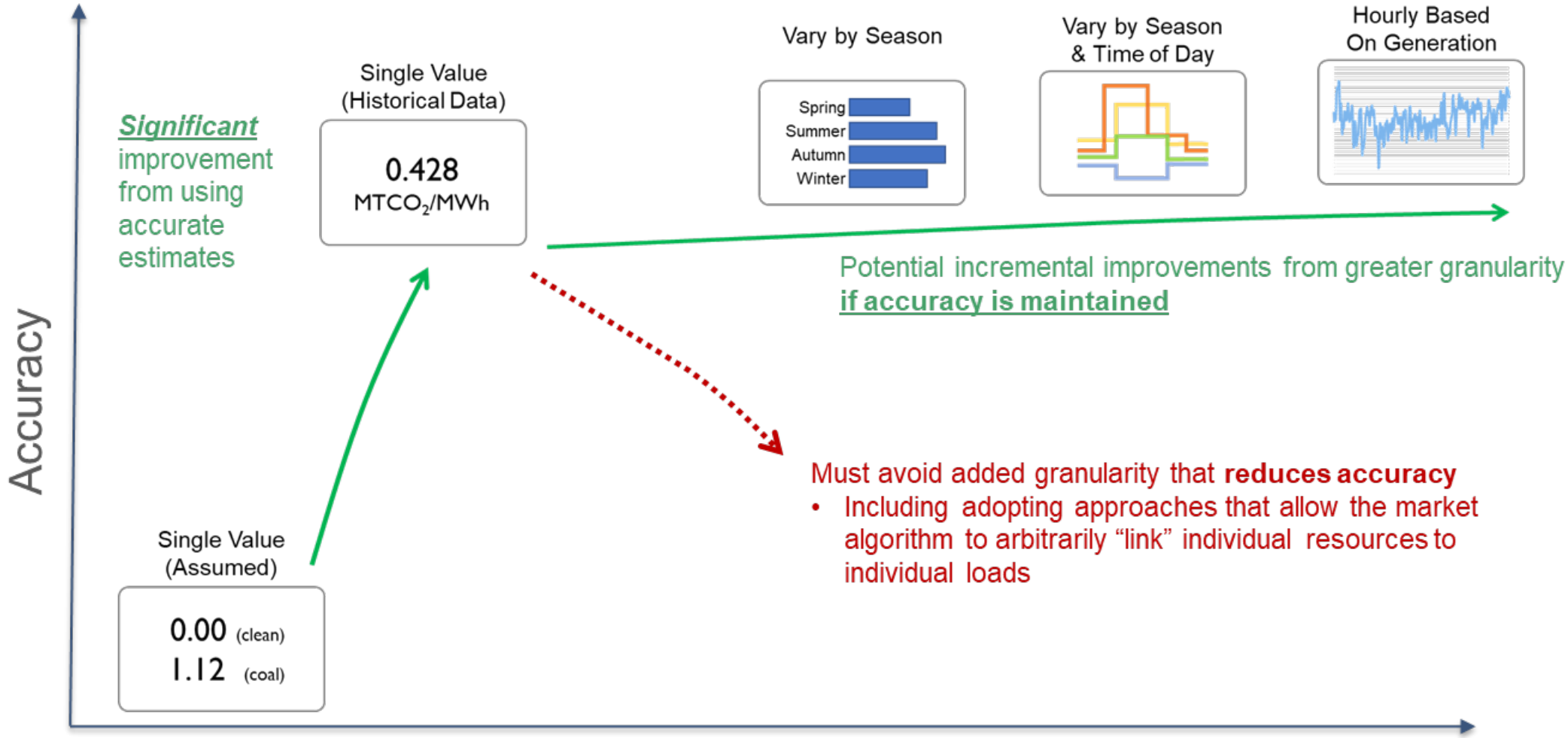
Inaccurately High
Import GHG Rate

e.g. all imports treated as coal generation

- Opportunities to reduce GHG emissions through import substitution are not realized.
- Consumers in GHG zone face excess costs to achieve environmental goals.
- Clean and low-emitting resources outside GHG zone have limited access to opportunities to sell into GHG zone.
- Higher-emitting generators inside GHG zone benefits from reduced imports.
- Areas outside GHG zone may experience export bottlenecks, oversupply challenges, and suppressed market prices

ACCURATELY DETERMINING THE GHG RATE FOR IMPORTS

UNSPECIFIED IMPORTS



IMPLEMENTATION APPROACH

- Unspecified imports can be implemented as enforcing a market constraint on the quantity of unspecified imports into a GHG zone:

  Unspecified Imports <= 0, where:

  Unspecified Imports = [Load] + [Specified Exports] + [Losses] – [Internal Generation] – [Specified Imports]

- Constraint can be relaxed at a penalty price that is set equal to the unspecified toll rate

- For example, assume toll is equal to $10/ MWh
  - Unspecified imports would only be scheduled—i.e., the constraint would only be relaxed—if the value of electricity in the GHG zone was at least $10/MWh more than the cost of producing additional electricity in the non-GHG zone

FOR DISCUSSION: SUCCESS CRITERIA

1. Accurate accounting for GHG emissions associated with generation and imports into the GHG zone including minimizing any shift of emissions from the GHG zone to the non-GHG zone without reducing overall emissions

2. Market prices in the GHG zone that reflect GHG pricing policies and that will provide clear and transparent price signals to incentivize clean resources

3. Opportunity for clean and low-emitting resources outside the zone to be imported and receive a price that reflects the value of their GHG attributes

4. Ensuring that similarly situated resources (inside and outside the GHG zone) are treated comparably

5. Ensure GHG pricing is not applied to resources in external regions

6. Provide granular, objective, and verified data for enhanced reporting

7. Ensure sellers maintain autonomy to choose where to deliver their output

8. A simple technical design

ADDITIONAL TOPICS

- Verifying Specified-source Imports

- Accommodating Multiple GHG-Pricing Zones
  - Independent GHG-pricing zones (operates as two zones)
  - GHG-pricing zones that mutually recognize each other (creates one zone)

- Special Case – Splitting resource output between GHG-zone and non-GHG zone
  - Multiple potential solutions to address this complex case

- Setting The Unspecified Rate
  - Should be determined by each applicable GHG-pricing program
  - Discussion of single static rate vs static shaped rate vs dynamic rate

WESTERN ENERGY IMBALANCE MARKET
BOSR
Body of State Regulators

Next Steps

Bonnie Lamond, Program Manager – Wholesale Electricity Markets, WIEB

EDAM Market Design Next Steps

Date	Topic
July 11th-26th	Technical workshops
August 11th	Revised straw proposal
September 9th	**BOSR comments on revised straw proposal (tentative)**
October 19th	Draft final proposal
November 18th	**BOSR comments on draft final proposal**
December 14th	WEIM Governing Body decision

EDAM Governance Design Next Steps

Date	Topic
July 15th	Governance straw proposal
July 20th	Public meeting
July 22nd (tentative)	BOSR meeting to discuss governance straw proposal
August 1st (tentative)	Staff to circulate draft BOSR comments
August 12th	Monthly BOSR Meeting
August 15th	Comments due on straw proposal

Upcoming Meetings

BOSR Teleconference on Governance

Friday, July 22, 2022 at 12:00 PM MDT / 11:00 AM PDT

BOSR Monthly Meeting

Friday, August 12, 2022 at 10:00 AM MDT / 9:00 AM PDT

Fall 2022 WEIM Body of State Regulators Meeting

Wednesday, September 28, 2022

Tempe, Arizona