WESTERN ENERGY IMBALANCE MARKET
BOSR
Body of State Regulators

July Monthly Meeting

Chair: Thad LeVar
Chair of the Utah Public Service Commission

Vice-Chair: Hayley Williamson
Chair of the Nevada Public Utilities Commission

Staff: Bonnie Lamond
Western Interstate Energy Board

July 14, 2023

Agenda

- **Welcome Remarks and Announcements** – *BOSR Chair LeVar*
- **GHG Accounting for Cap-and-Trade Programs in EIM and EDAM**
  – *Clare Breidenich, Carbon and Clean Energy Committee Director, Western Power Trading Forum*
- **CAISO GHG Coordination Survey Results** – *Sylvie Spewak, Senior Policy Developer, California ISO*

GHG Accounting in EIM and EDAM

Clare Breidenich

Carbon and Clean Energy Committee Director, Western Power Trading Forum

GHG Accounting for Cap-and-Trade Programs in EIM and EDAM

Clare Breidenich

Presentation to the BOSR

July 14, 2022

Presentation Overview

- Cap-and-Trade Basics Relevant for Electricity Markets
- WCI Framework for the Electricity Sector
  - First Jurisdictional Deliverer
  - Emission factor assignment
- California Program Rules for Electricity Imports
  - Identification of importer
  - Requirements for specified imports
- EIM GHG Accounting
  - Approach
  - Bidding
  - Dispatch, Deeming and Prices
  - Secondary Dispatch
  - 2018 Changes
- EDAM GHG Approach
  - Modifications to EIM approach
  - Remaining Stakeholder Concerns

Cap and Trade Basics Relevant for Electricity Markets

- Covered entities must acquire and surrender sufficient allowances to cover their GHG emissions
- Allowances are auctioned periodically by state and are bought and sold in a secondary market
  - The market price of allowances establishes the carbon price signal
- For the electricity sector, the carbon price signal in generator offers alters the economics of dispatch
  - Emitting generators become less economic due to compliance costs
  - Clean generation benefits from carbon premium in energy prices within cap-and-trade states
    - When emitting resources set market energy prices, energy prices increase

WCI Framework for Electricity

- The Western Climate Initiative (WCI) adopted a framework for electricity in cap-and-trade programs of participating jurisdictions in 2008
  - The First Jurisdictional Deliverer Approach: "The owner or operator of an electricity source in a Partner jurisdiction, or an electricity importer that is jurisdictional to the program authority or the immediate downstream purchaser or recipient of electricity from a non-jurisdictional electricity importer.
    - Compliance obligation rolls down stream when state does not have jurisdiction over importer (e.g. BPA currently in Washington)
  - Renewable Energy Credits (RECs) have no GHG accounting value

WCI Framework Continued

- "Specified Import": when imported electricity can be tracked back to a particular generating source
  - Specified imports are assigned a resource-specific emission factor
- Unspecified Import: when imported electricity can not be tracked back to a particular generating source
  - Unspecified imports are assigned a default emission rate
  - Recommended a default emission factor of .428 metric tons/MWh)
    - the generation-weighted average of resources in the WECC with a capacity factor of less than 60%

California Program Rules

- The California Air Resources Board (CARB) adopted the first detailed program rules implementing the WCI approach
  - The electricity importer is defined as the purchasing-selling entity on the leg of the physical path of the NERC e-tag that crosses the state border.
    - Works for imports via CAISO day-ahead market
  - Criteria for specified imports:
    - The importer must own, or have a 'specified contract' with, the resource
      - Any and all contracts in the chain between generator and importer must also be specified
    - The electricity must be directly delivered to California
      - Injected into CAISO footprint by generator, or
      - Single e-tag from resource to generator

EIM GHG Accounting Approach

- GHG accounting in regional organized electricity markets must be done differently than for bilaterally transacted imports because
  - Individual import transactions are not associated with a single e-tag;
    - Instead, 'bulk' tags are created for aggregated transfers between EIM BAAs
  - Electricity is not tracked from generating source to load sink within an organized market
    - Instead, dispatched energy serves the entire market footprint
    - Load-serving entities take energy from the collective pool of dispatched energy
- For these reasons, CAISO adopted a 'deeming' approach to accounting for imports and associated GHGs to California
  - Market optimization determines which MW are 'deemed to serve California load' based on consideration of energy and GHG costs of generator

California and Washington Rules for EIM Imports

- CARB cap-and-trade regulation assign the compliance obligation for EIM imports to the resource scheduling coordinator
  - All EIM imports are specified
  - Regulation gives authority for CAISO to include functionality for GHG costs in generator gids
- Washington program assigns the compliance obligation for EIM imports to the EIM participating utility
  - All EIM imports are unspecified
  - Need for CAISO to calculate volume of EIM import to each utility BAA but no need for GHG costs
  - Ecology is initiating a new rule-making to address imports through organized markets
    - This is expected to better align program rules to facilitate linkage to California
- Both regulations are currently silent on EDAM
  - EDAM GHG accounting approach will need to be reflected in each program's regulations

GHG Bidding in EIM

- Resources within California and Washington submit energy bids that include the generator's anticipated GHG compliance cost per MWh
- Resources outside of California that are not willing to be deemed to serve load in California submit energy bids only
- Resources outside of California that are willing to be deemed to serve load in California submit
  - A MW bid indicating the amount that they are willing to have deemed
  - A separate GHG bid adder, reflecting anticipated GHG costs if output is deemed to California load
- No provisions for resources outside Washington to serve Washington load
  - If Washington changes its rule to assign carbon obligation to resource scheduling coordinators, this would require functionality for separate GHG bids for Washington
  - If and when programs are linked, only a single GHG bid would be needed for both states

EIM Dispatch & Deeming

- The EIM optimizes for least-cost dispatch for the entire market footprint, where
  - Energy plus carbon costs are considered for resources physically located in California, or located outside California but that are deemed to serve load inside California
  - Energy costs only considered for resources outside California that do not serve load in California
- MW deemed to serve California load are an output of the market optimization
  - There need not be an actual physical flow from the resources to the CAISO BAA
  - However, the total MW deemed delivered by all resources must match the total physical flow into CAISO

EIM GHG Pricing

- The optimization calculates System Marginal Energy Cost (SMEC), the GHG shadow price and Locational Marginal Prices (LMPs)
- The SMEC is based on the California footprint
  - If emitting resources are dispatched in California, or deemed delivered to California, the SMEC will reflect embedded carbon costs
  - LMPs outside of California are calculated by deducting the GHG shadow price from the SMEC (all else being equal)

Secondary Dispatch

- Refers to a phenomenon where the market optimization assigns zero emission resources to California (even if these resources would have run anyway) to minimize total costs:
  - Deemed MW of clean resources displaces dispatch of emitting (gas) resources within California
  - External emitting resources are ramped up to backfill the MW deemed to California (this is the secondary dispatch)
  - In retrospect, is a predictable consequence of optimizing for least-cost dispatch for both the market as a whole and California
- Consequences of secondary dispatch:
  - Emissions associated with deemed imports are lower than they should be
  - Emissions in the EIM footprint as a whole may be higher than they would be in the absence of the cap-and-trade program, due to dispatch of less-efficient/higher emitting resources
  - Inappropriate market price formulation
    - Shadow price of carbon lower than it ought to be due to zero or low emission resources being deemed to California instead of emitting resources
    - As a result, LMPs outside California are higher than they ought to be

2018 EIM GHG Changes

- CAISO modified the EIM GHG approach in 2018 to address secondary dispatch
  - For resources that are willing to be deemed delivered to California, EIM limits the 'deemable' MW quantity to the difference between the resource's submitted base schedule for that interval and its upper economic limit
  - For example, if a 100 MW resource has a 75 MW base schedule, the maximum deemable quantity would be 25 MW
- This reduces secondary dispatch, but does not eliminate it
  - If the resource is only dispatched to 50MW, 25MW would still be deemable to California
- Because this does not eliminate secondary dispatch, CARB assigns "EIM Outstanding Emissions" to California participating utilities for EIM purchases
  - Calculated as the difference between emissions attributed by EIM and emissions associated with same MW at default emission rate

EDAM GHG Accounting

- EDAM GHG accounting approach based on EIM's in that
  - Separate GHG bids for resources outside cap-and-trade states willing to be deemed to serve load in cap-and-trade states
  - EDAM will optimize for east-cost dispatch considering energy and GHG costs to serve load in the cap-and-trade states
- EDAM takes different approach to addressing secondary dispatch
  - Counterfactual GHG run to establish resource 'base schedules'
    - GHG baseline run is done without allowing any transfers into California
  - Deeming limited to the lower of (1) GHG bid MW (2) difference between resource's upper economic limit and counterfactual dispatch and (3) optimal energy schedule
  - Total deeming of resources from a non-GHG area BAA will be limited to the volume of electricity exported from a BAA
- The EDAM Tariff reflects this approach

Stakeholder Concerns with EDAM Approach

- GHG baseline run will unfairly prevent clean resources from serving load, and capturing carbon premium in, cap-and-trade states
  - Relatively low cost, clean resources will always be dispatched in baseline run
- Secondary dispatch will continue because optimization model does not limit deemable MW to *incremental* dispatch above baseline dispatch
- Addition of a provision to enable unspecified imports into the cap-and-trade states would result in better price formation and more accurate attribution of emissions in the event that the market runs out of deemable MW
- Separate GHG bid adders for resources located inside the cap-and-trade states would improve market transparency
- The approach does nothing to facilitate implementation of clean energy procurement programs

GHG Working Groups Update

Sylvie Spewak
Senior Policy Developer, California ISO

GHG Coordination Working Groups
Overview and Updates

Sylvie Spewak, Senior Policy Developer
July 14, 2023

GHG Coordination Working Groups

➢ Goals of GHG Working Groups

Following our commitment to continuing discussions after the EDAM proposal was approved, working groups will focus on what design(s) are durable for western climate policies.

1. Meet stakeholders where they are-- education for attendees new to markets and GHG design
2. Invite a diversity of perspectives and objectives
3. Gain alignment across stakeholders on priorities and the role of the ISO in GHG policy
4. Enhance transparency and build certainty to facilitate state policy development

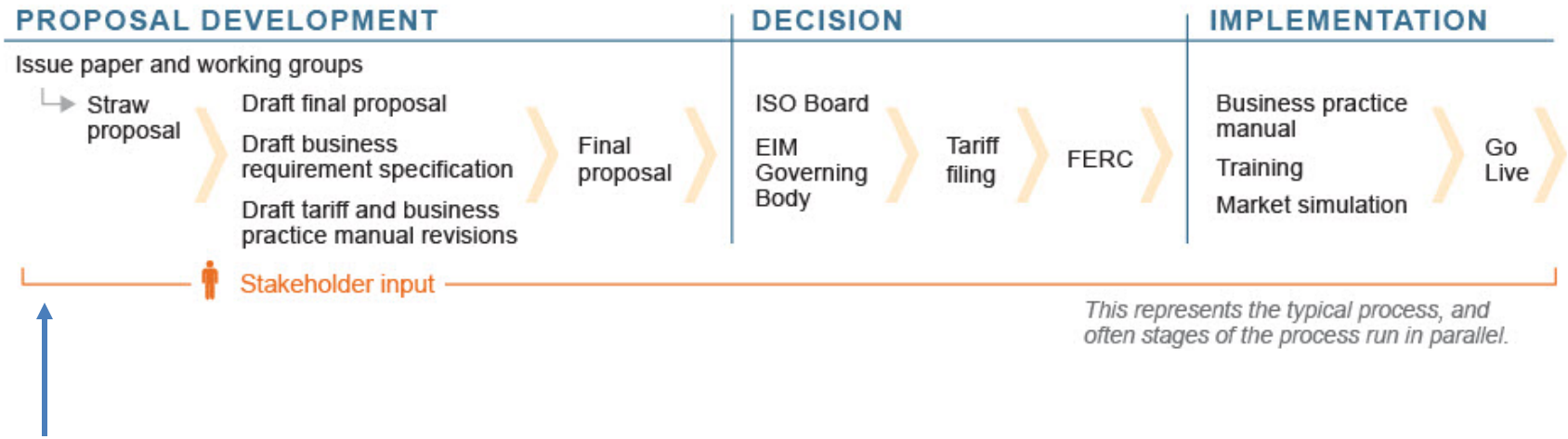
GHG Coordination Working Groups

The working group structure aims to give stakeholders a more active role in policy development. Stakeholders will lead by:

1. Defining the topics and scope of the working groups;
2. Defining data needs and analyzing supporting evidence;
3. Establishing a cadence to balance the sustainability of staff and stakeholder bandwidth, respect ongoing rulemaking processes; and
4. Determining the role of the ISO as facilitators, subject matter experts, data analysis

These collaborative working groups are intended to stimulate open dialogue, engage different perspectives, and enhance the quality of market design policy.

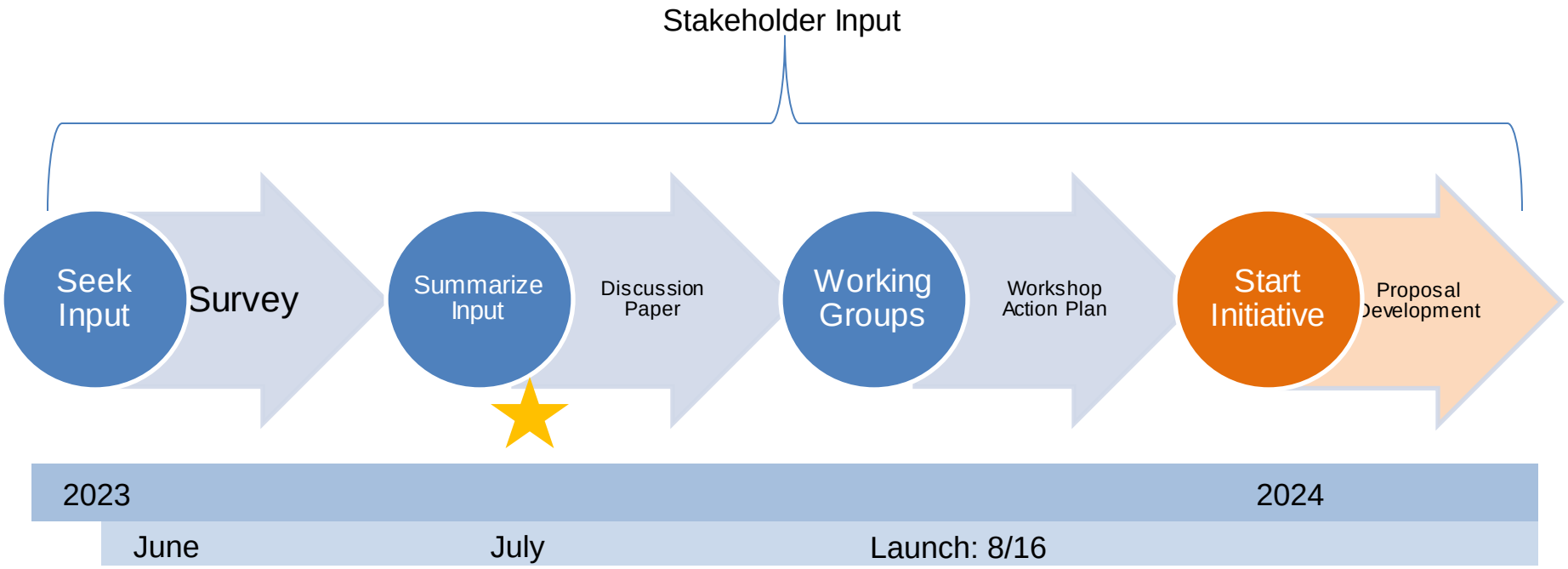
ISO Policy Initiative Stakeholder Process



We are here

- Working groups will inform the development of a future straw proposal
- The ISO will take notes and produce an action plan from the working group meetings

Approach and Draft Timeline



GHG Coordination Working Group: Survey

The ISO sought stakeholder input to supplement what we've heard previously and open the scope of discussion. We asked stakeholders to start thinking about:

1. Problem statements and priorities,
2. Opportunities to present unique challenges and areas of expertise

Feedback from the survey will be summarized into broad topic areas and related concepts in a **Discussion Paper**.

GHG Coordination Working Group: Discussion Paper

Stakeholders will ultimately decide the topics and scope of GHG Coordination working group discussions. The Discussion Paper will serve as a stakeholder resource, providing background and context on broad topics:

Topic 1: Review of CAISO Market Operations and GHG Design

Topic 2: Leakage, Resource Shuffling, Secondary Dispatch

Topic 3: Beyond GHG Pricing Policy

Topic 4: Monitoring and Reporting

- **Discussion Paper will be published on 7/31, two weeks prior to the first Working Group Meeting.** Please contact Holly Taylor (htaylor@caiso.com) for updates.

Questions?

Upcoming Meetings

BOSR Monthly Meeting

Friday, August 11, 2023 at 10:00 AM MDT / 9:00 AM PDT

2023 Wholesale Electricity Market Training Forum

Thursday, August 17 – Friday, August 18
Location: Western Power Pool's Offices
Portland, Oregon