

CARB Electricity Sector Greenhouse Gas Accounting

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AB 32: Global Warming Solutions Act of 2006

- Assembly Bill (AB) 32 directs the California Air Resources Board (CARB) to adopt regulations to reduce greenhouse gases (GHG) emissions
 - AB 32 set the GHG emissions limit for 2020 at 1990 levels
 - Senate Bill (SB) 32 sets a GHG emissions limit for 2030 of 40% reduction below 1990 levels
 - Executive Order B-55-18 (2018) requires carbon neutrality by 2045
- Under AB 32, CARB must account for all GHG emissions from the generation of electricity delivered to and consumed in California, whether that electricity is generated in-state or imported
 - AB 32 requires CARB to minimize the potential for emissions leakage and ensure no resource shuffling is occurring

Accounting for Electricity Emissions

- Under AB 32, GHGs are reported pursuant to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (MRR)
 - California power plants must report facility-level emissions
 - Electricity importers must report imports based on physical delivery of electricity by source
 - Imported electricity is reported as either specified or unspecified
 - Renewable, hydro, and nuclear energy is generally assigned a zero-emission factor
 - Emissions data reports are subject to annual third-party verification requirements under MRR
- MRR emissions data feeds into California's statewide GHG inventory
 - Source-based accounting is consistent with IPCC methods and designed to avoid double counting

First Jurisdictional Deliverers of Electricity

- Electricity importers, or first jurisdictional deliverers (FJD), are the first responsible party for placing power onto the California grid at the state border. The FJD is responsible for emissions reporting and compliance obligations in the Cap-and-Trade program
- The FJD approach for emissions accounting was included in the design recommendations of the Western Climate Initiative (WCI)
- The FJD approach reflects practical, administrative, constitutional, and regulatory constraints, and is designed to:
 - Address the interconnected nature of the electricity grid and the potential for emissions leakage
 - Apply to electricity consumed in California
 - Ensure like treatment of importers and in-state generators
 - Support Cap-and-Trade and maintain a consistent price on carbon

Imported Electricity

- Specified Imports
 - Imports must be reported as specified when they have proof of direct delivery (e.g. e-Tag) and a written contract or ownership stake
 - Importers register their specified resources each year and CARB calculates an emissions rate for each resource based on U.S. EPA and/or U.S. EIA data
- Unspecified Imports
 - If imported power does not meet the specified source reporting requirements, it is assigned a default marginal unspecified source emissions rate equal to 0.428 MTCO₂e/MWh – similar to a single-cycle natural gas plant
- EIM Imports
 - Electricity “deemed” in the EIM to serve California load. Emissions rate is calculated by CARB as a specified source

Emissions Leakage and Resource Shuffling

- Per AB 32, CARB designed the Cap-and-Trade program to minimize the potential for emissions leakage
 - Emissions leakage is a decrease in GHG emissions in-state that has a corresponding increase in out-of-state GHG emissions as a result of the Program
- Resource Shuffling is a plan to substitute lower GHG emission power for higher GHG emission power in order to reduce a compliance obligation for emissions from imported electricity in the Program
 - Resource Shuffling is a type of emissions leakage
 - Not all emissions leakage is Resource Shuffling
 - CARB has strict prohibitions against Resource Shuffling

Accounting for Emissions Leakage in EIM

- CARB has implemented requirements to address leakage in the EIM
 - These requirements are placed on California utilities that receive freely allocated allowances and purchase EIM energy to serve California load (EIM Purchasers)
 - Solution was designed in coordination with CAISO
- Out-of-state EIM load and generation do not incur any obligation for EIM Outstanding Emissions
- EIM Purchasers collectively address EIM Outstanding Emissions through the direct retirement of a portion of their freely allocated allowances
- Outstanding Emissions are apportioned to EIM Purchasers based on their share of retail sales
- Ensures the environmental integrity of the Cap-and-Trade Program

Complementary Programs

- California has complementary programs with separate requirements
 - Renewable Portfolio Standard
 - Power Source Disclosure
- Does the reporting of emissions in MRR constitute a claim on the environmental attributes of a REC that would require the retirement of the REC?
 - No. The legal definition of a California REC states that environmental attributes only concern “avoided emissions.” In a capped program, which is based on source-based accounting, no emissions are “avoided” by creation of renewable energy.
- RECs do not confer an avoided emissions value under the Cap-and-Trade Program, as total GHG emissions allowed under the cap are fixed
 - The generation of renewables instead of fossil-fuel based electricity makes allowances available that can be used by other entities
 - Entities that import electricity to California must report the electricity based on the emissions profile of the generation facility, irrespective of whether the imported electricity is associated with RECs
- Other states and voluntary programs may have different requirements and definitions

CARB's Emissions Calculations

Unspecified Source Emissions: $CO_2e = MWh \times TL \times EF_{unsp}$ §95111(b)(1)

Specified Source Emissions: $CO_2e = MWh \times TL \times EF_{sp}$ §95111(b)(2)

EIM Outstanding Emissions

= Total CA EIM Emissions – Deemed Delivered EIM Emissions

*= (Total EIM MWh * TL * EF_{unsp}) – \sum Deemed MWh_{sp} * TL * EF_{sp}* §95111(h)(1)(A)

Where:

TL – Transmission Loss Factor (1 or 1.02)

EF_{sp} – Specified Emission Factor

EF_{unsp} – Unspecified Emission Factor (0.428)

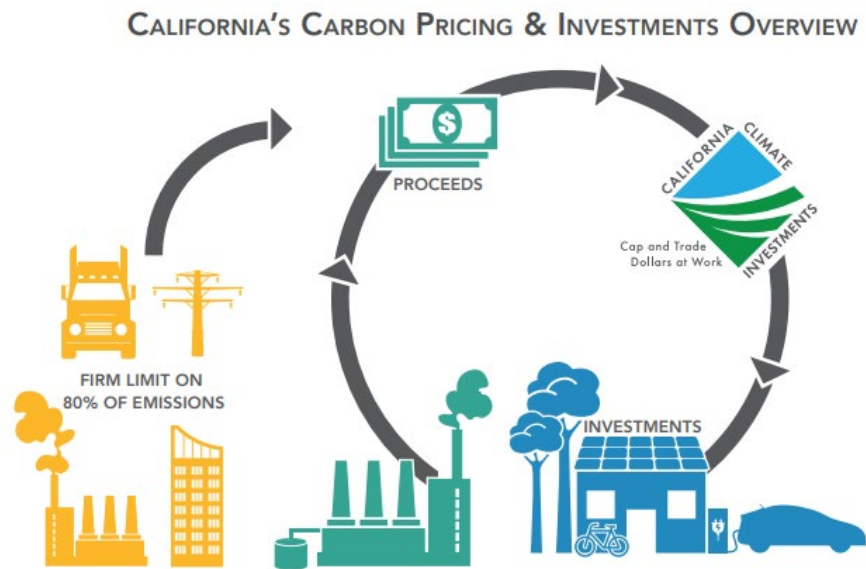
Addressing Confusion from Previous Workshop

CAP-AND-TRADE AUCTION PROCEEDS

WHAT IS LINKAGE?

California Climate Investments

- Cap-and-Trade auction proceeds at work
 - \$18.2 Billion provided to date
 - Over 50% directed to disadvantaged communities
 - Over 399,000 zero-emissions and plug-in hybrid vehicle rebates
 - 660,000+ acres of land preserved or restored
 - Reinvests proceeds to replace high energy-consuming equipment with advanced technologies



What is Linkage?

- “Linkage” means the approval of compliance instruments from an external greenhouse gas emission trading system (GHG ETS) to meet compliance obligations under the Cap-and-Trade Regulation, and/or the reciprocal approval of compliance instruments issued by California to meet compliance obligation in an external GHG ETS.
- Linkage with another jurisdiction requires:
 - Alignment of certain program design elements
 - Findings by Governor under Gov. Code §12894(f)
 - Equivalent or stricter program requirements
 - Equivalent or strict enforcement requirements
 - Linkage does not impede enforcement of California’s laws
 - Linkage does not impose liability on California
 - Linkage agreement
 - Approval by Board through a formal, public rulemaking process

Additional Information

- Mandatory Reporting Program
 - <https://ww2.arb.ca.gov/our-work/programs/mandatory-greenhouse-gas-emissions-reporting>
- Cap-and-Trade Program
 - <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>
- Joint CARB, CEC, and CPUC Letter to Oregon Department of Energy
 - <https://www.oregon.gov/energy/energy-oregon/Documents/2017-Public-Comments-RECs-EIM.pdf>