Imported Electricity in California’s Cap-and-Trade Program

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CA GHG Reduction Targets

Source: CARB, 2017
CARB’s Climate Portfolio for 2030 Target

- Double building efficiency
- More clean, renewable fuels
- Cleaner zero or near-zero emission cars, trucks, and buses
- Walkable/bikeable communities with transit
- Cleaner freight and goods movement
- 60% renewable power
- Slash potent “super-pollutants” from dairies, landfills and refrigerants
- Cap emissions from transportation, industry, natural gas, and electricity
- Invest in communities to reduce emissions
- Protect and manage natural and working lands
Critical part of State strategy to achieve AB 32 and SB 32 GHG reduction targets
- Ensure GHG reduction targets are realized through a strict limit
- 2017 Scoping Plan that includes Cap-and-Trade is four times less costly than alternatives

Works in concert with other complementary air quality and climate policies
- Program designated in AB 398 to reduce GHG emissions for oil and gas extraction and refinery sectors
- Provide compliance flexibility to achieve cost-effective reductions
- Facilitate integration of regional, national, and international GHG reduction programs

Emissions data is provided by the Mandatory Reporting Regulation (MRR) Program established by AB32
Cap-and-Trade: Facts and Figures

- Covers ~80% of State’s emissions
- ~450 covered entities in the Program
  - Large industrial sources & electricity generators with emissions ≥ 25,000 MTCO$_2$e per year
  - Electricity importers, natural gas suppliers, and transportation fuel suppliers
- 36 auctions held to-date (28 joint-auctions)
  - First joint auction with Québec was held in November 2014
- $16.9 billion generated for California Climate Investments
  - Over 50% benefiting disadvantaged communities
Electricity in Cap-and-Trade

- AB 32 requires capture of emissions associated with all CA energy consumption
  - In-state power generation
  - Imported electricity
- Limits emissions leakage by avoiding incentive to locate generators out-of-state or unnecessarily increasing imports
2019 California’s GHG Emissions

418.2 MMTCO$_2$e

GHG Intensity of California Electricity 2000-2019

Electricity Imports by Source

- Emission profiles are public:
  - By reporter:
    - https://ww2.arb.ca.gov/mrr-data
  - By emission source:
    - https://ww2.arb.ca.gov/ghg-inventory-data
Electricity Transactions Reported Under MRR [§95111]

**Imported Power**
Accounts for GHG emissions associated with electric power that is generated outside California but consumed inside the state.

**Exported Power**
Documents electric power generated inside California but consumed outside of the State.

**Wheeled Power**
Documents power generated outside California that passes through California but is consumed outside of the State.

**In-State Power**
Emissions from power generation are reported under §95112.
Examples of Electric Power Entities [§95102(a)]

- Point of regulation is transacting electricity across California border.

- Entities required to report under MRR include:
  - Electric corporations, Investor-Owned Utilities (IOU)
  - Electric service providers (ESP)
  - Local publicly owned electric utilities (POU)
  - Community choice aggregators (CCA)
  - Western Area Power Administration (WAPA, Federal)
  - Marketers - Purchasing-selling entities (PSE) that deliver electricity (Marketers)
The difference between specified and unspecified source electricity is in the contract. Specified source electricity is contingent upon delivery of power from a particular facility, unit, or ACS system designated at the time the transaction is executed [§95102(a)]. Applicable to written or verbal contracts. Buyer and Seller must both agree on the source or its unspecified.
Specified Sources

- Types of Specified Sources [§95852(b)(3)]
  - A single facility or unit which is permitted to be claimed as the source of electricity delivered
  - An ACS supplying electricity from a fleet of generation sources that is assigned an emission factor by CARB
  - Multiple dams, if one project for FERC hydroelectric licensing purposes
  - Source owned/controlled - generation-providing entity (GPE)

- Each specified source has an emission factor calculated by CARB based on US EPA (Part 98 data) and/or EIA (Form EIA 923) data (one-year lag)

- Specified source electricity must be “directly delivered,” i.e., the power is verified as having actually come into CA and sunk here [§95111(g)(3)]
Unspecified Sources

- Unspecified source of electricity means a source of electricity that is not a specified source at the time of entry into the transaction to procure the electricity [§95102(a)]

- Default Emission Factor for Unspecified Electricity Imports [§95111(b)(1)]
  - 0.428 MT CO\textsubscript{2}e/MWh*
  - Calculated by CARB and Western Climate Initiative (WCI)
  - Modeled to approximate the marginal generation that would be needed for an additional MWh of electricity imported to California

Imported electricity (specified and unspecified) must be reported by:
  - Purchasing-Selling Entity (PSE) on last segment into California on e-Tag Physical Path
  - Retail providers must report electricity imported on their behalf to serve their load [§95111(c)]

Exported electricity reported by:
  - PSE on last segment out of California on e-Tag Physical Path

Wheeled electricity reported by:
  - PSE on last segment out of California on e-Tag Physical Path
  - Only EPEs report wheels – having only wheels does not an EPE make!
Asset-Controlling Suppliers

- Specific type of EPE registered and approved by CARB
  - Owns or operates interconnected electricity generating facilities, or serves as an exclusive marketer for those facilities
  - Assigned a supplier-specific identification number by CARB
  - Assigned a system emission factor (EF) by CARB
  - ACS are considered specified sources
  - Currently two ACS entities: BPA & Tacoma Power
Multi-Jurisdictional Retail Providers

- MJRP provides electricity to CA consumers and one or more other states from a common power system.
- Emissions from MJRP imports are based on specific emission factor calculated from total MJRP system emissions and sales.
- Similar to ACS concept, but not opt-in.
- Currently only PacifiCorp.

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EF_{ACS} = \frac{\text{Sum of System Emissions MT of } CO_2e}{\text{Sum of System MWh}}
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\text{Sum of System Emissions, MT of } CO_2e = \Sigma E_{asp} + \Sigma (PE_{sp} \times EF_{sp}) + \Sigma (PE_{unsp} \times EF_{unsp}) - \Sigma (SE_{sp} \times EF_{sp})
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\text{Sum of System MWh} = \Sigma E_{Gasp} + \Sigma PE_{sp} + \Sigma PE_{unsp} - \Sigma SE_{sp}
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CAISO EIM

- EIM is a real-time energy market that identifies lowest-cost power to serve demand.
- EIM participants include “GHG bid adder” for resources that may be “deemed” by CAISO algorithm to come to California.
- Deemed imports into California provided to EPEs via CMRI.
  - CAISO Market Results Interface (CMRI) contains confidential market results info.
  - e-Tags are not used for deemed imports.
- Same reporting and verification requirements as other EPEs.
- Like other specified imports, emissions calculated based on emissions profile of generation resource.

Source: westerneim.com
Cap-and-Trade vs. Renewable Portfolio Standard

- Programs are complementary; each has separate requirements

- Cap-and-Trade Program compliance is based on allowances retired
  - 1 allowance = permit to emit 1 MTCO$_2$e

- RPS compliance is based on Renewable Energy Credits (REC) generated and retired
  - 1 REC = 1 MWh of renewable electricity
  - RECs may be bundled or unbundled, but always includes the “environmental attributes”

- For Cap-and-Trade, reporting specified imports from eligible renewable requires reporting REC serial numbers

- The reporting of zero emission renewables does not constitute a claim on the environmental attributes and does not require the retirement of the REC
  - In a capped program, no emissions are “avoided” by the generation of the renewable electricity
Questions?

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