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

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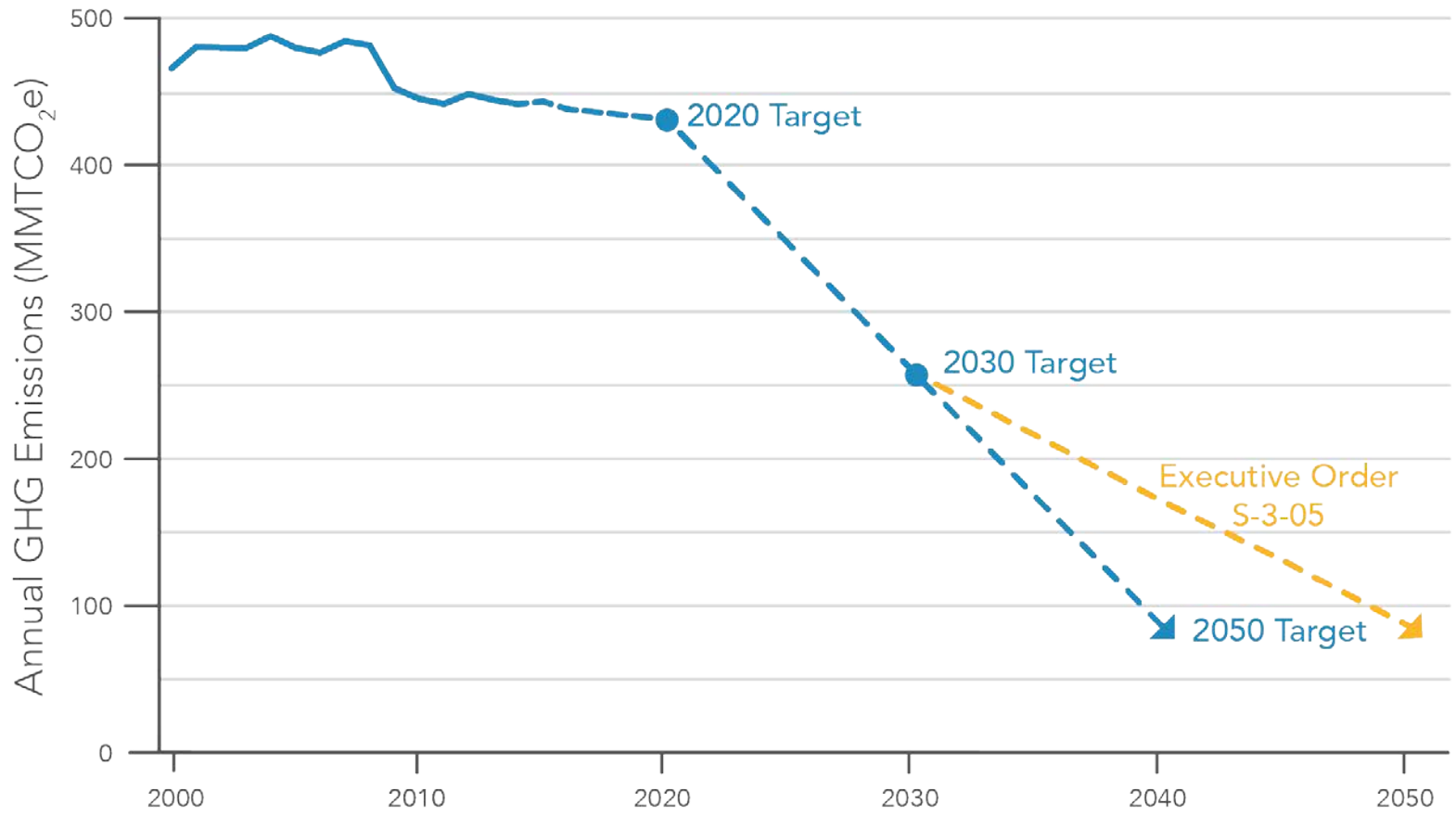
CA GHG Reduction Targets



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

Cap-and-Trade Program Background & Goals

- 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

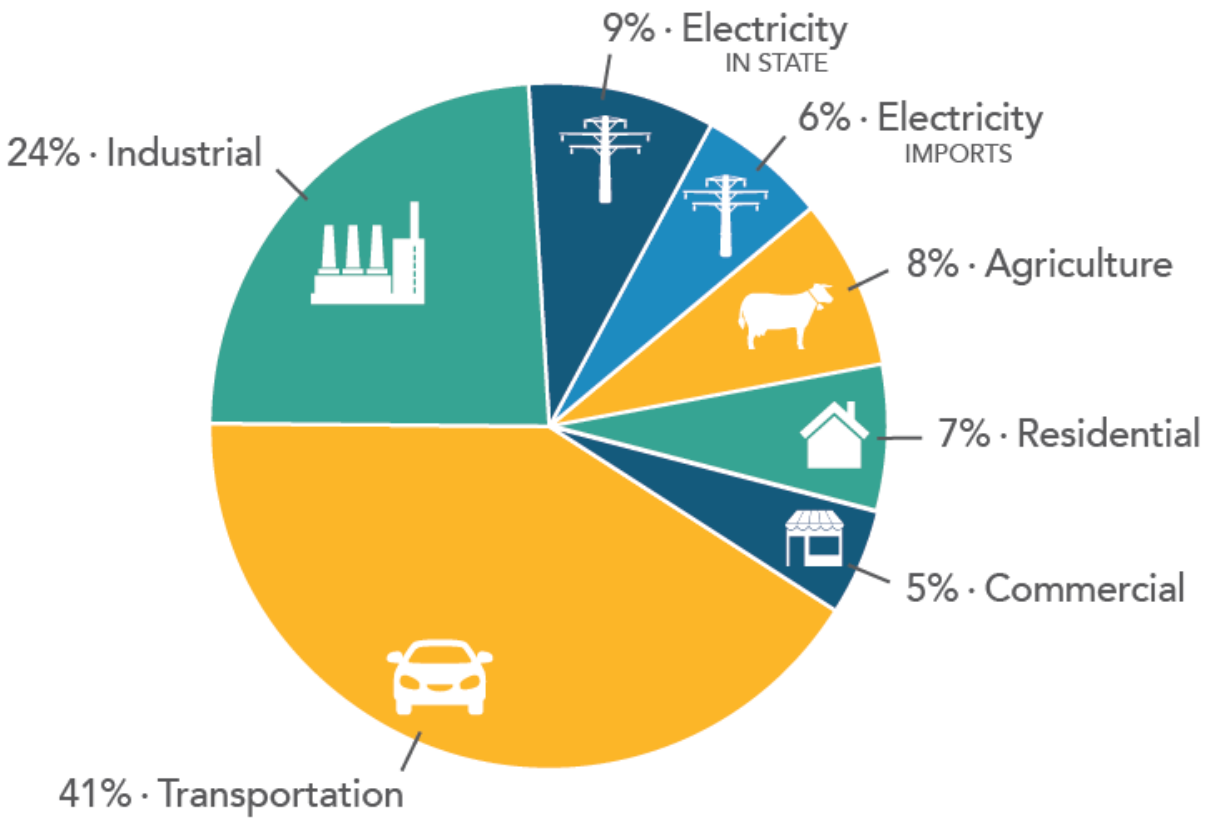
Cap-and-Trade: Facts and Figures

- Covers ~80% of State's emissions
- ~450 covered entities in the Program
  - Large industrial sources & electricity generators with emissions ≥ 25,000 MTCO2e per year
  - Electricity importers, natural gas suppliers, and transportation fuel suppliers
- 31 auctions held to-date (23 joint-auctions)
  - First joint auction with Québec was held in November 2014
- Over $13 billion generated for California Climate Investments
  - ~50% of investments are benefiting disadvantaged communities

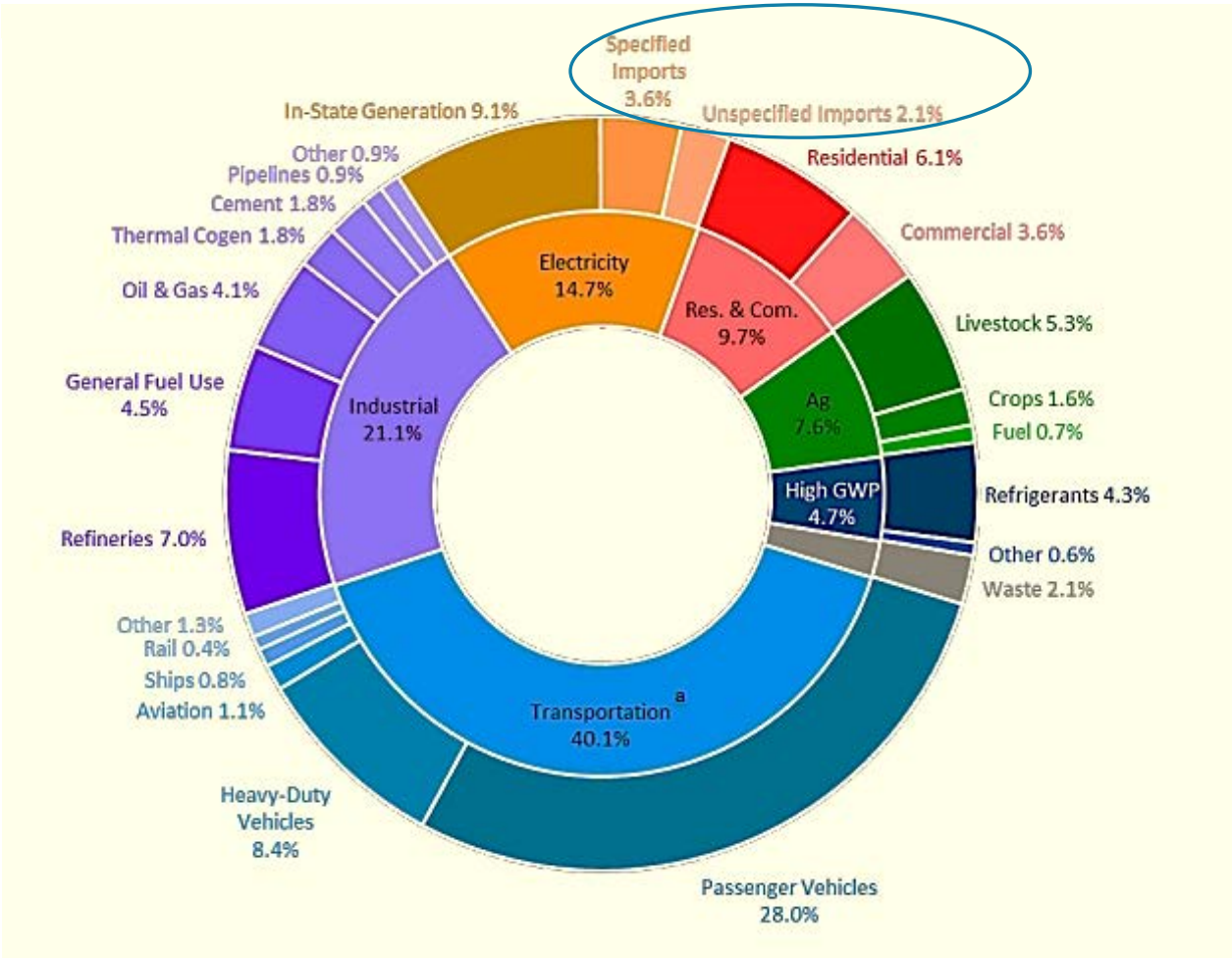
Imported Electricity in Cap-and-Trade

- Imported electricity is basis for emissions accounting under MRR and C&T; "the focus is direct, source-based emissions associated with electricity that is directly delivered" (2010 MRR FSOR, pp 108-109)
- Statutory mandate to measure total emissions associated with all CA energy consumption (AB 32)
  - In-state power plants report directly
  - Large portion of electricity consumed in CA is generated out-of-state requiring accounting for GHG emissions from imported electricity (2010 ISOR, pg. 164)
  - Limits emissions leakage by avoiding incentive to locate generators out-of-state or unnecessarily increasing imports

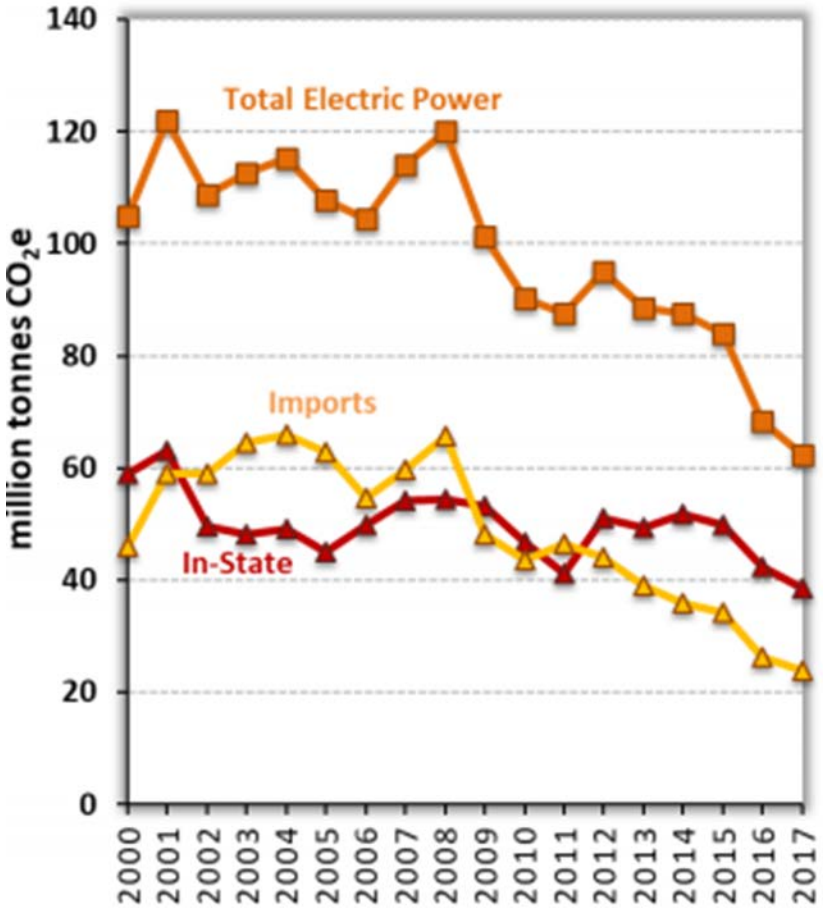
California's GHG Emissions

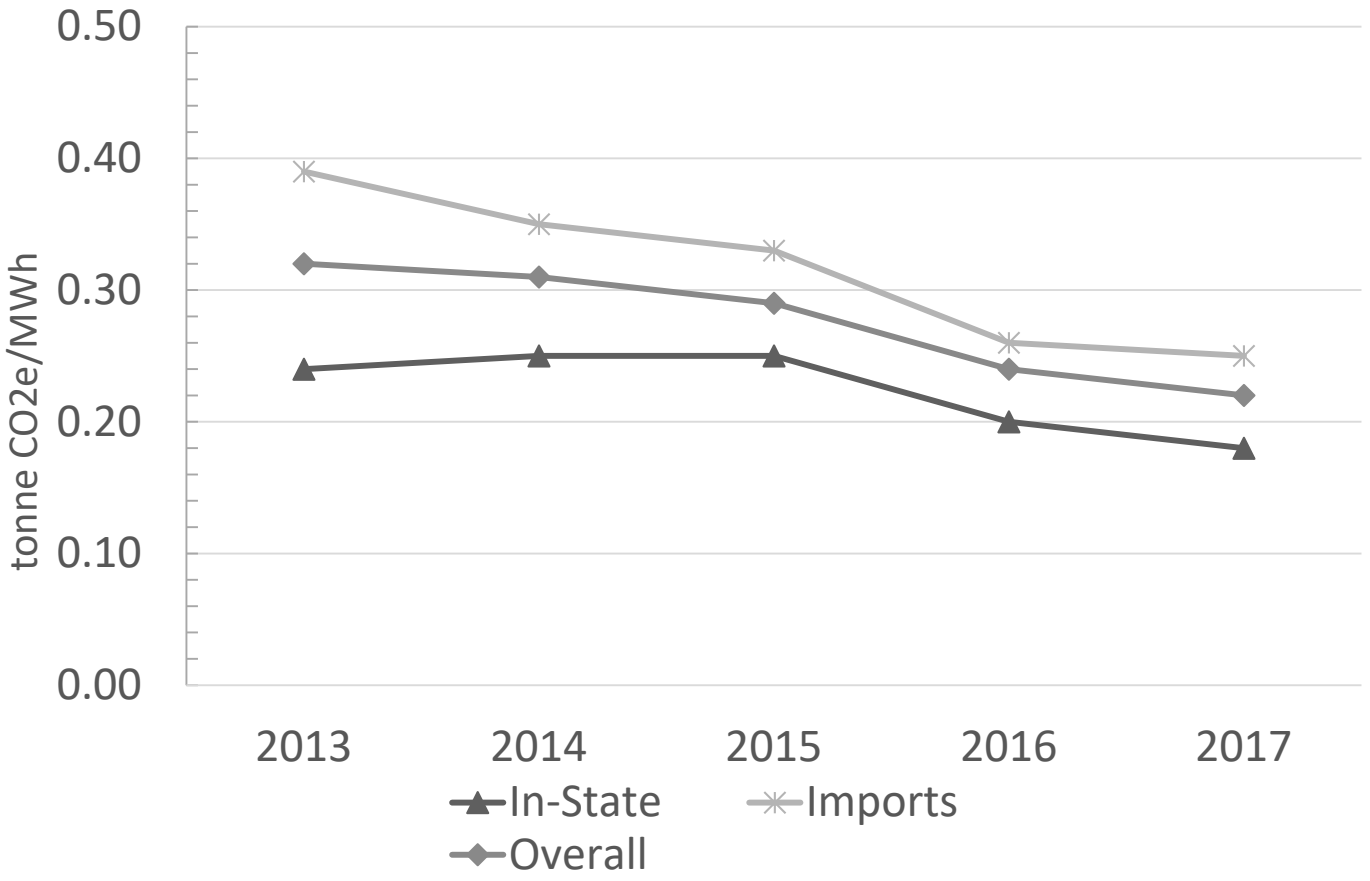


424.1 $MMTCO_2e$
2017 TOTAL CA EMISSIONS



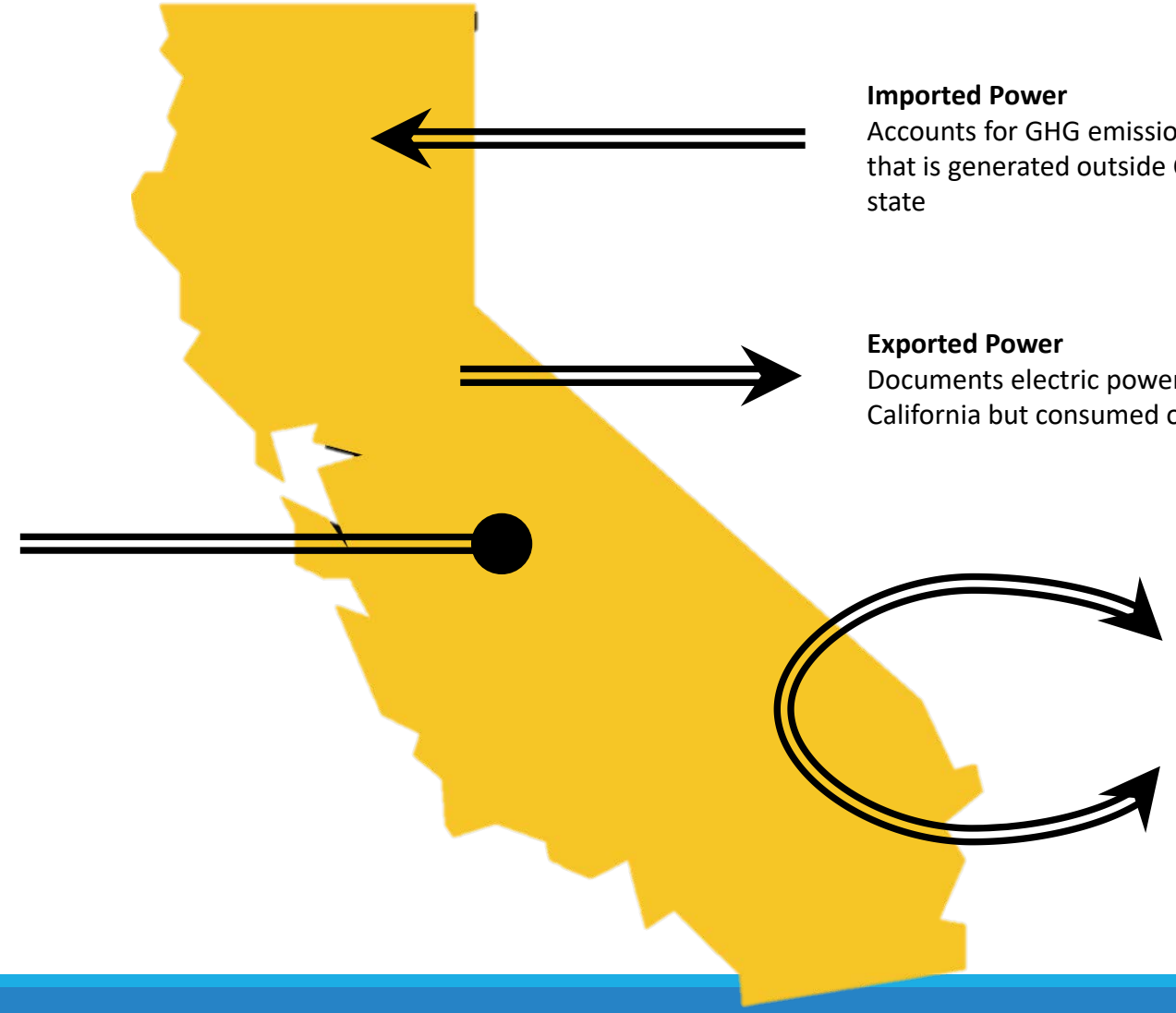
GHG Intensity of California Electricity 2013-2017





CARB 2000-2017 GHG Emissions Trends Report, Figure 9

Reportable Transactions (Overview) [§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

In-State Power
Emissions from power generation are reported under §95112

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

Examples of Electric Power Entities [§95102(a)]

- Point of regulation is transacting electricity across California border. Example entities in MRR reporting 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)

Specified and Unspecified Import Sources

- 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
- 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 suppling 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_2e/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

*http://www.arb.ca.gov/regact/2010/ghg2010/ghgisor.pdf, pg 167-169

Reporting: Who and How for Imports, Exports, Wheels

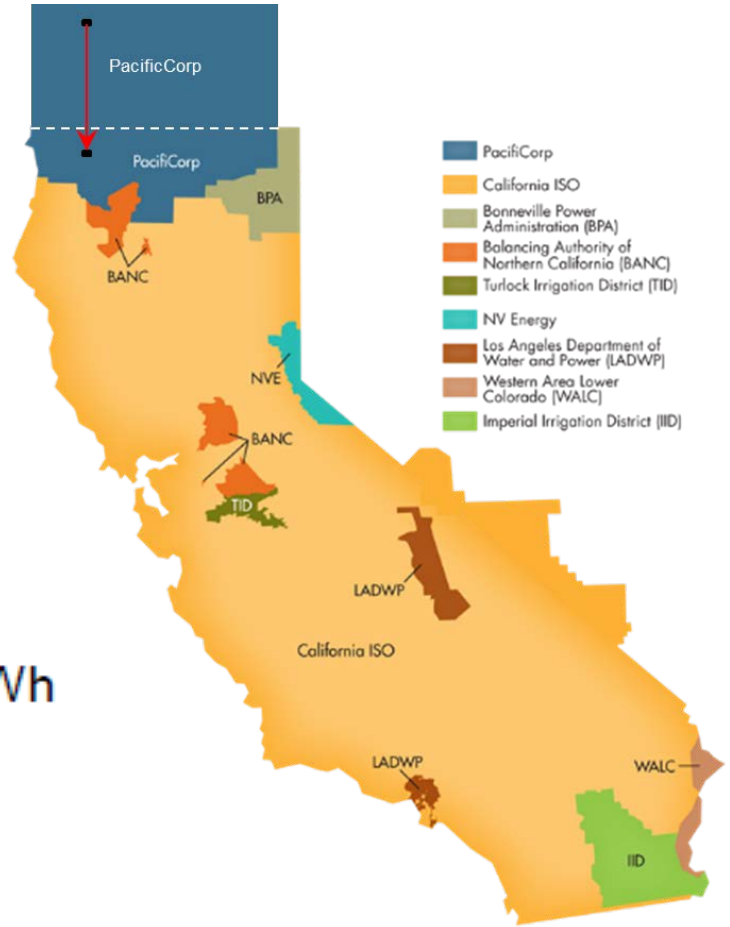
- Imported electricity (specified and unspecified) must be reported by:
  - Purchasing-Selling Entity (PSE) on last segment into California on e-Tag Physical Path
  - Retail providers must report electricity imported on their behalf to serve their load [§95111(c)]
- Exported electricity reported by: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

- 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 three ACS entities: BPA, Powerex, & 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 limited to PacifiCorp



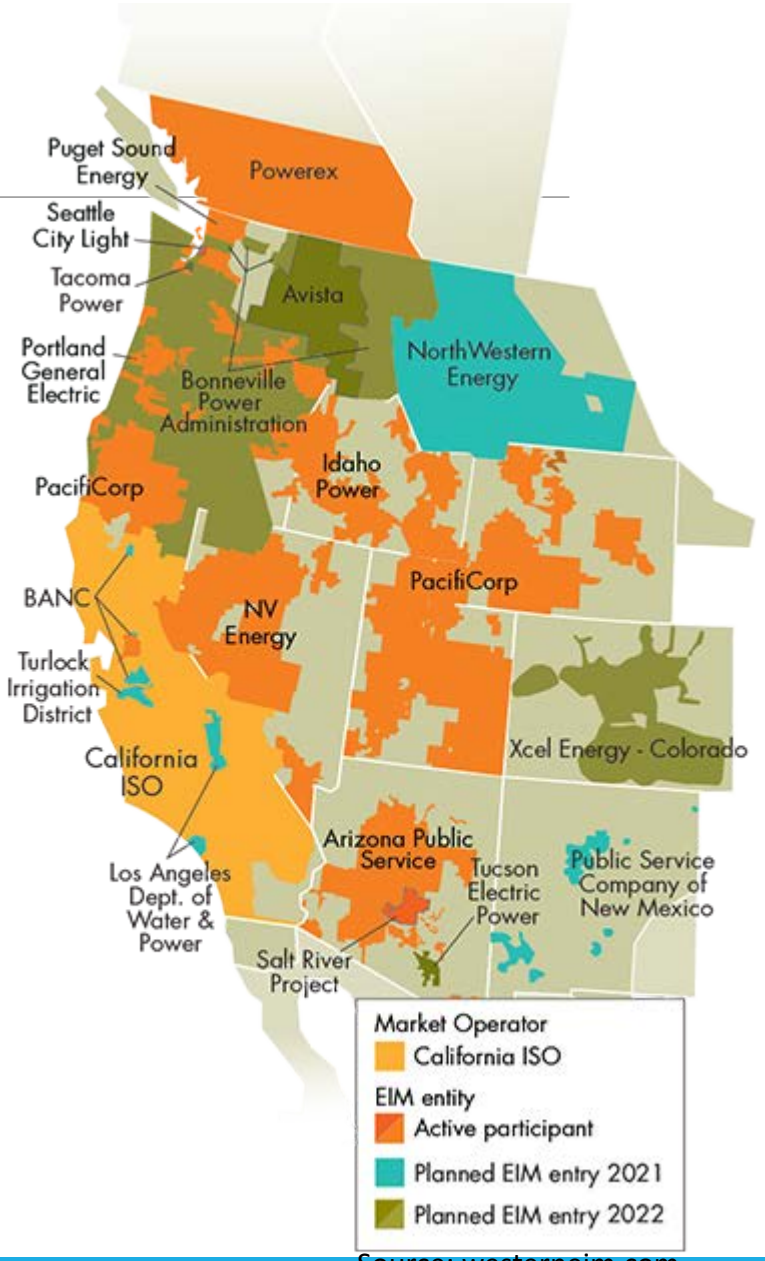
$$EF_{ACS} = \text{Sum of System Emissions MT of } CO_2e \text{ / Sum of System MWh}$$

$$\text{Sum of System Emissions, MT of } CO_2e = \Sigma E_{asp} + \Sigma(PE_{sp} * EF_{sp}) + \Sigma(PE_{unsp} * EF_{unsp}) - \Sigma(SE_{sp} * EF_{sp})$$

$$\text{Sum of System MWh} = \Sigma EG_{asp} + \Sigma PE_{sp} + \Sigma PE_{unsp} - \Sigma SE_{sp}$$

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 MTCO2e
- 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"
- The reporting of zero emission renewables to MRR 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

RPS Adjustment

- "RPS adjustment" provides a reduction in compliance obligation for electricity procured from a California-eligible RPS facility when importers meet the following requirements:
  - Ownership or contract right for electricity and RECs
  - RECs purchased and retired
  - Electricity is not directly delivered to California
  - Additional requirements per Cap-and-Trade Regulation §95852(b)(4)
- Reporting is optional; if any requirements not met, entity must remove RPS adjustment or receive adverse verification statement

Policy Purpose of RPS Adjustment (1 of 2)

- RPS adjustment was originally implemented in 2010 MRR and Cap-and-Trade Regulation
- RPS adjustment represents an "adjustment to the compliance obligation to recognize the cost to comply with the RPS program"
- "Not a recognition of avoided emissions"; emissions reporting and accounting is built on direct delivery of electricity

Quoted sections from 2010 MRR FSOR, pp 108-109

Policy Purpose of RPS Adjustment (2 of 2)

- Tradeable RECs associated with RPS-eligible facilities do not carry emissions benefit in Cap-and-Trade
  - RPS adjustment-eligible transaction may reduce compliance obligation, not emissions profile or "carbon footprint"
- Cap-and-Trade designed to be "technology-neutral" and delivery-based; precludes recognizing emissions benefit of out-of-state renewables that are not delivered to California
- RPS program purpose is to encourage development of eligible renewable energy; distinct from Cap-and-Trade's role to provide market-based reductions in GHG emissions

Questions?

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