



California ISO

GHG Tracking / Accounting Approaches

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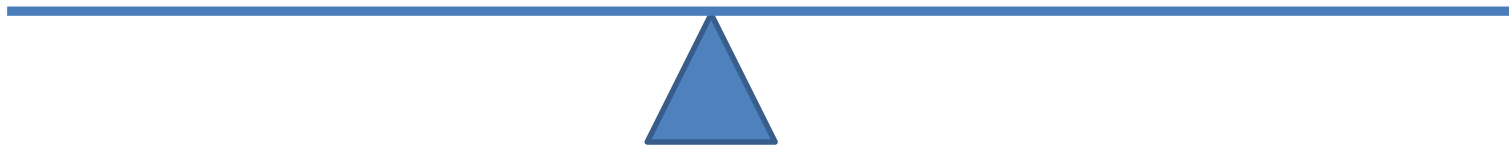
How GHG is accounted for in ISO dispatch

- Resources internal to California ISO have ability to incorporate GHG compliance costs into energy bid
- Imports into California ISO incorporate GHG compliance costs into their import bid.
 - Specified Resources responsible for their specific emission rate
 - Unspecified resources responsible for GHG compliance based on default emission rate (.428 mTCO₂/MWh)
 - Asset Controlling Supplier (ACS) responsible for GHG compliance based on their areas average emission rate
- Energy Imbalance Market transfers: CAISO optimizes EIM participating resources contributing to CAISO load service based on resources GHG bid adder.

Accounting for GHG from external supply has competing objectives which must be balanced.

Efficient
Dispatch

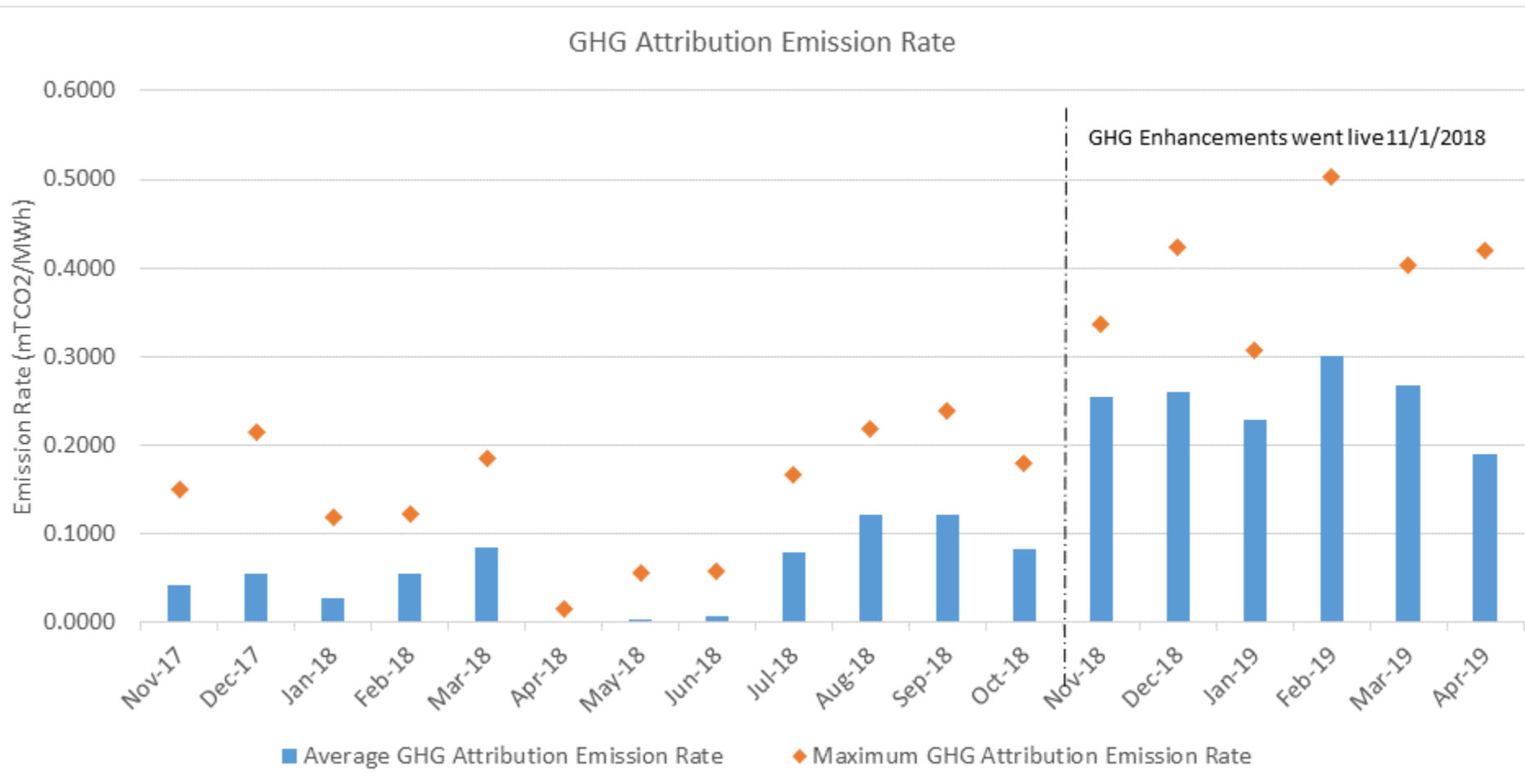
Accurate
Accounting for
GHG compliance



GHG performance in EIM since November 2018 implementation of GHG tracking enhancement

- Observations since implementation of GHG tracking enhancement:
 - Increased accounting of GHG from EIM resources serving ISO load
 - Reduction of potential secondary dispatch
- No market efficiency issues observed related to either:
 - Base schedule forecast greater than real-time energy need
 - Resources changing base schedule behavior
- However, unrelated to GHG enhancement observed the following:
 - Interplay with GHG cost and Real-Time Imbalance Energy Offset
 - Unintended effects between secondary dispatch on EIM entities that are using Asset Controlling Supplier for GHG accounting of non-EIM transactions

Accounting of GHG from resources attributed to meet ISO demand increased



GHG policy effect on electricity market

- **Cap-and-Trade (Allowances) vs Tax (Cost)**
 - Cap-and-Trade: separates allowances from a GHG price, allowing suppliers to incorporate their costs into their bids
 - Tax: establishes a specific price per jurisdiction
- **Point of Regulation**
 - Energy suppliers: Allows suppliers to incorporate GHG costs into their supply bids for optimized use
 - End users: Requires knowing how end user energy needs being met. (contractual, self-supplied...)
- **Interplay with Renewable Energy Credits**
 - De-coupled: Allows for resource to be optimized considering GHG
 - Coupled: Limits ability to optimize supply to meet regional demand

GHG emissions to serve ISO load reduced 34% since 2014

