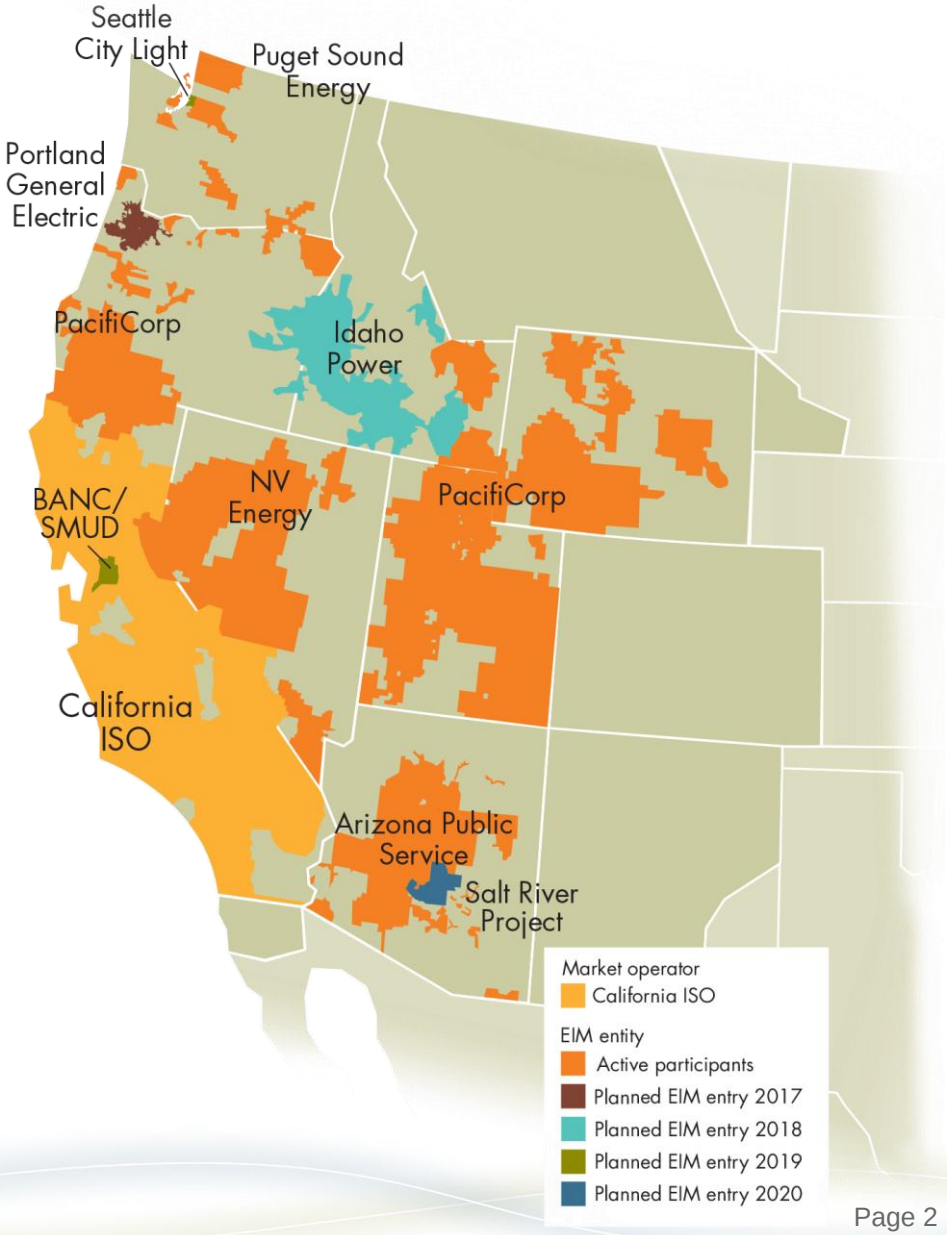
# Western Energy Imbalance Market Greenhouse Gas Bid Adder

Briefing for Board of State Regulators

May 2017

# Western Energy Imbalance Market

- Integration of renewables across a larger geographical area
- Enhances reliability with improved situational awareness
- Reduces costs through automatic economic dispatch
- Balancing authorities maintain control and reliability responsibilities



# The Western EIM extends the ISO's real-time market to other balancing authority areas.

- ISO dispatches EIM participating resources and ISO internal resources with economic bids to create transfers of energy between balancing authorities within the EIM area.

- Current market optimization balances total supply and total demand, not incremental changes

- Market optimization minimizes total production cost while resolving congestion

# The EIM design treats EIM participating resources serving ISO load in the same manner as internal ISO resources.

- California greenhouse gas regulations apply to first deliverers of electricity
- Resources located in the ISO have a compliance obligation
- EIM participating resource scheduling coordinators incur a compliance obligation under California greenhouse gas regulations only if dispatched to serve ISO load

# EIM participating resources elect whether or not to offer their output to serve ISO load.

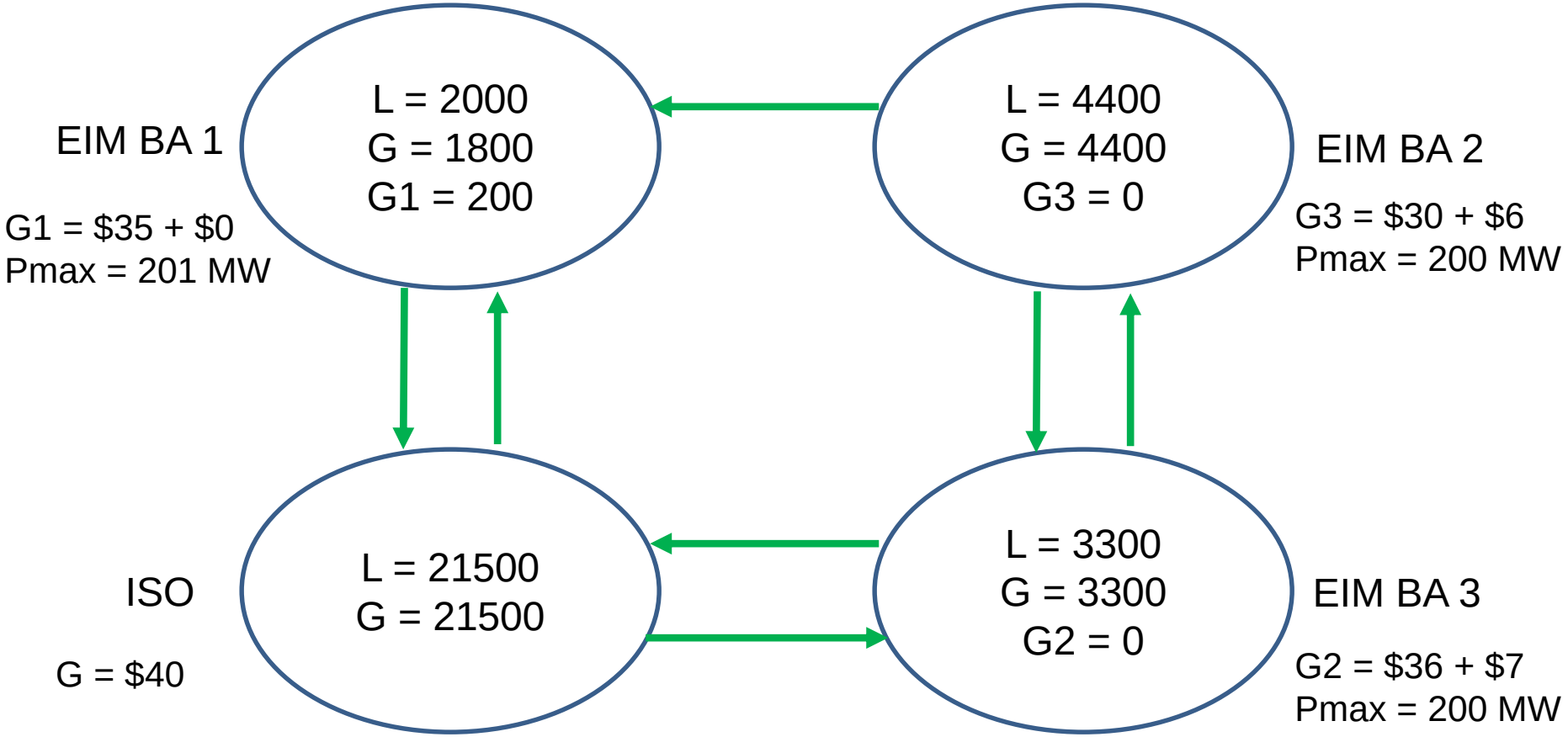
- EIM participating resources may submit cost-based greenhouse gas bid adders to offer their output to serve ISO load
- The greenhouse gas bid adder must include (1) an hourly price not to exceed the resource's daily maximum cost of compliance plus 10 percent; and (2) a quantity in megawatts
- Resources may enter a zero megawatt quantity in their greenhouse gas bid adder
- If an EIM participating resource does not submit a bid adder, the EIM cannot dispatch the resource to serve ISO load

# ISO load pays for EIM participating resources dispatched to serve ISO load.

- EIM participating resources dispatched to serve ISO load receive a payment that reflects the marginal greenhouse gas bid price

- ISO load pays these costs

# Assumptions for example to show attribution of transfers to serve ISO load.

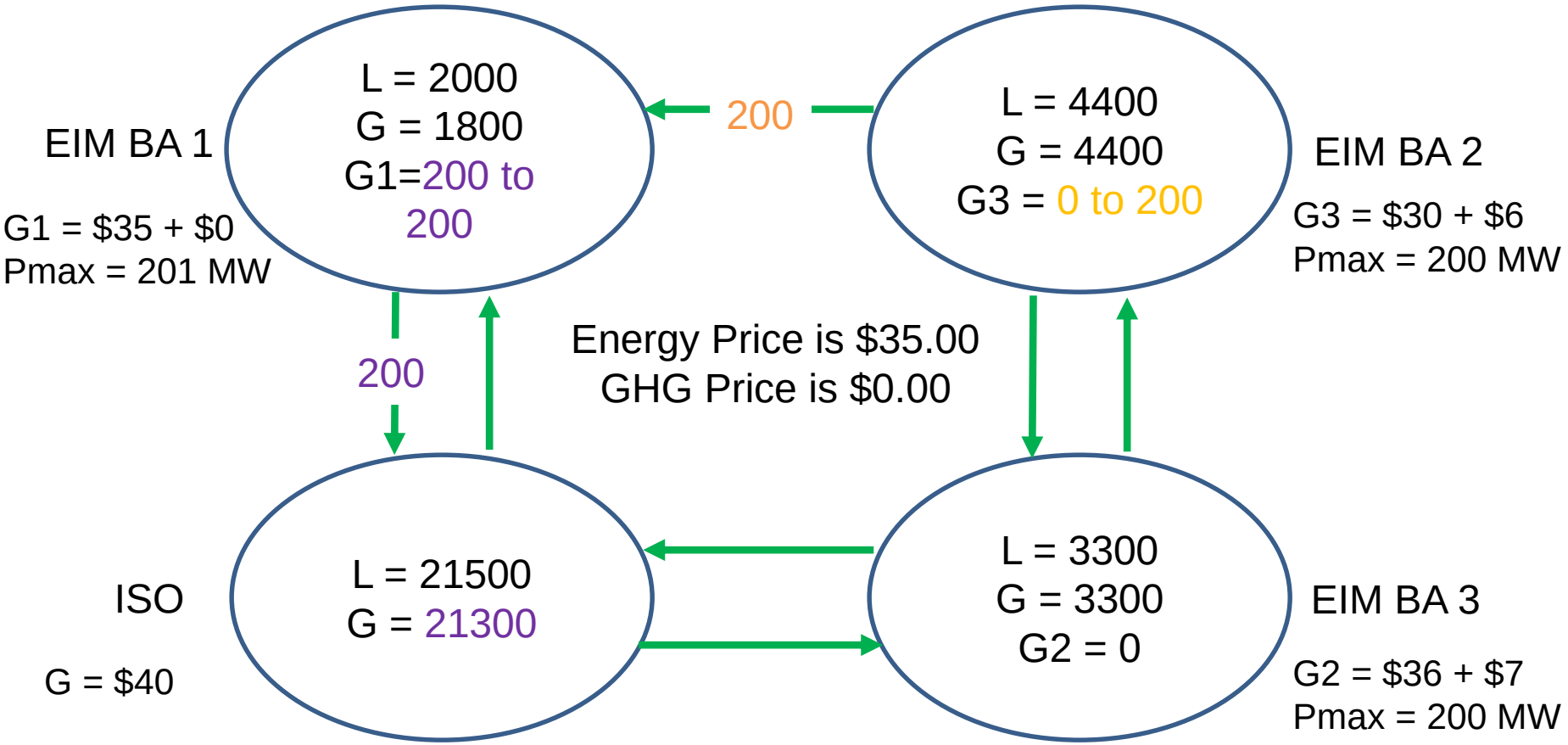



Maximum reduction in ISO supply is 200 MW

EIM Generator = Energy Bid + GHG Bid

G1-G3 PMin 0 MW
GHG MW for all is 200 MW
Transfer limit into ISO is 200 MW

# Let's solve the market for the EIM footprint




Resources must submit a GHG bid to be eligible for dispatch to serve ISO load.

# The California Air Resources Board is examining changes to its greenhouse gas regulations

- Least cost dispatch can have effect of sending low emitting resources to ISO, while not accounting for secondary dispatch of other resources to serve external demand
- ARB and other stakeholders have expressed concern that the ISO's optimization does not account for secondary or backfill dispatch that may occur to serve EIM load outside of the ISO
- ARB has proposed an interim solution to calculate additional emissions not currently captured by the EIM's resource-specific attribution and retire unsold allowances under its cap and trade program

# Any changes the ISO may adopt to account for which EIM participating resources serve ISO load will continue to respect existing rules.

- The ISO is currently examining enhancements in coordination with proposed California greenhouse gas regulation changes
  - Election to offer output to ISO load will remain voluntary
  - EIM participating resources will continue to submit greenhouse gas bid adders and MW quantities to offer their output
  - EIM participating resource serving ISO load will receive a locational marginal price that reflects the marginal greenhouse gas bid.

  http://www.caiso.com/informed/Pages/StakeholderProcesses/RegionalIntegrationEIMGreenhouseGasCompliance.aspx