West Wide Story Panel Discussion

AN OVERVIEW OF DAY-AHEAD MARKET PARTICIPATION BENEFITS STUDY RESULTS

PRESENTED BY

KAI VAN HORN

COAUTHORS

JOHN TSOUKALIS

HANNES PFEIFENBERGER

EVAN BENNETT

ALISON SAVAGE BROOKS

PRESENTED FOR

CALCCA ANNUAL CONFERENCE

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IRVINE, CA

Brattle

Timeline of the Brattle Team's Western Markets Studies

Our team has been conducting market benefits studies in the WECC and other regions for more than a decade and have worked with a broad array of clients while continuously honing our approach

- **Beyond the 10+ EDAM & Markets+ studies we've conducted, we've analyzed SPP RTO West, WEIS, WEIM, SPP expansion in the east, RTO-like options for the WECC, and various market options in the Southeast**
- **The nodal WECC model we use for our EDAM & Markets+ studies includes system-specific data from more than a dozen utilities in the WECC, giving us a detailed view of the western system**
  - **Study participants and other parties have helped refine our model by performing reviews** of relevant modeling assumptions for their systems, including transmission rights & costs, load forecasts, fuel prices, generation mix & costs, etc.
  - Study participants include **the Balancing Authority of Northern California, El Paso Electric, Idaho Power, LA Department of Power and Water, NV Energy, Portland General Electric, PacifiCorp, Public Service Company of New Mexico, Sacramento Municipal Utility District,** and other utilities, transmission owners and independent power producers

1 Pre-2022 Studies

Western Market Studies

- EDAM Feasibility Study
- SPP RTO Expansion Study
- CAISO EIM GHG Structure Study
- Xcel Colorado WEIS/WEIM Study
- WEIS and SPP Integration Study
- Mountain West RTO Study
- CA SB350 Study

2 2022 EDAM Study

2022 EDAM Benefits Study

We produced an updated assessment of EDAM benefits for five study participants, building on the work done for the 2019 EDAM feasibility study:

- BANC, Idaho Power, LADWP, PacifiCorp, SMUD

3 2023-24 EDAM-M+ Studies

Comparative EDAM-M+ Studies

We further refined our 2022 EDAM benefits study model with input from study participants and the Markets+ design documents to conduct benefits studies for several additional utilities , including:

- Portland General Electric, NV Energy, Public Service New Mexico, El Paso Electric, and others

4 Most Recent Study

CEC Pathways Study

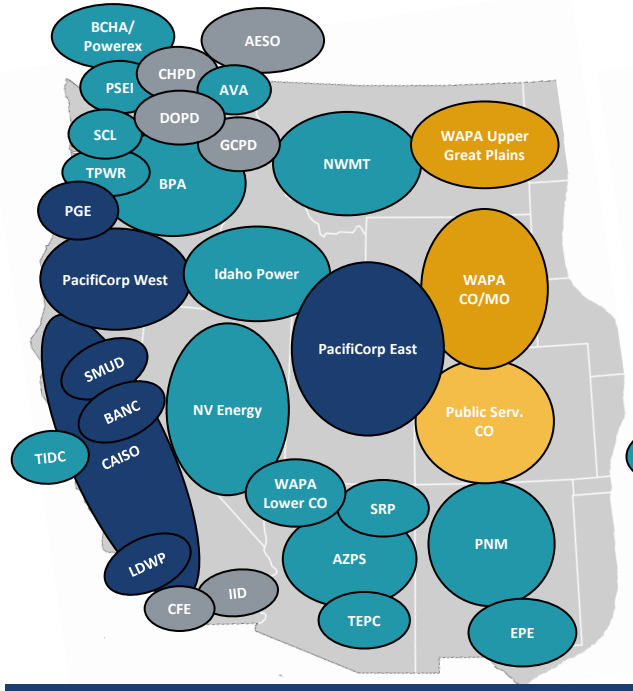
We leveraged our work and modeling enhancements from all prior studies to assess the value of a nearly-WECC-wide day-ahead market (i.e., an EDAM with a large footprint) compared to an outcome with two competing day-ahead markets in the WECC (i.e., split between EDAM and Markets+).

Markets+ (DA & RT)
EDAM (also in WEIM)
SPP RTO West
WEIS
WEIM

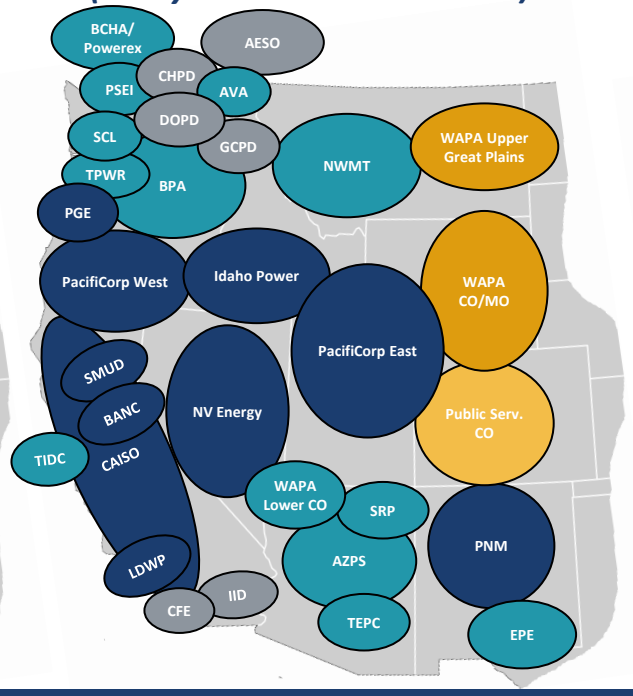
CA Customer Benefits Increase with the Size of the EDAM Footprint

Expansion of EDAM footprint could produce $500 million/year in market benefits to CA customers

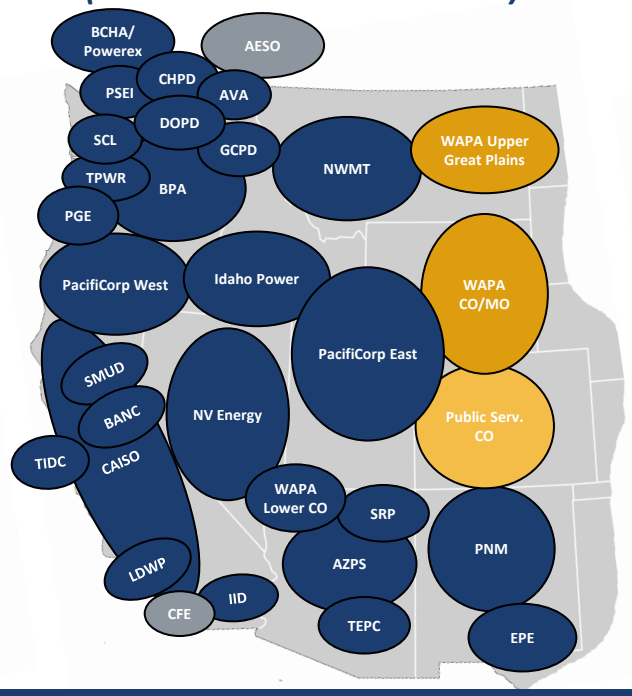
Baseline Case
(Approved EDAM Commitments)



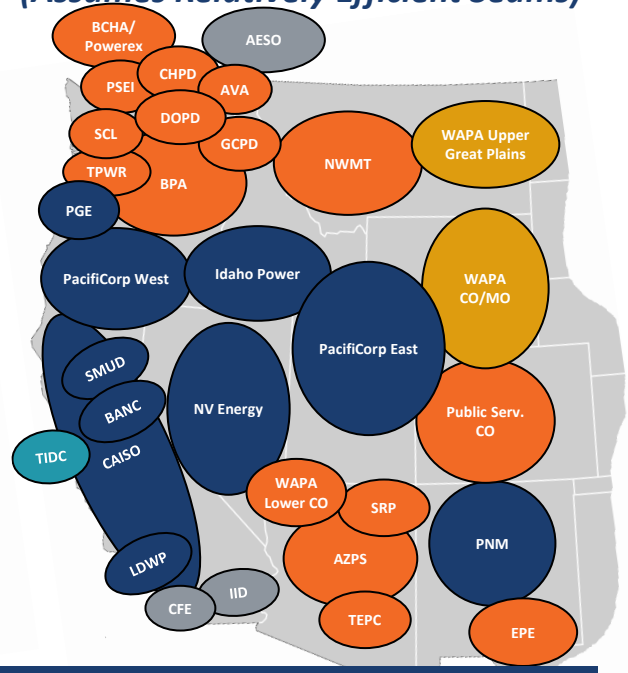
Baseline+ Case
(Likely EDAM Commitments)



Expanded EDAM Case
(Maximum EDAM Potential)



Split Market Case
(Likely EDAM Entities w/ Markets+)
(Assumes Relatively Efficient Seams)



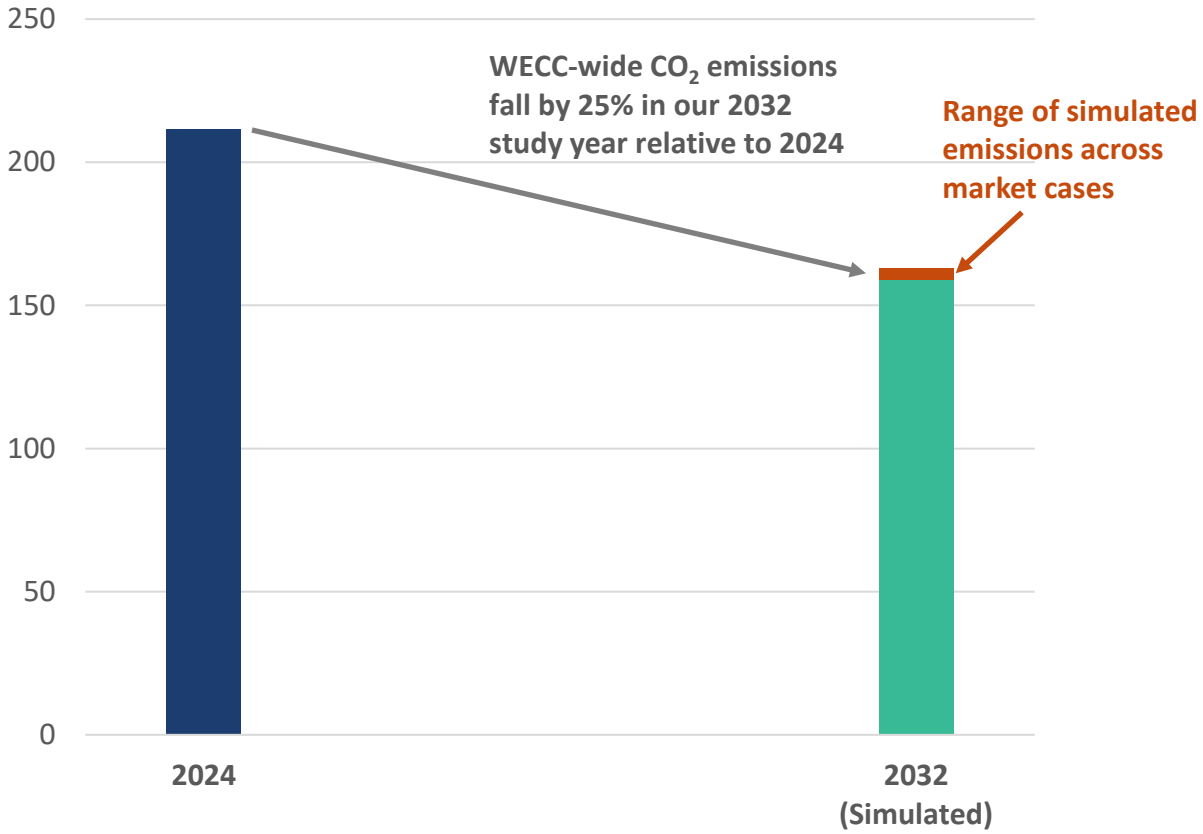
	Baseline Case	Baseline+ Case	Expanded EDAM Case	Split Market Case
CA Total Cost ($million per year)	$4,511	$4,399	$3,721	$4,217
Δ to Baseline		$112	$790	$294
Δ to Baseline+			$678	$182

CO_2 Emissions Fall Relative to History in all Market Footprint Scenarios

Shifts in resource mix across the WECC are the main driver of reduced emissions in simulated future year

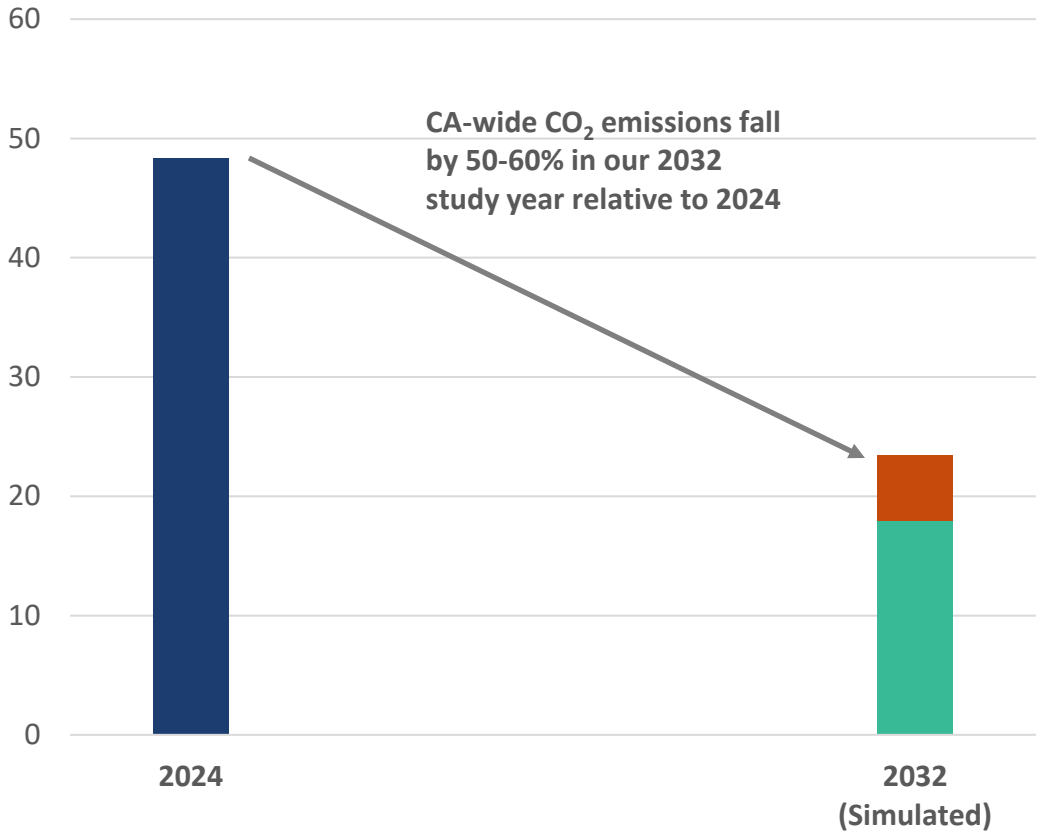
WECC-wide Annual CO_2 Emissions, Historical vs Simulated

Million Metric Tons (Electric Sector Only)



CA-wide Annual CO_2 Emissions, Historical vs Simulated

Million Metric Tons (Electric Sector Only)



Sources: historical CO_2 emissions data from the EIA 2025 Annual Energy Outlook

Presented By

Kai Van Horn

SENIOR CONSULTANT
WASHINGTON, DC

Kai.VanHorn@brattle.com

+1.202.419.3359

Dr. Kai Van Horn leverages electricity system modeling, analysis, and visualization to illuminate and navigate the opportunities and challenges presented by the energy transition.

He has worked with market participants, market operators, utilities, and an array of other stakeholders on a diverse range of matters. He has experience with energy and capacity market design, transmission and generation planning, the modeling and analysis of financial transmission rights, carbon pricing issues, on- and offshore renewables integration, and transmission benefits analysis.

Dr. Van Horn has nearly a decade of experience analyzing wholesale market designs, planning, and operations via the development of large-scale power system models in commercially available software packages, as well as custom-built simulation and analysis platforms. He has led numerous teams in the deployment of such models and worked with clients to develop new modeling approaches that meet the evolving needs of the energy transition