

The Next EPIC Challenge: Reimagining Affordable Mixed-Use Development in a Carbon- Constrained Future

Meridian at Corona Station



Herb Yaptinchay (EPRI)

Sean Armstrong (Redwood Energy)

DISCLAIMER

This document was prepared as a result of work sponsored by the California Energy Commission. It does not necessarily represent the views of the Energy Commission, its employees, or the State of California. Neither the Commission, the State of California, nor the Commission's employees, contractors, or subcontractors makes any warranty, express or implied, or assumes any legal liability for the information in this document; nor does any party represent that the use of this information will not infringe upon privately owned rights. This document has not been approved or disapproved by the Commission, nor has the Commission passed upon the accuracy of the information in this document.

All Electric, Net Zero, Affordable Multi-family Community

Demonstrate the Next Generation Highly Efficient Grid-Friendly Community in Petaluma, CA

Goals:

- Quickly increase housing stock in California with minimal grid infrastructure investment
- A Non-Export Power Solution
- 95% of the year Grid Independent

Site:

- 5 acres, mixed use development
- 131 Low-Income housing units
- Office Space; EV Food Truck Hook-ups
- Transit Hub—new train and bus stops

Integrated Community Solution:

- 5.2 MWh Battery + 1.5 GWh of Solar
- EV charging stations (bidirectional resilience)
- High efficiency appliances and design
- Greywater recycling & edible landscaping
- Community Engagement





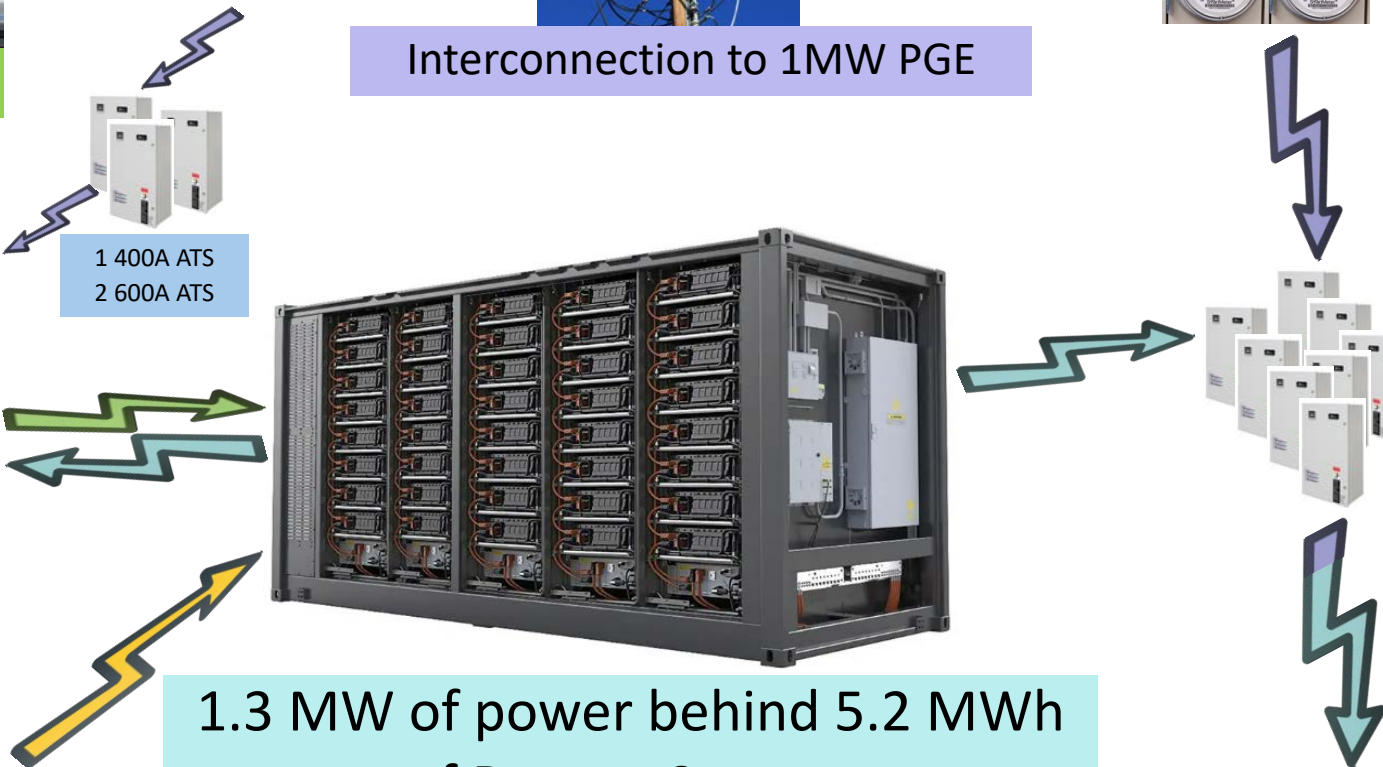
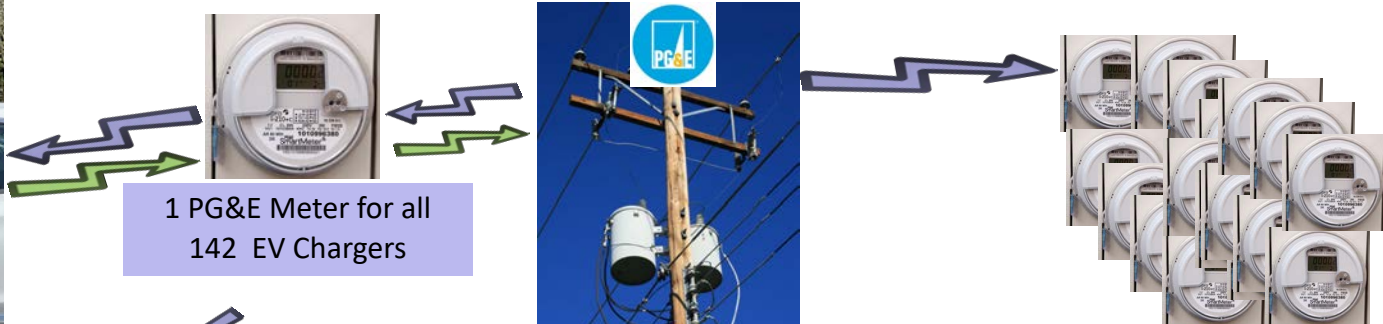
91 Standard EV Chargers



51 Bidirectional EV Chargers



1.05 MW of PV, ~1.5 GWh/yr



Meridian's 95%+ Off Grid Energy Flows Illustrated



Apts operate 95%+ off-grid, on-grid 2-3 weeks during winter months.

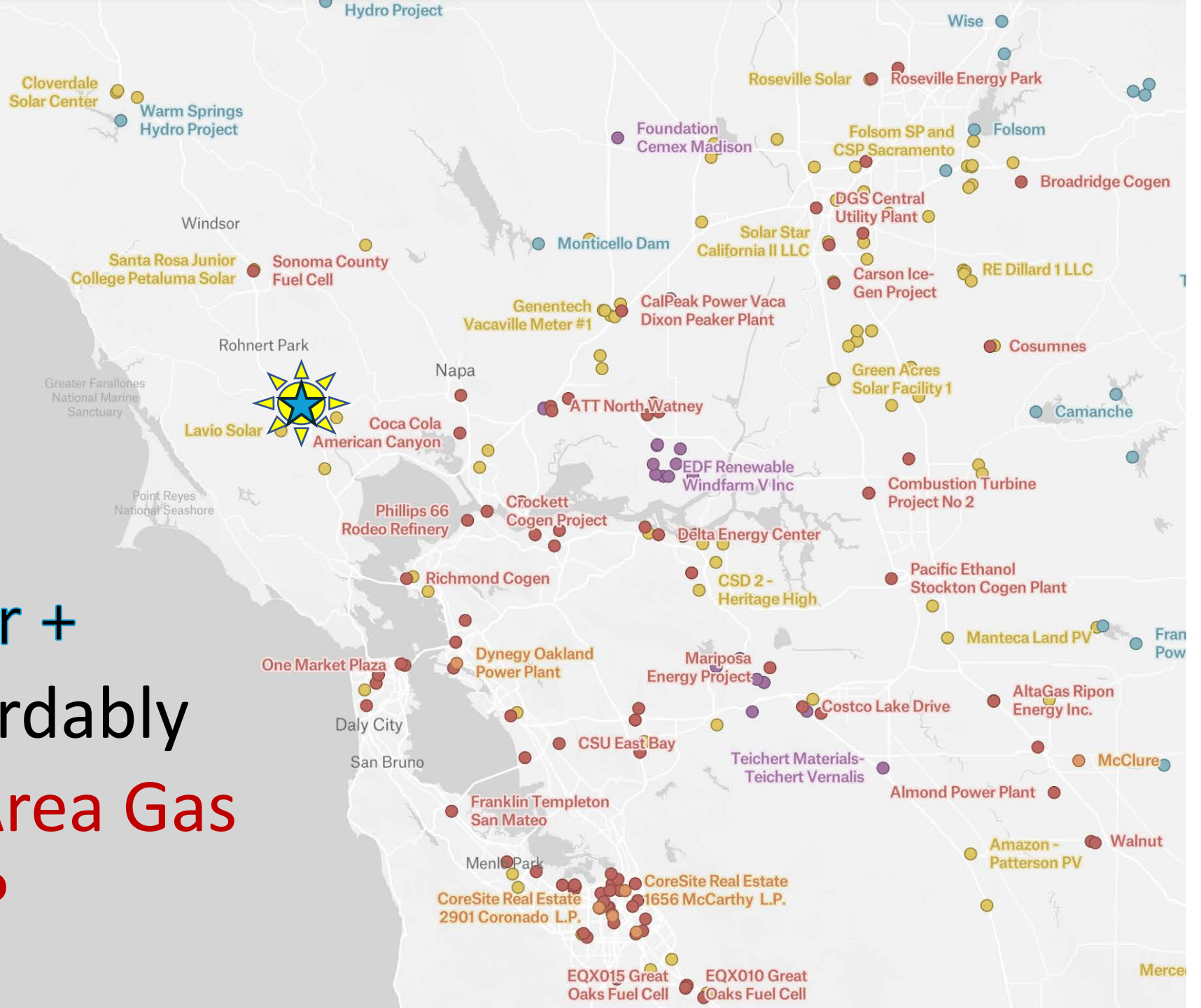


We're Moving Dirt! And
Zero Carbon Concrete!

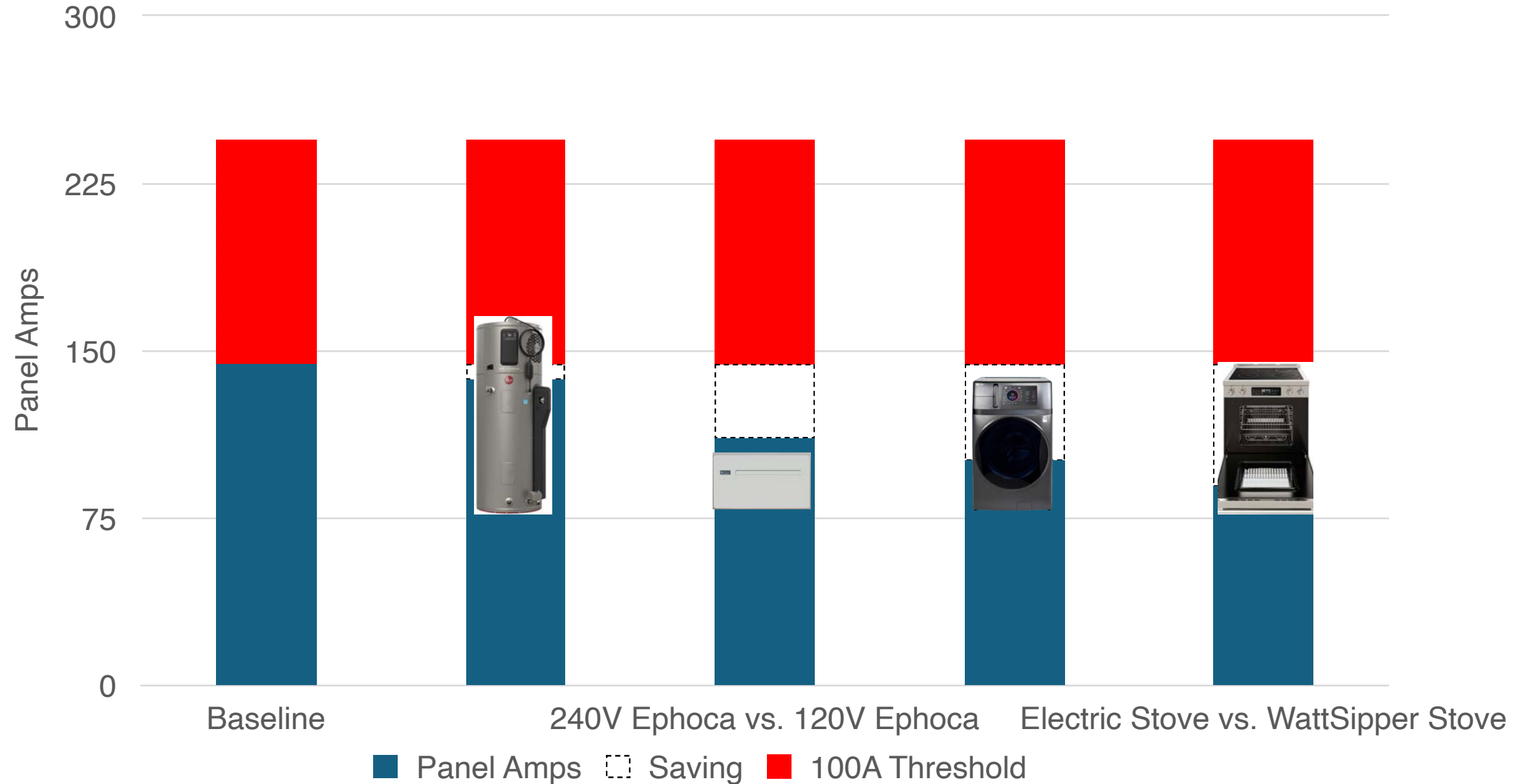
Power Plants

- Solar
- Hydro
- Wind
- Gas
- Coal
- Oil
- Nuclear

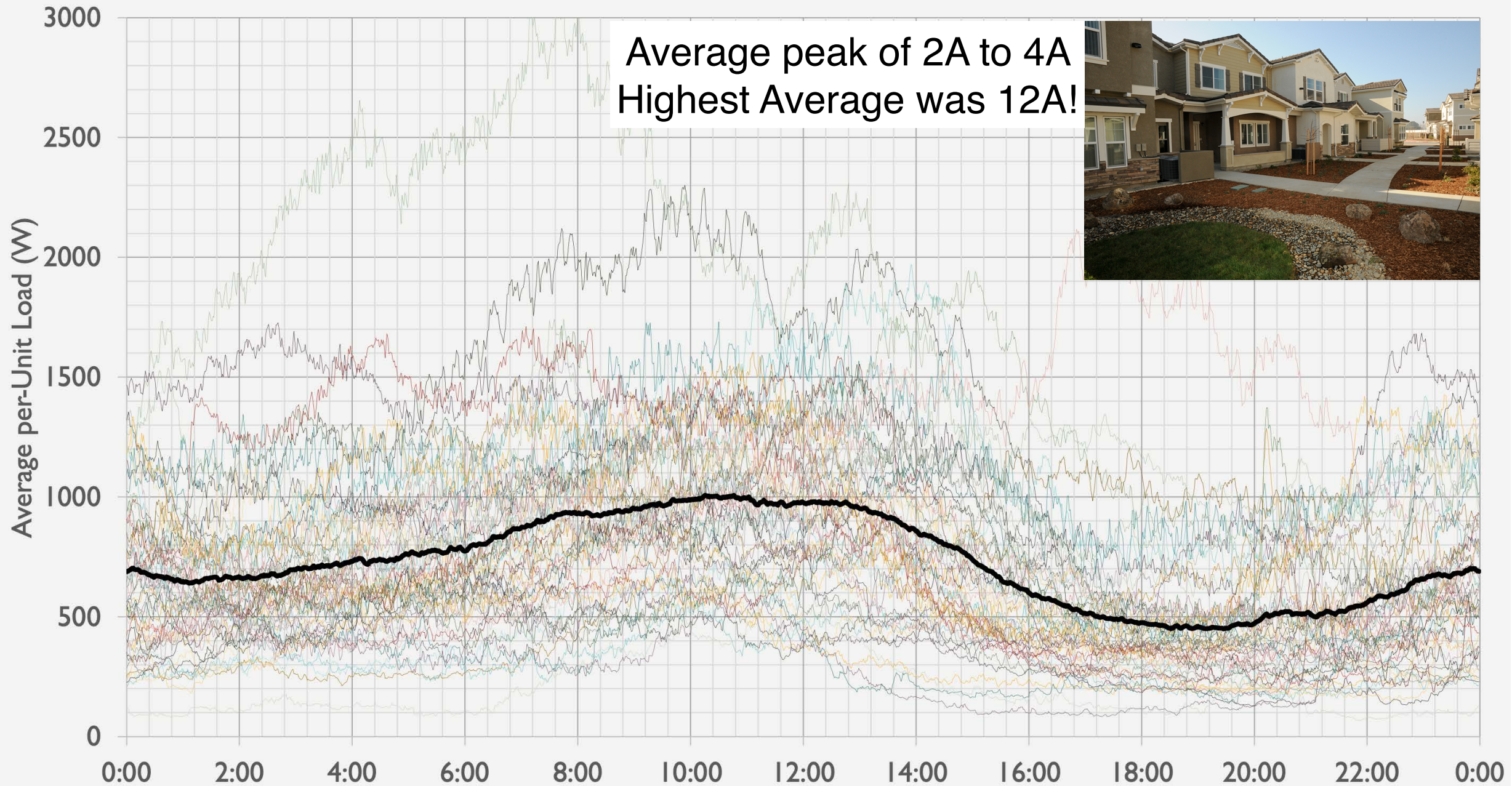
How Can Solar +
Batteries Affordably
Replace Bay Area Gas
Power Plants?



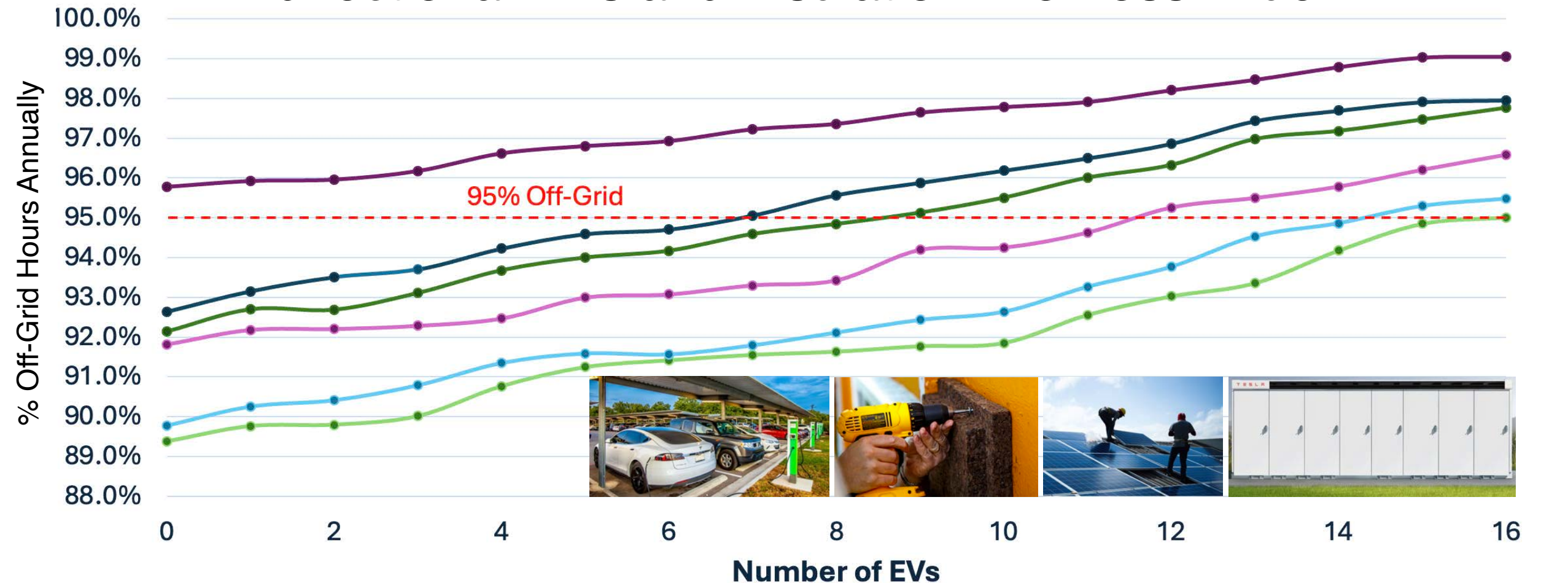
Using Power Efficient Appliances to Stay Under 100A (Load Calculation per National Electrical Code 220.82)



Average Weekday (M-F) Loads for all Apartments at Dixon



Getting to 95%+ Off-Grid Hours with Solar Power, Batteries, Bidirectional EVs and Insulation. No Fossil Fuel.



2MWh Battery, 1.26MWh Solar, No Cont. Insul.

5.2MWh Battery, 1.26MWh Solar, No Cont. Insul. No cost add!

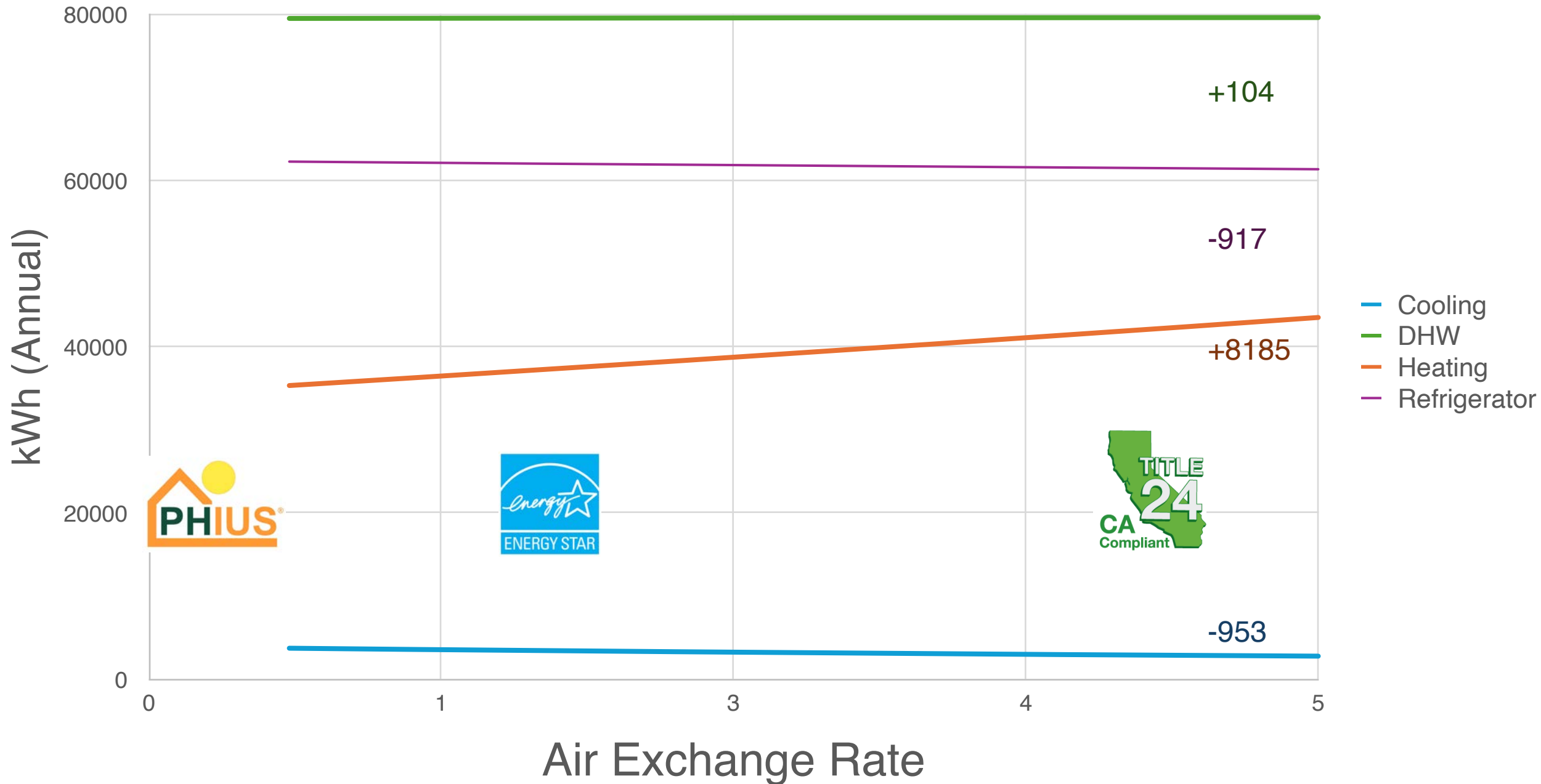
+\$1.8M 2MWh Battery, 1.26MWh Solar, 2 Inch Cont. Insul.

5.2MWh Battery, 1.26MWh Solar, 2 Inch Cont. Insul. +\$1.8M

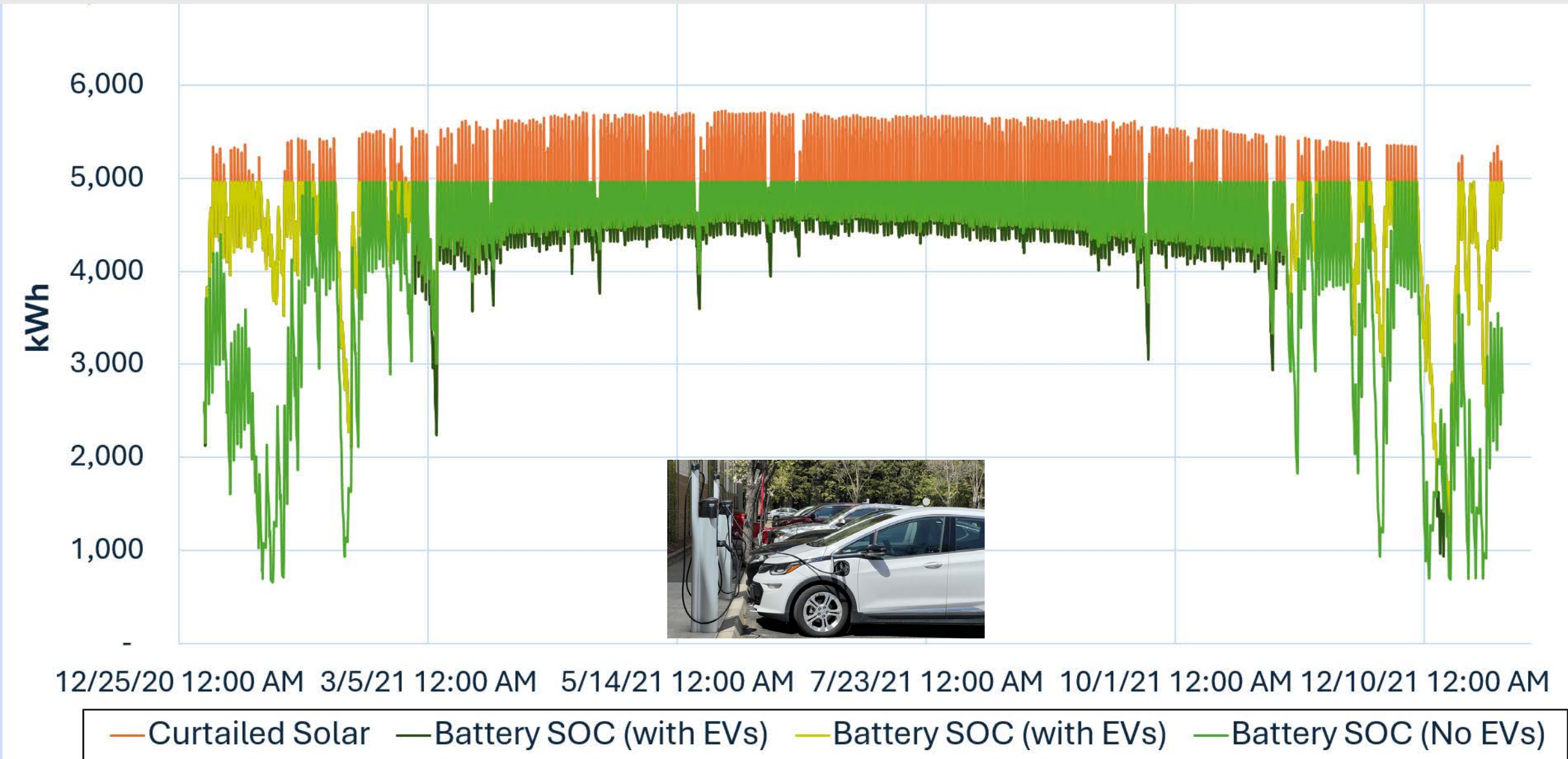
+\$370k 2MWh Battery, 1.5MWh Solar, No Cont. Insul.

5.2MWh Battery, 1.5MWh Solar, No Cont. Insul. +\$370k

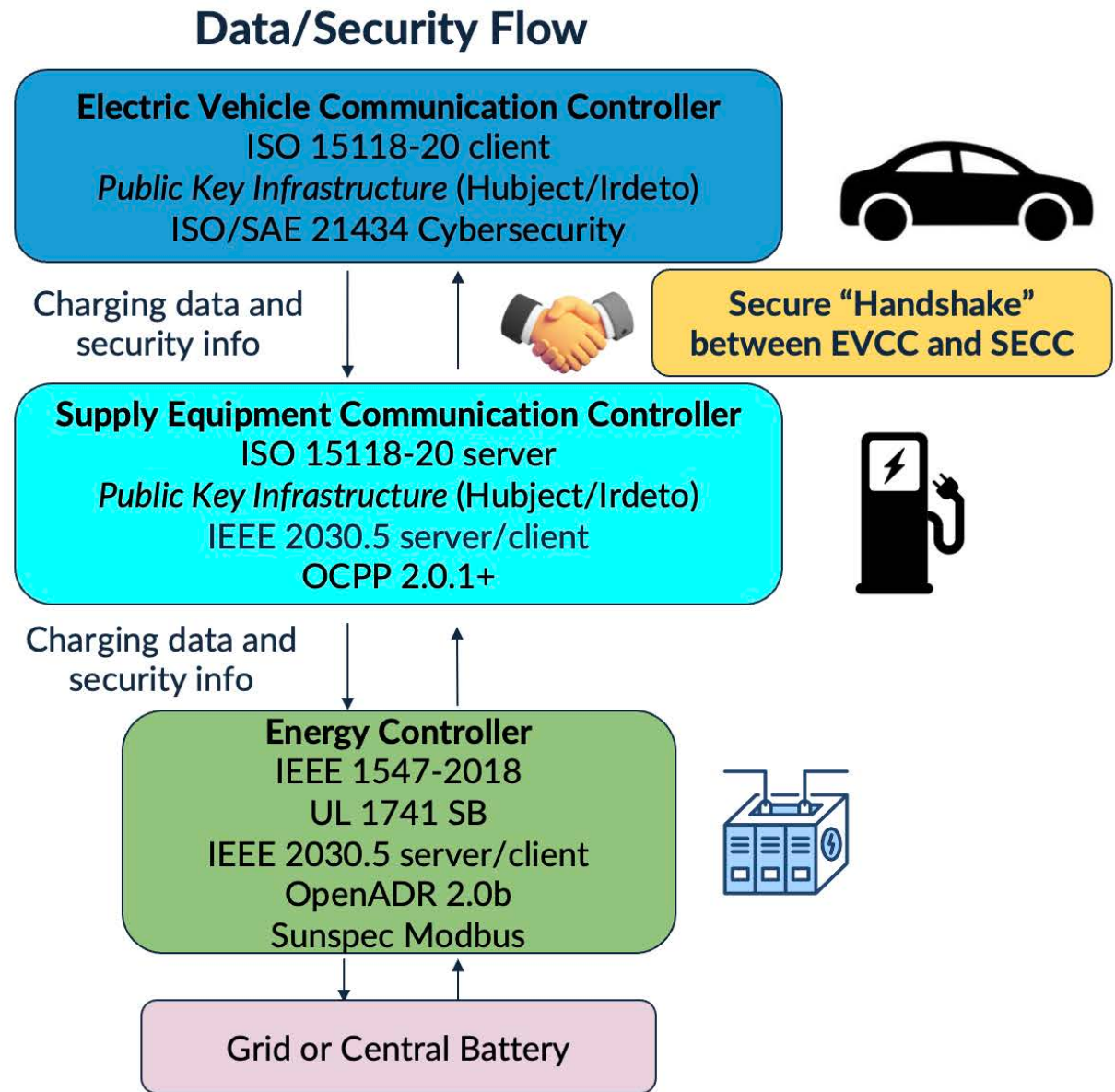
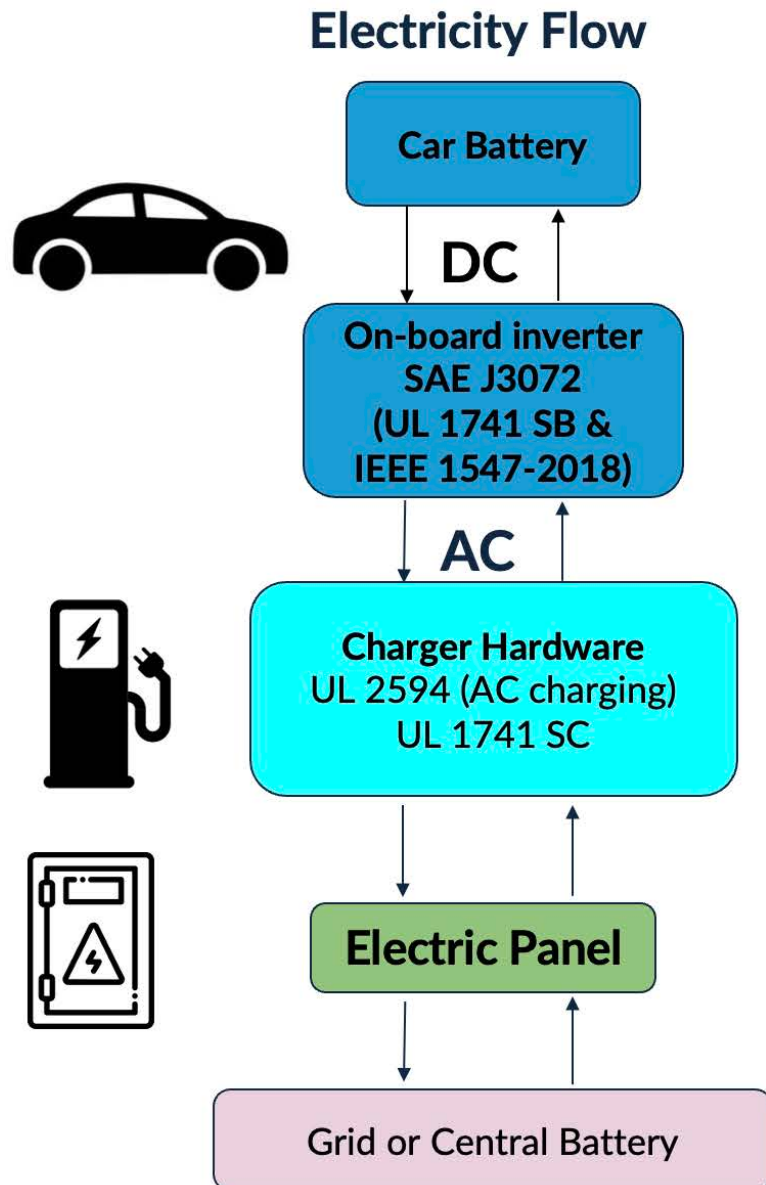
and +0.95% total consumption @ 5 air exchanges/hour



20% of parking spaces with Bidirectional EVs gets to 100% Off-Grid! (28 out of 142 spaces, serving 131 apts)



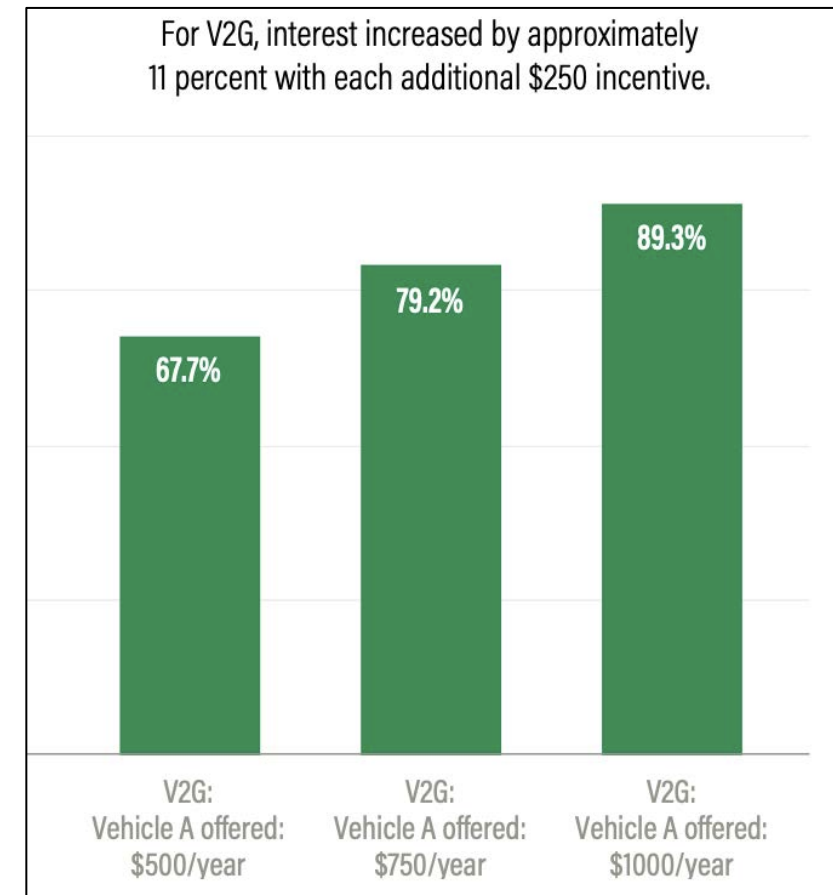
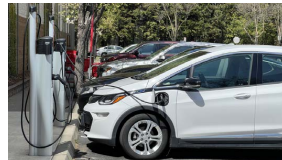
1/3rd The Cost and Complicated: AC Bidirectional EV Charging



EV batteries are 10x more abundant than home batteries and 2x more abundant than grid batteries in California.
90% of EV owners would sell to the grid.



WORLD
RESOURCES
INSTITUTE



Questions?



Herb Yaptinchay
hyaptinc@epri.com

Sean Armstrong
sean@redwoodenergy.net