

DETAILED TECHNO-ECONOMIC ASSESSMENT IN MINUTES OF A PROPOSED EV CHARGING STATION WITH SIMPLE BUT POWERFUL SOFTWARE MODELING

Understand the value of powerful modeling software for designing and optimizing electric vehicle (EV) charging stations.

Learn how to maximize return on investment (ROI) of integrating EV charging into distributed generation and storage systems.

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CAN THE GRID HANDLE AN ALL-ELECTRIC TRANSPORTATION FUTURE?

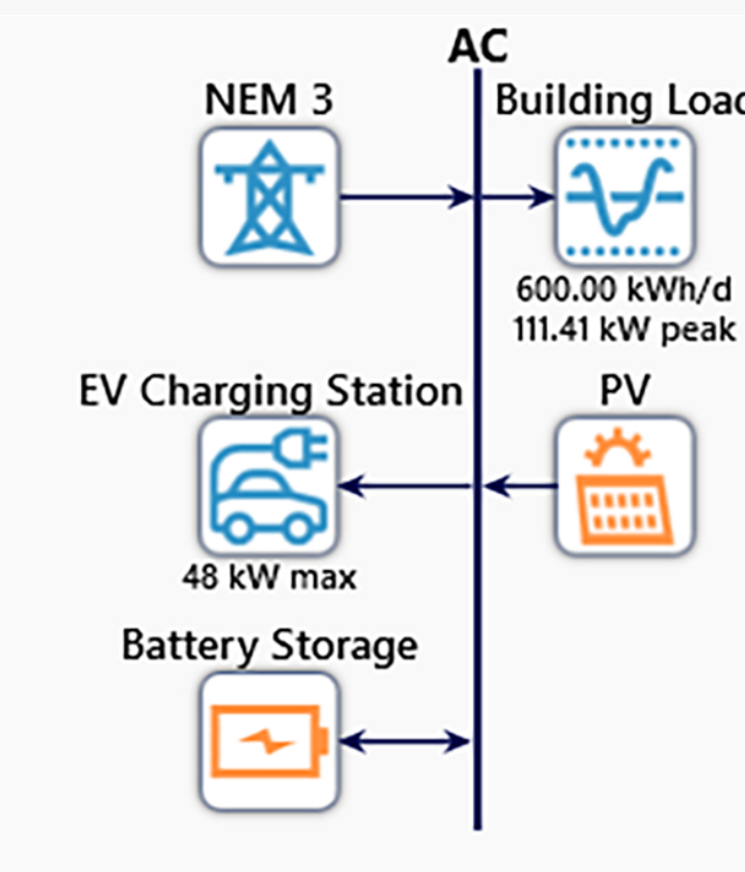
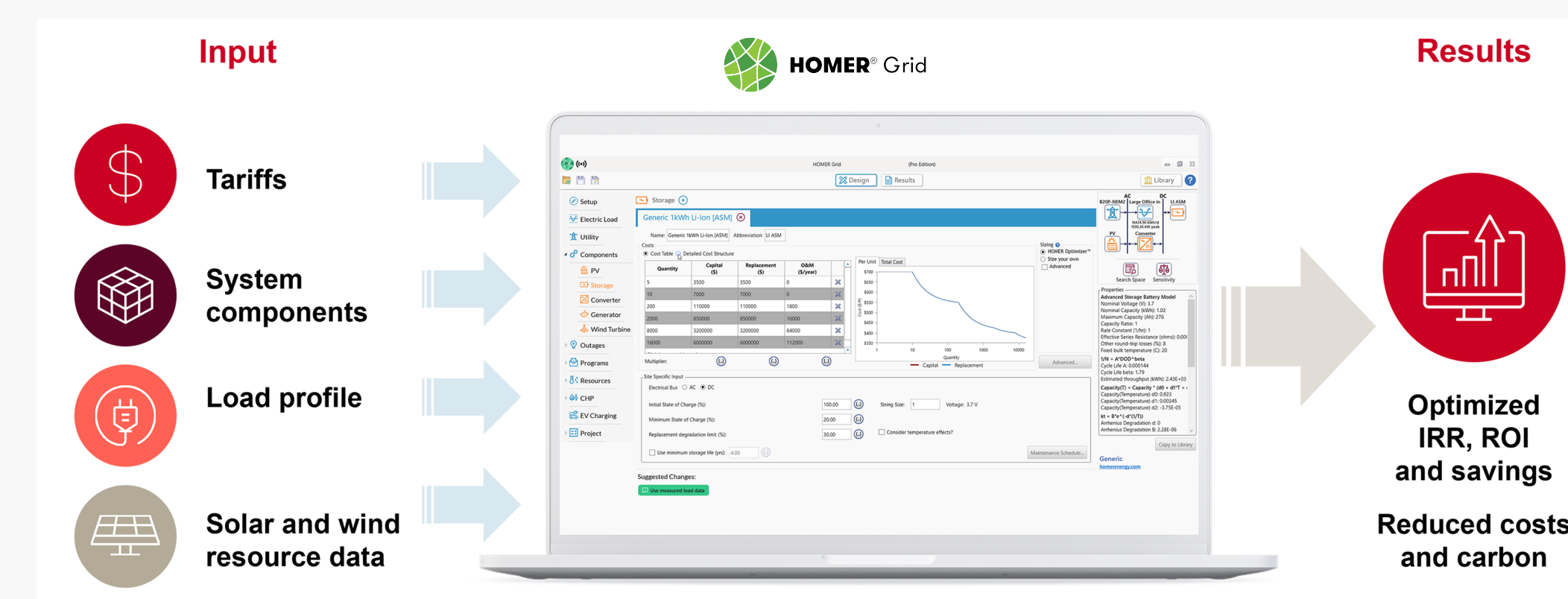
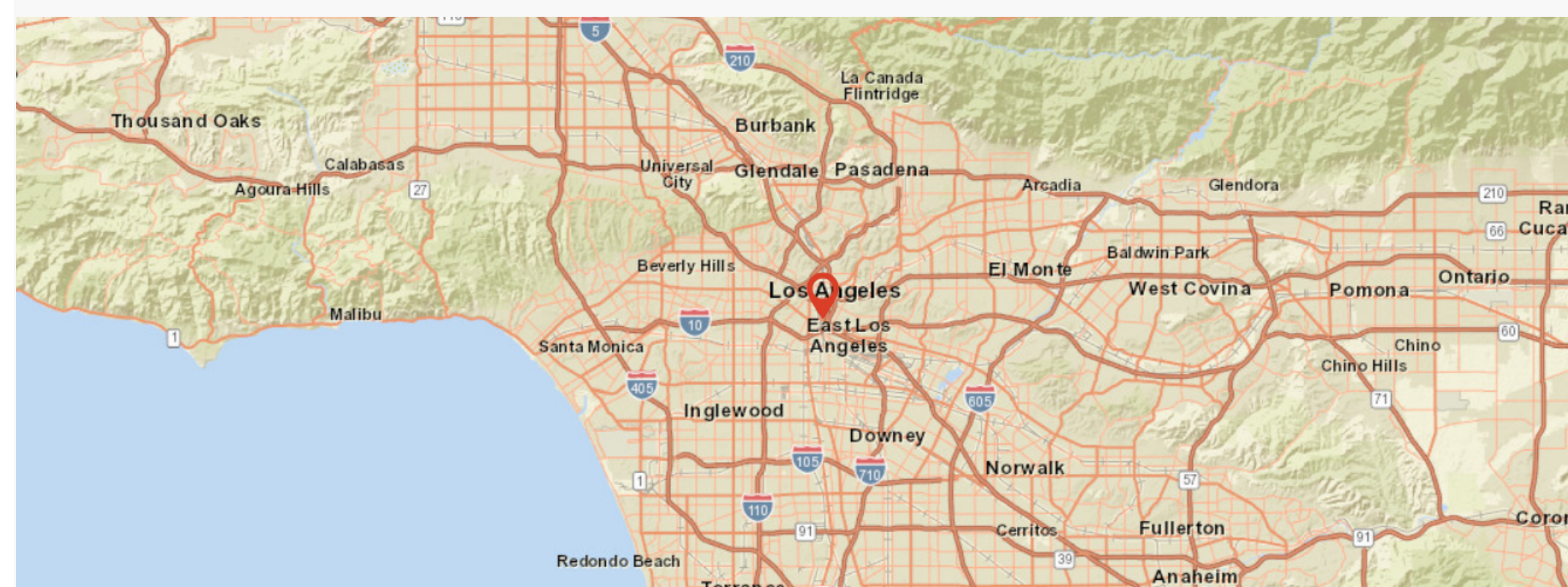
- Yes, but only if we prepare for it.
- By 2030, half of new vehicle sales will be EVs.¹
- To support an all-electric transportation future, we will need better planning on when to charge EVs and more local generation and storage to support the distribution grid.
- Well planned on-site generation and storage to support your EV charging station can lead to energy and demand-charge savings and eliminate purchasing additional electricity from the grid to meet EV charging demand.

¹ Bloomberg NEF. <https://www.bloomberg.com/news/articles/2022-09-20-more-than-half-of-us-car-sales-will-be-electric-by-2030>

BETTER EV CHARGING STATION DEVELOPMENT WITH SOFTWARE MODELING

- Software can help eliminate guess work by providing automated and built-in access to the following databases:
 - Utility tariff rate structures.
 - Building load profiles.
 - Weather resource data.
 - EV charging data analytics.
 - Component libraries including solar photovoltaic (PV), wind turbine and battery models.
- Utilize the software's sensitivity analysis to compare thousands of possible solutions in a single model run and evaluate the impact of variables.
- Quickly model various EV charging patterns and behaviors and the impact on the overall load profile.
- Determine the value of on-site generation and storage to support EV charging.
- Run optimizations of on-site generation and storage component sizing to meet EV charging loads reliably and increase the project's ROI.

CASE STUDY



- Building owner wants EV charging in the parking lot.
- Lot will have four Level 2 chargers.
- Space for up to a 50-kilowatt (kW) solar carport and up to 500-kilowatt hours (kWh) battery storage.

Designing and analyzing an EV charging station for a multi-tenant property in Los Angeles.

Automate project design and analysis using software modeling.

Schematic of system components.

RESULTS

- Results Summary (top) shows the best-in-class outcomes for the scenarios run by the software, with each row showing the most ideal outcome for that scenario. The most ideal outcomes are the projects with the lowest system cost and maximum possible revenue.
- Time Series Profile (bottom left) shows an hourly or sub-hourly visualization of data that enables comparison of component performance and interaction.
- Utility Bill Comparison (bottom right) allows evaluation of the economics of adding generation plus storage and EV charging to your property.

Architecture		Cost				Project Economics				NEM 3					
PV (kW)	Battery Storage (y)	NEM 3	NPC (\$)	LCOE (\$/kWh)	Operating cost (\$/yr)	CAPEX (\$)	IRR (%)	Simple Payback (yr)	Utility Bill Savings (\$/yr)	Net Present Utility Bill Savings (\$)	Demand Charge Savings (\$/yr)	Energy Charge Savings (\$/yr)	Demand Cost (\$)	Energy Cost (\$)	Energy Purchased (kWh)
50.0	224	1	\$1,03M	\$0,282	\$61,352	\$234,715	18	5.3	\$46,781	\$504,765	\$35,529	\$11,252	\$30,394	\$56,746	308,175
46.7	182	1	\$1,07M	\$0,290	\$74,694	\$100,242	30	3.3	\$32,323	\$417,854	\$31,162	\$1,160	\$34,761	\$66,837	395,584
		1	\$1,32M	\$0,337	\$94,087	\$107,778	6.2	12	\$114,531	\$140,87	\$140,87	\$8,719	\$65,783	\$59,279	314,552
		1	\$1,33M	\$0,341	\$102,717	\$0,00			\$0	\$0	\$0	\$0	\$65,924	\$67,998	392,358

Results Summary

