

Welcome to this month's educational webinar

Modeling Electric Vehicle Charging

Minimize EV charging station energy costs with HOMER Grid



Our presentation will
begin at the top of the
hour. See you soon!

AUDIO DIFFICULTIES?

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by UL



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Modeling EV Charging

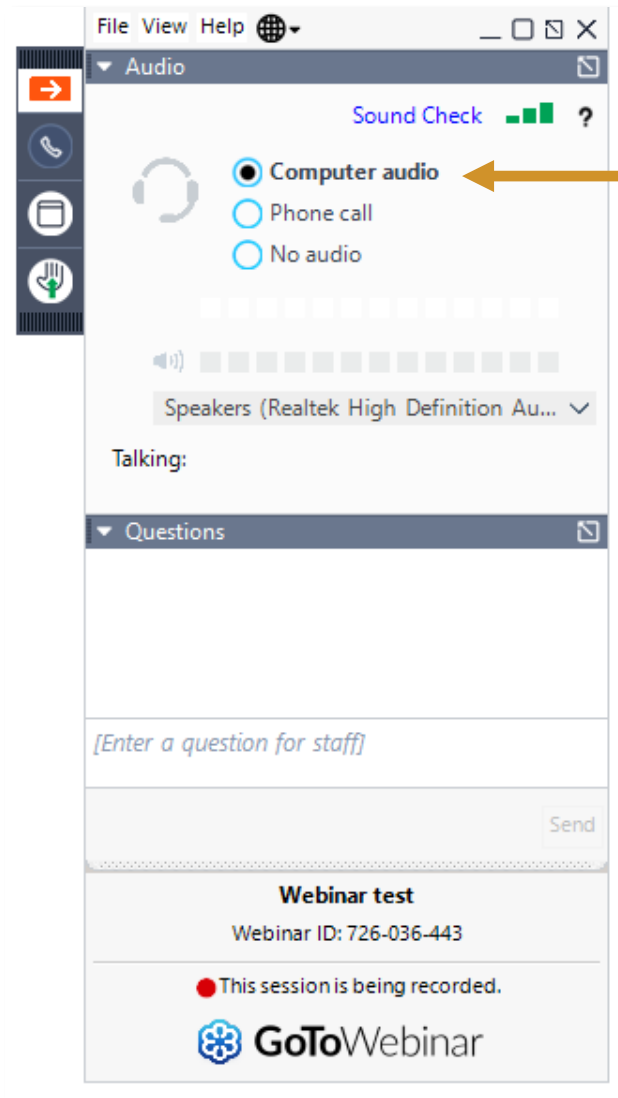
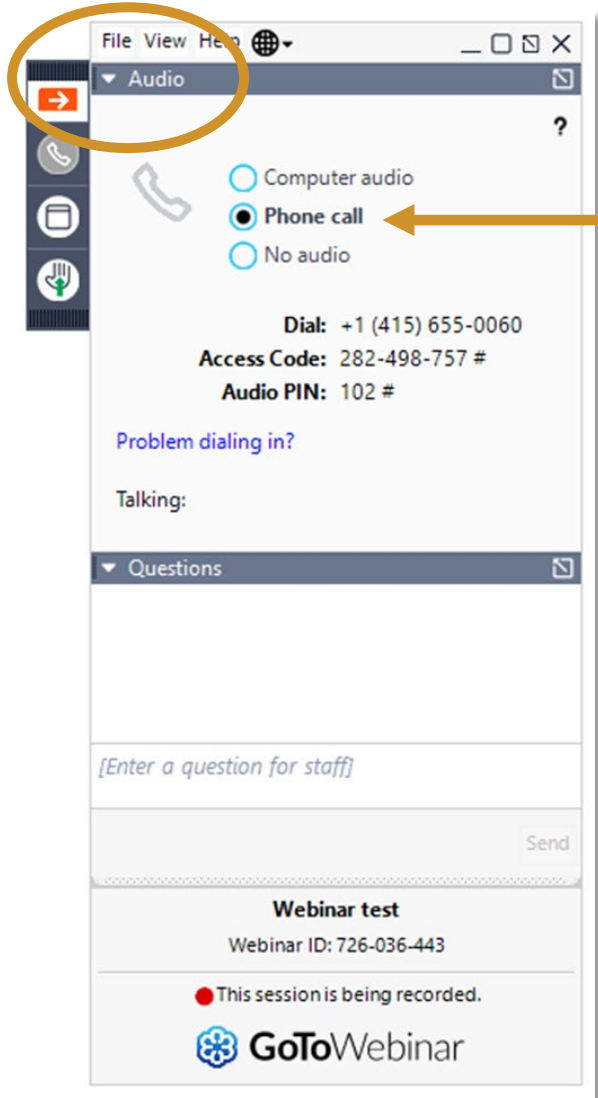
Minimize energy costs with HOMER Grid

May 14, 2020

Steffi Klawiter, Product Manager, HOMER Energy by UL & David Mintzer, Starboard Energy Advisors



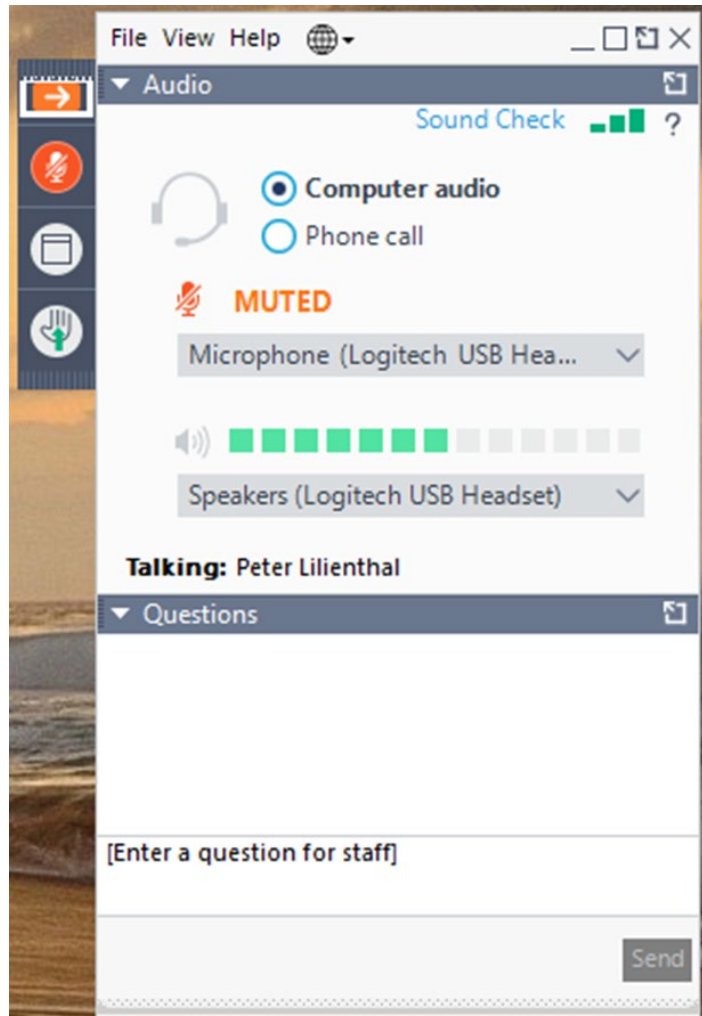
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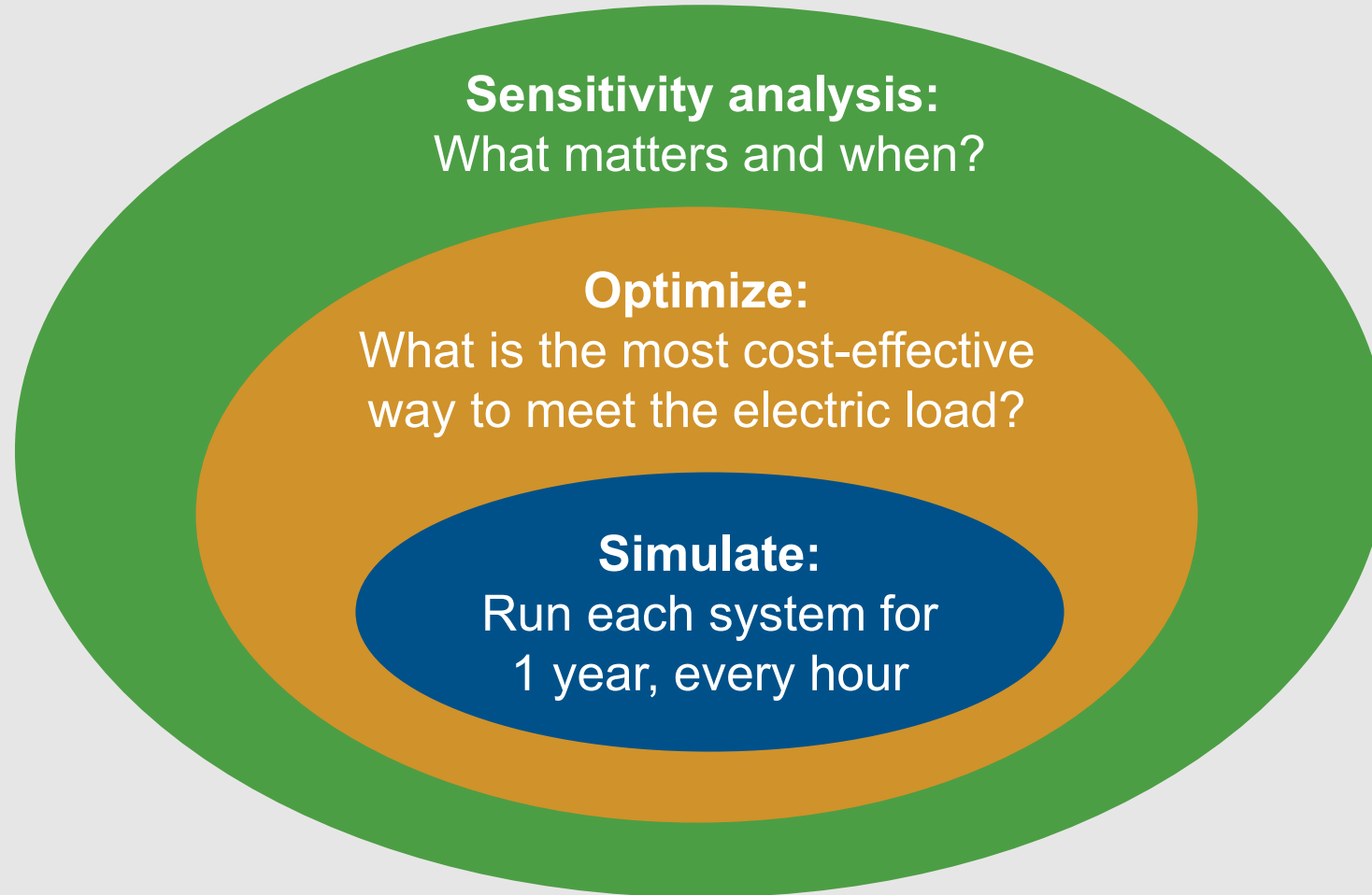
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Your Questions Are Welcome



HOMER: Hybrid Optimization of Multiple Energy Resources



Microgrid/DER Optimization and Design in HOMER[®]

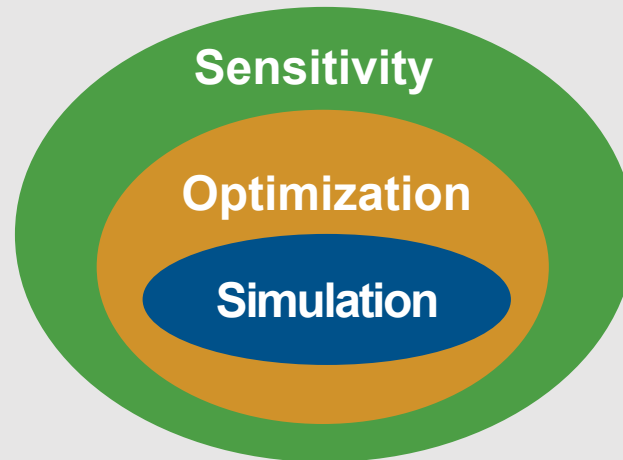
Project Inputs



Economics
Load Profile
Site-Specific
Renewable Resources
System Components



Analysis



Results



Economics &
Engineering
System Sizing
Performance
Details
Financials
Various Reports

Behind the meter distributed power systems

- Demand charge reduction
- Time of use rates
- Maximize self consumption
- Incentives
- Demand response
- Resilience and reliability
- Electric vehicle charging

Microgrids and distributed energy resources of all types



HOMER
Grid



HOMER
Pro

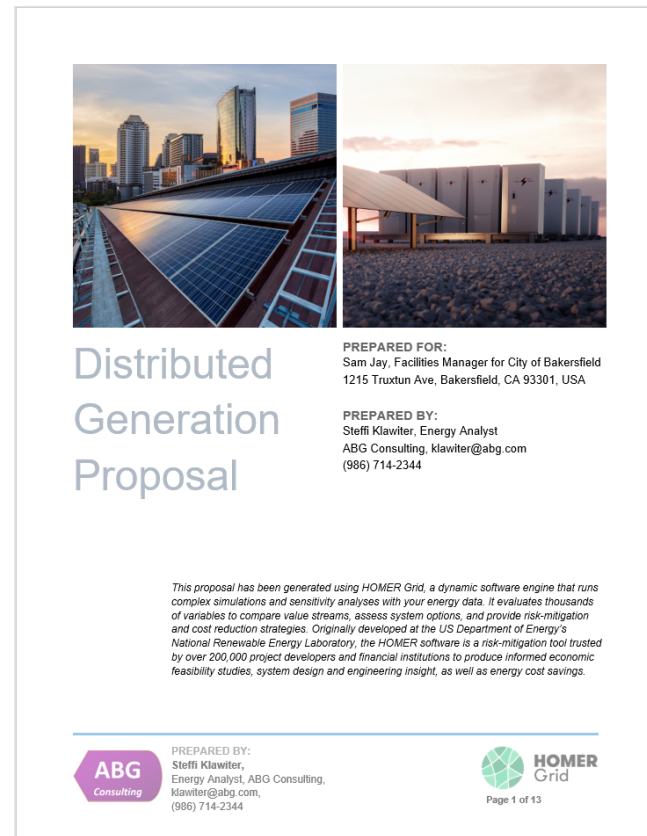
NEW

EV Charging—v1.8

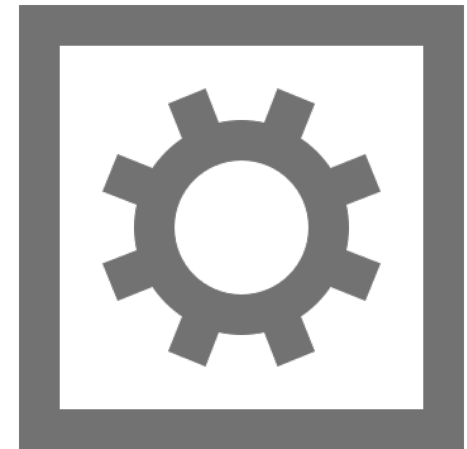


RECENT

Custom Proposal Writer



Two Custom Controllers: MATLAB® Link & C++ Controller API





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Modeling EV Charging

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The Growing Economy of Electrified Transportation

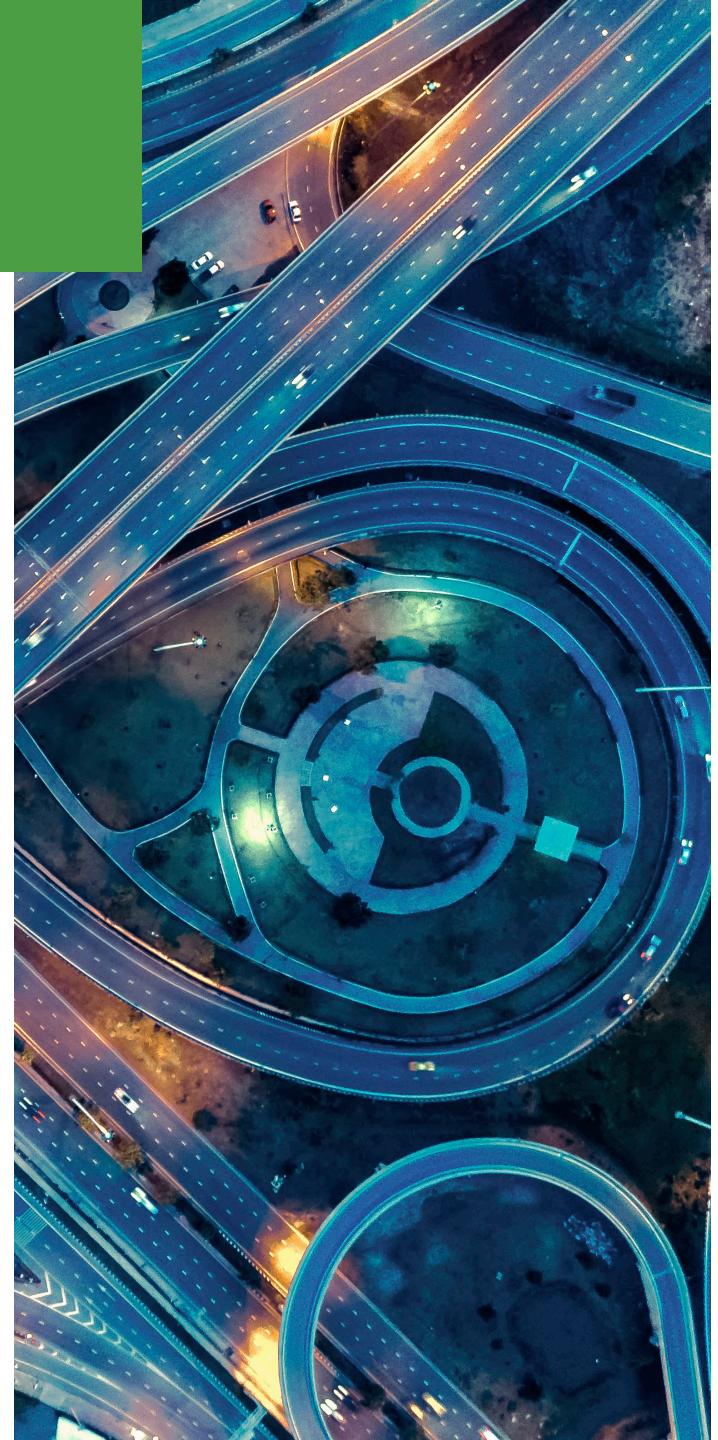


- Market uptake
- Cost of charging



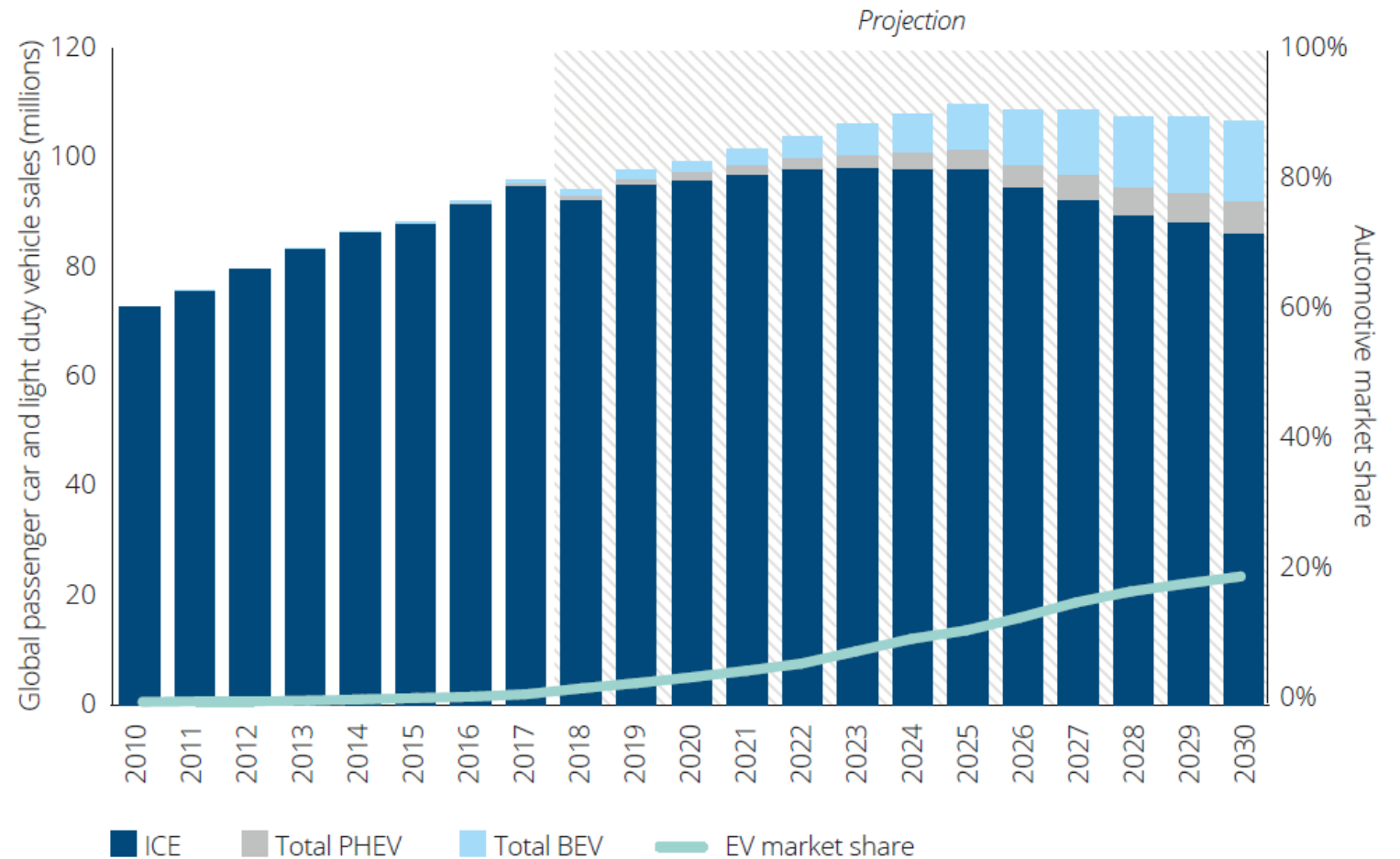
Market Uptake – Policy/Regulation

- Fuel economy
- Emissions targets and regulations
- Financial incentives
- City access/restrictions



Market Uptake – Customer Demand

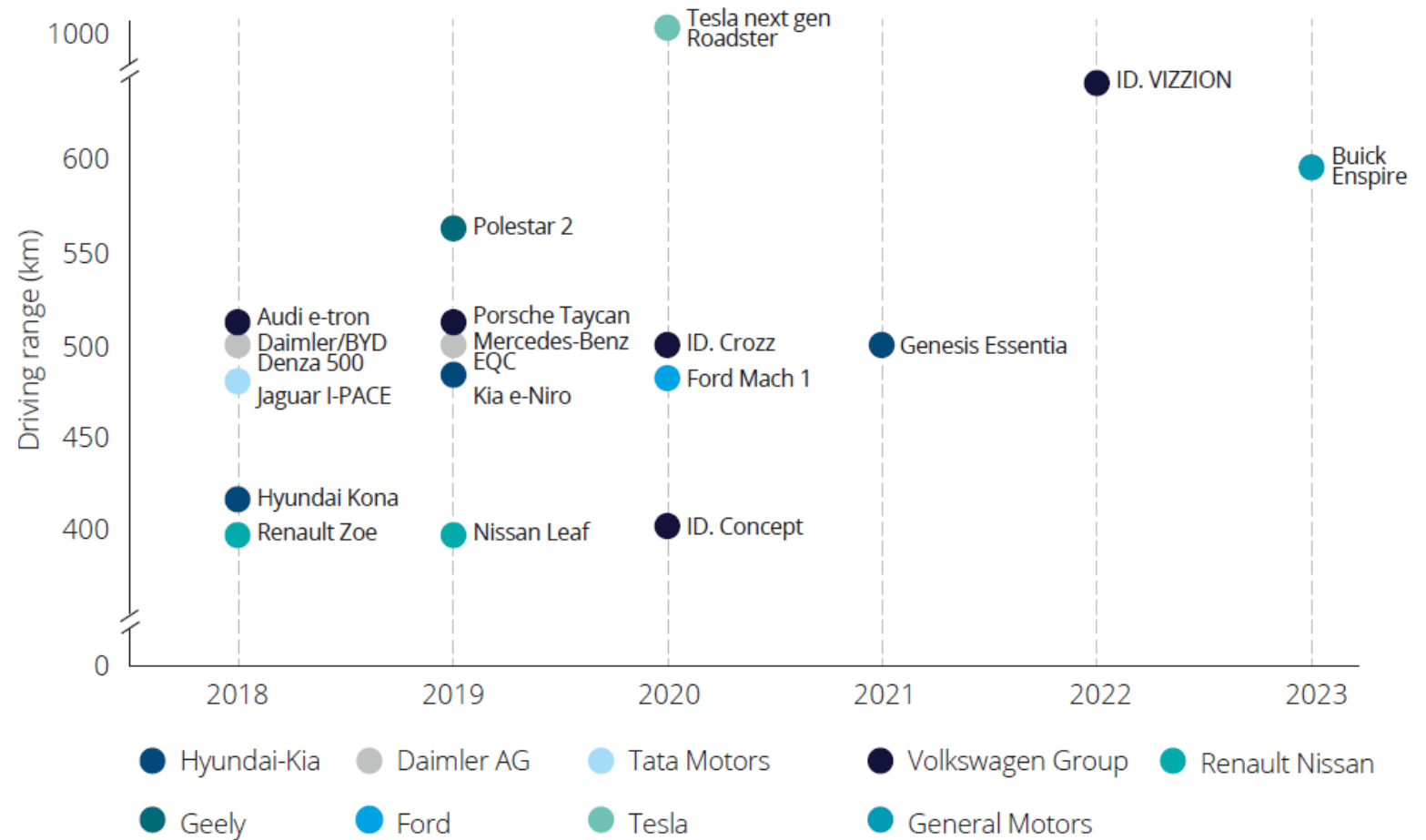
- Performance
- Lower operating cost
- Innovative technology
- Lower GHG production
- Full city access and carpool lane access
- Driving experience (quiet ride, spacious, body styling, fun)



Source: IEA, IHS, Deloitte analysis

Market Uptake – Concerns

- Range
- Cost premium
- Available charging infrastructure
- Time to charge



Source: OEM public announcements

Market Uptake – Challenges

Greater demands on site infrastructure and utility grid

- Next generation EVs have increased range with larger batteries
- DC fast-charging stations reduce charging time, charge more EVs
- Local infrastructure (transformer/switchgear) & interconnection limits... potentially expensive site upgrades
- Resiliency strategies needed for mission critical operations and to maintain driver experience



Rate analysis - Tariff rates differ greatly and evolving; demand charges or high TOU rates could produce expensive utility bills

Renewable energy generation - PV Solar, Energy Storage, incentives

Techno-Economic analysis is key - Configuring, architecting and optimizing charging infrastructure requires deep analysis

Cost of Charging - Example

	So Cal Edison GS-3	So Cal Edison EV-8
Application	Fleet of 10 DCFC Chargers (50 kW, dual port)	
Annual Energy Use (kWh)	2,464,886	
Peak Load (kW)	495	
Electricity Expense/Year 1	\$328,703	\$292,621
PV Size (kW)	100	
ESS Size (kW/kWh)	200/400	
System CAPEX (incl. SGIP)	\$275,000	
Strategies Deployed	Energy shifting arbitrage, peak demand charge reduction	
New Electricity Expense/Year 1	\$274,498	\$225,350

How HOMER Grid Models EV Charging



- Firm charging
- Managed charging





HOMER
Grid

A robust, powerful tool for optimizing the value of **behind-the-meter**, distributed generation systems, especially when **demand charges**, **self-consumption**, **energy arbitrage**, and the value of reliability and resilience matter.



HOMER Grid

- Determines the best mix of resources for the least-cost solution
- Enables you to design a system which reliably balances energy supply and demand
- Leverages over a decade of expertise in designing distributed generation systems



How can HOMER Grid help you?



Value-Stacking



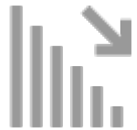
Dig Deep into Details



Global Resource Data



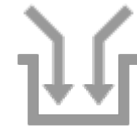
Robust Storage Model



Demand-Charge Reduction



Understand and Quantify Risk



Accurate, Up-to-Date Tariffs



Combined Heat and Power



Cutting-Edge Dispatch Strategy



Beautiful Reports



Library of Components



Electric Vehicle

HOMER's New Feature

What this EV feature brings to HOMER

- Convenience charging/on-demand charging
- Managed (smart/deferrable) charging
- Level 2, DCFC
- Multiple chargers
- EV charging savings

What's on the roadmap?

- EV charging revenue
- V2G
- V2X

Software demonstration



Long Beach, CA



Hospital considering electrifying their ambulances



Compare two tariffs



Usage profile is greater during day-time hours, 40 chargers, 150 kW output per charger



The goal is for the hospital to pay the lowest electricity bill



Compare charging strategies:

Ambulances arrive and should be charged immediately

Or, ambulances may be charged over the course of 5 hours



Software demonstration take-aways



HOMER Grid helps compare utilities.

EV-8 tariff offered a lower lifetime cost than GS-3-E



HOMER Grid helps consider the economic impact of managed charging vs firm charging requirements.

Managed charging results in a 35% lower NPC



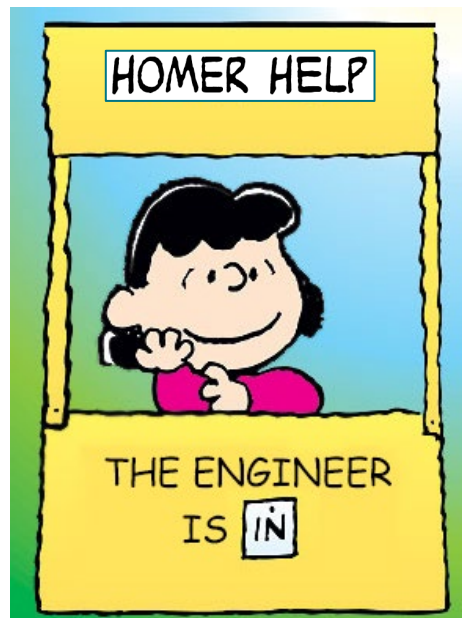
HOMER Grid can help you design the optimal, lowest cost system that will serve the facility's energy demand and EV charging requirements



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Need help with your modeling?

We can do it
for you or with you.



Support@HOMERenergy.com



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You invested in HOMER—now you need to make the most of your investment through training and support. We offer the only certified training on how to use HOMER for analysis of distributed generation and microgrids. We have either online or live options for individuals and organizations—at your facility or ours.

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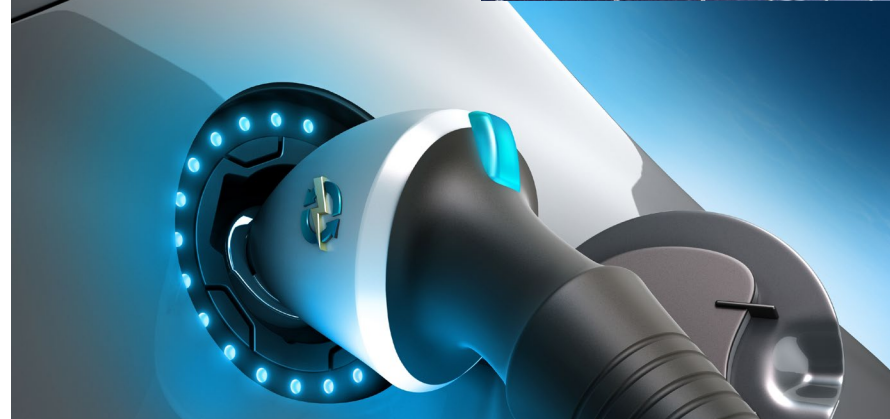
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Q&A



Free 21-Day Trial or Trial Renewal
www.HOMEREnergy.com/products/grid/index.html



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WEBINAR

EV Charging: Powering the Future of Transportation

Tuesday, May 19 | 1:00pm CDT

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WEBINAR



Simple, Free HOMER App Powers African Health Clinics

Thursday, June 18 | 9 a.m. MDT

Presented by Peter Lilienthal, Ph.D., CEO, HOMER Energy & Global Microgrid Lead, UL

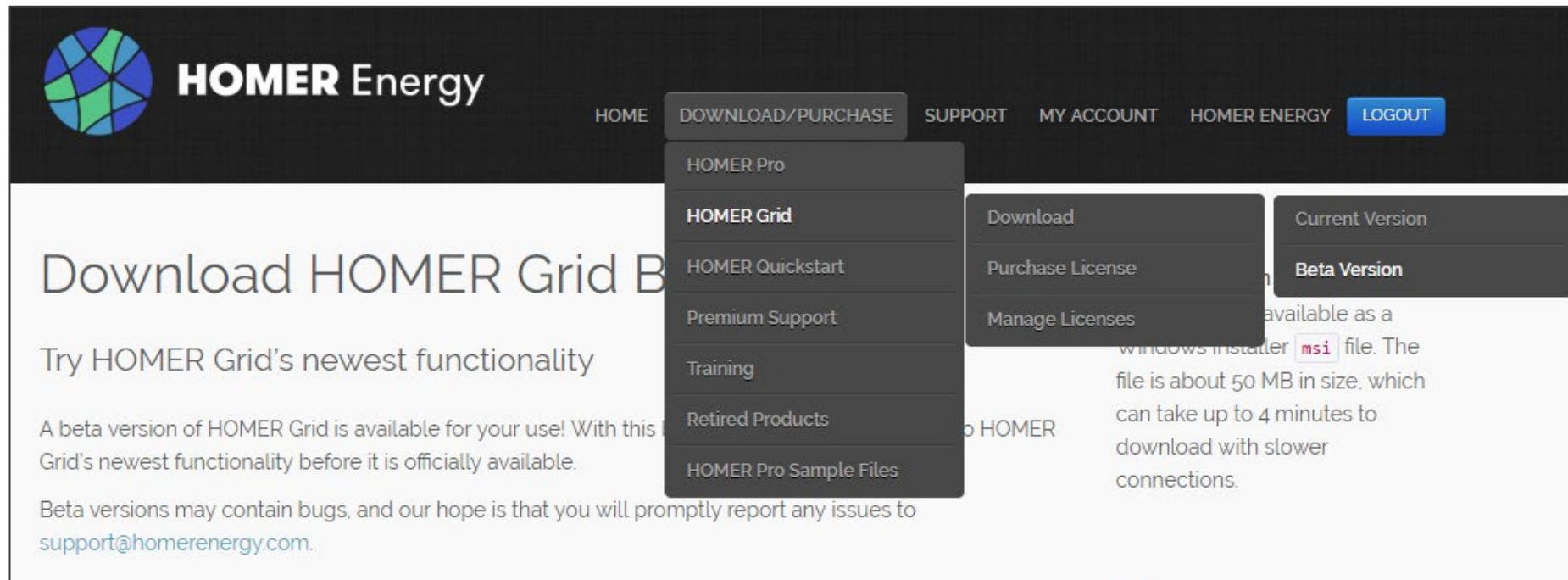
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- Log-in at **users.HOMERenergy.com**
- Download/Purchase>HOMER Grid> Download > Beta Version



The screenshot shows the HOMER Energy website interface. The top navigation bar includes the HOMER Energy logo, a search bar, and links for HOME, DOWNLOAD/PURCHASE, SUPPORT, MY ACCOUNT, HOMER ENERGY, and a LOGOUT button. A dropdown menu is open under the DOWNLOAD/PURCHASE link, listing options: HOMER Pro, HOMER Grid, HOMER Quickstart, Premium Support, Training, Retired Products, and HOMER Pro Sample Files. The HOMER Grid option is selected, leading to a sub-menu with Download, Purchase License, and Manage Licenses. The Download option is further expanded to show Current Version and Beta Version. The Beta Version option is highlighted. Below the navigation, the main content area features a heading "Download HOMER Grid B" and a sub-heading "Try HOMER Grid's newest functionality". The text below states: "A beta version of HOMER Grid is available for your use! With this HOMER Grid's newest functionality before it is officially available. Beta versions may contain bugs, and our hope is that you will promptly report any issues to support@homerenergy.com." To the right, a text block explains that the software is available as a windows installer `msi` file, which is about 50 MB in size and can take up to 4 minutes to download with slower connections.

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Thank You
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