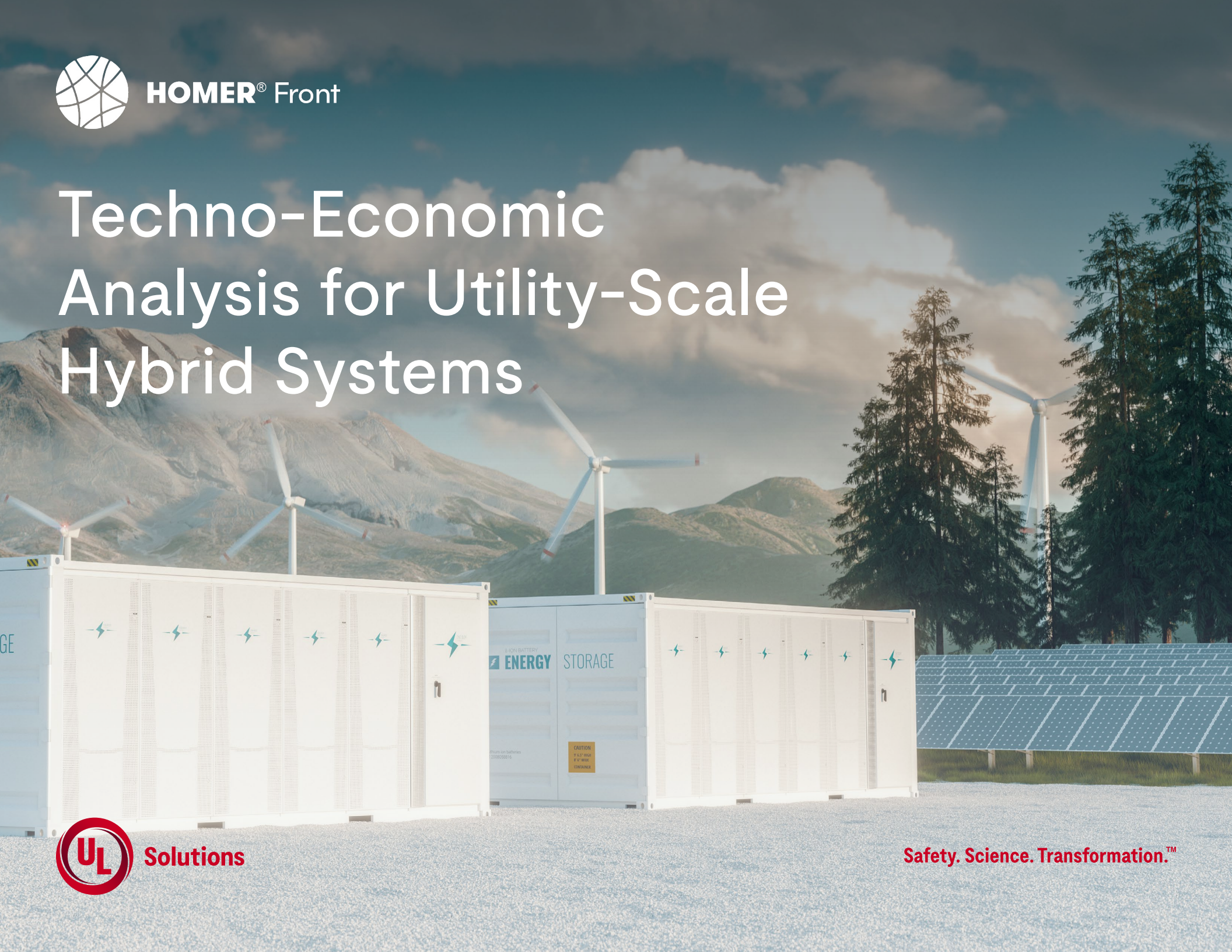




HOMER® Front

Techno-Economic Analysis for Utility-Scale Hybrid Systems



Solutions

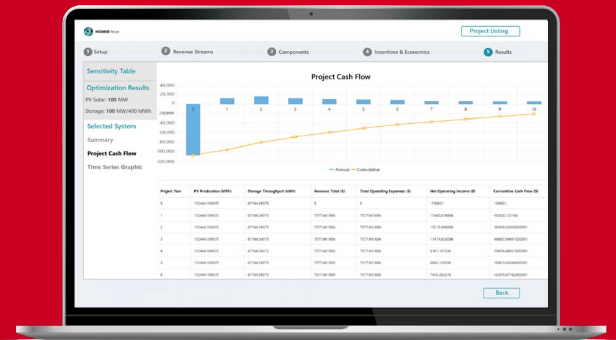
Safety. Science. Transformation.™



Maximize value for energy storage and hybrid system projects

HOMER® Front software by UL Solutions provides a powerful web-based platform for rapidly designing, sizing and optimizing utility-scale energy storage and hybrid systems. Maximize and demonstrate project value, mitigate potential risks and optimize multiple areas, including:

- Variable generation
- Energy markets
- Power purchase agreements
- Battery capacity

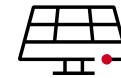


HOMER® Front software

Save hours of analysis time during project development, bid evaluation and due diligence. HOMER Front software models the technical and economic performance of utility-scale energy storage systems — independently or with solar and wind.

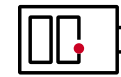
You'll get critical, actionable insights into optimal sizing and operational strategies designed to mitigate technical and economic risks while maximizing the potential revenue from multiple streams, including energy and capacity markets, ancillary services and power purchase agreements (PPAs).

By optimizing key aspects of your design with the software's robust computations and simulations, you can determine the winning system faster.



Size your system

Calculate the optimal size of energy storage and other components in utility-scale hybrid systems.



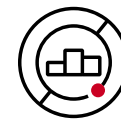
Manage battery augmentation

Model battery lifetime, capacity degradation and augmentation or replacement strategies to minimize ongoing expenses and maximize revenue. Custom storage capability enables you to provide detailed inputs that replicate commercially available batteries.



Compare and stack multiple revenue streams

Perform detailed, holistic modeling of most major electricity markets in front-of-the-meter systems worldwide, including PPAs, energy, capacity and ancillary markets.



Utilize robust sensitivity analysis

De-risk your project's performance projections through sensitivity analysis on key parameters that often fluctuate, like solar irradiance, wind speeds or energy market prices. Screen and evaluate project sites and system economic viability.

Evaluate electricity markets worldwide

Compare revenue projections from most major energy markets around the world, including:

- Wholesale energy markets, such as day-ahead and real time
- Capacity markets
- Ancillary services
- Time-of-delivery (ToD) and PPAs

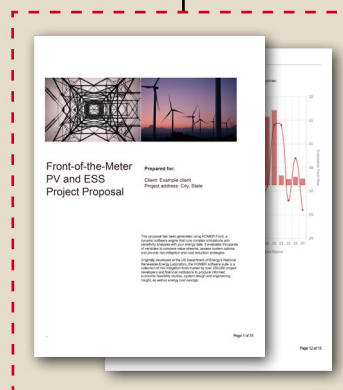
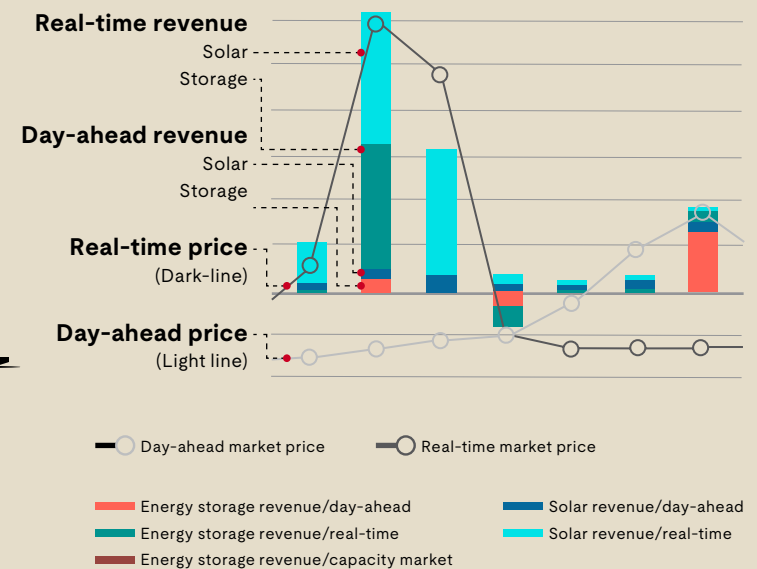
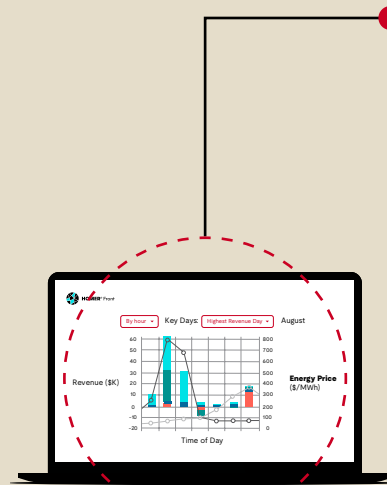
Select from all major monetary currencies globally and customize inputs for a specific country or region. By stacking and comparing multiple revenue streams and dispatch strategies, you can more accurately size and plan system operations to deliver the optimal return on investment while reliably meeting contractual obligations.

Mitigate risks with advanced energy storage modeling

HOMER Front software provides comprehensive battery modeling and sensitivity analysis to assess the impact of energy storage degradation and varying dispatch and augmentation strategies. Easy-to-understand time series graphics empower you to:

- Optimize augmentation strategies and cycling limits
- Model warranted battery values and storage usage
- Determine the most efficient dispatch strategies with charging and discharging rules
- Assess the system's ability to meet off-take agreement requirements consistently

Revenue stacking and wholesale energy price



Create insightful proposals that help demonstrate project value

Quickly turn your project analysis into a customer-facing proposal that presents critical aspects of your project, including revenue streams, technical performance and return on investment.

With a detailed proposal in hand, you, your customer and your stakeholders can move forward with confidence.



Get the clear advantage of HOMER Front software

Model your projects more accurately with a license for HOMER Front web-based software, or work with our respected team of renewable energy experts. Rely on UL Solutions to help accelerate your project's design-to-build timeline with a feasibility study or complete project evaluation.

Make hybrid power system decisions with confidence

Rely on accurate, confirmable analysis of multiple inputs of energy resources, markets, and dispatch and augmentation strategies.

Easily export data and share across companies without exposing intellectual property related to the project.

A trusted third-party model helps partnering companies, financiers and customers feel confident.

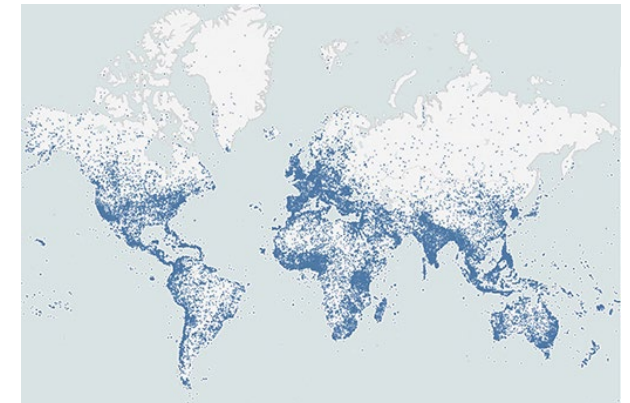
Save time with data integration through Helioscope's application programming interface (API); import PvSys and wind production data, resource data for solar and temperature, and multiple formats of price data.

Put HOMER software to work for you

Originally developed at the National Renewable Energy Laboratory, HOMER modeling software by UL Solutions optimizes the value of your hybrid power systems and energy storage – whether your system is standalone, connected to the grid, behind-the-meter or utility-scale.

Leverage the long-standing expertise in renewable energy and trusted independent engineering of UL Solutions. We offer complete project support, including market and regulatory assessment, project and site evaluation, technical design and analysis.

Gain unmatched advanced energy storage modeling along with our 25 years of experience in modeling hybrid power systems.



HOMER software has enabled more than 250,000 users in 190+ countries to model and optimize hybrid power systems.

Learn more at [UL.com/HOMERsoftware](https://www.ul.com/HOMERsoftware)

