HOMER Software

HOMER Front

Utility-scale hybrid investments software

HOMER Front, from UL Solutions (*), provides a powerful online web application that helps you more accurately and quickly **model and optimize the technical and economic performance of future utility-scale hybrid projects** with battery energy storage systems (BESS), solar and / or wind.

Critical pain points

Revenue Uncertainty

Merchant revenue from energy arbitrage and ancillary services depends on **volatile market prices & multi-coupled variables**. Without robust multi-year dispatch modeling, revenue projections are completely inaccurate.

Sizing Trade-offs

Should you pair 200 MW solar with 50 MWh or 100 MWh of storage? The answer depends on **market prices volatility, BESS degradation, interconnection limits, and offtake structure**. Trial-and-error is not an option.

Pipeline Velocity

Today, competitive development means **fast iteration cycles to determine optimal project setup**. Months-long analyses for each project delay interconnection filings and offtake negotiations.

Bankability

Project finance lenders and tax equity investors **demand independent, verifiable techno-economic analysis**. Your internal model isn't sufficient (you need a tool with market credibility).

(*) HOMER software products (HOMER Pro, HOMER Grid and HOMER Front) are built on the trusted, market-leading HOMER platform, used by more than 250,000 system designers and developers in over 190 countries. With decades of experience, we provide the most robust, accurate solutions to help make hybrid power systems technically optimal and maximally cost-effective. **HOMER software has been part of UL Solutions since 2019.**

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Core modeling advantages:

Optimized Dispatch:

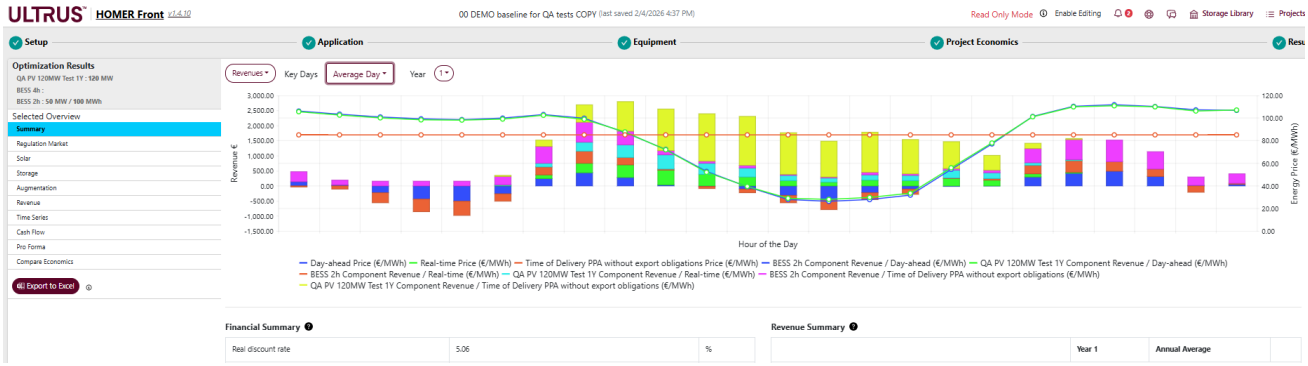
In liberalized and congested **merchant markets,** HOMER Front optimizes BESS dispatch to shift energy from low-price hours to high-price periods and **coordinate dispatch to operate on the different markets** (energy, regulation, capacity, PPAs, etc.) ensuring maximum profits.

Delivery Compliance:

In **prescriptive markets**, projects must deliver a fixed amount of energy at a predetermined price. Because solar and wind are intermittent, a BESS is required to maximize **compliance with the delivery obligation** and deal with the potential penalties associated with shortfalls.

Battery Selection:

By simulating multiple battery technologies **with different efficiencies, response characteristics, and degradation profiles** (along with alternative augmentation strategies) a developer can identify which BESS option delivers the optimal battery choice for the project.



Use Case: Optimizing a 200MW Solar + 100MW/400MWh BESS Project

A renewable energy developer is advancing a 200 MW solar + BESS project in ERCOT (Texas). The site has an interconnection agreement for 250 MW. The developer needs to determine optimal storage sizing, evaluate the revenue mix between a 10-year fixed PPA and merchant exposure, and produce a bankable financial model for their tax equity partner and project finance lender.

What Was Modeled

Using HOMER Front, the developer's asset valuation team modeled 25-year dispatch for each storage configuration against ERCOT nodal price forecasts. Revenue streams included contracted PPA (10-year, $35/MWh), merchant energy and ancillary services. Battery dispatch was co-optimized across energy arbitrage, ancillary services, and PPA obligations. Sensitivity analysis tested 3 market price scenarios and 2 types of batteries.

The Outcome

Optimal configuration: 100 MW / 400 MWh storage. Blended project IRR: 12.4% (levered), PPA providing 65% of revenue certainty and merchant exposure adding 3.2 percentage points of IRR upside. HOMER Front model was reviewed and accepted by the tax equity investor and project finance lender, with financial close achieved on schedule. Total project value: $380M.