



Energy Storage and NWA Planning

Siting – Sizing - Cost Estimation – Techno-Economics – Stacked Revenues - Option Value

Energy storage is increasingly attracting the interest of project developers and electric utilities. These modular assets have the capability to rapidly inject and absorb not only reactive power but also real power making them of universal utility along the electricity value chain from generation plants to consumers.

The storage's rapid dynamic response can help system planners to increase the transfer limits on congested lines that are either constrained by N-1 contingencies or by stability limits such as voltage, transient, or rotor dynamics. A properly sized and sited storage system can provide several grid reliability and market efficiency services while facilitating public policy initiatives.

Other Non-Wire Alternative (NWA) technologies can also affect transmission system thermal loading and voltage limits and can be used alone or in combination with energy storage and conventional solutions such as shunt compensation to bring a competitive hybrid solution.

Service Offerings

Siting and Sizing

- Quanta's proprietary algorithm calculates a siting index for each bus in the study area, based on the locations ability to reduce line overloads after contingencies. The resulting heatmap guides developers and utility planners to find suitable locations.
- The MW rating of single or multiple storage systems are optimized to ensure lowest storage cost while meeting system security constraints.
- Time-Series power flows (8760 hours) is utilized to size the energy capacity requirement taking into account not only the relief of the grid constraints but also the ability to recharge (or discharge) the storage system to be ready to serve its function the next time it is needed.
- For distribution reliability applications, the siting and sizing algorithm identifies sections of the feeder to place the storage system to eliminate feeder overloads and minimize customer interruptions.

Cost Estimation and Revenue Stacking

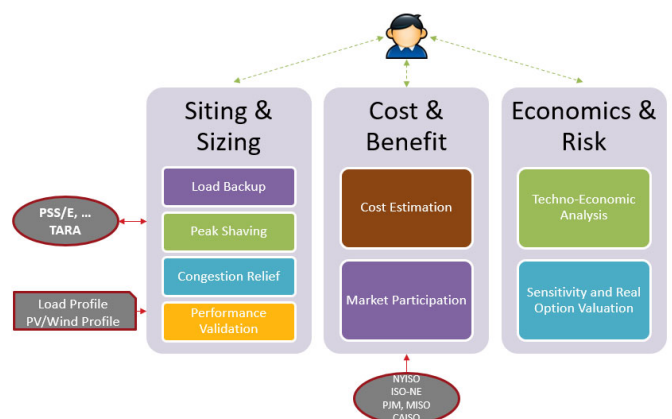
- Robust method and software tool to develop a total cost of the storage system and its bill of material and cost breakdown.
- Storage extra capacity, beyond its primary function, is optimized in the wholesale energy and ancillary markets.

Comparative Lifetime Techno-Economic Analysis

- Compares the revenue requirements of a regulated storage asset against a conventional solution, while accounting for the differences in asset life and O&M practices.
- Calculates investment metrics of IRRs, NPVs, and breakeven analysis for market assets.

Real Option Valuation

- Valuation of the optionality value embedded in energy storage to deal with uncertainty in load forecast and market prices. Rolling incremental investment decisions are triggered to address near to mid term forecasts. Monte Carlo simulations show the envelop of financial outcomes.





Storage and NWA Planning:

- Siting Analysis
- Sizing Optimization
- Cost Estimation
- Revenue Stacking
- Techno-Economic Lifetime Analysis
- Real Option Valuation

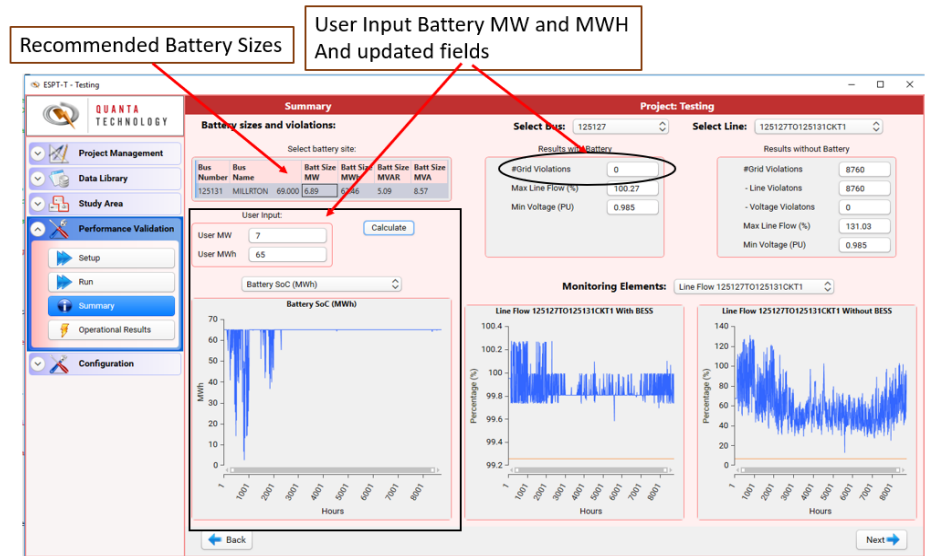
Why Quanta Technology?

Quanta Technology has been at the forefront of energy storage planning, engineering, testing, and commissioning. The experience gained from working with utilities and developers in the USA, Europe, and South America has honed the skills of our consultants.

Quanta also has developed a leading software tool to help our consultants to produce consistent results productively. Energy Storage Planning Tool (ESPT) enables a planner to site size, cost estimate, stack revenues, and perform techno-economic analysis.

Robust Solutions

Quanta’s experience ensures that the best solutions are determined for any application. Energy storage and NWA solutions are increasingly competitive but by far are not a replacement to conventional solutions all the time. Our experience and tools help our customers to screen opportunities and deep dive into the valid ones.



About Quanta Technology

Quanta Technology is an independent technology, consulting, and testing company providing business and technical expertise, along with advanced methodologies and processes, to utilities and others in the power and energy industries. Our mission is to provide unparalleled value to our clients in every engagement across the value chain by using advanced software and hardware, laboratories, and custom tools for a holistic approach to practical service and the most insightful thought leadership in the industry.

For Additional Information Contact:

Northeast (USA) and Québec
Mike Longrie: MLongrie@Quanta-Technology.com

South/Southeast (USA) and Ontario
Diana Prkacin: DPrkacin@Quanta-Technology.com

Central (USA and Canada)
Evan Estes: EEstes@Quanta-Technology.com

West (USA and Canada)
Reza Nasri: RNasri@Quanta-Technology.com

International (outside USA and Canada)
David Elizondo: DELizondo@Quanta-Technology.com

Smart Solutions Practical Results

All product and company names are trademarks™ or registered® trademarks of their respective holders. Use of them does not imply any affiliation with or endorsement by them.



**QUANTA
TECHNOLOGY**