



End-to-End Battery Energy Storage Services

Black & Veatch is at the forefront of the rapidly evolving energy storage market. Our services span the project's complete life cycle, from planning and development to installation and grid integration. We support our Clients with everything from project feasibility and conceptual design services to Owner's Engineer and turnkey Engineering, Procurement and Construction (EPC) delivery.



Lake Placid Solar Project (45MW)
in Highlands County, Florida.
Client - Duke Energy Corporation

Full Services, Life-Cycle Solutions

Black & Veatch offers a comprehensive set of services that span the life of an energy storage project. From development to construction, our service offerings encompass a wide array of emerging energy storage solutions, including hybrid concepts for renewable generation with storage.



Plan & Develop

Project success is dependent on a thorough strategy. With the ability to analyze markets, perform technical and financial evaluations, identify viable project sites, and complete detailed feasibility studies, Black & Veatch provides the inputs needed for clients to make informed decisions.

Planning Stage Offerings

- Market Assessment & Analysis
- Program Strategy Development
- Prospecting/Site Identification
- Feasibility Assessment

Development Stage Offerings

- Project Development Management
- Facility Conceptualization

- Land Acquisition
- Resource Assessment
- Environmental Studies
- Engineering Studies
- Permitting
- Project Cost / Scheduling Estimating
- Interconnection Application
- Financing/Capitalization Evaluation
- OFE Procurement Support
- Execution Contracting Support

Execute

Once projects reach the execution stage, ensuring the project stays on budget and schedule becomes a priority. With more than 4,000 engineering, construction, and procurement professionals in our worldwide Power organization and our extensive OE and EPC experience, we can provide experienced professionals to support a project in any role, anywhere in the world. In addition to experienced BESS professionals, we have teams with renewable generation, substation and transmission experience to support the entire scope of a typical project.

Execution Stage Offerings

- Market Assessment & Analysis
- Program Strategy Development
- Program/Portfolio Execution Management
- Design Reviews
- Procurement Support
- Construction Management/Support
- Site Surveying & Investigation
- Electrical Studies & Design
- Site/Civil Studies & Design
- Structural/Foundations Studies & Design
- Commissioning
- Operator Training

Operate

Our life-cycle approach maximizes “after market” operations. Black & Veatch professionals help identify performance indicators, conduct tests and monitor operations. We develop tools clients can use to confidently manage assets for top performance and the highest financial reward. Additionally, we provide performance assessment services which can protect you from underperforming assets and mitigate issues before they begin to affect your ROI.

Operation Stage Offerings

- Warranty Management
- Preventative Maintenance
- Major Corrective Maintenance
- Predictive Maintenance
- Long Term Service Agreements
- Performance Improvement
- Remaining Life Assessment
- Asset Disposition Studies
- Decommissioning or Decommissioning Support



Dania Beach Black Start BESS
(11 MWhs) in Dania Beach, Florida.
Client - Florida Power & Light

Project Experience

With advanced engineering experience and deep knowledge of diverse power generation and distribution systems, our experts can confidently answer important questions about viability, optimal technologies, safety, maintenance, profitability and more.

20+ GWhs

of BESS project experience, globally

12+ GWhs

of owner's engineer/studies

170+ MWhs

of BESS engineering experience

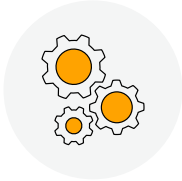
200+ MWhs

of BESS EPC/construction experience

600+ MWhs

of aggregate energy storage capacity for microgrids installed

Excellence in Energy Storage



Technologies

- Lithium Ion Battery
- Flow Battery
- Flywheel
- Green Hydrogen
- Thermal
- Liquid Air
- Pumped Hydro
- Novel Storage Products



Designing for Safety and Efficient Operation

- Liquid-cooled modules for efficiency and safety and warranty adherence
- Enclosure with exterior-only access
- Early Warning prevention: system shutdown
- Fire suppression and/or enclosure ventilation
- Dry-pipe connection for interior water deluge
- Deflagration panel for relieving internal pressure
- Auxiliary power source redundancies to maintain operations



Interconnects

- Completed renewable integration projects in **9/10 U.S. Electric Power Markets**
- **40+ interconnection projects** with renewable generation since 2016

Storage Use Cases

The Black & Veatch engineered energy storage solution focuses on critical battery parameters while addressing client specific needs applications and use cases.

- Rated Power and Energy (duration of power)
- Equipment Life, as affected by Cycling and throughput Time spent at a state of charge
- Round-trip-efficiency at the interconnection
- Use cases highly dependent on client Utility vs Developer Generation vs Wires Rate-based vs Merchant

