Designing balance-of-system solutions

Battery energy storage

Battery energy storage holds tremendous potential. As it offsets the intermittency of renewable energy technologies, such as solar and wind, it allows decarbonized economies to edge closer to reality. Energy storage also can help balance supply and demand within the grid, while helping to deliver power to remote areas. However, there are challenges. While the cost of utility-scale, lithium-ion battery storage continues to decline, developing a long-term, cost-effective system is essential. WSP USA can help. We provide detailed engineering and engineer-of-record services for battery energy storage projects at the transmission and distribution levels, as well as integration with renewable energy facilities.

WSP has the experience and multidisciplinary technical expertise to guide you from project inception to completion. Our team includes licensed civil, structural and electrical engineers across the U.S. to support development and construction of projects in any location.

OUR SERVICES

WSP's integrated technical and consulting services include:

- Detailed design and engineer-of-record services covering civil, structural and electrical systems
- Site-specific civil engineering design services, including grading, drainage and hydrology, erosion control, access, and storm-water pollution prevention plans
- Detailed simulations, modeling and optimization of equipment, equipment sizing and configuration
- Systems integrations and grid-impact studies
- Supervisory control and data acquisition used for detailed designs and specifications
- Preliminary design, value engineering, and evaluation of vendors and technologies to optimize project designs
- Project operations and maintenance and system augmentation strategies
- Feasibility studies and levelized cost-of-storage assessments
- Evaluations of incentives, market mechanisms and revenue streams to help maximize project profitability
- Factory acceptance test witnessing and manufacturing quality assessment testing
- Network and protection designs incorporating innovative technologies

- Technical specifications and proposal evaluations to support the procurement of battery energy storage system (BESS) equipment
- Integration of BESS with new and/or existing wind and solar farms
- Technical support to original equipment manufacturers with U.S. codes and standards compliance and product certifications

OUR WORK

Texas waves battery energy storage Sweetwater, Texas

WSP served as balance-of-plant design engineer, providing civil, structural and electrical plans and studies for 2 x 9.9 MWac/4.5 MWh projects located at existing wind farms. The projects used LG Chem battery cells and system, mess and anlagentechnik inverters, enabling the owner to sell ancillary services in the Electric Reliability Council of Texas, fast-response market.

Battery energy storage system Moss Landing, California

The WSP team supported an engineering-procurement-construction (EPC) contractor with preliminary (30%) design engineering for the EPC RFP response for the Moss Landing Energy Storage System. A 300 MW/1200 MWh BESS in California, this is among the largest BESS initiatives to date.

Edwards and Sanborn PV/BESS Kern County, California

WSP is serving as the 3rd party engineer for the EPC team staff to deliver the largest solar+battery project in the world (as of June 2021).

Our role includes:

- Design coordination
- Submittal reviews
- Interconnection coordination
- Commissioning support

This massive project includes:

- 1118 MW solar
- 2165 MWh of BESS
- 2.5 million solar modules
- 110,000 lithium-ion battery modules

Broad View Energy Center Billings, Montana

WSP developed a conceptual-level 10% design plan set and single line diagrams for this integrated renewable energy complex that includes:

- 710 MWAC solar generation (4 projects)
- 250 MW wind energy generation
- 500 MW / 2000 MWh BESS
- Alternating current and direct current coupled energy storage
- Multi points of interconnection for integrated system

WSP developed energy yield, CapEx and OpEx estimates for each component of the integrated system.

ABOUT WSP

WSP USA is the U.S. operating company of WSP, one of the world's leading engineering, environment and professional services firms. Recognized on Fast Company's Brands that Matter List for 2022 as a top Community-Minded Business, WSP USA brings together engineers, planners, technical experts, strategic advisors and construction management professionals who are dedicated to collaborate in the best interests of serving local communities. WSP USA designs lasting solutions in the buildings, transportation, energy, water and environment markets. With more than 15,500 employees in 300 offices across the U.S., WSP partners with its clients to help communities prosper.

CONTACT US

For more information about how we can help you deliver your next project, contact:

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