NEXT GENERATION ENERGY STORAGE SOLUTIONS

AHEAD OF THE INDUSTRY BEHIND THE METER
The demand for energy storage is surging—behind-the-meter deployments tripled from 2.1 megawatts (MW) in 2013 to 6.4 MW in 2014, with forecasts predicting that 220 MW of energy storage will be installed in 2015 (GTM Research and Energy Storage Association, 2015). This next generation of energy management requires an ecosystem of partners with specialized experience in batteries, energy-management software, communications systems and site design and installation. Black & Veatch is a market leader in engineering and installation of energy storage systems, positioning us in front as a valuable partner behind the meter.

PrIMED FOR ENERGY STORAGE MARKET GROWTH
Our leadership in energy storage spans 30 years and includes extensive experience in the specification, design, and construction of behind-the-meter energy storage systems. We have been actively involved in utility-scale energy storage projects for over 10 years and have relationships with most storage technology OEMs, power conversion system vendors and system integrators.

We know the value of collaboration in emerging technology markets and develop partnerships with behind-the-meter energy storage leaders, as our energy storage projects demonstrate. Black & Veatch worked alongside:

- Tesla to install more than 24MW of behind-the-meter stationary capacity at more than 20 commercial and industrial facilities in support of their energy storage initiative.
- Advanced Microgrid Solutions on behalf of Southern California Edison to design and install 10MW of energy storage in Orange County, California.
- Coda Energy to install energy storage systems at commercial sites in California.
- Data centers and high-reliability facility clients to provide energy storage systems, including microgrid and solar photovoltaic (PV) integration.
- AES Energy Storage to deploy numerous utility-scale energy storage facilities worldwide.
OVER THREE DECADES OF ENERGY STORAGE EXPERIENCE
FOR 30+ YEARS, BLACK & VEATCH HAS PROVIDED END-TO-END ENERGY STORAGE EXPERTISE ON BOTH SIDES OF THE METER TO MAXIMIZE ENERGY EFFICIENCY AND RESILIENCY.
SPECIALIZED EXPERIENCE CALIBRATED TO EACH PROJECT
We are one of the most diversified contractors in the industry and offer nationwide access to a full-suite of engineering, procurement and construction (EPC) services. With comprehensive experience in distributed infrastructure, power generation, communications, renewable energy infrastructure and energy storage modeling, Black & Veatch can pilot all phases of energy storage installation – from site selection and preparation to permitting, installation design and connection. We are experts in multiple, concurrent distributed infrastructure programs, which affords us first-hand knowledge of utility design requirements, standardized site designs, site aggregation, and electrical equipment and building primary power system interfaces. As this industry thrives, clients need a partner who can match demand site-to-site, state-to-state. With nearly 11,000 professionals and locations worldwide, we can scale to any project scope, calibrating staff and skillset to meet client rollout.

ENERGY STORAGE ADVANCED MODELING SUITE
Black & Veatch modeling and analytic capabilities provide additional value to energy storage system planning, deployment and operations. Black & Veatch’s modeling suite includes our detailed performance model, SmartES; our economic tool; regulation modeling; and transmission and distribution planning. This suite delivers high-resolution analysis of the entire energy storage system to:
- Determine optimal system sizing
- Conduct lifecycle analysis
- Calculate payback time, return on investment (ROI) and cost-benefit analysis per option
- Calculate regulation requirements to maintain reliability
- Inform energy storage interconnection and ramping studies

Black & Veatch offers additional planning and operational analytic solutions through our ASSET360™ Smart Analytics platform, providing value throughout the lifecycle of infrastructure-based solutions.
Our SmartES model aggregates multiple energy storage applications to find optimum energy storage solutions that meet operational objectives:

- Ramp rate control
- Capacity firming
- Electrical energy time-shift
- Peak load shaving
- Frequency regulation

RENEWABLE ENERGY PLUS STORAGE SURGE

As distributed wind and solar energy continue to gain traction in the energy market, Black & Veatch leverages our extensive power generation and renewable energy experience to integrate numerous energy sources seamlessly into energy storage systems to optimize reliable, stand-alone power. In the electric vehicle (EV) market, Black & Veatch creates synergy between solar, EV and energy storage to improve the economics of EV charging, reduce grid impact, and accelerate sustainability goals.

Black & Veatch integrated three types of solar panels into their microgrid system, which powers the innovation pavilion of their World Headquarters in Kansas City. This microgrid is a living laboratory that allows them to test performance scenarios in PV, battery storage and microgrid technologies, and pass those insights onto our clients for data-proven decision-making in this emerging market. Black & Veatch is well-versed in microgrid design and integration and can lead all phases of microgrid development, from site assessment and project planning to design, construction and performance testing. More than 250 Black & Veatch professionals have experience with renewables projects, spanning virtually all technologies (wind, solar thermal, solar PV, biomass, hydro, geothermal, landfill gas, marine, and others).
BLACK & VEATCH CONSTRUCTED A MICROGRID WITH PV AND ENERGY STORAGE AT ITS WORLD HEADQUARTERS IN OVERLAND PARK, KANSAS, TO TEST AND DEMONSTRATE EMERGING TECHNOLOGIES TO CLIENTS.

SYNERGY BETWEEN ELECTRIC VEHICLES, SOLAR POWER GENERATION AND ENERGY STORAGE BOOSTS GRID RESILIENCE AND IMPROVES THE ECONOMICS OF CAR CHARGING.
Black & Veatch offers a full range of energy storage-related services including:

- Feasibility studies
- Electrical studies
- RFP development/response support
- Conceptual and detailed design for balance of plant
- Interconnection design and coordination with utility
- Independent engineering and ROI analysis

Black & Veatch is committed to advancing the energy storage industry to promote efficient, sustainable energy supply and balanced grid operations. Contact us to help you envision, plan and realize your energy storage goals. Visit bv.com/sii or follow us on Twitter @BVSII to learn more.
BUILDING A WORLD OF DIFFERENCE®

Black & Veatch is an employee-owned, global leader in building critical human infrastructure in Energy, Water, Telecommunications and Government Services. Since 1915, we have helped our clients improve the lives of people in over 100 countries through consulting, engineering, construction, operations and program management. Our revenues in 2014 were US $3 billion. Follow us on www.bv.com and in social media.

MARYLINE DAVIAUD LEWETT | BUSINESS DEVELOPMENT MANAGER, SMART INTEGRATED INFRASTRUCTURE (SII)
P +1 913-458-48731 | E LewettMD@bv.com

PAUL STITH | SOLUTION LEAD, SMART INTEGRATED INFRASTRUCTURE (SII)
P +1 913-458-8747 | E StithP@bv.com