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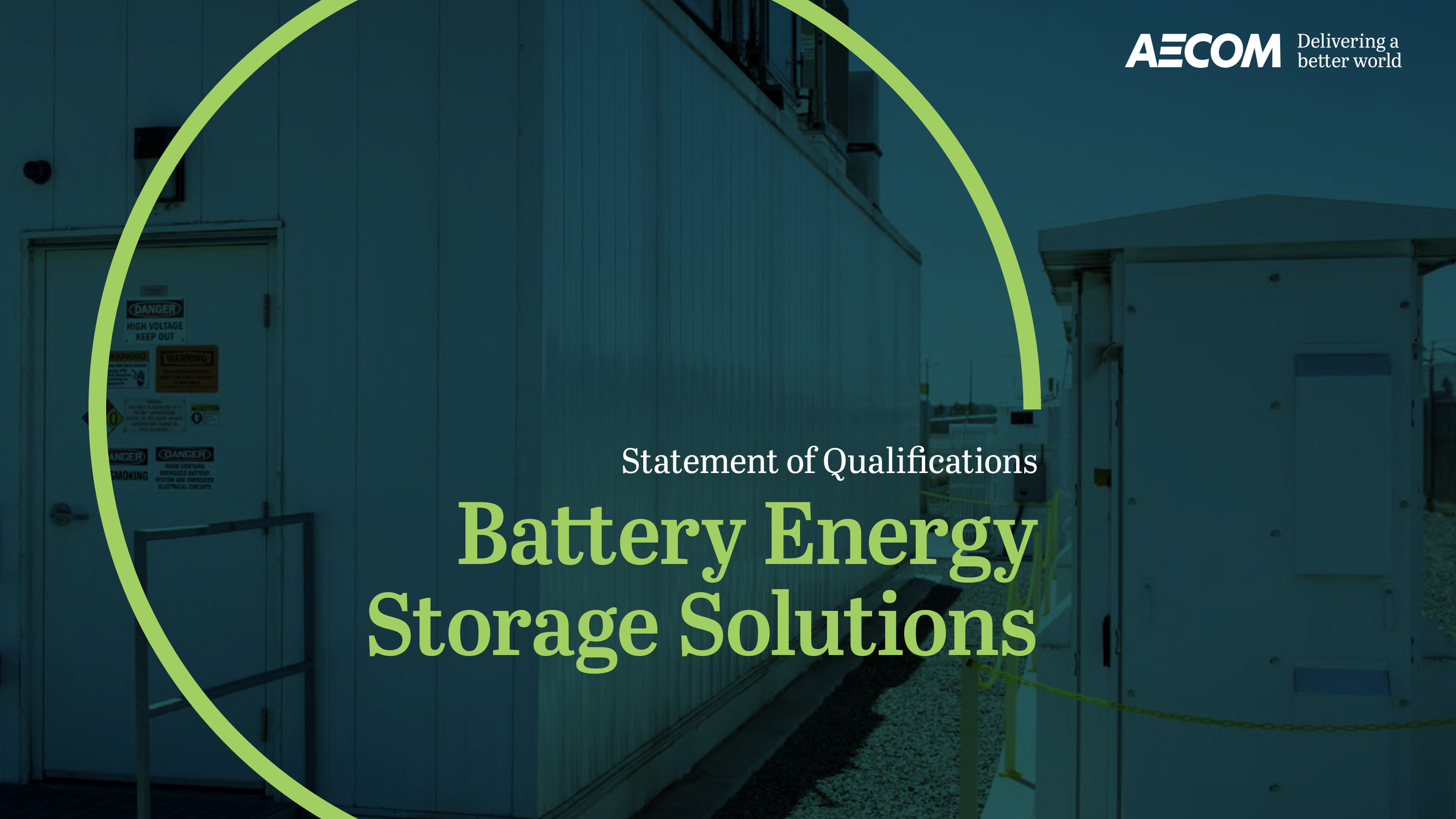
Statement of Qualifications

Battery Energy Storage Solutions



Pomerado Battery Energy Storage System

AECOM is providing all of the preliminary and detailed engineering for two 3 MW co-located battery energy storage projects, which is in an ideal commercial location to deliver supplemental power to San Diego.

Client
Enel Green Power North America

Location
Poway, California

Completion Date
Project was canceled by Enel in 2020

Project Overview
Enel is currently developing a 6 MW / 24 MWh lithium ion battery energy storage project in Poway, California with an anticipated commercial operation in Q4 2019. The proposed project will be two separate Battery Energy Storage Systems, 3 MW (12 MWh) co-located on one parcel of land. The client holds an option to lease on a privately owned 0.86-acre parcel that is located in a commercial area. This project executed a power purchase tolling agreement with the utility, San Diego Gas and Electric (SDG&E) in March 2017.

The project must maintain the energy rating for a 20-year useful life. Interconnection into the grid will be at the 12 kV line underground on the site with both systems interconnecting into existing SDG&E circuits. SDG&E operates the Pomerado Substation just a block away from the BESS project site.

AECOM is providing all of the preliminary and detailed engineering for the project. The project is currently pending development approval with the City of Poway. Once the approval is granted, AECOM will proceed with the detailed engineering design.

Client Benefits
- Strategically located within one block of the SDG&E substation in a commercial area in the City of Poway
- Only the second BESS project in San Diego
- Commercial operation expected in Q4 of 2019This was a truly collaborative effort, with the client and AECOM PMs jointly managing the project risk register.

Gas Turbine and Battery Energy Storage System Hybrid Projects

> "AECOM truly looked out for the client's best interest, which in my experience is quite rare. The engineering staff was skilled, professional, and completed assigned tasks in a very timely manner."
>
> *Matthew Zents, Senior Project Manager, Southern California Edison*

AECOM served as the owner's representative and provided on-site construction and project management along with commissioning and operations support of hybrid storage systems at two peaker plants for Southern California Edison.

Client
Southern California Edison (SCE)

Location
Cucamonga and Norwalk, California

Completion Date
2016

Project Overview
Installed in 2017 at the Grapeland and Center Peaker Plants, each storage system has a capacity of 10 MW. AECOM successfully managed the 5-month installation, delivering both on time and on budget in late 2016.

Both projects met all CAISO and California Public Utilities Commission (CPUC) requirements, deadlines, and acceptance criteria. What sets this project apart is the synergy of combining the battery's ability to immediately respond to the grid's needs with the flexibility of a quick-start, fast-ramping gas turbine (50 MW). The new system provides value in the existing peaker plants by making the hybrid electric gas turbine instantaneously available 24/7, providing grid frequency control and spinning reserves even when the gas turbine is off line.

If greater loads are required, the system's battery will provide power long enough for the gas turbine to start and reach a specific power output, eliminating the need for fuel and water consumption in standby mode. This configuration allows SCE to reduce operating cost and maintain flexibility in balancing demand and variable production from renewable energy resources.

Client Benefits
- **SAFETY:** Worked more than 50,000 safe work hours with zero recordable incidents; zero days away, restrictions and transfers (dart) incidents, and zero lost-time incidents.
- **QUALITY:** Zero non-conformance issues during the construction phase.
- **SCHEDULE:** Completed engineering, procurement, construction, commissioning, and start-up in less than five months from initial kick-off meeting to completion of successful performance testing and acceptance by CAISO. Met CPUC deadline of commercial operation prior to December 31, 2016.
- **COST:** BESS completed below budget.

Cascade Battery Energy Storage System

25MW of Battery Energy Storage in an ideal location to deliver power to Pacific Gas and Electric's Weber substation.

Client
Enel Green Power North America/ Broad Reach Power

Location
Stockton, California

Completion Date
Expected 2022

Project Overview

Initially developed by Enel Green Power North America and sold to Broad Reach Power, this project consists of a 25MW/100 MWh lithium ion battery energy storage project in Stockton, California on a 2 acre portion of a parcel conveniently located next to Pacific Gas and Electric's (PG&E) Weber substation, with an anticipated commercial operation of 2022. This project executed a power purchase tolling agreement with PG&E.

The project must maintain the energy rating for a 20 year useful life. Interconnection into the grid will be stepped up to 60 kV through the on-site project substation through an overhead line into the PG&E Weber substation located next door.

AECOM is providing all of the preliminary and detailed engineering for the project. The project planning design will be submitted to San Joaquin County in early November. Once the approval is granted, AECOM will proceed with the detailed engineering and construction design.

Client Benefits

- Strategically located next to the PG&E substation in a light agricultural area in the County.
- One of the largest BESS projects in the country with 100 MWh capability
- Commercial operation expected in 2022

Beacon 250 MW Solar Plant and 20 MW BESS Project

AECOM's coordination with contractors included the development and maintenance of master project schedule, project documentation, budgeting, and coordination of in-house engineering and construction groups, and providing QA/QC of the solar plant construction on behalf of LADWP. The Beacon BESS project was installed adjacent to the Beacon Solar Substation.

Client
Los Angeles Department of Water and Power (LADWP)

Location
Kern County, California

Completion Date
2018

Project Overview

LADWP's Power System Engineering Division (PSED), Major Project Section, managed the overall 250 MW Beacon Solar Plant project and coordinated the in-house design engineering and construction activities and delivery of solar power facilities to be designed, constructed, and operated by third-party contracted generating station in California. This project will provide increased electricity capacity and support the stability of the local grid at a strategic location, near the western terminus of the service territory. Electricity dispatched solar developers. This project was a unique blend of in-house infrastructure buildout by LADWP and the individual solar fields designed and constructed by the third-party solar developers.

This project entailed having AECOM senior construction managers on-site during all construction activities. Additionally, AECOM also provided all of the environmental construction compliance monitoring on behalf of LADWP under an on-call environmental contract with LADWP.

The Beacon Solar Plant was a high-priority project, being an essential part of LADWP's 50% Renewable Portfolio Standard (RPS). The professional services delivered through this task order are assisting LADWP in successfully meeting the overall project goals.

20 MW BESS Capacity

The BESS, installed adjacent to the Beacon Solar Substation, provides voltage support and reactive power adjustments at the 230kV transmission line to help mitigate voltage rise and voltage drop occurring due to the wide variability in energy production and load during a typical day. The BESS also maintains and meets North American Electric Reliability Corporation (NERC) and Federal Energy Regulatory Commission (FERC) alternating current frequency specifications within allowable tolerances as a Balancing Authority (BA).

Battery Energy Storage System under Energy Savings Contract at Fort Carson, Colorado

AECOM served as the turnkey contractor for the BESS under an energy savings performance contract for the U.S. Army at Fort Carson.

Client
U.S. Army Engineering and Support Center, Huntsville

Location
Colorado Springs, Colorado

Completion Date
2018

Project Overview
Fort Carson is a major U.S. Army training facility and leader in energy management. As this is the installation's fifth ESPC, AECOM's efforts to achieve deep energy savings were challenging. The installation has an extremely low energy rate (4.4 cents/kilowatt-hour [kWh] on peak), and almost all of the "easy" energy saving strategies were implemented as part of previous ESPC efforts.

Ultimately, Fort Carson decided on a mix of traditional energy conservation measures — such as lighting and heating, ventilation and air conditioning (HVAC) improvements — combined with advanced strategies — such as smart energy management control systems (EMCS) and a BESS that manages electrical demand charges.

Project Specifications
- 14 Lockheed Martin Grid Star Lithium Energy Storage Units
- 4.2MW/8.5MWh of energy
- 300kW PCS per ESU

Client Benefits
Despite previously implementing four previous ESPCs, the overall impact of AECOM's ESPC program is:

- Approximately $530,000 in annual savings with a 15-year payback
- Improved resiliency to more effectively meet mission requirements

Savings from the BESS will be achieved by charging the system during off-peak periods for discharge during peak demand. The BESS will also produce time-of-use savings by providing demand response, time-of-use shifting, solar-firming, frequency and voltage support and microgrid support, with the BESS eventually connected to the installation's solar assets.

The combination of energy conservation measures at Fort Carson will achieve a deep energy retrofit, with an aggregate energy savings of 36 percent across the project's 49 buildings (non-weighted).

This strategy is getting a lot of attention from U.S. Army leaders at all levels for its groundbreaking approach, a first-of-its-kind for an ESPC at a federal facility. In addition to impressive cost savings, the BESS provides Fort Carson a new asset to bolster resiliency. Having the ability to store 8 MWh of energy for use during times of emergency is a tremendous bonus.

Work Performed
To help Fort Carson reduce its energy costs and improve resiliency, this ESPC includes:

- Upgrading building controls and employing energy efficient, occupancy-based control strategies to reduce energy usage and minimize operating costs at 49 facilities. This work includes replacing obsolete building controllers and JAVA Application Control Engines with new units that adhere to current DoD cybersecurity and Risk Management Framework requirements.
- Upgrading interior lighting to high efficiency light emitting diodes (LED) to improve light quality, reduce energy usage, and reduce operation and maintenance costs. The retrofit will address 2,889 interior light fixtures, including linear LED tube retrofits and high-bay fixture replacements.
- Converting air handling units equipped with inlet guide vanes to variable speed operation by installing variable frequency drives that reduce energy consumption and minimize operating costs.
- Converting constant volume hydronic pumping systems to variable flow operation to reduce pumping energy and electrical cost.
- Installing and implementing a BESS to reduce electrical demand charges.

Energy Conservation Measures
- Energy Conservation Measures:
- Lighting upgrades
- HVAC upgrades
- EMCS upgrades
- BESS

Design and Permitting for Battery Energy Storage System

AECOM's design facilitated grid reliability and reduced GHG emissions by making power available during off peak time, while our permitting work ensured timely review and approval, community understanding of potential risks and public safety measures, and minimal noise and aesthetic disruption to the community.

Client
Confidential

Location
Santa Barbara, California

Completion Date
Ongong

Project Overview

The client proposed to install two modular battery units with an approximate combined capacity of 500 kW on the site of an existing generating station in California. This project will provide increased electricity capacity and support the stability of the local grid at a strategic location, near the western terminus of the service territory. Electricity dispatched from the battery storage system will supplement the existing peaking capacity available to the CAISO system.

Project components included two modular battery units each measuring 40 feet long, 8 feet wide, and 9.5 feet high (similar in size and appearance to a typical truck trailer cargo container). The battery storage system used Li-ion technologies. A power conversion system, transformers, and other auxiliary electrical equipment connected the battery storage system to the existing SCE 16 kVA power distribution system.

AECOM was responsible for both project design and permitting. The agency application package included project design details and technical studies to address key issues based on the project's location in an urbanized area (public safety, noise, aesthetics, and existing hazardous conditions) as well as biological resources, cultural resources and other topics. A comprehensive environmental document was prepared to support the application process, including a detailed discussion of potential safety-related issues and safety measures based on current industry practices and evolving industry design standards. This is the first project of its kind in Santa Barbara County.

Client Benefits

Our team's permitting work ensured timely review and approval, community understanding of potential risks and public safety measures, and minimal noise and aesthetic disruption to the community.

About AECOM

AECOM (NYSE: ACM) is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy, and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical expertise and innovation, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a Fortune 500 firm and its Professional Services business had revenue of $13.3 billion in fiscal year 2021.

See how we are delivering sustainable legacies for generations to come at aecom.com and @AECOM.

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