AECOM

STATEMENT OF QUALIFICATIONS

Renewable Energy

Learn More

Delivering a better world

Overview

AECOM designs, builds, finances, operates and manages projects and programs that unlock opportunities, protect our environment and improve people's lives.

As an integrated global network, AECOM works with clients, communities, and colleagues to develop and implement innovative and cost-effective solutions to the world's most complex challenges.

Meeting these challenges requires a fully integrated engineering and construction services organization with the capabilities to support the entire project in a holistic manner – from inception through construction and operations and maintenance (O&M), to decommissioning and closure.

AECOM is that company. Using our worldwide network, we deliver the full range of planning, permitting, engineering, environmental and design services across markets.

Our integrated approach connects global expertise with local perspectives, bringing together the right disciplines and resources to deliver innovative solutions that do more for clients and communities.

Powering Energy

Delivery methods, project life cycle, and relevant services

AECOM's combination of global experience and integrated technical capabilities deliver strategic solutions that improve and modernize infrastructure, enhance sustainability and resiliency, and benefit the community.

AECOM has engineered and/or constructed more than 280,000 MW of electricity worldwide – equivalent to approximately one fourth of the generating power in the U.S. today.

We provide clients a single source for multidisciplinary engineering, environmental and management services. From international and domestic market analysis, to siting and permitting, through final project development and execution, we develop, design and construct projects that enhance infrastructure, reduce energy and water consumption, and generate traditional and renewable power.

Our understanding of the big picture – such as the interconnection between generation, transmission, storage, grid improvements, conservation and efficiency – allows us to deliver a holistic energy strategy tailored specifically to our clients' needs.

Through our network of engineers, scientists, planners and construction specialists, we provide our clients with technology neutrality, a track record of innovation, proven tools and processes, and current industry knowledge.

While our experience with renewable and alternative energies includes everything from biomass and geothermal, to solar, wind, and hydroelectric generating systems, the following sections of this document focus on our qualifications and experience delivering a wide range of wind, solar and energy projects across the U.S. and Canada.

Why Choose AECOM

Global Experience, Local Expertise

With 56,000 employees around the world, including nearly 40,000 in North America, AECOM supports such clients as the Long Island Power Authority, Public Service Electric & Gas Company, Noble Wind Farms, Pattern Energy, Hydro-Québec, New York Power Authority, Los Angeles Department of Water and Power, BC Hydro, National Grid, Florida Power and Light (NextEra), SaskPower, Southern Power Company, U.S. Department of Energy, U.S. Army Corps of Engineers, all branches of the U.S. military, and many other similar agencies, firms and municipalities.

Our integrated services framework achieves speed-to-market by bringing together a unique combination of engineers, planners, scientists, project managers, and support staff.

We provide clients with energy analysis and planning, siting and due diligence, environmental permitting and compliance, public outreach, conceptual design, detailed design, engineering, procurement, project management, construction management, and asset management.

In-house planning and environmental teams, engineers, scientists, geographic information system (GIS) and computer-aided design (CAD) staff, planners, regulatory specialists, publications specialists, and community relations staff provide superior technical skills and detailed knowledge of the current regulatory environment.

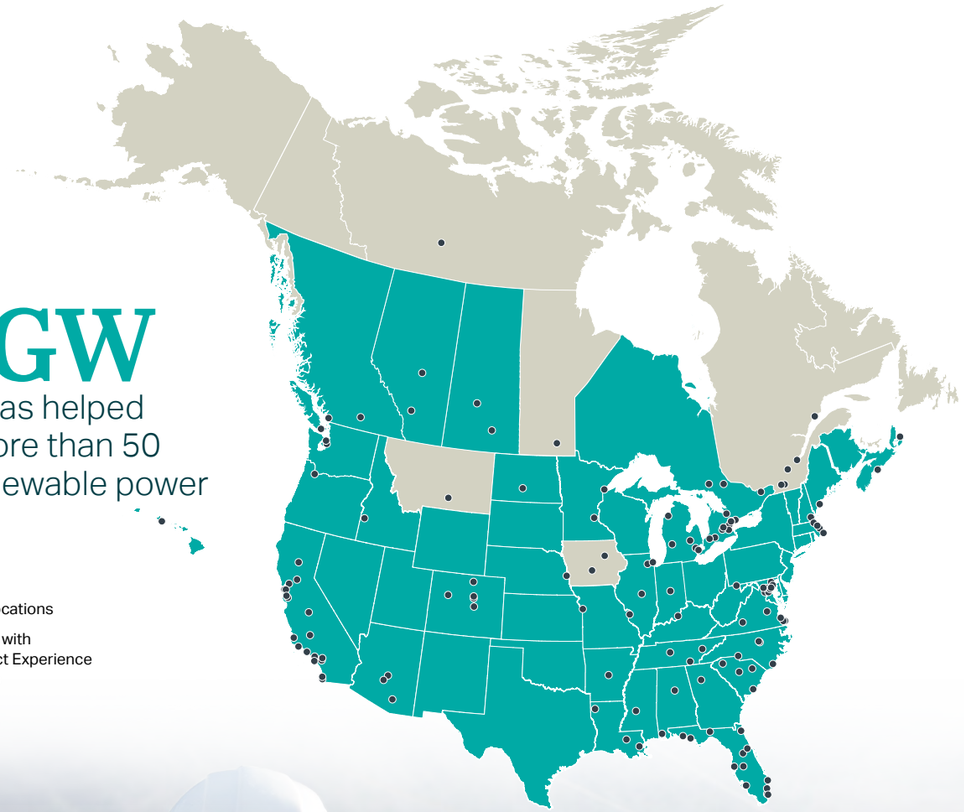
Our project scheduling, estimating, cost control, document control, risk management, compliance management, forecasting, asset management and owner's engineering services keep projects on schedule and on budget.

We also help developers and end users evaluate renewable energy options, navigate regulatory environments and implement strategies for large utility scale projects to the building level. By offering a variety of delivery options, AECOM can match each project to your specific needs.

MORE

50 GW

AECOM has helped deliver more than 50 GW of renewable power globally.



- AECOM Office Locations
- States/Provinces with Renewable Project Experience in the last 5 years

Our Customized Approach

Understanding each client's unique conditions and project requirements is central to identifying the most appropriate approach for project delivery.

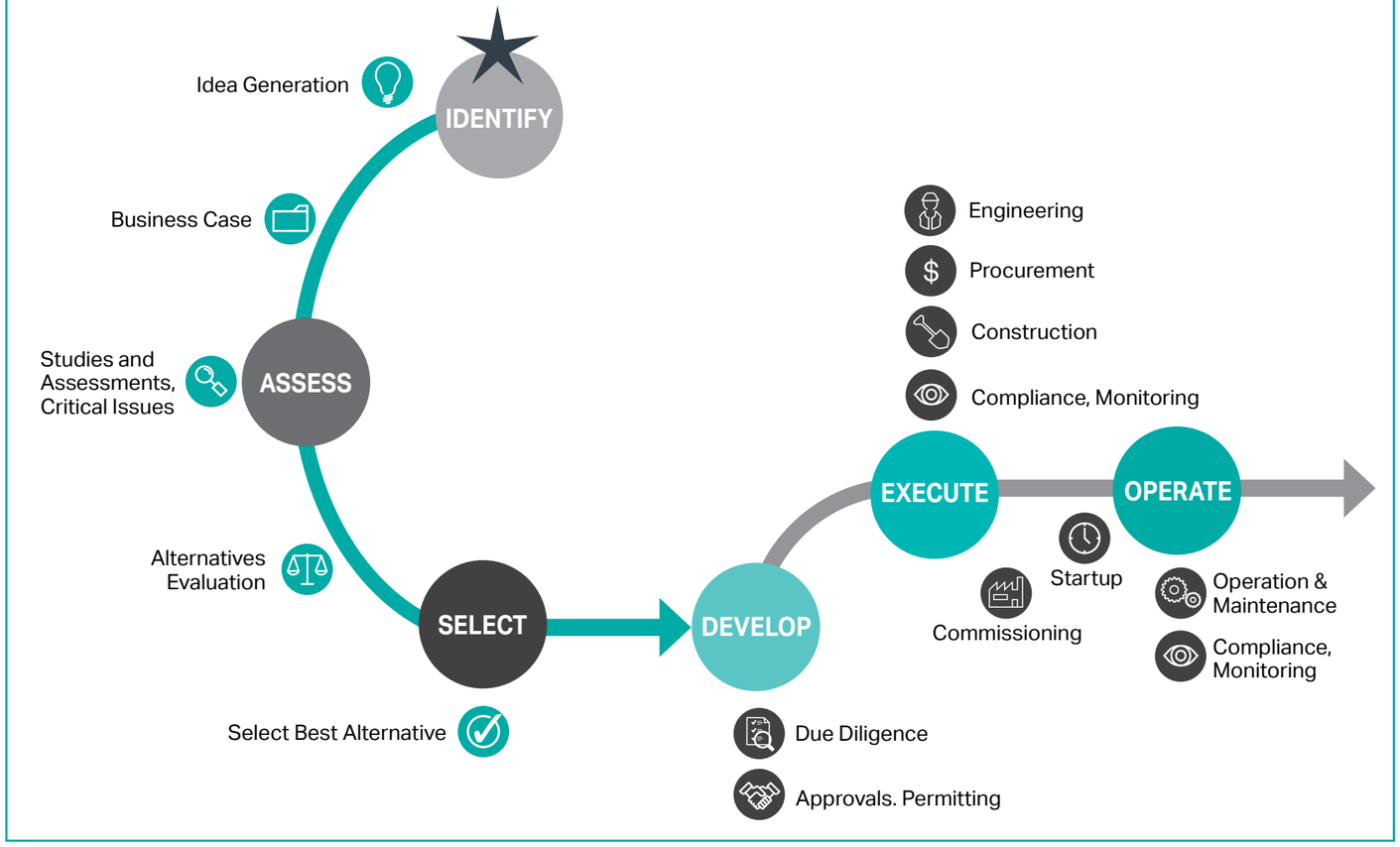
Whether it is overcoming a financing hurdle, guaranteeing cost, reducing risk or finding efficiencies, there are many reasons to look to alternative delivery methods.

Each approach has its own advantages and drawbacks, so we explore all the options to find the methods that best fit an owner's objectives, timelines and constraints.

When it comes to alternative delivery, no one has more experience around the world in more markets than AECOM. From public-private partnerships (P3) and design-build (D-B), to integrated project delivery and construction management-at-risk, AECOM can help find the most suitable approach for your needs.

MORE

A customized approach to project delivery, with comprehensive support from idea to operation



"Our staff was impressed with the quality of the work and how AECOM has gone beyond what is expected. AECOM performed at a very high level of professionalism, and I'm very impressed with their troubleshooting, communications, organization and planning of all aspects of the project."

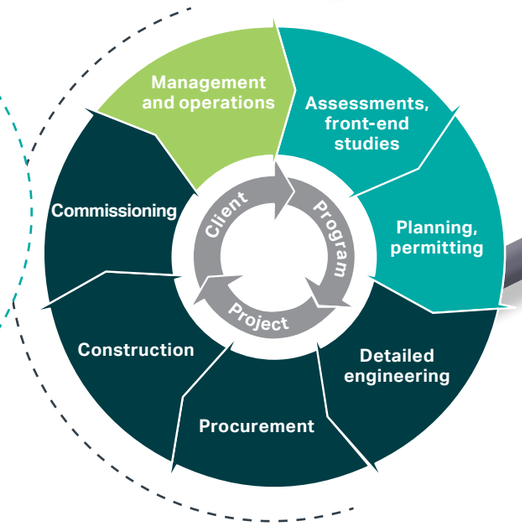
U.S. Navy's Space and Navy Warfare Systems Command Systems Center Pacific (NAVWAR), Performance Evaluation

Comprehensive Project Delivery

Using integrated project management and technical resources, AECOM plans, develops, and executes environmental review and permitting, engineering design, procurement, construction, and commissioning for energy projects around the world.

MORE

AECOM also provides a variety of alternative delivery approaches to match the needs of each project and client.



1 ASSESSMENTS AND FRONT-END STUDIES

- Site selection, siting studies
- Conceptual design, system sizing
- Grid interconnections
- Risk and critical issues analysis
- Feasibility studies
- Alternatives evaluations
- Social impact assessments
- Financial models
- Economic benefit assessments
- Efficiency improvements
- Energy performance modeling

2 PLANNING AND PERMITTING

- Project/resource planning
- Life cycle analysis
- Risk and hazard assessments
- Baseline environmental surveys
- Resource studies and assessments
- Environmental compliance
- Public/stakeholder outreach
- Equipment selection, sizing and specifications
- Preliminary design
- Utility requirements

3 DETAILED ENGINEERING

- Civil, electrical, environmental, geotechnical and structural engineering
- Construction/as-built drawings
- Instrumentation, controls, electrical collection and Supervisory Control and Data Acquisition (SCADA)
- Substation/grid connection

4 PROCUREMENT

- Commercial terms and conditions
- Bid package preparation
- Contractor pre-qualification
- Bid solicitation and analysis
- Pre-bid meetings
- Purchasing and expediting
- On-site and source inspections

5 CONSTRUCTION

- Value engineering
- Constructability review
- Technical reliability and viability review
- Construction management
- D-B services
- Inspection
- Commissioning
- Compliance/monitoring
- Worker awareness training

6 COMMISSIONING

- Testing procedures
- Startup planning
- O&M support
- On-site inspection

7 MANAGEMENT AND OPERATIONS

- Troubleshooting, optimization, consultation
- Site management
- Safety, health and environmental management
- Project reporting and stakeholder management
- Contract management
- Compliance/monitoring

Recognized Technical and Delivery Excellence

With experience that spans more than 90 years and 150 countries, AECOM has conceived, planned and built energy projects of every type and size.

A single source for multidisciplinary engineering, environmental and management services, AECOM's combination of global experience and technical capabilities allows us to deliver strategic solutions that enhance long-term sustainability and resiliency.

From market analysis, to siting and permitting, through final project development and execution, we develop, design and construct power projects that enhance electrical infrastructure, reduce energy consumption and produce on-site power using traditional and renewable energy sources.

The *Engineering News-Record* (ENR) – the industry's preeminent trade publication – continues to recognize our capabilities, ranking AECOM #2 in its annual list of the Top 500 Design Firms by revenue (2018), with top rankings across most technical and specialty categories.

A Different Kind of Energy Services Company

AECOM's ability to deliver customized energy services is unmatched. We are the only global planning, engineering and construction management firm accredited by the National Association of Energy Service Companies (NAESCO).

With superior technical and management skills, our engineers, scientists, planners and construction specialists provide clients customized solutions based on:

- TECHNOLOGY NEUTRALITY: As an unbiased technology integrator, we do not manufacture equipment; instead, using equipment that best-fits our clients needs.
- INNOVATION: Our technical practice network connects subject matter experts from around the world for innovative solutions to today's most challenging issues.
- PROVEN TOOLS AND PROCESSES: In-house and third-party tools for planning, equipment sizing, design and project management, including safety and quality, deliver efficient and cost-effective project implementation and management.
- DEEP INDUSTRY KNOWLEDGE: Engineers, scientists and technologists are selected for projects based on their in-depth knowledge and expertise in a particular sector and geography to provide excellent service.

Solar Energy Experience

From initial planning to final development and execution, AECOM's integrated services deliver utility-scale to distributed solar power generation systems.

With broad solar experience, proven project controls, and customized delivery options, AECOM knows how to make your solar project a success.

AECOM has been involved in some of North America's largest projects, and we are currently working with many of the world's foremost solar energy developers, manufacturers and leading solar-adopting utilities and government entities on solar power generation facilities.

With over 300 offices spread across North America, we provide local and cost-effective resources wherever the effort is needed.

Local resources are coupled with a strong internal network that connects specialists from around the world to solve our clients' challenges most efficiently.

Environmental planners and scientists provide global knowledge at the local level to facilitate projects through complex siting and permitting efforts.

Experienced staff provide strategic agency and stakeholder guidance to efficiently navigate environmental review processes and minimize compliance and compensatory obligations.

Clients rely on our comprehensive environmental services for biological, cultural, air, soil, noise and water resources, as well as technology-specific evaluations, such as glint-glare analysis and visual simulations.

Along with being a leading environmental service provider for solar projects, AECOM also provides full-service engineering, consulting and construction phase services, acting as owner's engineer or part of an EPC or design-build project team.

VIEW PROJECTS

15 GW

AECOM has helped deliver more than 15 GW of solar power globally.

SOLAR

AECOM's design-build services delivered 1.6 MW of solar generation at schools in the San Diego Unified School District.

LADWP
Cantil, California
AECOM helped deliver 9.75 MW of solar generation for the Los Angles Department of Water and Power.

Environmental Permitting for 18 MW Solar Project

Salem County, New Jersey

AECOM developed the environmental assessment for a nominal 18 MW PV solar project. The Pilesgrove Solar Project is located on 134 acres of agricultural cropland and has more than 77,000 solar panels. Our work included:

- Permit plan
- Township Environmental Impact Statement (EIS)
- Environmental due diligence (Phase 1 ESA)
- Wetlands Letter of Interpretation extension (field work and application to the New Jersey Department of Environmental Protection)
- Expert witness support during Township Planning Board Meetings
- Preliminary assessments related to the New Jersey Flood Hazard Area Control Act and Stormwater Management Rules

Construction Oversight for 150 MW of Solar Assets

Multiple Sites, Minnesota

AECOM was responsible for construction oversight and monitoring for a $290 million, multi-site effort to bring 150 MW of renewable power to mostly rural areas of Minnesota,

As one of the largest multi-site distributed solar projects in North America, the Aurora Solar Project serves more than 17,000 customers from 16 small utility-scale solar sites (920 acres total) that range in size from 5 to 15 MW.

We used our local field personnel and remote support personnel to support construction efforts. Duties included installation oversight for solar PV panels, inverters, electrical infrastructure and communications equipment. We also oversaw the use of heavy construction equipment for interior road construction and landscaping. Our work involved up to three full-time, on-site construction personnel at the various sites working to oversee the work being done by subcontractors. We provided daily reporting to the client's project management team, which included verification of contractor hours, photos of site conditions and reports on project safety.

Engineering and Procurement services for 9.75 MW Solar Project

Cantil, California

AECOM provided comprehensive engineering design and equipment procurement services for the 9.75 MW Pine Tree Solar Project. Co-located with LADWP's Pine Tree Wind Farm, this was one of the largest utility-owned PV projects in the U.S. when completed in 2012. LADWP construction forces built the project with on-site assistance and training from AECOM.

To minimize the levelized cost of electricity and maximize energy production, we developed an innovative design to take maximum advantage of this space-constrained site in the Tehachapi Mountains. The design uses three different module tilt angles to optimize output while minimizing inter-row shading. AECOM's responsibilities included:

- Detailed civil, structural, mechanical and electrical design
- Full SCADA system design and specifications that were integrated into LADWP's existing network
- Specification of all components and materials, including PV modules, racking and inverters
- Procurement and delivery of all materials, components and balance of system components, such as wiring, conduit, trays, boxes and clips
- Training of LADWP work crews on installation techniques

MORE

Beacon 250 MW Solar Plant and 20 MW BESS Project
Kern County, California

Environmental Services and Compliance Support for 250 MW Solar Project

Kern County, California

AECOM led the permitting of both the original 250 megawatt (MW) concentrating solar thermal power and subsequent PV for the Beacon Solar Project located on about 2,000 acres. We also led linear permitting for a 3-mile, 230 kV generation tie-in line. Our work included biological and cultural resources field studies, geo-archaeological field studies, groundwater modeling, hydrology studies, Phase 1 and Phase 2 environmental site assessments (ESAs), and other environmental technical studies. We also prepared the Application for Certification for submittal to the California Energy Commission (CEC) and provided support throughout the permitting process, which included addressing the requirements and concerns of a many federal, state and regional agencies, including the U.S. Fish and Wildlife Service (USFWS), FEMA (Federal Emergency Management Agency), U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), Central Valley Regional Water Quality Control Board (RWQCB), California Department of Transportation, and Kern County.

Originally licensed for concentrating thermal power, the project was repermitted as PV for economic factors. AECOM led all aspects of the updated environmental permitting and obtained necessary permits and approvals, including USFWS (Section 10) and CDFW (Section 1600 and Section 2081).

We effectively negotiated final avoidance, minimization and mitigation measures and facilitated the acquisition of the permits/agreements from the agencies with reduced compensatory mitigation. After purchase by the Los Angeles Department of Water and Power (LADWP), our project support continued as the lead biological and cultural resources construction compliance contractor, providing strategic guidance, in-the-field clearance and monitoring and construction management.

AECOM's solar experience includes concentrating and photovoltaic projects.

MORE

Austin Independent School District
Austin, Texas

Environmental Assessment and Project Permitting for 80 MW Solar Project

Lauderdale County, Alabama

AECOM completed a third-party Environmental Assessment (EA) for the 645-acre River Bend Solar project for the Tennessee Valley Authority (TVA). The project was performed under the TVA's Renewable Standard Offer Program and terms of the conditional Power Purchase Agreement (PPA) approved by TVA.

For the NEPA EA, AECOM conducted all required field studies, including the Phase 1 Cultural Resource Survey, Historic Architecture Survey, a Threatened & Endangered (T&E) species survey, and an inventory and delineation of wetlands on the project site. In association with the T&E surveys, bat habitat surveys were also conducted.

We prepared visual renderings of the proposed project for incorporation into the EA. AECOM also assisted in coordinating consultation with the USFWS for T&E species, USACE for jurisdictional wetlands and the U.S. Department of Agriculture's Natural Resource Conservation Services for prime and unique farmland.

Design and Construction Oversight for 1.6 MW of Solar Assets

Austin, Texas

AECOM provided detailed design and construction oversight services for solar PV arrays totaling 480 kilowatt (kW), the first of a two-phase program to bring solar assets to Austin elementary, middle and high school campuses. We currently completed leading the second phase of the program that brought an additional 782 kW of solar assets to the district.

Our work has included energy production modeling, construction cost estimates, project scheduling support, siting analysis, technology evaluation, conceptual layouts, utility interconnection support, permitting support, detailed solar array design, electrical engineering, rapid system shutdown design, structural engineering, RFP development, procurement support, construction oversight and system commissioning supervision.

AECOM has helped the Austin Independent School District develop more than 1.6 MW of solar assets on district facilities.

MORE

Environmental Support and Engineering
Claresholm, Alberta, Canada

AECOM's services include developing computer renderings to show project alternatives, as we did here for the Claresholm Solar Project.

Speedway Solar Project

Shelby County, Indiana

The Speedway Solar Project is a 199 MW alternating current (AC) solar electric generation facility in Shelby County, Indiana. The project will be located on approximately 1,800 acres of agricultural land. Services AECOM provided include: agency consultations; preliminary civil engineering siting analysis including project lifespan estimation, decommissioning plan, and materials plan; project mapping; natural communities and waters of U.S. surveys; a Phase I Environmental Site Assessment (ESA); local community issues including review of agricultural soils, local zoning issues, road use and safety, and land use plans; an erosion control and storm water management plan; cultural and historic resources; a sound study and visual impact assessment and development and submission of all permits.

Environmental Support and Engineering for 130 MW Solar Project

Claresholm, Alberta, Canada

AECOM provided a complete a suite of environmental and engineering services to support design of a proposed 130 MW solar PV project located on 1,260 acres (510 hectares).

Our work included preliminary geotechnical and hydrogeological assessments with a desktop review before starting the field investigation. In the field, 11 test holes were drilled, with monitoring wells installed in select test holes. We assessed the data and developed preliminary geotechnical and hydrogeological evaluation reports.

AECOM provided detailed engineering for the preliminary support, which included comprehensive solar array layouts, circuit diagrams and plans, and electrical details. Environmental work included constraints mapping with wildlife features and wetland setbacks. We also developed a three-dimensional rendering for use at a public open house.

Engineering Support for Concentrated Solar Power Projects

Southern California

AECOM supported development of four concentrated solar power projects with a total installed capacity of 800 MW.

These projects went through design, but they were never constructed as concentrated solar facilities for economic reasons (cost of PV). For these projects we provided:

- GIS mapping, including critical setback zones for wetlands, buildings, roadways, woodlots, and environmentally sensitive areas
- Project engineering services
  - Electrical and civil engineering
  - Grading and drainage plans
  - AC and DC collection systems
- Major Use Permit applications

MORE

Wind Energy Experience

Comprehensive planning, design, environmental and construction services provide clients with a single source for wind energy developments worldwide.

Wind energy projects require specialized technical and environmental capabilities. AECOM's integrated services seamlessly deliver wind developments of all sizes.

AECOM is fully committed and equipped to meet today's challenges with existing generating and transmission facilities and to prepare for the changes ahead in the power industry.

As a single source for multi-disciplinary environmental and engineering services, we have delivered hundreds of wind energy projects.

With a broad range of technical resources and project management services, we thoroughly plan, develop and execute environmental permitting, engineering/design, procurement and construction services for wind energy projects.

Across North America, our environmental professionals provide strategic environmental planning and permitting support to facilitate siting, permitting and approvals of small and large-scale wind developments, both onshore and offshore.

Clients rely on our comprehensive environmental services for biological, cultural, air, soil, noise and water resources, as well as technology-specific evaluations, such as shadow flicker and visual simulations.

Through our global reach of local professionals and relationships, we effectively navigate complex project approval processes.

Beyond our environmental services, AECOM also provides full-service engineering, consulting and construction phase services, acting as owner's engineer or design engineer.

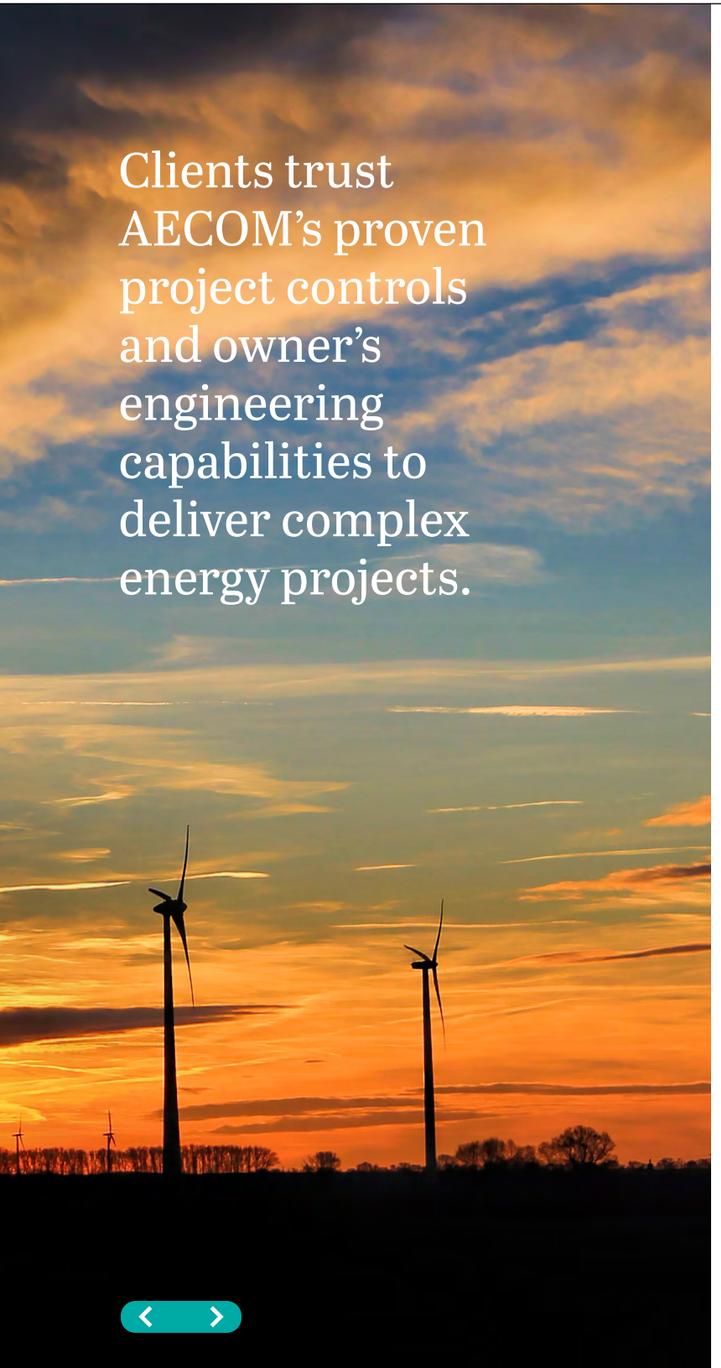
VIEW PROJECTS

551 MW

AECOM's environmental services supported development of the 551 MW Cedar Creek Wind Farm in Weld County, Colorado.

35 GW

AECOM has helped deliver more than 35 GW of wind power globally.



Environmental Services for 3,000 MW Chokecherry & Sierra Madre Wind Project

Rawlins, Wyoming

AECOM worked with the U.S. Bureau of Land Management (BLM) Rawlins Field Office to prepare a third-party EIS for this 1,000 turbine, 3,000 MW facility that is spread across two sites. Currently under construction with an estimated 2020 completion, this facility will produce enough clean electricity to power approximately 1 million households.

As part of the NEPA process, we coordinated public and agency involvement, facilitated the alternatives development process, conducted extensive wildlife and cultural resource field surveys, and prepared a visual resource inventory and simulations. We also worked closely with the BLM to overcome the multiple challenges facing this large and complex project, such as state agency concerns about sage-grouse, a remand of visual resource management decisions in a newly released Resource Management Plan that required a plan amendment, and development of an appropriate range of EIS alternatives.

When complete, electricity generated in Wyoming will go to California and the Southwest U.S. over a major powerline project under development by TransWest Express, LLC. AECOM also supported the powerline's EIS process, which involved 23 BLM field offices, five U.S. Forest Service offices, 50 cooperating agencies, and many other local entities.

Environmental Services for 150 MW Foxtail Wind Energy Center

Dickey County, North Dakota

AECOM supplied environmental permitting services, prepared the North Dakota Public Service Commission (PSC) Application and provided expert witness testimony for the shadow flicker and acoustic analyses at the PSC hearing for this 75 turbine, 150 MW facility. With construction beginning in 2018, this project sits on 20,000 acres in Southeast North Dakota.

Our work included wetland delineations, cultural resources surveys, architectural history surveys, GIS, acoustic modeling and assessment, and shadow flicker analysis for siting turbines and infrastructure. We also participated in tribal outreach efforts throughout the project, including GIS assistance for completing Cultural Heritage forms, as well as meetings and site visits with various tribal stakeholders. For the North Dakota State Historic Preservation Office, we prepared visual simulations to assess visual impacts to the nearby Whitestone Hill Battlefield State Historic Site.

Following PSC approval, AECOM prepared a noxious weed plan for construction and provided assistance with reviewing construction plans. We also completed cultural resources surveys, wetland delineations, land use surveys, raptor nest surveys and T&E species analysis to support a Categorical Exclusion for an associated transmission line upgrade.

Environmental, Cultural and Permitting Support for 450 MW Wind Project

Webb County, Texas

AECOM provided environmental and cultural resources support for this 226 turbine project in South Texas. Our work included avian use surveys, bat activity surveys, biological and cultural resources evaluations, USACE assessments and Phase 1 ESAs.

Constructed in two phases, the first had 126 turbines (250 MW) and began operation in December 2015, with the second phase adding 100 more turbines (200 MW) in November 2016. Combined, the site is capable of generating enough electricity to power more than 134,000 homes.

For the bat survey, we used Titley's Anabat passive acoustic monitors to determine levels of risk and help develop mitigation options. The USFWS and Texas Parks & Wildlife Department approved our biological evaluation, with the USACE approving our evaluation of waters of the U.S., including wetlands.

AECOM continues to provide similar services for wind farms throughout the area.

AECOM's ability to plan, permit, design and construct wind energy projects provides clients with a single-source for total project delivery.

Environmental Services for 102 MW Wind Energy Centre

Pincher Creek, Alberta, Canada

AECOM has supported the Heritage Wind Energy Centre Project for more than two years. Our work began with a due diligence review prior to NextEra's acquisition of the project, which led to AECOM being awarded the full suite of permitting tasks. Our permitting support has furthered the development of this 28 turbine facility located about 130 miles (215 km) south of Calgary.

In addition to the turbines, the project includes a 34.5 kV gathering system that consists of underground power lines to collect and send the electric power from each wind turbine to a substation where the wind plant is connected to the Alberta Interconnected Electric System.

Our work has included all required environmental surveys – such as wildlife surveys, land cover reconnaissance surveys, wetland surveys, rare plant surveys, etc. – and relevant regulatory consultation with Alberta Environment and Parks and Alberta's Utility Commission.

We developed a three-dimentional rendering and provided public consultation. We also submitted an Alberta Utilities Commission Rule 007 Facility Application in March 2018, with current work on the substation application underway.

Permitting, Design and Construction Support for 112.5 MW Wind Project

Sheldon, New York

AECOM provided planning, permitting, design and construction support for the High Sheldon wind project (shown above). The project includes 75 turbines, 20 miles of service roads, a buried electrical collection system, new substation and construction of a Operations and Maintenance Building.

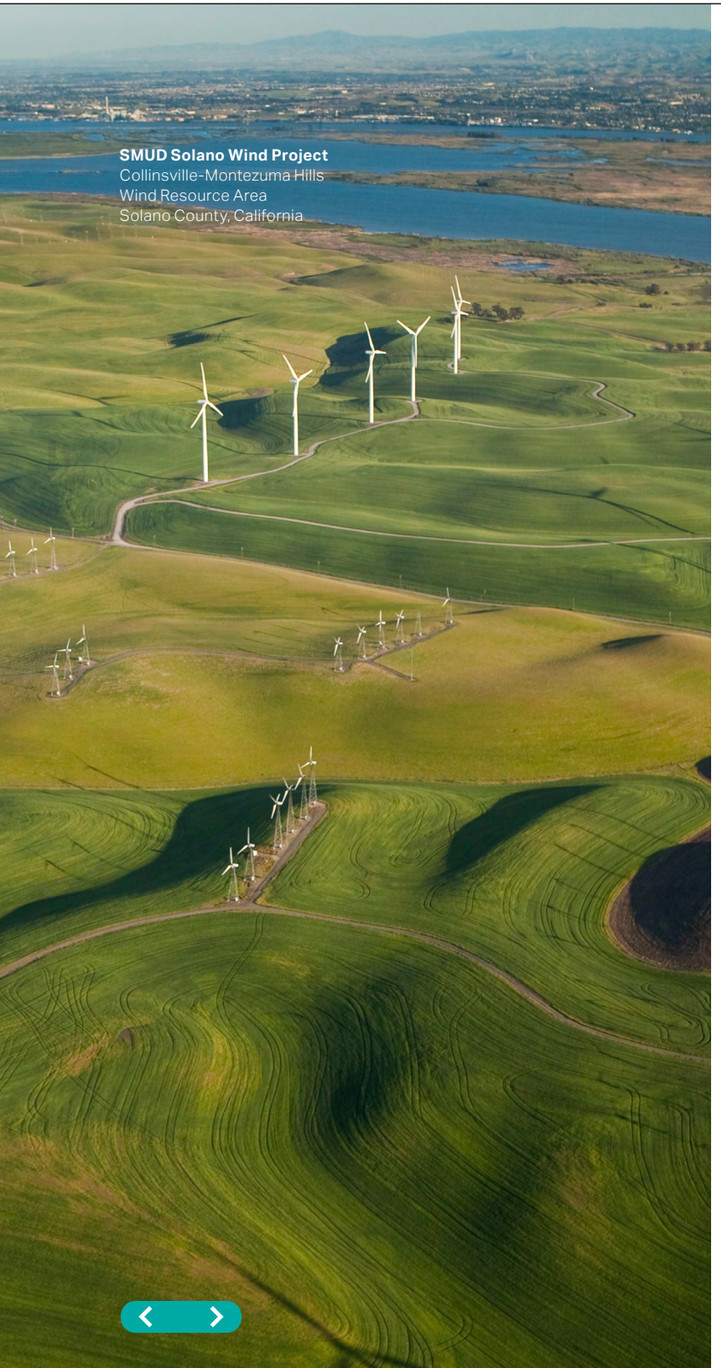
Our involvement began by preparing the initial supplemental zoning applications, which required field verification of utilities. We next provided a preliminary wetlands delineation; optimization of service road locations; preparation of site plans and setback exhibits; and preparation of an Erosion and Sediment Control Plan. During pre-construction, we prepared a federal wetlands delineation with detailed mapping, as well as permits for stormwater, wetlands, stream disturbances, Section 401 Clean Water Act, USACE nationwide permit authorizations and the environmental monitoring plan.

To satisfy financing requirements, we conducted several due diligence tasks, including a Phase I ESA, ALTA Pre-Construction Surveys and mapping of lease and oil and gas agreements, along with Land Title Surveys for the 73 tax parcels. During construction, we did survey stakeouts of turbine locations and property boundaries siting.

We supported regulatory compliance, including issues related to spill reporting, solid waste disposal, and stormwater, along with performing daily environmental and agricultural monitoring activities during and after construction.

High Sheldon Wind Project
Sheldon, New York

AECOM helps guide clients through the complex environmental permitting and compliance issues facing energy developments.



SMUD Solano Wind Project
Collinsville-Montezuma Hills
Wind Resource Area
Solano County, California

Environmental and Owner's Engineering Services for 230 MW Wind Project

Solano County, California

Over more than 15 years, AECOM has provided a wide range of environmental and owner's engineering services for this multi-stage, 230 MW wind energy project (shown above). Our support continues today, as we develop a project level environmental impact report (EIR) for repowering a previous project phase with new turbines and adding new turbines to an adjacent property.

AECOM's services have included resource assessments, viability analyses of turbines and their components, meteorological analyses, turbine siting, and associated biological, hydrological and geological services. We have provided California Environmental Quality Act documentation, including EIRs, Notices of Preparations and technical reviews. Our biologists and other scientists have provided many EIR monitoring and compliance activities, from biological surveys for avian mortality and ground-nesting birds, to construction personnel environmental training. Specialized technical services include geotechnical investigations, engineering, procurement support, equipment option review, land acquisition and floodplain services. Our work included wetland delineation reviews, radar interference investigations, visual simulations, GIS analysis, an Eagle Conservation Plan and a 3-year bird and bat fatality monitoring effort. We also provided wind resource planning and economic and feasibility analysis of alternative scenarios and ownership options.

Permitting Support for 140 MW Offshore Wind Project

Long Island, New York

Through a complex permitting effort, AECOM supported this project to develop an offshore wind power facility with associated infrastructure. The project is designed to include 40, 3.6 MW turbines in a cluster array offshore of Long Island with an offshore substation and 138 kV cable to connect the project to the onshore substation.

The permitting effort involved upwards of 20 federal and New York State agencies, with the project subject to extensive federal and state review. We developed a significant public outreach program that involved meetings with federal and state agency staff; county, state, and U.S. legislative representatives; public interest groups; communities; and environmental and commercial organizations. Close coordination with Long Island Power Authority and its consultants was also important because the environmental submittals included the assessments of both the wind farm and the 138 kV cable. Field programs and studies included:

- Boat and aerial avian surveys
- Marine radar and NEXRAD avian surveys
- Benthic surveys
- Background noise measurements at shoreline and within wind farm area (offshore)
- Simulations of visual resource impacts
- Limited geotechnical survey (side-scan and magnetometer) in the wind farm area

Environmental Services for 300 MW Henvey Inlet Wind Centre and Transmission Line

Henvey Inlet First Nation Reserve #2, Ontario, Canada

AECOM has provided specialty cultural and environmental resources from inception through construction for this 87 turbine, 300 MW wind centre and associated 55 mile (90 km) transmission line.

Because the wind centre is located on the Henvey Inlet First Nation reserve, there is no provincial EA requirement. Instead, we helped develop an approvals framework for the wind centre and undertook natural heritage and archaeological fieldwork for the entire project. The subsequent assessment was approved by the Henvey Inlet First Nation. Concurrently, we completed a Provincial EA for the transmission line, including all fieldwork. We were responsible for all public consultation activities and helped implement an off-reserve aboriginal consultation program. We then led the provincial and federal species-at-risk permitting and completed Fisheries Act permitting for water crossings associated with the project.

Under construction with completion scheduled for 2018, AECOM continues to provide environmental construction monitoring for the wind centre and transmission line. Before construction, AECOM developed an in-depth environmental management system to document and track EA commitments and compliance during construction.

Energy Storage Experience

Energy storage provides greater flexibility and increased resiliency for new and existing assets, for both utility scale and behind the meter applications.

AECOM provides the full complement of services to develop energy storage projects across the globe.

Clients benefit from our broad range of project management services and technical resources, providing them with a single source to thoroughly plan, develop and execute environmental reviews, permitting, engineering/design, procurement, construction and commissioning.

The importance of energy storage can be seen in the wide variety of technologies coming to market.

As the only global planning, engineering and construction management firms also accredited by the National Association of Energy Service Companies (NAESCO), AECOM is vendor and technology neutral.

We carefully evaluate both proven and new technologies and make decisions based on what is best for our clients.

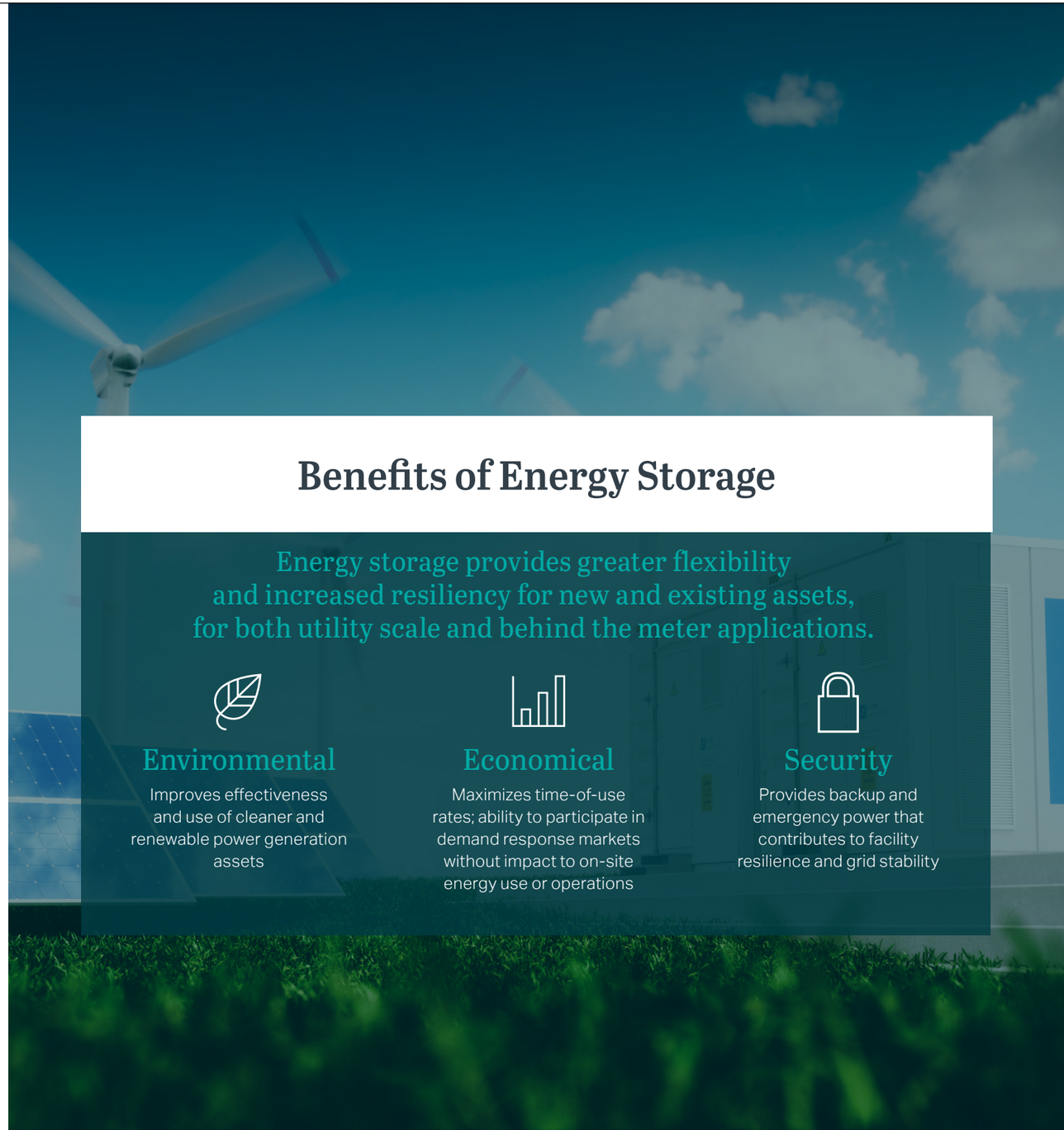
Our energy storage project experience includes:

- Battery energy storage systems (BESS)
- Compressed air energy storage (CAES)
- Pumped hydro storage
- Thermal energy storage
- Battery backup systems

Whether paired with traditional or renewable power generation, energy storage is changing the way utilities, project developers, and industrial/commercial clients are doing business and their strategic plans for the future.

When working with clients, we use a holistic energy strategy to evaluate storage and generation options, as well as efficiency and conservation methods, to deliver the best overall solution. A close and collaborative working relationship with our clients allows us to deliver creative, sustainable, cost-effective, and value-added solutions that enhance system infrastructure, improve efficiencies, and increase savings.

VIEW PROJECTS



Benefits of Energy Storage

Energy storage provides greater flexibility and increased resiliency for new and existing assets, for both utility scale and behind the meter applications.

Environmental

Improves effectiveness and use of cleaner and renewable power generation assets

Economical

Maximizes time-of-use rates; ability to participate in demand response markets without impact to on-site energy use or operations

Security

Provides backup and emergency power that contributes to facility resilience and grid stability

Fort Carson, Energy Savings Performance Contract with Battery Energy Storage System

Colorado Springs, Colorado

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.

To deliver a comprehensive ESPC program that delivers on Fort Carson's current and future goals, our team developed a master plan using AECOM's Sustainable Systems Integration Model Energy Vision (SSIMe™).

Using the SSIMe process enabled AECOM to present various project options in a dynamic and transparent framework, allowing the team to analyze various options in a live "game-boarding" environment.

SSIMe also enabled the team to easily manipulate critical project factors, such as scope of work, financial inputs, utility rates/escalation and project phasing to evaluate the project options against Fort Carson's program goals.

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 battery energy storage system (BESS) that manages electrical demand charges.

Client benefits included:

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.

Gas Turbine and Battery Energy Storage System Hybrid Projects

Cucamonga and Norwalk, California

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.

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.

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.

50 MW

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) is what sets this project apart.

You have big challenges, we have bigger solutions

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