AECOM Imagine it. Delivered.

QUALIFICATIONS

GRID MODERNIZATION

PROJECTS ARE MORE POWERFUL WHEN DRIVEN BY A PURPOSE.

The purpose that brings AECOM's experts together with its clients is to create, enhance and sustain the world's built, natural and social environments. The scope and scale of this aspiration unites scientists, planners, architects, engineers, and program, cost and construction managers. It partners AECOM with public sector clients at every level and private sector clients in every industry. It works at every scale, from an intimate garden, to a city block, to a national infrastructure program.

AECOM is a leader in integrated planning and engineering solutions for a sustainable energy future. The company's mission is to help its clients reduce energy consumption, develop renewable sources, cut carbon emissions and improve grid reliability. AECOM's comprehensive suite of energy services drives performance and produces innovative solutions. We've conceived, planned and built energy projects of every type and size, totaling more than $1 billion worth of energy efficiency and optimization improvements, 140,000 megawatts (MW) of installed capacity and 25,000 miles of transmission and distribution lines and substation projects.

True global presence

CORPORATE OVERVIEW

Electrical power infrastructure is being transformed. The electric grid of the future will be a two-way, technology enabled system able to accommodate greater distributed generation resources, engage active energy management by utility customers and achieve unprecedented levels of security and resilience. AECOM believes the future of the electrical power infrastructure will accommodate constellations of microgrids, operating at different scales and with different missions, networked together and supported by a modernized transmission and distribution system.

AECOM offers a full range of services to support grid modernization and microgrid development from system planning and design to system construction and operations.

Our project expertise includes network systems for utilities, cities, military installations, distributed generation, residential distribution systems, and systems for industrial centers. Our wide range of computer-aided engineering and design capabilities facilitates quick responses to clients as well as their needs for rehabilitation, upgrades and expansion of existing facilities, or the design of new distribution systems.

Technology is allowing significant improvement in the management and operation of power delivery systems through improved information and operational technology improvements. AECOM is providing planning, engineering and design services for electric grid improvements that improve reliability, security and efficiencies in operations, communications and economics to utility customers.

AECOM is helping customers improve their current power delivery infrastructure and systems by implementing new technologies in communications, distribution automation, smart metering and other new system technologies geared to optimize and improve system reliability and customer satisfaction.

AECOM is working with our power delivery customers to plan and implement programs related to new and advanced technologies. Together we can provide real-time monitoring and information on grid conditions, high-speed telecommunications, processing and analysis of massive amounts of system real-time information and the integration of new technologies into the existing transmission and distribution grid. AECOM stands ready to support client-grid modernization improvements.

MICROGRID / SMART GRID CAPABILITIES

Rikers Island Cogeneration Microgrid
New York, New York, U.S.A.

AECOM believes the smart grid of the future will consist of fleets of microgrids, networked by a modernized transmission and distribution system. Traditional power consumers will become producers who offer generation, storage, and ancillary services to a vastly diversified energy market. This trend towards more active energy customers and distributed energy resources will drive the construct of transactive energy toward one of its essential and inevitable practical outcomes: the recapitalization of America's power infrastructure.

Smart microgrids operate at different scales to serve the many missions of a broad range of interests: owner, investor, utility, cooperative, energy-services company and energy broker.

They provide energy surety and electrical resiliency. They optimize renewables and facilitate conservation, efficiency, and reduced carbon emissions. Smart microgrids enable expanded strategies for demand management and demand response, as well as more sophisticated forms of market participation.

The ascendancy of microgrids owes to the recent emergence of technological enablers. Although it also derives from the promise of the internet of things and the harnessing of big data, it is pressed urgently forward by a broad recognition of the existing grid's critical vulnerabilities.

At AECOM, we understand the importance of and demand for microgrids. We've assembled our best and brightest engineers, technologists and planners to help realize smart, microgrid development. And we stand ready to assist our clients, regardless of their kind, size, mission, or motivation as they, too, move forward into this bright future.

Development

AECOM's planners, economists, and utility market experts will prepare business case analyses for microgrid development. We address various ownership models: direct (maintain control of all aspects), joint (retain ownership and financing, but with third-party development and operation) and third-party (outsource all to transfer risk). We have experience with various financing vehicles such as power purchase agreements, energy savings performance contracts, enhanced use leases, and direct financing.

Design

AECOM offers a team organized to provide functional integration and foster innovation for each aspect of design. Our deep bench of in-house engineers optimizes microgrid design across a complete spectrum of disciplines: conventional/renewable distributed energy sources, energy storage, medium voltage, microgrid control, cybersecurity, permitting and utility interconnection.

Construction

Program and construction management professionals from AECOM's energy services group have delivered energy projects to utilities, government and private industry via many procurement methods. Our project management team is organized to manage the risk inherent in the complex undertaking of microgrid implementation.

Microgrid functions and capabilities

Security

The ability to disconnect from the macrogrid grid when it becomes unstable and continue to serve one's critical loads with internal resources is is a primary mission of a microgrid.

Conservation and efficiency

Microgrids provide energy security and they extract efficiences from the interrelationship of energy assets that, individually, may already be operating most efficiently. Does the savings to investment ratio and payback justify the effort? Does the project compete financially with other organizational imperatives?

Market participation

In some more sophisticated applications of microgrid technology, there is the ability to monetize energy, to make it transactive. Another way to say this in practical terms is that the energy flows in both directions. Microgrids have the ability to mitigate price volatility. The barriers to entry into this market can be high, but for the right facility, the benefits can be worth the cost. If the facility's generation or demand response capacity are significant, and its energy operations staff is capable, it may make financial sense to pursue the development of a more complex microgrid.

From top:
Noble Wind Farms
Nobles County, Minnesota, U.S.A.

NYPA Poletti 500 MW Combined Cycle Power Plant
Astoria, New York, U.S.A.

Castle Hill
Bronx, New York, U.S.A.

DISTRIBUTED GENERATION AND RENEWABLE ENERGY CAPABILITIES

AECOM delivers comprehensive distributed generation and renewable energy solutions and services from inception to completion through our program management and technical services. Our broad range of project management services, coupled with our technical resources, allows us to thoroughly plan, develop and execute planning and feasibility analyses, environmental review and permitting, engineering/design, procurement, construction and commissioning. Our program/construction management services provide the project with controls that clients require to manage their projects and provide banking and financing partners with information they need to track the project's status. These project controls include project scheduling, estimating, cost control, document control, risk management, compliance management, forecasting, asset management and owner's engineering services.

We help developers and end users evaluate co-generation, solar, battery storage, wind, biomass, geothermal, small hydro and other renewable energy options; navigate regulatory environments; and implement distributed generation and renewable energy strategies from buildings and facilities to large-scale, utility-size solar fields built to deliver energy to thousands of homes and businesses. Alternative energy production and a new electricity "smart grid," which provides information and controls electricity flow between suppliers and consumers using digital technology, are integral parts of the renewable energy process that saves energy, reduces cost and increases reliability. Our experts combine experience in traditional transmission and distribution interconnections with expertise in point-of-use smart meters to provide a comprehensive approach to demand reduction. Integrated into existing energy management system software, smart metering will enhance conservation and cost control across a site's portfolio.

Our capabilities

AECOM brings the broad capabilities of our heritage companies into one streamlined organization. Our team possesses the unrivaled ability to strategically plan, develop, design and construct projects to enhance system infrastructure, reduce energy and water consumption and generate on-site energy from traditional or renewable sources.

Design

- Public Involvement, planning and implementation
- Environmental resource studies and impact

Assessment

- Permitting
- Site identification
- Fatal flaw analysis
- Resource assessment
- Transmission analysis
- Interconnection studies
- Design
- Technology due diligence and selection
- Plans of development
- Power purchase agreement review
- Economic analysis and financial pro formas
- Detailed engineering design
- Owner's engineering
- Project management
- Construction management
- Turnkey design build

ENERGY EFFICIENCY CAPABILITIES

NASA Ames Research Center
Utility Energy Service Contract

As one of a few global planning, engineering, and construction management firms that also is a National Association of Energy Service Companies (NAESCO) accredited energy services company, AECOM's services are increasingly in demand by clients who seek to develop and implement comprehensive energy efficiency projects. Because AECOM has performed as an energy consultant, owner's representative and subcontracted designer to other ESCOs, turnkey ESCOs and agency program managers, we have the multiple perspectives necessary to inform complete energy solutions and to deliver the best value to our clients.

Our services, broadly characterized, include:

- Energy savings performance contracting
- Utility energy services contracting
- Energy consulting and master planning

AECOM's project experience includes energy efficiency work that saves megawatts of power at California State University campuses, upgrading of transmission lines in Australia, wind farm design and construction in the U.S., and hydroelectric in Laos to supply power to Thailand. AECOM designed a system to reduce nitrogen oxide emissions from coal-fired plants in Canada, created a sustainable energy guidebook for London's developers, installed a fuel cell at a medical clinic in Texas and developed a turbine-generator unit for a geothermal field in West Java. Our experience in power and energy is as broad as our geographic reach.

AECOM has designed and implemented more than $400 million worth of ESPC projects in the last 10 years. Our portfolio includes federal-, state- and municipally-operated office buildings; elementary, secondary, and university campuses; correctional, healthcare, and industrial facilities; and water and wastewater reclamation plants.

We have extensive practice in all the phases of energy infrastructure development: strategic planning, development, design, construction, operations and maintenance. Our team strives to synchronize performance factors across all project phases. Our engineers and planners are continuously optimizing the critical factors that enhance system resiliency, reduce energy and water consumption and maximize generation from traditional or renewable sources. In general, our work is characterized by:

Comprehensive, single-source solutions. AECOM takes a project from initial project development through final system commissioning and project turn-over. We do not need to subcontract project development, engineering, or construction management services, though, of course we can, if doing so is in the best interest of the client.

Flexibility. AECOM is technology agnostic and vendor neutral. We do not make or sell equipment; thus, we recommend technical solutions that are singularly driven by the client's best interests.

Robust internal technical resources. Unlike most ESCOs, 100 percent of our engineering and project management is delivered by AECOM's in-house, professional engineers.

ISO 9001 certification. AECOM deploys its ISO-certified Quality Management System (QMS) in each of our projects, in order to maintain our reputation for superlative delivery of first-rate services.

AECOM's energy efficiency-related services include:

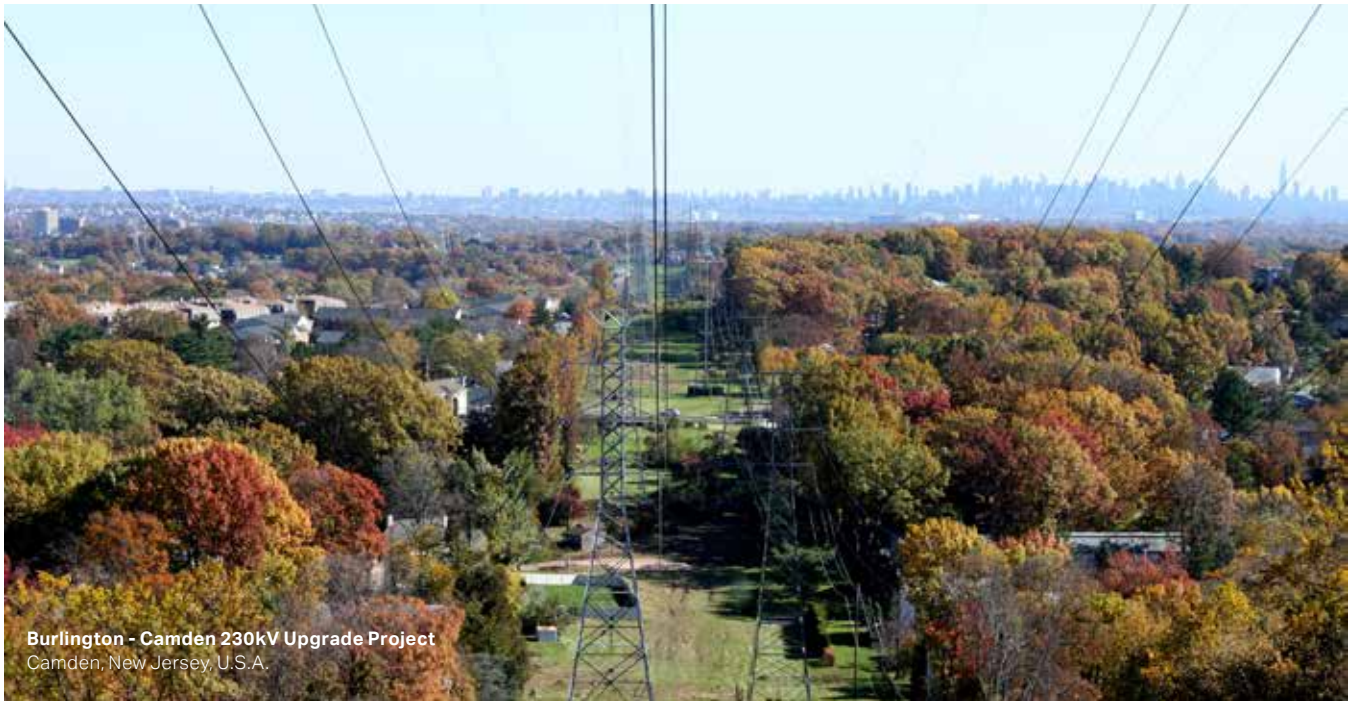
- Energy efficient renovation and new construction
- Re-, retro-, and continuous-commissioning
- Leadership in Energy and Environmental Design (LEED) certification process
- Management—new construction and retrofit
- Sustainability consulting
- Energy savings performance contracting
- Energy master planning
- Cogeneration, distributed generation and renewable energy design and implementation
- Facility improvement and optimization projects
- High-performance building design and construction

From left:
SPAWAR
San Diego, California, U.S.A.

Locomotive shop
Altoona, Pennsylvania, U.S.A.

City College of New York
New York, New York, U.S.A.

SMART CITY AND RESILIENCE CAPABILITIES



Burlington - Camden 230kV Upgrade Project
Camden, New Jersey, U.S.A.

From smart grids and meters to high performance buildings, networked streetlights and distributed energy resources, the modern electric system is an interconnected, data driven network that can be the platform of a smart, connected city. AECOM provides a full range of services to help clients plan, design build, and secure smart city infrastructure.

AECOM's approach to smart cities and infrastructure starts with state-of-the-art master planning tools that allow clients to understand how their energy and smart city choices impact each other. Optimizing the benefits of smart city investments and integrating complex funding sources requires the identification and tracking of multiple variables including technical, contractual, and regulatory requirements. This complexity can create schedule, budget and performance risks for clients that can discourage project implementation.

Tools

AECOM has developed and deployed a number of state-of-the-art master planning and program management tools that address these risks, and can be used to help clients identify, plan, design, finance, implement and manage sustainable energy and smart city projects.

The Sustainable Systems Integration Model (SSIM) supports multi-variable decision making and optimizes outcomes. Its suite of tools can be used across a project's life cycle. It allows project planners and stakeholders to modify project approaches and simulate outcomes to support decision making and define performance metrics that track and deliver performance. AECOM has used SSIM extensively to assist clients with projects from comprehensive smart city redevelopment areas and eco-districts to implementation of energy and water conservation projects in large wastewater treatment facilities. SSIM District Energy is particularly suited to evaluating microgrid alternatives.

In-City Generation Program
New York, New York, U.S.A.

Resilience experts

As one of the world's largest professional and technical services firms that designs and constructs secure infrastructure assets around the globe, AECOM recognizes resilience as a critical consideration on all of our projects, and we take a holistic approach that goes beyond cybersecurity. Our teams have unmatched resources and expertise to handle the complex, interconnected challenges associated with safety, security and functionality of critical infrastructure across every market sector. AECOM's resilience experts provide a streamlined process that integrates resilience into all project phases, from planning and design to construction, operations and maintenance.

We are committed to strengthening and maintaining secure, functioning and resilient systems; networks; and other assets. Our extensive real world knowledge of infrastructure and the factors that impact business continuity—such as aging and/or deteriorating infrastructure, climate-related impacts and natural disasters, sophisticated criminal threats and economic fluctuations in the economy—help us deliver proactive solutions that are customized to meet a clients' short- and long-term needs.

Below:
WDG Battery storage integration to PV Projects
Southern California, U.S.A.

Alabama Electric Cooperative, Inc. Compressed Air Energy
McIntosh, Alabama, U.S.A.

SYSTEMS INTEGRATION AND COMMUNICATION CAPABILITIES

Wards Island Water Pollution Control Plant
New York, U.S.A.

At its core, microgrids, smartgrids or smart cities are all about resource management and understanding resource balances and interdependencies. The key is to accurately model demand/supply information and integrate across buildings and infrastructure.

Managing a system of systems

The constituent parts have been around for a long time and AECOM can provide a full suite of engineering design, program/construction management, and project delivery services to support a smart infrastructure architecture solution.

Critical components to any smart infrastructure implementation are (1) a robust, secure, and scalable communications network, (2) a network operations center, (3) a data center and (4) a test lab.

Support includes:

- Building automation
- Distribution automation
- Substation automation
- Supervisory control and data acquisition (SCADA) systems
- Microgrids
- Volt/Var management
- Asset management solutions (ISO 55000 compliant)
- Communication network design, integration and administration
- Energy management
- Demand response
- Battery storage
- Electric vehicles
- Data use and security
- Data use and technology
- Infrastructure integration and optimization

Whether it's building a city, modernizing the grid, or developing a microgrid, processing "big" data into meaningful, actionable results is paramount. As your solutions partner, AECOM helps you choose up-to-date, seamlessly integrated solutions. From the specialized design of information technology (IT) and operational technology (OT) networks, to communication systems, to the physical and operational security of your facilities, we understand what it takes to get it done.

Above:
Los Angeles Department of Water and Power Pine Tree Solar Project
Los Angeles, California, U.S.A.

Riker's Island Cogeneration Facility
New York, New York, U.S.A.

Analytics

AECOM is combining IT and SMART (Self-Monitoring Analysis and Reporting technologies) with world class engineering and industry experience to implement smarter solutions to address the significant challenges facing the power, water and wastewater industries. New solutions to help minimize the life cycle cost of assets while lowering the risk of failure are available and leverage the application of IT and analytical tools to data already being collected. This approach can shift how we think about doing business by introducing new insights and optimized approaches to problem solving using data and analytics to stimulate innovative thinking and improved and timelier decision making.

AECOM's analytics and simulation team specialize in turning data into insights. With 90 percent of the world's data having been generated in the last few years, the ability to process and interpret big data is becoming imperative. The team specializes in decision support and operational modeling tools including:

- data mining and visualization
- process simulation
- interactive dashboards
- 3D animation
- statistical analysis
- scheduling
- mathematical optimization

Cloud computing

AECOM's cloud computing professional services team has extensive cloud offerings and a long-standing commitment to enabling the Federal Agency marketplace to leverage the benefits of cloud computing and related advanced technologies and delivery models. Since April 2012, we received and currently hold an authority to operate (ATO) at the Federal Information Security Management Act (FISMA) Moderate level, and have leveraged Federal Risk and Authorization Management Program—(FedRAMP) compliant infrastructure solutions for our customers certification programs.

At a high level, AECOM is a cloud solutions integrator. AECOM does not build or offer its own cloud infrastructure, but we provide professional consulting services that fully support an organization's IT transformation to and sustainment in a cloud computing model. Our professional consulting services and value proposition can be represented in four main delivery areas:

- Pre-cloud services—assessment and suitability determination
- Cloud transition services—cloud solution architecture, design migration and deployment into the cloud
- Cloud operations services
- Cloud security, accreditation and compliance

Hudson Exiting, PSEG North Grid
New York, New York, U.S.A.

Above:
World Trade Center (WTC) PATH Transportation Hub
Manhattan, New York, U.S.A.

California State University, San Bernardino
San Bernardino, California, U.S.A.

Critical infrastructure protection

Some of the greatest management challenges facing the public and private sectors today are from persistent and advanced cyber threats. The challenge is understanding potential vulnerabilities and making informed, critical decisions on what and where to budget for security and resilience of assets, systems and networks. AECOM's Converged Resilience™ approach provides integrated, holistic solutions that bolster your ability to anticipate, avoid and absorb threats.

Our cyber security, information technology, and risk experts work closely with our architects and engineers to provide tailored solutions that minimize risks, align security investments to industry specific standards and greatly reduce the impact of an incident. We work with key stakeholders to frame, assess, remediate and monitor risk, focusing on those critical business processes that have the greatest impact to shareholder value, brand name and business operations.

Operational resilience must address wired and wireless cyber security, physical security and safety, environmental impact, process improvement and an executable governance structure. These elements must be "engineered-in" to create a safe, secure, effective and economic solution focused on business continuity. We leverage our global capability to design, build, finance and operate facilities, systems and associated infrastructure for nearly every market sector.

AECOM intergrated technologies

Communications and security solutions and services include:

- Vulnerability assessment
- Integrated security systems and screening services
- Information security and acceptable use policy review
- Business continuity planning and disaster recovery practices
- Domain and core server security settings
- Logical access and privilege controls
- Wireless network security
- LAN/WAN connectivity
- Remote access controls
- VoIP security
- Patch management
- Malicious codes control (anti-virus/anti-malware)
- Intrusion detection and prevention
- Media control practices
- Physical and environmental security
- Data leakage protection
- Forensic application suites (e.g., EnCase)
- Biological threat reduction
- Host-based intrusion prevention systems
- Network penetration assessment tools (e.g., core impact)
- Facility design, engineering and operation (substations, data centers, operation control centers, network operation centers)
- Systems integration (SAP, MV90, asset Management, GIS, network operations, alarm management, SCADA/AGC/EMS/DMS/BMS/HMS, etc.)
- Telecommunications strategy, master planning, and network architecture development (assessment of current infrastructure, traffic models, etc)
- Data/application/smart grid/security architecture development and governance
- Integrated network management system architecture (enterprise IT/OT infrastructure integration, management and operation)
- Technical and commercial specifications for software, hardware and systems integration services
- RFPs, evaluation of proposals and award recommendations
- Technology roadmaps, key performance indicators (KPIs), performance evaluations, capital expenditure (CAPEX) / operational expenditure (OPEX) / life cycle cost (LCC) analysis, implementation plans
- Regulatory compliance

In addition, our Managed Security Services (MSS) offers an integrated cyber security solution. MSS is a solution to enhance, implement, and operationalize governance, risk and compliance (GRC) processes. It leverages Security Content Automation Protocol (SCAP) compliant tools and provides visibility into the “dark space” network infrastructure that is unmanaged and unmonitored. It also provides a consolidated dashboard with views at an executive, mission and operations level, enabling an enterprise view of the security posture based on multi-dimensional behavioral analytics, advanced correlation and pattern recognition.

AECOM offers world class program management services to our customers, including strategic planning, portfolio management and investment, acquisition support, financial management, project management, enterprise architecture, service catalog design and maintenance, technology vetting and technology infusion, community liaison and engagement, research services, performance management and dashboarding, and enterprise governance. Our OneSource tool provides a unified system for performing enterprise program management, and has been successfully deployed internally and to manage large customer enterprises.

REPRESENTATIVE PROJECTS

SPAWAR System Center Pacific, Energy Savings Performance Contract, Task Orders #1-3

This first task order of $12.3M is anticipated to produce more than $950K annually in energy and operational savings. SSC PAC has exceeded all of its federally mandated energy efficiency goals.

Client

Space and Navy Warfare Systems Command

Location

San Diego, California, USA

Contract Value

USD $37.5M

Years

2011—2014

Project Overview

As part of their continued effort to meet federally mandated energy efficiency and water conservation goals, SPAWAR Systems Center Pacific (SSC PAC) selected AECOM to develop and implement an Energy Savings Performance Contract (ESPC) of their facilities in San Diego, California. This ESPC is contracted through the Army Corps of Engineers Support Center in Huntsville, Alabama.

SSC PAC is the U.S. Navy's premier research, development, testing and evaluation, engineering and fleet support center for ocean surveillance, command and control, and communication systems. SSC PAC has an extensive footprint in California and Hawaii, operating approximately 224 buildings with a combined workspace of 3,032,000 square feet.

Work Performed

To help SSC PAC achieve their energy and financial goals, AECOM developed a turn-key project solution that included 100% up-front project financing for the effort and enough energy and operation savings to pay for itself. In fact, the project's energy and water savings were large enough to pay for a variety of other much-needed infrastructure upgrades.

In January 2012, AECOM completed the first of three task orders for SSC PAC. This first task order of $12.3M included comprehensive lighting, domestic water, heating ventilation, air conditioning and energy management control system upgrades throughout SSC PAC's San Diego facilities. It's anticipated to produce more than $950K per year in energy and operational savings.

Due to the success of the first task order, SSC PAC awarded AECOM with two additional task orders totaling over $22 million. Further task orders are in development for other SSC PAC facilities in California and Hawaii with expectation that the entire project total will exceed $40M.

Rikers Island Cogeneration Microgrid

This initiative established a combined heat and power facility on the island that will reduce annual energy costs, reduce emissions to the environment and improve energy reliability, therefore enhancing security on the island combined with a fully islandable microgrid.

Client

New York Power Authority (NYPA)
New York City Department of Corrections (NYCDOC)

Location

New York, New York, USA

Contract Value

USD $108M

Years

September 2011—January 2015

Project Overview

Following a major regional power outage impacting the New York area, AECOM, was retained by the NYPA and NYCDOC to evaluate building a reliable, energy efficient cogeneration microgrid facility on Rikers Island.

Work Performed

In addition to cogeneration and microgrid improvements, the project included the modernization and upgrade of 10 on-site substations and rationalization and optimization of a fleet of onsite emergency generator installations. The plan was also developed to align with the sustainability and resilience goals of the City of New York's PlaNYC. Following initial planning, AECOM was retained to design, procure and construct the cogeneration microgrid. This project—which incorporated strengthened resilience standards—is a part of NYPA's broader initiative to promote distributed generation and microgrid development at NYPA customer locations throughout the state of New York. The project involved close coordination with ConEd and included the development of detailed islanding protocols and performance standards governing the operations of the microgrid, and allowing the utility to fully island the microgrid to maintain support both the reliability of the correctional facility or the stability of the broader grid. In addition to increased resilience, the project resulted in significant cost and carbon savings. The project involved close coordination with ConEd and included the development of detailed islanding protocols and performance standards governing the operations of the microgrid, and allowing the utility to fully island the microgrid to maintain support both the reliability of the correctional facility or the stability of the broader grid. In addition to increased resilience, the project resulted in significant cost and carbon savings. Project work included:

- Feasibility analysis of generation and microgrid alternatives
- Design and construction of a 15 MW cogeneration facility
- Design and construction of a microgrid system with full islanding capability by ConEd
- Modernization of onsite substations and rationalization of existing emergency generators to support the microgrid operations
- Development of interconnection and islanding procedures and performance measures for microgrid operations with ConEd
- Initial operations and commissioning of the cogeneration microgrid, including full islanding of the facility from the ConEd system.

NYPA In-City Generation and Transmission Program

Start-up of the units prior to the peak cooling season was essential. A typical power plant would likely take 2-3 years to construct. AECOM finished this project in under 18 months.

Client

New York Power Authority

Location

New York, NY, USA

Contract Value

USD $15M

Years

2000—2001

Project Overview

AECOM performed program and construction management for the In-City Generation Program. At the direction of former Governor George Pataki, the New York Power Authority undertook the installation of eleven LM6000 gas turbine generators on seven locations situated throughout New York City and on Long Island. The objective of this project was to provide much needed support to the power grid in the area where diminishing capacity margins had raised the threat of power outages.

Work Performed

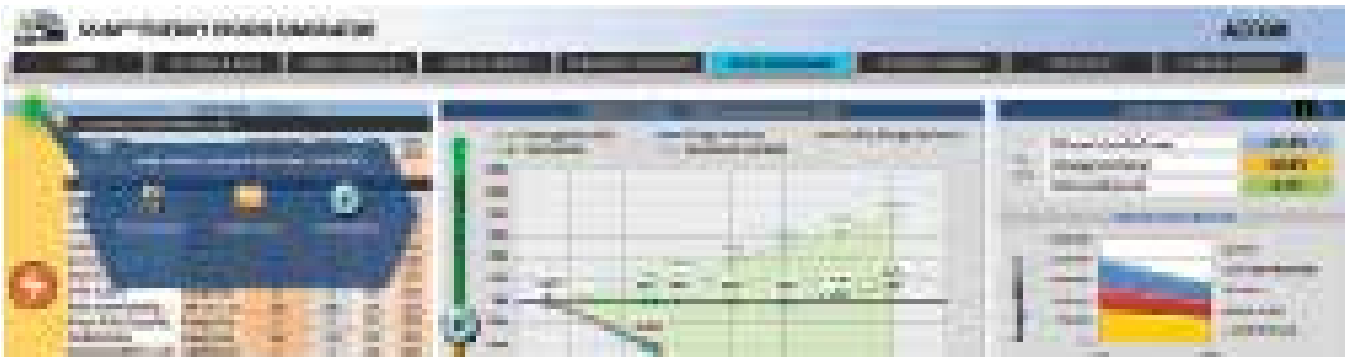
While providing additional generation capacity required for summer peak loads, the project was completed under extremely aggressive engineering, procurement and construction schedules. During a record-setting heat wave, the generators ran in support of the grid and helped to avert power outages.

Bringing this much power in support of the grid is unprecedented and required best efforts and teamwork from the owner, designer, construction manager and contractor. Part of the effort included staffing the project with 50 construction services personnel within 30 days of notice to proceed. The construction phase peaked at more than 1,400 craft personnel working on the project. Pulling together these resources in an already taxed construction labor market was a true challenge. Meeting this schedule was critical to protecting the economy and safety of the City of New York.

Making it through the record-setting heat without major power failures was the ultimate proof of the success. Services included:

- Planning and scoping
- Detailed design
- Budget/schedule control
- Design management
- Bid analysis
- Final inspections
- Estimating and scheduling
- Construction oversight
- Project close out

Navy Region Midwest Energy Vision 2035



AECOM established a long-range energy vision and smart energy strategy that increases energy efficiency, reduces energy consumption, expands renewables, reduces life cycle operation costs and prioritizes key improvement projects and investments across 3 Navy installations in the Midwest.

Client

US Navy NAVFAC Atlantic

Location

Various locations

Contract Value

USD $1.2M

Years

2011—2013

Project Overview

Through the compilation and analysis of energy, utility, project programming, infrastructure systems, data, and detailed site interviews, the AECOM team conducted a region-wide assessment of energy performance, patterns and trends as a first step in the planning process. AECOM utilized the innovative methodology called the Sustainable Systems Integration Model (SSIM™) for robust strategic sustainability decision making. The framework and model allowed for the creation and testing of multiple scenarios across various performance levels and cost benefit outcomes.

Work Performed

The feasibility of achieving the aggressive targets set forth in Executive Orders 13423 and 13514, the DoD Strategic Sustainability Performance Plan, and by the Secretary of the Navy were explored at both the site and region level during an AECOM facilitated Regional Vision Session with Navy Energy Managers, Utility Managers, Public Works personnel, Asset Management, Command Information personnel, facility managers, and major tenant commands. A gaming process was used that incorporated the unique aspects of building age, typology, condition, improvement level, and mission-dependence criteria to create a sustainability program meeting energy and High Performance Sustainable Buildings (HPSB) mandates. Energy conservation measures were identified and applied though facility prototype modeling to yield a preferred scenario that considers eROI criteria, stakeholder input, energy efficiency and other drivers. Additional workshops explored functional requirements, needs (technology, hardware, software, people resources) and solutions for implementing smart energy strategies across the region. A key outcome was a prioritized region-wide Energy Integrated Priority List (IPL) and 1391 Activity-level project documentation for preferred options at each site.

CSU Fullerton Comprehensive Energy Efficiency Program

The California State University campus will save an estimated USD $2M annually as a result of sustainable design features incorporated by AECOM Energy.

Client

California State University

Location

Fullerton, California, USA

Contract Value

USD $43M

Years

2009—2012

Project Overview

CSU Fullerton selected AECOM to develop and implement a comprehensive design-build energy retrofit project that would produce a positive cash flow to enable the campus to install a new Central Utilities Plant (CUP) to serve the campus' current and future heating and cooling needs.

Work Performed

The $43M project delivered much-needed equipment, system, and infrastructure upgrades necessary to accommodate the campus' growth while also enabling the campus to comply with the State's aggressive energy reduction goals.

To ensure that we developed a bundled project solution that met all of the campus' goals, AECOM developed an energy master plan and reviewed various scenarios and project options with the campus during initial project development. To help accelerate some of the anticipated project benefits, AECOM developed a two-phase project implementation strategy so that we could rapidly implement the less complicated projects while finalizing the development and design of the more complicated projects such as the tri-generation plant.

Projects included:

- Tri-generation plant
- CBE sewer
- CHW and HHW piping to CBE
- McCarthy Hall HVAC
- Performing arts HVAC and kinesiology HVAC
- Visual arts HVAC
- Dan Black Hall precooler
- McCarthy Hall and Dan Black Hall steam upgrade
- 1.16MW rooftop/canopy PV system

About AECOM

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A *Fortune 500* firm, AECOM had revenue of approximately $20.2 billion during fiscal year 2018. See how we deliver what others can only imagine at aecom.com and @AECOM.

For more information, contact:

Bill Abolt
Vice President, Energy
T +1-312-373-7547
E william.abolt@aecom.com

aecom.com

P_EE_Quals_GridModernization_20160802