

Super ESPC Takes Off at NASA Glenn Research Center

DOE's Regional Super ESPC allows NASA center to speed up energy efficiency improvements that should save about \$200,000 in annual energy costs



ESPC Case Study

Overview

Reductions in operating and maintenance budgets prompted staff at the NASA John H. Glenn Research Center (GRC) in Cleveland, Ohio, to look for alternative ways to fund energy-saving projects. A U.S. Department of Energy (DOE) Regional Super Energy Savings Performance Contract (Super ESPC) has proved to be a good way to fund new projects and reduce energy use at GRC.

Reduce Utility Bills with Energy Savings Performance Contracts

The Department of Energy's Federal Energy Management Program (FEMP) helps government agencies use Energy Savings Performance Contracts (ESPCs) to finance many kinds of energy efficiency projects.

Benefits of ESPCs:

- New equipment
- No up-front costs
- Energy and water savings
- Lower utility bills
- Improved reliability and load management
- Better air quality

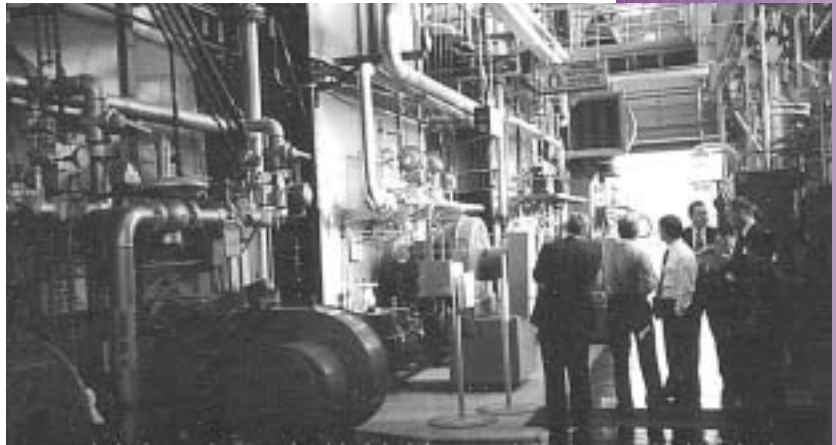
FEMP has developed streamlined "Super ESPCs" so Federal agencies can contract with preselected energy service companies to implement projects. FEMP's six Regional Super ESPCs allow agencies in a particular U.S. region to place delivery orders with the preselected companies. Technology-Specific Super ESPCs can help any facility in the country obtain access to financing for certain advanced energy technologies.

Advantages of Super ESPCs:

- Prequalified, competitively selected energy service companies
- Expedited contracting process
- Ability to combine multiple projects or facilities in one contract
- DOE's technical and contracting expertise

For more information, please call 1-800-363-3732 and see FEMP's Web site (www.eren.doe.gov/femp/financing/espc.html).

NASA GRC originally planned to create its own ESPC. But after hearing about the DOE Midwest Regional Super ESPC program, GRC staff requested that the center be a sample site for the Regional Super ESPC in order to benefit from DOE's contractual and technical assistance. The GRC Energy Team supported DOE's Audit Team by providing energy-use site data that was needed to develop the procurement. The GRC team also helped to review the energy service company (ESCO) proposal sections dealing with the site. Of the six ESCOs selected for the Midwest region, GRC chose Duke Solutions, Inc., to work on its project.



Staff of NASA Glenn Research Center (GRC) and Duke Solutions, Inc., the energy services contractor, assess energy efficiency improvements needed at the GRC boiler plant.

As a result, Duke Solutions is providing GRC with new or improved boilers, lighting, and associated controls. Future delivery orders could also provide improved heating, ventilating, and air-conditioning (HVAC) equipment; piping and distribution systems at the boiler plant; and efficient motors and drives.

Background

GRC facilities are divided into mission-variable buildings (for example, research facilities) and non-mission-variable buildings (institutional facilities). The 43 mission-variable buildings cover an area of 1.13 million gross square feet (104,833 square meters) and are exempt from Federal mandates to reduce energy use. The 47 non-mission-variable buildings cover 1.17 million gross square feet

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(108,887 square meters) and are subject to Federal energy-reduction goals for buildings. They include office and storage buildings, some laboratories, and research and development buildings that are not energy intensive.

DOE's RFP for the Midwest Regional Super ESPC was issued in July 1997. Twenty-four ESCOs toured the GRC site in July, and 19 of them submitted proposals. GRC provided DOE with technical evaluations of the 19 proposals in November. By early 1998, DOE had selected six "finalist" companies. GRC ultimately selected Duke Solutions from that list of six awardees to implement projects.

Project Summary

Staff from Duke Solutions visited the GRC site in October 1998 to discuss the requirements of the delivery order. In November, the contractor's energy engineers conducted extensive audits, surveys, and a project assessment with the support of the GRC Super ESPC team. The visit resulted in a reevaluation of the buildings that were to be involved in the final proposal.

Potential energy conservation measures included boiler improvements in three buildings; HVAC improvements in four buildings; lighting improvements, such as electronic ballasts, energy efficient lamps, and motion sensors, in 15 buildings; improvements to the chilled/hot/steam piping and distribution systems at the boiler plant; and more efficient motors and drives in eight buildings.

Measures implemented under the first delivery order included lighting system upgrades, new lighting controls, a boiler economizer, and lower drum steam heating coils. Duke Solutions has completed the installation of these measures, and the GRC/DOE team began considering a Phase 2 proposal that would save more energy and money at the site.

The project implementation period was eight months. The project has an estimated energy savings of 18,000 million British thermal units (Btu) (19 trillion joules) per year, and an estimated energy cost savings of approximately \$200,000 per year. The capital investment was approximately \$1,200,000, and the contract term is seven years.

Benefits of Using a Super ESPC

There are many benefits associated with this Super ESPC. It is a viable source of funding for facility improvements; it enables projects to be bundled together to achieve results more quickly and economically; it allows the facility to replace aging

and inefficient equipment with little or no out-of-pocket investments; it assists in managing and covering O&M costs and staff; and it significantly improves the comfort levels, functions, and indoor (and outdoor) environment of the staff. As a result of Phase 1 of this project, more than 3 million pounds of carbon dioxide emissions will be avoided.

Lessons Learned

This project suggests that successful Regional Super ESPC projects require the following elements:

- Support from management and their commitment to the success of the project
- An innovative, problem-solving team
- The involvement of all parties in the process—management, technical staff, contracting officials, budget staff, financial experts, and legal personnel
- Knowledge of, and training in, ESPCs
- Assessments of specific needs and desired results
- Planning, issues identification, and problem resolution
- Dedication of staff resources and time.

Looking Ahead

Duke Solutions' initial proposal for Phase 2 work included expanded lighting upgrades, site chiller system modifications, improved condenser water pumping, and expansion of the site's energy management system. Phase 2 would require an estimated investment of \$4 million with expected annual savings of \$380,000. Because of future budget uncertainties, however, Phase 2 is not being implemented at this time.

For More Information

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