

Strategic Energy Management Through Optimizing the Energy Performance of Buildings

Oak Ridge National Laboratory Helps Others Meet Their Energy Goals

It is an obvious choice to replace old lighting systems with highly efficient new ones. Worn-out chillers and those using banned coolants must be replaced. After the easy choices are made, it is considerably more difficult to chart a course to meet ambitious federal energy goals and achieve energy independence.

The energy engineers, building equipment experts, and technology specialists at ORNL have more than 250 cumulative years' experience in applications research and are recognized experts in their fields. The synergy of expertise in our Commercial Buildings and Industrial Energy Efficiency areas has engendered a unique, comprehensive capability in strategic energy management and optimizing the energy performance of buildings.

ORNL has developed and implemented strategic energy management techniques that surmount the practical challenges of prioritizing, setting goals, and funding energy improvements. These achievements are based on the comprehensive knowledge of building systems and building energy use, including the macro level of multi-building sites, whole-building systems, system components, and system interactions.

Benchmarking and Energy Star Awards

Strategic energy management through benchmarking is a cost-effective, easy-to-use method for focusing and prioritizing energy-improvement decisions.

ORNL has unmatched expertise in building energy performance benchmarking, baselining, and target setting, and has pioneered an advanced methodology that is changing the way buildings are benchmarked. ORNL's energy engineers developed the benchmarking engines used in EPA's Energy Star rating systems and have helped federal agencies improve strategic energy management and reduce costs in many large federal buildings (more than 200 benchmarked; 25 major Energy Star awards). ORNL is developing advanced benchmarking tools for energy and water use for EPA Energy Star, the state of California, HUD, and others.

With minimal effort and ORNL's help, an organization can

- See where the performance of its buildings rank among similar U.S. buildings
- Easily pinpoint buildings that use excessive energy
- Estimate the improvement needed to bring buildings up to par
- Estimate cost savings
- Qualify buildings for Energy Star.



With ORNL's help, the new visitor's center at the Grand Staircase-Escalante National Monument received LEED (Leadership in Energy and Environmental Design) Gold Certification from the U.S. Green Building Council.

Retro-Commissioning (R-Cx)

R-Cx is the most cost-effective and best common-sense measure building owners can take to cut energy use and improve efficiency. R-Cx consists of determining how energy-consumption equipment is running – lighting, space cooling and heating, water heating, energy management and control system – and then making adjustments to optimize overall energy performance.

ORNL has the comprehensive knowledge of whole-building systems, system components, and system interactions that is required to analyze building performance and do effective R-Cx. ORNL is uniquely qualified to truly optimize building energy performance and educate the organization so the savings will last.

Examples:

- ORNL's R-Cx work for the Federal Courthouse in Jacksonville, Florida, cut energy use by 50%
- Energy cost savings in the Atlanta Federal Center paid back the investment in R-Cx in less than a year, and continue to accrue at more than \$100,000 per year.

Comprehensive Energy Projects

Most agencies will need to implement comprehensive improvements through financed energy projects to meet their goals. Federal agencies invested more than \$1.9 billion in financed energy projects through FY05 to save 14 trillion Btu per year.



Terry Sharp of ORNL assesses energy savings opportunities at the Atlanta Federal Center.

“...I encourage government officials to utilize ESPCs and Super ESPCs to meet their energy use reduction goals. These efforts will help conserve energy and create a better America for our children and grandchildren.”

—President George W. Bush, April 25, 2006

ORNL energy engineers are experts with the technical, financial, and contractual aspects of energy projects and have provided comprehensive technical assistance and expert guidance for more than \$200 million worth of financed federal energy efficiency projects. These experts know how to anticipate and overcome obstacles and keep projects moving forward and are irreplaceable as objective, unbiased consultants to federal agencies.

ORNL can provide assistance tailored to the customer's needs – technical and design reviews, feasibility study reviews, RFP development, proposal reviews, and measurement and verification.

ORNL also provides specialized technical assistance with geothermal heat pumps and combined heating and power.

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