Technical Assistance

Seven Steps to Savings:

How to Implement an Energy-Saving Project

1. *Identify your opportunities*
2. *Develop an action plan*
3. *Conduct a detailed feasibility study*
4. *Design the project*
5. *Implement the project*
6. *Evaluate and verify project savings*
7. *Be recognized for your success!*

When it comes to saving energy, water, and money, Federal energy and facility managers can make a big difference. With the assistance of the U.S. Department of Energy's Federal Energy Management Program (FEMP), energy officials and facility managers are implementing projects that result in considerable savings. One good example of this is a recent project at the U.S. Bureau of Reclamation's visitor center at Glen Canyon Dam.

Located at the western end of Lake Powell in northern Arizona, Glen Canyon Dam produces hydroelectric power for six western states. The facility generates about 1,000 megawatts of electricity every day, enough to power about a million typical western homes. Those who come to see the dam can also enjoy breathtaking views from the Carl Hayden Visitor Center, perched high above the canyon.

Even though electricity and water resources are plentiful at the dam, this is not the case everywhere in the nation, which is one reason why the Carl Hayden Visitor Center has become a showcase of energy efficiency and water conservation technologies. Using environmentally friendly technologies like solar water heating, low-volume faucets and toilets, and energy-efficient lighting and windows, the Bureau of Reclamation saves energy and water at the visitor center without sacrificing comfort or aesthetics.

The Energy Policy Act of 1992 and supporting Executive Orders have directed Federal agencies to implement cost-effective energy and water efficiency measures to help conserve our natural resources and protect the environment. The goal is to reduce the government's energy use by 30% from 1985 levels by the year 2005 and to increase the use of solar and other renewable energy technologies.

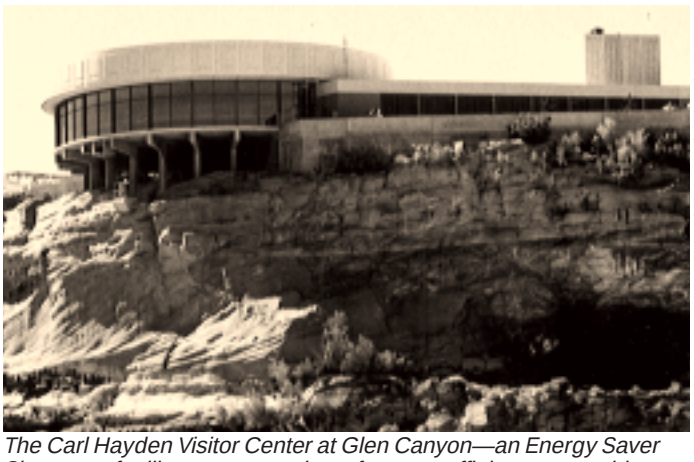
In the visitor center project, staff in the Bureau of Reclamation and DOE FEMP have reduced energy use at the center approximately 33% annually. The Bureau of Reclamation estimates that it now saves about $5,000 a month in energy costs.

With the assistance of DOE FEMP, the Bureau of Reclamation followed seven steps to achieving greater energy and water efficiency. These are steps that you, too, can take to achieve your goals:

1. Identify your opportunities
2. Develop an action plan
3. Conduct a detailed feasibility study
4. Design the project
5. Implement the project
6. Evaluate and verify project savings
7. Be recognized for your success!

Step 1: Identify Your Opportunities

In step 1, your agency inspects a facility to identify opportunities for saving energy and water. This step also includes collecting data on current energy and water consumption. You can do this by analyzing a year's worth of gas, electric, and water utility bills and calculating the number of electric fixtures and appliances your facilities use. If you are planning a new commercial facility for your agency, you will probably be incorporating many of the energy- and water-saving measures called for in Federal regulations for new construction.



Larry Gorden, Bureau of Reclamation/PIX04210

The Carl Hayden Visitor Center at Glen Canyon—an Energy Saver Showcase facility—uses a variety of energy-efficient, renewable energy, and water conservation technologies.

U.S. Department of Energy

Office of Energy Efficiency and Renewable Energy

To help identify opportunities for savings, free or cost-shared energy and water facility audits can often be obtained through FEMP's SAVEnergy Program, from local utilities, or from other sources. DOE's Regional Energy Action Project (REAP) staff can provide access to a team of energy efficiency experts in each DOE regional service area (see box on page 4). Using software provided by FEMP, auditing experts can help you choose an optimum mix of efficiency measures and new technologies that work together to increase energy savings.

Software tools available to the facility manager include FEDS, a computer program that helps to identify conservation opportunities; FRESA, a program that identifies opportunities for using renewable energy technologies such as solar water heating; and WATERGY, a program that helps you determine appropriate water conservation measures.

Step 2: Develop an Action Plan

Step 2, preparing an action plan, has three important elements: (1) selecting appropriate energy efficiency, water conservation, and renewable energy measures; (2) building project partnerships to implement these measures; and (3) exploring financing opportunities.

One way to set priorities among several energy and water efficiency measures is to compare them on the basis of their cost-effectiveness as well as on how they will affect each other. For example, installing new energy-efficient lighting in a building reduces the heating load, which in turn allows you to purchase a smaller cooling system.

Graham Knight/PIX06835

After identifying opportunities for saving energy and water, Larry Gordon and his project partners developed an action plan that would guide them from start to finish.

Graham Knight/PIX06837

Conducting a feasibility study involves checking details at the project site as well as "crunching the numbers" by estimating the life-cycle costs of conservation upgrades.

Graham Knight/PIX06838

Larry Gordon of the U.S. Bureau of Reclamation put together a project team for the Carl Hayden Visitor Center that included members of the National Park Service and private industry; they worked through each step of the process together.

Federal energy projects are often carried out in partnership with other Federal agencies, state government groups, and private companies. For the project at Glen Canyon Dam, the Bureau of Reclamation assembled a team that included DOE FEMP, the National Park Service, and private industry, and they worked through each step of the process together. Bureau of Reclamation staff credit their project's success to this partnership and to FEMP's assistance at critical points. For more information, contact your region's REAP team member (see box on page 4).

To help finance your project, you can explore financing alternatives such as local utility incentive programs and energy savings performance contracts (ESPCs). FEMP has developed streamlined regional and technology-specific contracts known as "Super ESPCs" to help finance Federal energy and water projects. Agencies can implement energy conservation measures through delivery orders under these contracts. For more information on ESPCs, contact your regional representative of the new FEMP Service Network (see box on page 3).

Step 3: Conduct a Detailed Feasibility Study

In step 3, a feasibility study is conducted. This involves obtaining detailed estimates of what it will cost to purchase, install, and maintain the energy- and water-efficient equipment and renewable energy technologies identified in the action plan. Estimating energy and cost savings allows you to verify that the planned efficiency measure is an appropriate, cost-effective priority. The results of these studies will help you make a "go" or "no-go" decision for each potential project.

One important element of Federal energy projects is determining the life-cycle cost of all the energy- and water-saving products and renewable energy technologies called for in the action plan. Call the FEMP Help Desk (1-800-363-3732) or visit FEMP's Web site (http://www.eren.doe.gov/femp/) for information about software such as BLCC, which can help you determine payback periods and life-cycle costs.

Step 4: Design the Project

In this step, your project team begins working with engineers, architects, and agency personnel on a specific design. To develop a good project design, your team may want to use a comprehensive approach like the one used at Glen Canyon Dam. In this approach, energy efficiency, water conservation, and renewable energy measures identified in the action plan are considered in relation to their effect on each other and in relation to their combined effect on the facility. For example, at the visitor center, new energy-efficient windows allowed more sunlight to enter the building while reducing its lighting and heating loads.

Graham Knight/PIX06841

New, energy-efficient windows installed at the visitor center at Glen Canyon Dam are easy on the eyes as well as the budget.

Your team can also establish measurement and verification (M&V) goals for energy performance and savings in this step. This will help you measure, evaluate, and verify project results (step 6).

FEMP can assist you with this step in many ways, from helping you determine project specifications to reviewing the work of your agency's design team.

Step 5: Implement the Project

In step 5, contracts are put in place, construction begins, new equipment is installed, and energy and water efficiency measures are implemented. At Glen Canyon, highly reflective energy-efficient windows, low-flow faucets, and a new solar water-heating system were installed in this phase of the project.

FEMP has many years of experience in assisting agencies with this step. Its teams of experts can help you find ways to overcome obstacles and solve problems during project implementation. Some of this work can be done on a cost-reimbursement basis.

Step 6: Evaluate and Verify Project Savings

Calculating and verifying energy and water savings are essential to proving the success of your project. Project team members address some important questions in this step: Did everything work as planned? What are the actual energy, water, and cost savings resulting from this project? If savings aren't as significant as estimated, what can be done to get better results?

Some projects, such as energy-efficient lighting retrofits, are relatively easy to measure and evaluate in terms of energy and cost savings. Others, such as new cooling towers or a new PV-wind-diesel energy system, may require more complex measurement, evaluation, and verification.

FEMP has identified two major substeps in this phase; FEMP staff can provide assistance with both of them. The first is postconstruction evaluation, in which a contractor's work is inspected to make sure that it meets regulatory and agency specifications. The second includes monitoring and verifying the performance of new energy and water conservation equipment. See FEMP's *Measurement and Verification Guidelines for Federal Energy Projects*, available from the FEMP Help Desk, for more detailed information.

FEMP Service Network Contacts

Southeast Region
Doug Culbreth, 919-782-5238

Northeast Region
Paul King, 617-565-9712

Midwest Region
Sharon Gill, 312-886-8573

Central Region
Randy Jones, 303-275-4814

Mid-Atlantic Region
Bill Klebous, 212-264-0691

Western Region
Cheri Sayer, 206-553-7838

Note: See the box on page 4 for the states and territories in each region.

Step 7: Be Recognized for Your Success!

There are many ways that agencies can celebrate successful projects. This recognition also helps to spread the word to others in government who want to implement similar projects. You may be nominated for one of DOE's Federal energy awards. Or you might propose that your project be summarized in a FEMP technical assistance case study or in the *FEMP Focus* newsletter. You might also want to place an article about the project in a local newspaper or a trade journal.

Graham Knight/PIX06842

While energy-efficient windows deflect some of Arizona's abundant sunlight to help cool the interior of the visitor center, solar panels on the roof are helping to heat its water.

A number of outstanding projects are selected by DOE FEMP each year to be Federal Energy Showcases; the Carl Hayden Visitor Center at Glen Canyon Dam was one of them. There, signs in several different languages tell a million visitors each year about the center's new energy- and water-saving features.

Finally, don't forget that *You Have the Power*. This means that you, as a Federal employee, may qualify for special recognition from FEMP for your energy- or

Larry Gorden, Bureau of Reclamation/PIX04209

Charles Calhoun, Regional Director for the Bureau of Reclamation Upper Colorado Region, and Curtis Framel of the U.S. Department of Energy dedicate a plaque designating Glen Canyon as an Energy Showcase.

water-saving project. The Bureau of Reclamation's coordinator for the Glen Canyon project, Larry Gordon, was selected as just such an "Energy Champion" for his hard work and dedication to energy and water efficiency. See the REAP contacts list for the numbers to call.

To order the free video version of this fact sheet, "How to Implement an Energy Savings Project," call the FEMP Help Desk: 1-800-363-3732.

FEMP Regional Energy Action Project (REAP) Contacts

To find out more about energy-saving projects, contact the REAP representative in your DOE support office:

Atlanta Regional Support Office (Southeast Region)
David Waldrop, 404-347-3483
(Serves AL, AR, FL, GA, KY, MS, NC, SC, TN, Puerto Rico, Virgin Islands)

Boston Regional Support Office (Northeast Region)
Paul King, 617-565-9712
(Serves CT, MA, ME, NH, NY, RI, VT)

Chicago Regional Support Office (Midwest Region)
Sharon Gill, 312-886-8573
(Serves IA, IL, IN, MI, MN, MO, OH, WI)

Denver Regional Support Office (Central Region)
Randy Jones, 303-275-4814
(Serves CO, KS, LA, MT, ND, NE, NM, OK, SD, TX, UT, WY)

Philadelphia Regional Support Office (Mid-Atlantic Region)
Leah Boggs, 215-656-6976
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(Serves DC, DE, MD, NJ, PA, VA, WV)

Seattle Regional Support Office (Western Region)
Curtis Framel, 206-553-7841
(Serves AK, AZ, CA, HI, ID, NV, OR, WA, Guam, the Northern Marianas, Amercian Samoa, and Palau)

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For More Information

Call the FEMP Help Desk: 800-363-3732
And visit the FEMP Web site:
http://www.eren.doe.gov/femp/

Or contact:

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