

# SAVEnergy Action Plans

Katherine Mayo  
Robert Westby  
*National Renewable Energy Laboratory*

Sharon deMonsabert  
*George Mason University*

Mark Ginsberg  
*U.S. Department of Energy*

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National Renewable Energy Laboratory  
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### 1. SYNOPSIS

The SAVEnergy Action Plan program has been initiated by the Department of Energy to comply with the Energy Policy Act of 1992 (EPACT). The objective of this paper is to describe the development of a new approach to energy and water conservation audits that will be available to all Federal Agencies.

### 2. ABSTRACT

The Department of Energy's Federal Energy Management Program (FEMP) is charged with carrying out key sections of EPACT and Executive Order 12903, to make the Federal government operate more efficiently. A congressionally mandated energy and water conservation audit program is one component of this growing DOE program. This paper traces the SAVEnergy Action Plan program throughout its development from (1) identifying projects and Agency champions, (2) establishing a protocol and fitting

auditors into the program, (3) developing a data base to track the audits and measure their success, and (4) evaluating the process, learning from mistakes, and charting and transferring successes. A major tenet of the SAVEnergy program is to proactively prescreen all audit activities to ensure that-- where audits are done and Action Plans completed-- projects will be done.

### 3. INTRODUCTION

#### 3.1 Background

With EPACT and the Executive Order mandating that Federal Agencies conduct energy audits of their facilities, the same documents charged FEMP with developing a program that could help Agencies complete those audits and implement projects that would save energy and money. The SAVEnergy Action Plan program was funded for the first time in FY 1994 and started as a totally new and different initiative. The mission of the SAVEnergy Action Plan program is to provide a means to perform energy and water conservation analyses and to complete cost-effective projects enabling the Federal government to operate more efficiently.

### 3.2 Scope

The SAVEnergy Action Plan has been designed to serve the needs of any Federal Agency requesting an energy or water conservation audit. The process starts at the point when Agencies request or are targeted for audits and ends with the Action Plan completion and presentation. To build success into the project, we determined that tracking projects would be important and that some follow-up to audits, in the form of Action Teams, could facilitate projects.

## 4. PROJECT IDENTIFICATION

### 4.1 Agency Requests

In September 1993, DOE announced the SAVEnergy Action Plan program and gave a two-page request form to all Agency members of the Interagency Energy Management Task Force. Agencies were to distribute these forms to facility managers in the field, and those interested in SAVEnergy audits were to respond to the questionnaire. The response was overwhelming-- in four months, we had 60-million square feet of facility audit requests. Both large and small agencies responded with a variety of types and sizes of buildings in nearly every state.

This response confirmed what we had always suspected-- that there is a tremendous need for help in energy efficiency and water conservation in the field. Before committing to any requests, we organized the projects by region and prescreened each as we shall describe next. We also required that, before a SAVEnergy auditor is deployed to a site, the facility manager would have to sign a letter of agreement with the Directors of FEMP and of the DOE Support Office, committing to following up on the audit with actual projects.

#### 4.2 Prescreening

As Agency requests for audits are received, we evaluate the data to determine if the facility and associated buildings meet prescreening standards. Two-hundred audits are budgeted for FY 1994 under the SAVEnergy program, and we anticipate that not all agency audit requests will be satisfied. The most likely candidates will exhibit a majority (seven or more) of the following nine characteristics:

- Energy "champion" at the facility
- Aggressive utility demand-side management (DSM) program available
- High utility costs
- Agency funds available for projects
- Transferable project opportunities at the facility and within the Agency

- Potential for energy-savings performance contracting (ESPC) as a funding option
- Potential Federal Energy Efficiency Fund (FEEF) candidate
- Showcase potential to display leadership and set an example within their own and other Agencies
- Site personnel are experienced, have proved the ability to undertake projects, or have completed FEMP training

The prescreening criteria ensures that the facilities audited under the SAVEnergy program have a high likelihood of completing the energy or water conservation project, thus being good investments of the limited appropriated funds.

#### 4.3 Selecting Facilities to be Audited

Eighty percent (approximately 240) of the audits originate from Federal Agency requests for audits; these facility projects exhibit seven or more of the key characteristics. The remaining 20% (approximately 60) of the audits are determined from the results of an energy and water end-use model that estimates potential resource and cost savings for all Federal buildings; facilities with a potential savings of 30% or more are targeted for an audit as shown in the following table.

Audit Initiation	Facility Project Completion Potential	Percent of Audits
Agency Requested	High Potential - Exhibits 7 or more characteristics	80 %
Agency Requested	Low Potential - Exhibits less than 7 characteristics	none
Model Targeted	High Potential - Greater than 30% savings	20 %
Model Targeted	Low Potential - Less than 30% savings	none

For the facilities exhibiting a high potential for successful project completion, audits are distributed proportionally (by number of buildings or building area) according to type of building as delineated in EPACT:

- Hospitals
- Housing
- Industrial facilities
- Office buildings

- Prisons
- Research and development laboratories
- Schools
- Service buildings
- Storage facilities

In addition, utilities and other structures (e.g., pumps, outdoor lighting, fenceline security systems) not explicitly covered under EPACT are audited in a representative manner.

The audit program also attempts to distribute proportionately audits among Federal government Agencies (e.g., NASA, USDA, DoD) and the 10 DOE regions. Another objective of the audit targeting process is to ensure that both energy and water conservation goals are represented.

Although the audit process places the greatest emphasis on the facilities and building candidates with the highest likelihood of energy and water conservation success, we will collect data for the low-potential facilities from the Energy Information Agency survey of Federal Agencies. Other energy and water end-use survey data collected by the Agencies themselves will similarly be loaded into the SAVEnergy data base management information system. Of note, Executive Order 12903 requires that Agencies perform energy and water conservation audits of 10% of their buildings beginning in FY 1995. This information allows us to perform an unbiased analysis of energy and water end-use patterns throughout the Federal sector. The data will serve as a baseline

for future economic and resource conservation estimates. If we collected the information for the high-potential-for success candidates only, the data base from which to project savings would reflect a bias toward cost and resource savings. The collection of data, economically, from other sources will ensure that we can perform future analyses in a statistically sound manner.

As energy and water conservation projects are carried out, we will be collecting responses and incorporate them into the end-use models to provide cost and resource savings estimates that will improve the facility targeting process. Similarly, we will modify the list of nine facility characteristics used in the prescreening process using knowledge-acquisition techniques or simple statistical metrics. These methods will help us determine characteristics that are closely correlated with successful projects that we can then incorporate into the targeting process.

## 5. SAVENERGY ACTION PLAN PROCESS

### 5.1 Developing Protocol

To ensure that some basic practices were followed for each audit, we developed an audit protocol that every auditor would be required to follow. This protocol includes items like

1) perform life-cycle costing on all projects using the National Institute of Standards and Technology(NIST) Building Life-Cycle Costing (BLCC) software; 2) conduct a renewable energy and water conservation screening to identify opportunities for expert follow-up on those technologies; 3) understand the funding mechanisms available (like performance contracting and DSM programs) and apply them when recommending projects; 4) maintain a fuel-neutral approach when recommending energy conservation measures (ECMs); 5) rank-order all ECMs with under 10-year payback and list all operation and maintenance procedures which can be done at no cost; and 6) use the SAVEnergy reporting format that can be input to an audit- and project-tracking data base for reporting and monitoring.

The protocol does not dictate how an audit should be done; it merely sets the minimum criteria for a FEMP-sponsored audit. The following section describes how auditors are chosen for the process.

## 5.2 Identifying Auditors

Auditors for the SAVEnergy Action Plans come from a wide spectrum of backgrounds and sectors. DOE national laboratories have tremendous in-house expertise in technologies like lighting, building shell and renewable energy. Specialized teams from these labs can be deployed to meet certain technology-specific

Agency needs. Other resources-- like State energy offices, auditors in the Institutional Conservation Program (ICP) and the Energy Audit Diagnostic Centers (EADCs)-- have expertise in specialized types of audits and can quickly make the change from state and local or industrial buildings to Federal facilities. Universities with energy management programs often have teams of students and professors who can use the audit as a learning tool for a reasonable fee. Small businesses can be contracted expeditiously, often have low overhead and can quickly deploy audit teams. Utilities also offer a variety of audit levels, as long as they maintain the required fuel-neutral approach. For the longer term, the private sector with its many qualified engineering firms will be competing by region to be placed on a Blanket Purchase Order agreement and be deployed by the DOE Support Offices on task orders. The General Services Administration is undertaking a related effort to put auditors into the Federal Supply Schedule.

All auditors receive a packet with diskettes, protocol, reporting format and the Agency letter before they proceed to the audit. They must have shown that they understand the FEMP funding mechanisms and can incorporate them into their analyses. Auditors are not required to have special training; we review their technical qualifications closely to assure FEMP that the audits will be done well. In addition, we are developing a quality control mechanism to follow up on audits: we will check

the work of the auditors and determine if FEMP is getting the highest quality work for its funding. Agencies are also called back to ensure that the SAVEnergy Action Plan is a useful package that can turn building data into actual projects.

### 5.3 Processing Action Plans

When the auditor completes a SAVEnergy Action Plan, one copy goes to the Agency and a second copy goes to FEMP and the SAVEnergy staff. The plans include a basic cover sheet and Executive Summary, as well as a prioritized list of ECMs and the funding options the Agency could use to implement them. For example, the ECMs could include replacing a chiller which might be funded by a utility DSM program, a lighting and steam-trap retrofit bundled into an energy-savings performance contract and a solar hot-water project funded by the Federal Energy Efficiency Fund. The idea is that a SAVEnergy Action Plan will be a document that can be used by the Agency to turn data into projects.

## 6. ACTION PLAN AND PROJECT FOLLOW-THROUGH

### 6.1 Developing Data base

Our tracking data base was, at first, an audit-tracking system. In other words, it would simply trace the audit process: the

auditors, the Agencies for whom the audits were done, the resulting recommendations. We soon realized that, to accomplish the mission of the program, the system should track projects. These projects could result from SAVEnergy audits, utility initiatives, the Federal Energy Efficiency Fund, and any other project that FEMP could reasonably be expected to track.

The data base needed to be compatible with other FEMP software packages that also track high-level information about agencies, utilities, training courses, etc. Therefore, we programmed the data base into FoxPro with Windows compatibility to be able to move quickly from one data base to another, potentially viewing several levels of information about a particular facility. The data base is a user-friendly system with only a few entry screens but with a multitude of custom reports allowing FEMP to illustrate progress to its stakeholders.

## 6.2 Documenting Progress

We document progress by generating reports from the data base. We can ask how many facilities have had renewables audits, for example, and then find out the progress of those project recommendations and how much energy and how many dollars those projects are saving. These figures will help FEMP in documenting success for in-house management, reporting to Congress and

serving as a resource for Agencies who need more-detailed information on projects in which they are involved.

### 6.3 Initiating Projects with Agencies

Once an Action Plan is in hand, an Agency may need more guidance to start on the project. Because the program has limited people-power, we have developed an empowered Action Team process that enables an Agency to negotiate internal hurdles and to kick off projects.

With the Action Teams, we include decision-making representatives from any Agency department that could affect or be affected by the project. Members of the budget, energy, operations, construction, environment, legal and procurement departments all need to be involved. This team meets together over the completed Action Plan and strategizes as to implementation schedules. The team enables all parties to buy into the project, remove barriers and assert some quality control into the Action Plan process.

## 7. PROCESS EVALUATION

### 7.1 Lessons Learned

As we are still developing the SAVEnergy program, we cannot look back very far and easily spot lessons learned. We did find that

it is critical to establish a process as soon as possible and then modify it as issues arise. We found ourselves with far more audit requests than we could reasonably complete and with no set process to complete them. We ended up sending tag teams to critical sites while we worked on a general solicitation. Although EPACT and the Executive Order mandated audits, we simply were not prepared for the pent-up need for audits that could do more than collect dust on someone's bookshelf. And frankly, Congress was not prepared to fund the program at the level needed to support the Agency demand.

## 7.2 Charting Success

Success in a new program is what one defines it to be and what one can convince others it is. Although the goals of the SAVEnergy program for FY 1994 were a modest 200 audits, we jumped into a process that put priority less on the number of audits than on the cost-effectiveness of the Action Plans relative to the projects they produced. With extremely limited funding, we were constantly thinking of ways to partner or use technology transfer mechanisms to deploy multiple projects rather than conduct costly audits. The trick was in balancing the detail of the audit with a modest amount of funding. We often asked Agencies to co-fund large scale audits so that we could get more work done at their site.

In conclusion, we believe we have taken an identified need and developed a program that meets this need in a way very different from most audit programs. We can use this method to help Federal Agencies reduce their energy and water usage and costs. We hope to set an example for other sectors, if not by the process, then in the attitude we have toward filling a need which will help others meet their legislated goals and become models for still others. In the end our work should ultimately benefit the economic and environmental condition of the United States.

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National Renewable Energy Laboratory