

GREENING FEDERAL FACILITIES

**An Energy, Environmental, and Economic Resource Guide
for Federal Facility Managers and Designers**

SECOND EDITION



Greening Federal Facilities

An Energy, Environmental, and Economic Resource Guide for Federal Facility Managers and Designers

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*“Then I say the earth belongs to each ...
generation during its course, fully and in its own right,
no generation can contract debts greater than may be
paid during the course of its own existence.”*

Thomas Jefferson, September 6, 1789

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About the Contributing Organizations

U.S. Department of Energy – The U.S. Department of Energy (DOE) contributes to the welfare of the Nation by providing resources to achieve efficiency in energy use, diversity of energy sources, a more productive and competitive economy, improved environmental quality, and a secure national defense. DOE provides scientific and technical information and educational resources to Federal agencies and the public.

Office of Energy Efficiency and Renewable Energy – DOE’s Office of Energy Efficiency and Renewable Energy leads the Nation to a stronger economy, a cleaner environment, and a more secure future through the development and deployment of sustainable energy technologies.

Federal Energy Management Program – The Federal Energy Management Program (FEMP) reduces the cost of government by advancing energy efficiency, water conservation, and the use of solar and other renewable energy. FEMP accomplishes its mission by creating partnerships, leveraging resources, transferring technology, and providing training and support. Each of these activities is directly related to achieving not only the goals set forth in legislation and Executive Orders, but also those that are inherent in sound management of Federal financial and personnel resources.

BuildingGreen, Inc. – BuildingGreen, Inc., provides information on green building to architects, builders, facility owners, and facility managers. BuildingGreen publishes the monthly newsletter *Environmental Building News*; the *Green Building Advisor*, a software tool for identifying strategies for greening buildings; and *GreenSpec*, a directory of green building products.

ENSAR Group, Inc. – ENSAR Group, Inc., is an international design consulting firm, based in Boulder, Colorado, specializing in sustainable building development. ENSAR has led the design of many extremely energy-efficient federal buildings. ENSAR coordinates many sustainable design activities, including the development of this publication.

Greening America – Greening America is a nonprofit foundation that educates the public and private sectors about energy-efficient and environmentally sound design, innovation, and technology. Greening America, which had its genesis in the Greening of the White House, produces videos, publications, online technical resources, and other materials that show practical examples of how sound energy and environmental decision-making makes good economic sense.

Sustainable Systems, Inc. – Sustainable Systems, Inc., is a consulting firm that is dedicated to implementing the principles of sustainability in development. Multi-disciplinary teams of technical professionals, social scientists, economists, and business administrators address problems—from community development to technological issues—from the viewpoint of minimizing the resource and environmental impacts of the activities of its clients, without compromising quality of life.

Disclaimer

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Executive Summary

Greening Federal Facilities, Second Edition, is a nuts-and-bolts resource guide designed to increase energy and resource efficiency, cut waste, and improve the performance of Federal buildings and facilities. It is intended primarily for Federal facility managers, who administer more resources and have more impact on the environment than any other group in the world. Collectively, they are a powerful force for introducing improvements, and they set an example for the rest of the economy.

This guide highlights practical actions that facility managers, planners, and design and construction staff can take to save energy and money, improve the comfort and productivity of employees, and benefit the environment. The guide is one more step in a national effort to promote energy efficiency and sustainable actions in the nation's 500,000 Federal buildings and facilities.

Executive Order 13123, Section 403(d), instructs Federal agencies to develop sustainable design principles and use them in planning and building new facilities. This order also instructs agencies to optimize life-cycle costs and other environmental and energy costs associated with the construction, life-cycle operation, and decommissioning of a facility. The order's chief goals are to reduce the greenhouse gas emissions associated with Federal facility energy use by 30% by 2010 in comparison to 1990 levels, to reduce energy consumption by 35% between 1985 and 2010, and to increase water conservation and the cost-effective use of renewable energy.

The U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP) has supported several Federal facilities working to meet these goals through a process called *greening*. The Pentagon, the Naval Support Activity Mid-South in Millington, Tennessee, the Presidio of San Francisco, and Grand Canyon, Yellowstone, and other national parks are some of the many facilities that have well-organized, ongoing greening programs based on comprehensive, facility-wide planning activities. And on May 3, 2001, President George W. Bush announced that the Chief of Staff would review energy usage in the White House, which has also adopted energy-efficient practices. "Since I've asked other agencies to review their policy, I'm going to ask the White House to do the same. We want to be good, efficient users of energy in the White House," President Bush said.

FEMP's experience in helping to transfer the energy and environmental technologies used in the government's greening projects is summarized in this introductory guide. *Greening Federal Facilities* describes a wide range of effective actions that include selecting nonpolluting materials, recycling, conserving energy and water, improving landscaping, and purchasing energy-efficient lighting, heating, and cooling equipment. The guide highlights best practices to:

- Invest in improvements that have quick paybacks and make economic sense;
- Increase the productivity, comfort, and health of employees and building occupants;
- Maximize innovative financing and partnering opportunities;
- Facilitate interagency cooperation;
- Work within the ongoing operations and procedures of facilities management staff; and
- Reduce environmental impacts.

To produce *Greening Federal Facilities*, FEMP assembled an interagency team consisting of experts within DOE, the Department of Defense, the General Services Administration, the Environmental Protection Agency, the Office of the Federal Environmental Executive, and other agencies. FEMP also received considerable support from Greening America, ENSAR Group, Inc., BuildingGreen, Inc., and a team of experts from DOE's Lawrence Berkeley National Laboratory, National Renewable Energy Laboratory, and Pacific Northwest National Laboratory. An advisory group included dozens of leading private-sector experts in architecture, engineering, building operations, and energy and environmental management.

As a result, this guide concentrates on actions that are practical and cost-effective. *Greening Federal Facilities* reflects a long-standing commitment to make government work better and cost less, to use the Federal government's enormous purchasing power to stimulate markets for American energy and environmental technologies, and to save taxpayers money by reducing materials costs, waste disposal costs, and utility bills.