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Sustainability "How-to Guide" Series

US Government Policy Impacts and Opportunities for Facility Management

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TABLE OF CONTENTS

Acknowledgements . . . 1
About the Authors . . . 2
Foreword . . . 3
Part 1: Executive Summary . . . 6
Part 2: Introduction . . . 8
Part 3: Detailed Findings . . . 10
3.1 Current US Federal Policies . . . 10
3.1.1 Regulatory Acts . . . 10
3.1.2 Executive Orders . . . 11
3.1.3 State of the Union Address - January 2011 . . . 14
3.2 Sustainability Plan Reporting . . . 15
3.3 Market Advantage for Taking the Lead . . . 15
3.4 Current Reporting Requirements for Federal Agencies . . . 16
3.5 Current Reporting Requirements for Commercial Entities . . . 16
3.6 Reporting Templates and Resources . . . 17
3.6.1 Strategic Sustainability Performance Plans . . . 17
3.6.2 Balanced Scorecard . . . 18
3.7 Strategic Sustainability Performance Program Summary . . . 18
Part 4: Making the Business Case . . . 20
4.1 Federal Business Case Resources . . . 20
4.2 Benefits Resources . . . 21
Part 5: Case Study . . . 22
5.1 Atlanta Botanical Gardens . . . 22
Part 6: Appendices . . . 26
6.1 Appendix A: References . . . 26
6.2 Appendix B: Additional Resources . . . 27
6.2.1 IFMA Foundation Resources . . . 27
6.2.2 Federal Agency Support . . . 29
6.2.3 General Resources . . . 30
6.2.4 Grants and Incentives . . . 33
6.2.5 Green Procurement . . . 34
6.3 Appendix C: Glossary . . . 36
6.4 Appendix D: Certifications Supporting Sustainability . . . 37
6.5 Appendix E: EO 13423 and 13514 Crosswalk . . . 39
6.6 Appendix F: January 2011 State of the Union Address: Better Buildings Initiative . . . 43

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FOREWORD

It is no secret that a focused, well-defined sustainability strategy is beneficial to an organization's bottom line, whether it is a federal, private-sector, military or nonprofit entity. Sustainable practices are not only the right thing to do for the environment; they also benefit the communities in which they are implemented. Sustainability is the business implementation of environmental responsibility.

Sustainability is all around us. Federal, state and local governments are increasingly applying regulatory constraints on design, construction and facility operations standards. Employees expect their employers to act responsibly, and vice versa. Going green is no longer a fad or a trend, but a course of action for individuals and businesses alike – benefiting the triple bottom line of people, planet and profit.

Today's facility manager needs to be able to clearly communicate the benefits and positive economic impact of sustainability and energy-efficient practices, not only to the public, but also to the C-suite. While there is a dramatic need for each of us – and our organizations – to care for the environment, it is just as important that we convey to executives and stakeholders how these initiatives can benefit our company's financial success.

The document in your hands is the result of a partnership between the IFMA Foundation and IFMA, through its Sustainability Committee, each working to fulfill the shared goal of furthering sustainability knowledge. Conducting research like this provides both IFMA and the foundation with great insight into what each can do as an organization to assist the facility management community at large.

It is my hope that you, as a facility professional, will join us in our mission of furthering sustainable practices. This resource is a good place to start.

Tony Keane, CAE
President and CEO
International Facility Management Association

FOREWORD

IFMA Sustainability Committee (ISC)

The IFMA Sustainability Committee (ISC) is charged with developing and implementing strategic and tactical sustainability initiatives. A current initiative involves working with the IFMA Foundation on the development of a series of "How-to Guides" that will help educate facility management professionals and others with similar interests in a wide variety of topics associated with sustainability and the built environment.

The general objectives of these "How-to Guides" are as follows:

1. To provide data associated with a wide range of subjects related to sustainability, energy savings and the built environment

2. To provide practical information associated with how to implement the steps being recommended

3. To present a business case and return-on-investment (ROI) analysis, wherever possible, justifying each green initiative being discussed

4. To provide information on how to sell management on the implementation of the sustainability technology under discussion

5. To provide case studies of successful examples of implementing each green initiative

6. To provide references and additional resources (e.g., Web sites, articles, glossary) where readers can go for additional information

7. To work with other associations for the purpose of sharing and promoting sustainability content

The guides are reviewed by an editorial board, an advisory board and, in most cases, by invited external reviewers. Once the guides are completed, they are distributed via the IFMA Foundation's website (www.ifmafoundation.org) free of charge.

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The mission of the IFMA Foundation is to promote and support scholarships, educational and research opportunities for the advancement of facility management worldwide.

Established in 1990 as a nonprofit, 501(c)(3) corporation, the IFMA Foundation is supported by the generosity of a community of individuals – IFMA members, chapters, councils, corporate sponsors and private contributors – and is proud to be an instrument of information and opportunities for the profession and its representatives.

A separate entity from IFMA, the IFMA Foundation receives no funding from annual membership dues to carry out its mission. Supported by the generosity of the FM community, the IFMA Foundation provides education, research and scholarships for the benefit of FM professionals and students. Foundation contributors share the belief that education and research improve the FM profession.

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1 EXECUTIVE SUMMARY

'Expand knowledge of the built environment, in a changing world, through scholarships, education and research'

The Vision Statement of the IFMA Foundation

Companies of all sizes are striving to reduce any negative impact that their businesses are having on the environment through improved sustainable practices and more efficient source reduction initiatives. They are looking to their facility managers to be leaders and manage the planning and implementation of complete sustainability programs that are consistent with corporate strategic plans; meet and exceed applicable laws and regulatory acts; and demonstrate to employees, customers and the communities within which they operate that they are exemplary environmental stewards.

This "How-to" guide is written for facility managers who are pursuing a comprehensive approach to making sustainability improvements to the properties under their responsibility. In particular, the guide is written for facility managers who want to develop and then implement a strategic sustainability performance plan for their facilities while benefiting from the best-in-class tools, resources, benchmark information and support developed by the US federal government and state governments. The guide is written for a United States facility management audience. It is anticipated that a second guide written from a global perspective will be forthcoming. The specific goals of this guide are to:

- Describe how recent legislative and executive initiatives have focused on increasing the efficiency of energy and water use in federal buildings, reducing costs, providing leadership, and, through leveraging federal agency buying power, creating a market for goods and services.
- Outline the current reporting requirements for both federal agencies and commercial entities.
- Demonstrate how strategic sustainability performance planning provides market advantages for commercial entities that take the lead.
- Provide support for making the business case to senior management.
- Help facility managers take advantage of available grants, rebates and incentives, and encourage increased operational and capital investments.
- Identify best-in-class resources supporting both sustainability planning and execution.

The federal government has declared that it will take a leadership role in energy efficiency, renewable energy and environmental stewardship as demonstrated in law and Presidential Executive Orders (EO) and to make freely available all developed resources, support tools and information. Consequently, this guide is primarily focused on those US acts and executive orders that are focused on the built environment, most notably:

- The National Environmental Policy Act of 1969 (NEPA)
- Energy Policy Act 2005
- The Energy Independence and Security Act 2007
- Executive Order 13423
- Executive Order 13514

The most recent executive order, EO 13514 (October 2009), aims to establish an integrated strategy toward sustainability in the federal government and to make the reduction of greenhouse gas emissions a priority for federal agencies.

EO 13514 perfectly illustrates the federal government's commitment to energy. It states:

"In order to create a clean energy economy that will increase our Nation's prosperity, promote energy security, protect the interests of taxpayers, and safeguard the health of our environment, the Federal Government must lead by example. It is therefore the policy of the United States that federal agencies shall increase energy efficiency: measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services;

design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located.

"It is further the policy of the United States that to achieve these goals and support their respective missions, agencies shall prioritize actions based on a full accounting of both economic and social benefits and costs and shall drive continuous improvement by annually evaluating performance, extending or expanding projects that have net benefits, and reassessing or discontinuing underperforming projects.

"Finally, it is also the policy of the United States that agencies' efforts and outcomes in implementing this order shall be transparent and that agencies shall therefore disclose results associated with the actions taken pursuant to this order on publicly available Federal websites."

The requirements of EO 13514 were further reinforced by the president's Better Buildings Initiative goals outlined in the January 2011 State of the Union Address, which is included in the appendices and also discussed in section 3.1.3 State of the Union Address – January 2011.

The supporting resources developed across the various agencies cover all aspects of the built environment and, in particular:

- Sustainable buildings and campuses
- Operations and maintenance
- Greenhouse gases
- Water efficiency
- Data center efficiency
- Industrial facilities
- Federal fleet management

It is important to note that the executive orders detailed in this guide are directed to federal facilities and are not currently required for private sector entities. That said, these mandates are an excellent preview of what soon may be required from the private sector and, as such, an understating of these requirements and their policy drivers are important.

This also translates into an opportunity for commercial facility managers to take advantage of a significant body of knowledge and reuse that knowledge to make building portfolios even more efficient. These resources can support a facility manager when developing an overall strategic sustainability performance program and accelerate the completion of approved sustainability projects.

Table 1: Key operational questions

Question	Author's response
What are the current and relevant regulations and mandates that impact the environment and energy efficiency? I also want to stay current with whatever regulations are driving future legislation and executive orders including the likely impact of the most current (i.e., 2011) State of the Union Address.	It is best to start with section 3.1 Current US Federal Policies and then spend time on the "Laws and Regulations" section of the EPA website (www.epa.gov/lawsregs) and the Federal Energy Management Program (FEMP) website focused on current regulations (www1.eere.energy.gov/femp/regulations/requirements_by_reg.html).
I would like to understand how this guide, along with federal and state support resources complements the "How-to" guides that I am using in my workplace.	Section 6.2 Appendix B: Additional Resources provides a series of connections to each of the other guides in the IFMA Foundation sustainability "How-to Guide" series.
I am developing and executing an integrated strategic sustainability performance program from strategy through individual project execution, including tracking and reporting the returns achieved from each initiative. Where can I go to for guidance to ensure I have a best-in-class program?	Section 3.2 Sustainability Plan Reporting in this guide provides details on where to go to find supporting information for each step in the planning and execution of a strategic sustainability performance program.
I am in the private sector and, from the EOs, I want to learn how to achieve better energy efficiencies in my buildings.	Start with section 6.2 Appendix B: Additional Resources in this guide and then go to the "Program Areas" of the FEMP website (www1.eere.energy.gov/femp/program/index.html).
I really only want to get an overview of this area and then explore the various government websites to look at the available content.	In this case, it would be best to read the Executive Summary to this guide and then go straight to section 6.2 Appendix B: Additional Resources and, in particular, section 6.2.3 General Resources.

The guide is organized to support the different needs of facility managers and provides support in answering key operational questions (Table 1).

2 INTRODUCTION

When it comes to optimizing the life cycle of building portfolios, improving energy efficiency and advancing environmental stewardship, one may look at the work of facility managers from three perspectives: opportunity, improvement and compliance (Figure 1).

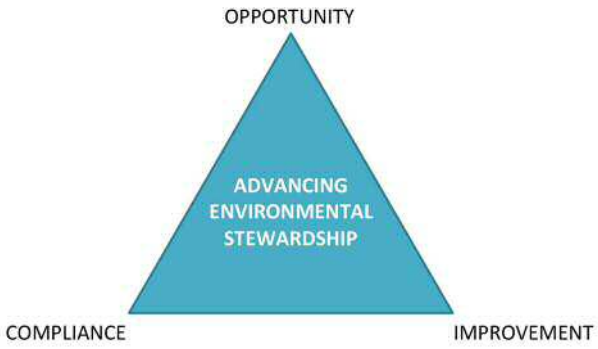

Figure 1: Three perspectives to advance environmental stewardship

Opportunity refers to those actions taken by facility managers to improve the environmental and energy performance of their buildings that, at the same time, generate business in other sectors. These new business opportunities should leverage technologies that support environmental stewardship to a greater extent than traditional alternatives. Green procurement and supply chain management actions also fall into this category. It is worth noting that many of the mandates for federal funding were made without any new spending associated with them. As an answer to these funding constraints, energy savings performance contracts (ESPC) provide new business opportunities and sometimes the only viable funding options left to agencies. In this context, ESPCs become a significant enabler for private and government partnerships.

Improvement refers to actions that are voluntary in nature but progresses the overall environmental and energy efficiency advances being sought by the US government in the areas of global environmental stewardship, energy independence and ensuring national security. For example, many of the energy actions taken in the commercial and industrial private sectors are consistent with the executive order mandates (EO 13423, 13514 and 13221) established for federal government employees. Many of the incentives provided by federal and state agencies and progressive cities are in place to support the voluntary improvement actions taken by companies in the private sector.

Compliance refers to ensuring actions are consistent with the requirements of regulations that are approved into law. For example, many of the laws monitored and enforced by the Environmental Protection Agency (EPA) fall into this category. It also includes regulation such as the National Environmental Policy Act (NEPA), the Energy Independence & Security Act – 2007 (EISA 2007) and the Energy Policy Act of 2005. The executive orders (EO) requirements and goals covered in this guide are mandates federal agencies are obligated to act upon. These are also laudatory goals, but not mandates, for the commercial and industrial sectors to work to achieve.

Whether federal or private, the actions taken by facility managers when it comes to improving the buildings under their control are essentially the same. This was further reinforced by the president's Better Buildings Initiative goals outlined in the January 2011 State of the Union Address. The fact that the federal government has taken the position that it will lead by example in the areas of environmental stewardship and energy efficiency for the 429,000 buildings under its control is resulting in a significant body of knowledge that is being made freely available to all facility managers.

The authors of this "How-to" guide hope it will:

- Advance the dialogue between the federal and private sectors
- Encourage private sector facility managers to take advantage of the body of knowledge being generated
- Encourage the sharing of sustainability benchmarking and best practices

This "How-to" guide concentrates on the built environment and focuses on actions to improve energy efficiency that benefit the environment. The guide does not concentrate on the broader issues of environmental stewardship where the building is not central to improvement opportunities. For

example, actions or acts related to fleet management and “smart city” initiatives are outside the scope of the guide.

This “How-to” guide specifically concentrates on the questions facility managers ask about buildings and building portfolios under their control, covering topics such as:

- How to develop a strategic sustainability performance plan that clearly details the contribution to and achievement of organizational strategy and business goals
- How to present the plan as a business case with environmental stewardship and energy efficiency initiatives prioritized
- Once the plan is approved, how actions, progress, accomplishments, setbacks and need for support are communicated
- How to identify and use benchmarks to determine if the maximum environmental benefit is being achieved
- Where to find best-in-class content for inclusion in requests for approval of new initiatives
- Where to find incentives, subsidies and grant information to potentially aid in achieving the best possible return on investment (ROI) for plan initiatives
- Where to find guidance and support for developing the plan and then executing the approved programs

Facility managers addressing these questions will more effectively leverage the sustainability improvement cycle (Figure 2) and:

- Optimize the life cycle costs of the building portfolios under their control, including capitalizing on available support, incentives and grants without compromising established triple bottom line (TBL) goals
- Ensure building operations comply with all environmental regulations
- Implement environmental improvement actions without regulation requirement
- Be part of an environmental stewardship ecosystem by embracing transforming technologies and procuring green products

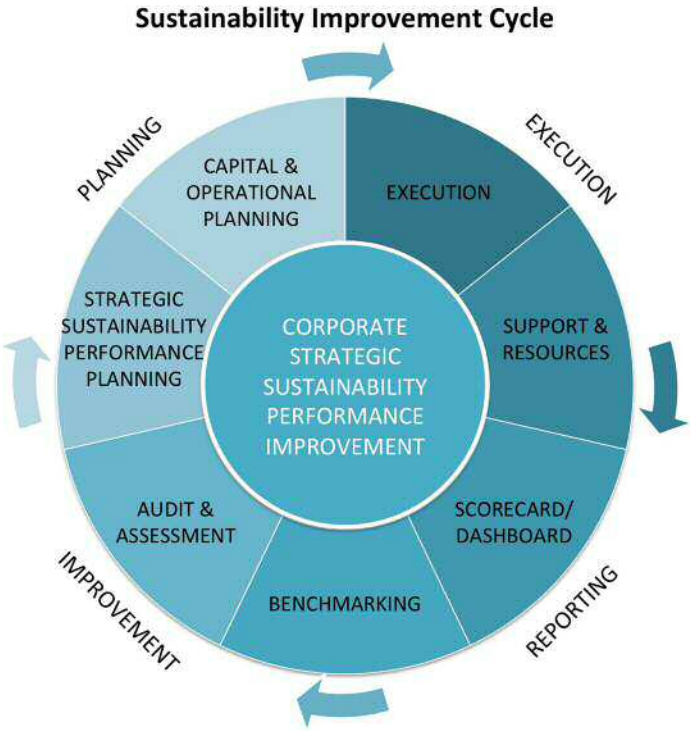

Figure 2: Sustainability improvement cycle

3 DETAILED FINDINGS

3.1 Current US Federal Policies

"The US federal government manages approximately 429,000 buildings of many types with a total square footage of 3.34 billion worldwide, of which about 80 percent is owned space" (NRC 2011). Recent legislative and executive initiatives have focused on increasing the efficiency of energy and water use in these buildings, to reduce costs, provide leadership and, leveraging its buying power, to create a market for goods and services.

This section describes the recent initiatives and provides the context for the development of the market and resources available for commercial facility managers.

3.1.1 Regulatory Acts

There are a large number of regulatory acts that could be considered for review and inclusion in this guide. For example, the Environmental Protection Agency (EPA) alone administers all or part of over 30 acts and executive orders (EO) and abides by and uses another 12 as guides for its efforts. More information on the summaries of environmental laws and EOs can be found at www.epa.gov/lawsregs/laws/index.html#env. This release of the "How-to" guide is focused on acts driving the areas of energy efficiency and environmental stewardship related to the built environment. With that in mind, the acts considered to have the most significant impact on facility managers are:

- The National Environmental Policy Act (NEPA)
- The Energy Independence & Security Act of 2007 (EISA 2007)
- The Energy Policy Act of 2005

As environmental needs change and new challenges arise polices are revised (Figure 3).

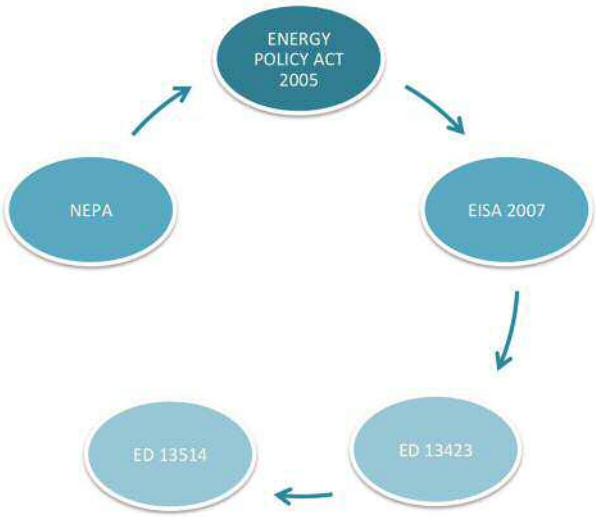

Figure 3: Policy evolution

The National Environmental Policy Act of 1969 (NEPA) (www.epa.gov/oecaerth/basics/nepa.html) was enacted on January 1, 1970 and established the broad national framework for protecting the environment. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

NEPA requirements are invoked when airports, buildings, military complexes, highways, parkland purchases and other federal activities are proposed. Environmental assessments (EAs) and environmental impact statements (EISs), which are assessments of the likelihood of impacts from alternative courses of action, are required from all federal agencies and are the most visible of NEPA requirements. Specific guidance on meeting the EIS and other requirements can be found at www.epa.gov/compliance/nepa.

The Energy Policy Act of 2005 (www.epa.gov/regulations/laws/epa.html) amended portions of the National Energy Conservation Policy Act (NECPA). In turn, EO13423 has updated a number of energy management requirements of EPAct 2005. The act addresses energy production in the United States, including:

- Renewable energy
- Electricity
- Energy tax incentives
- Climate change technology

For example, the act provides loan guarantees for entities that develop or use innovative technologies that avoid greenhouse gas byproducts.

The Energy Independence & Security Act (EISA 2007) (energy.senate.gov/public/_files/RL342941.pdf) was signed into law on December 19, 2007. This act established various energy management goals and requirements. At the same time, it amended portions of the National Energy Conservation Policy Act (NECPA). The aims of the act include:

- Moving the United States toward greater energy independence and security
- Increasing the production of clean renewable fuels
- Increasing the efficiency of products, buildings and vehicles
- Promoting research on and deployment of greenhouse gas capture and storage options
- Improving the energy performance of the federal government

The EISA established specific energy use goals and performance standards for federal facilities, including new and existing buildings owned or leased by all federal agencies. It also required facilities management benchmarking, including adding consumption meters to existing and new buildings, with annual reports to the Office of Management and Budget. In addition, it required specific targets for the reduction of fossil fuels and the increased use of alternative energy.

For instance, EISA requires that all federal buildings be net-zero energy (i.e., produce as much energy in a year as they use) by 2030, with intermediate goals. Specifically, by 2015, federal owned/leased buildings must reduce energy use by 30 percent and water use by 16 percent (compared to a 2003 base year). In December 2010, the US General Services Administration released guidance to all federal agencies that they would not be permitted to renew expiring leases on existing buildings that did not have a specific plan to meet the EISA requirements by 2015 (www.gsa.gov/graphics/pbs/Energy_Star_RSL_2010-02-FINAL-508.pdf).

EISA 2007 also extended its influence beyond the government sector when it required the U.S. Department of Energy (DOE) to significantly improve the energy efficiency of new and existing commercial buildings. In response, the DOE established the "Net-Zero Commercial Building Initiative" (CBI) to establish marketable net-zero energy commercial buildings (NZEBs) by 2025. EISA 2007 also authorized the DOE to collaborate with the private sector, nongovernmental organizations, the DOE's national laboratories and other federal agencies; the objective being to speed development and widespread adoption of energy efficient green building technologies.

3.1.2 Executive Orders

An EO can be issued at the federal (by the US president), state (by a state's governor) or local (by a city's mayor) level. They are used to guide agencies in managing operations at a federal, state or local level. They normally have the full force of law when backed by mandated regulations, or can represent desired goals and objectives when not backed by legislation. There are three executive orders of particular relevance to facility management: EO 13221, 13423 and 13514. Each of these EOs has unique requirements but also augments or replaces provisions in those previously issued. The authors have established that this "How-to" guide has included more content associated with the most recent executive order, EO 13514. But it is important to emphasize that all three EOs should be read as an integrated set of documents.

EO 13514 establishes sustainability goals, targets and requirements for federal agencies. It builds on, but does not replace, EO 13423. Consequently, a crosswalk was developed by the U.S. Department of Energy (DOE) Office of Environmental Policy and Assistance and Federal Energy Management Program (FEMP) that aligns the goals and targets from EO 13514 with EO 13423 and related statutes to provide a clear perspective on current requirements. The crosswalk is included in section 6.5 Appendix E: EO 13423 and 13514 Crosswalk. Embedding these goals into each strategic sustainability performance plan brings a level of consistency to the plans as well as consistent nomenclature.

Areas of particular significance in executing the requirements of the acts are detailed below.

Executive Order 13221, Energy Efficient Standby Power Devices (www1.eere.energy.gov/femp/pdfs/eo13221.pdf) was signed into law on August 2, 2001. This act calls for federal agencies, wherever possible, to purchase products that use minimal standby power. FEMP offers a variety of resources to assist federal agencies in achieving EO 13221 compliance, including:

- A list of all of the ENERGY STAR qualified or FEMP designated products, which is available for download (www1.eere.energy.gov/femp/pdfs/eep_productfactsheet.pdf).
- FEMP guidance on buying products with low standby power, which provides additional information and is available on the FEMP website (www1.eere.energy.gov/femp/technologies/buying_low_standby.html).

Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management (edocket.access.gpo.gov/2007/pdf/07-374.pdf) was signed into law on January 24, 2007. This executive order strengthened key federal energy goals and established a number of federal energy and environmental management requirements in several areas, including, but not limited to:

- Designing and operating sustainable buildings to ensure that new construction and major renovations comply with the 2006 Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU). It also requires that 15 percent of the existing federal capital asset building inventory of each agency incorporate the sustainable practices in the guiding principles by the end of fiscal year 2015.
- Reducing energy intensity by 3 percent each year and leading to 30 percent by the end of fiscal year (FY) 2015 as compared to FY 2003 baseline data.
- Increasing use of renewable energy with at least half of all renewable energy required coming from new renewable sources (developed after January 1, 1999). Agencies can also purchase renewable energy to help meet EO 13423 requirements.
- Reducing water intensity (gallons per square foot or liters per square meter) by 2 percent each year through FY 2015 for a total of 16 percent (based on water consumption in FY 2007).

Executive Order 13514, Federal Leadership in Environmental, Energy and Economic Performance (edocket.access.gpo.gov/2009/pdf/E9-24518.pdf) has a stated purpose of establishing "an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions a priority for Federal agencies." It implements and expands on EO 13423 (see below) and was signed into law on October 5, 2009. Important requirements of EO 13514 include:

1. Accountability and transparency
    - Agency efforts and outcomes must be transparent and disclosed on publicly available federal websites.
    - Agencies must prepare scorecards providing periodic evaluation of federal agency performance. Scorecard results must be published on a publicly available website.
2. Strategic sustainability performance planning– Federal agencies are required to develop, implement and annually update a strategic sustainability performance plan that prioritizes agency actions based on life cycle return on investment. Each plan will incorporate:
    - Sustainability goals and targets, including greenhouse gas reduction targets
    - Identification of specific agency goals, schedules, milestones and approaches for achieving results and quantifiable metrics
    - Outline of planned actions to provide information about agency progress, performance and results on a publicly available federal website
    - Consideration of environmental measures as well as economic benefits, social benefits and costs in evaluating projects and activities based on life cycle return on investment
    - Annual identification of opportunities for improvement and evaluation of past performance to extend or expand projects that have net benefits, as well as reassessment or discontinuation of underperforming projects

A listing of all strategic sustainability plans for each agency is available on the Council on Environmental Quality website (www.whitehouse.gov/administration/eop/ceq/sustainability/plans).

3. Greenhouse gas management – Greenhouse gas (GHG) management is imperative within EO 13514. Each federal agency must establish and report a fiscal year 2020 percentage reduction target of agencywide GHG emissions in absolute terms relative to a fiscal year 2008 baseline. In establishing the target, agencies shall consider reductions associated with:
    - Reducing agency building energy intensity
    - Increasing agency renewable energy use and on-site projects
    - Reducing agency use of fossil fuels
4. Sustainable buildings and communities – Federal agencies must enhance their efforts toward sustainable buildings and communities. Specific requirements include:
    - Implementation of high-performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction by:
        - Ensuring that all new federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030
        - Ensuring that all new construction, major renovations, or repair or alteration of federal buildings comply with the "Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings"
        - Ensuring that at least 15 percent of existing agency buildings and leases (above 5,000 gross square feet [465 gross square meters]) meet the "Guiding Principles" by fiscal year 2015 and that the agency makes annual progress toward 100 percent compliance across its building inventory
        - Pursuing cost-effective, innovative strategies (e.g., highly reflective and vegetated roofs) to minimize consumption of energy, water and materials
        - Managing existing building systems to reduce the consumption of energy, water and materials, and identifying alternatives to renovation that reduce existing asset-deferred maintenance costs
        - Identifying opportunities when adding assets to agency building inventories to:
            - Consolidate and eliminate existing assets
            - Optimize the performance of portfolio property
        - Reducing associated environmental impacts
        - Ensuring rehabilitation of federally owned historic buildings utilizes best practices and technologies in retrofitting to promote long-term viability of the building

- Advance regional and local integrated planning by:
    - Participating in regional transportation planning and recognizing existing community transportation infrastructure
    - Aligning federal policies to increase the effectiveness of local planning for energy choices, such as locally generated renewable energy
    - Ensuring that planning for new federal facilities and leases considers sites that are pedestrian friendly, near existing employment centers, and accessible to public transport; and emphasize existing city centers and, in rural communities, existing or

planned town centers
    - Identifying and analyzing impacts from energy usage and alternative energy sources in all environmental impact statements and environmental assessments for proposals covering new or expanded federal facilities under the amended National Environmental Policy Act (NEPA) of 1969

5. Water efficiency – Federal agencies must improve water efficiency and management by:
    - Reducing potable water consumption intensity 2 percent annually through fiscal year 2020, or 26 percent by the end of fiscal year 2020, relative to a fiscal year 2007 baseline
    - Reducing agency industrial, landscaping and agricultural water consumption 2 percent annually, or 20 percent by the end of fiscal year 2020, relative to a fiscal year 2010 baseline
    - Identifying, promoting and implementing water reuse strategies consistent with state law that reduce potable water consumption

6. Electronic products and services – Federal agencies must make advances in product efficiency and stewardship by:
    - Ensuring 95 percent of new contract actions, task orders and delivery orders for products and services (excluding weapon systems) are energy efficient (ENERGY STAR or FEMP-designated), water efficient, bio-based, environmentally preferable (Electronic Product Environmental Assessment Tool (EPEAT) certified), non-ozone depleting, contain recycled content, or are nontoxic or less-toxic alternatives where such products and services meet agency performance requirements
    - Implementing best management practices for the energy-efficient management of servers and federal data centers

7. Pollution prevention and waste reduction – Federal agencies must make improvement in the areas of pollution prevention and waste reduction, by:
    - Minimizing the generation of waste and pollutants through source reduction
    - Decreasing agency use of chemicals where such decrease will assist the agency in achieving greenhouse gas reduction targets
    - Diverting at least 50 percent of nonhazardous solid waste by the end of fiscal year 2013
    - Reducing printing paper use and acquiring uncoated printing and writing paper containing at least 30 percent postconsumer fiber
    - Increasing the diversion of compostable and organic material from the waste stream

3.1.3 State of the Union Address – January 2011

In the January 2011 State of the Union Address (see section 6.6 Appendix F: January 2011 State of the Union Address: Better Buildings Initiative), President Obama called for a goal of producing 80 percent of US electricity from clean energy sources by 2035. To meet this goal, the president envisioned an inclusive approach, by stating: “Some folks want wind and solar. Oth-

ers want nuclear, clean coal, and natural gas. To meet this goal, we will need them all." The message stressed continued investment into science and research. To attain this vision, the president's proposed budget will:

- Focus on "high-value" research related to clean energy deployment
- Include more than a doubling of investments in energy efficiency
- Include more than an 85 percent increase in renewable energy investments

Such expenditures will focus on:

- Supporting a "$1 a watt" initiative to make solar energy cost competitive
- Increasing funding for 24-hour geothermal renewable energy
- Emphasizing industrial efficiency to keep US manufacturing competitive

A "Better Buildings Initiative" proposal with a new energy efficiency program will catalyze private sector investment resulting in upgrades to commercial buildings.

A significant part of the Better Buildings Initiative will be incentivized by changes to the tax code, specifically reformation of section 79(d) of the code. These changes, as well as programmatic funding, must be enacted by Congress. As of July 2011, Congress had not yet acted to move the program forward.

Future releases of this "How-to" guide will evaluate the impact and results of these initiatives.

3.2 Sustainability Plan Reporting

The starting point for making a business case for sustainability is the development of a corporate strategic sustainability plan that encompasses, where possible, the entire building portfolio. This enables the facility manager to best represent the impact of the plan to management. Ideally the plan should reflect the goals and objectives of the corporate strategic business plan. In cases where this is not possible, the strategic sustainability performance plan can exist as a standalone document that can be linked to the corporate plan at a future date.

3.3 Market Advantage for Taking the Lead

The facility manager needs to be able to articulate how the proposed initiatives will become projects, how they will be managed, how progress will be tracked and reported and how accomplishments will be documented (including the achieved return on investments and payback periods). Some initiatives will have soft savings that cannot be quantified, but these should also be documented if the company wants to position itself as having a triple bottom line approach focused on sustainability in general, environmental stewardship and energy efficiency. At the same time, there needs to be enough hard savings to justify the approval of the complete plan. Once again, the development of a comprehensive strategic sustainability performance plan is a critical first step in implementing a comprehensive energy efficiency program.

One way in which this can be accomplished is to review the federal agency strategic sustainability performance plan whose building portfolio is most similar to that of the facility manager's organization, and construct a plan in a similar fashion but customized to reflect the goals of the company. The facility manager will need to include a number of organizational groups associated with various components of the plan (Table 2).

Table 2: Strategic sustainability performance plan – organizational groups

Plan component	Appropriate staff
Corporate sustainable performance plan	Immediate manager and finance
Business case for each proposed initiative that requires investment	Finance
Balanced scorecard development	Finance
Scorecard development	IT
Environmental compliance	EH&S manager or equivalent
Energy efficiency	Energy manager or equivalent

Once the plan is approved, it is important that the balanced scorecard and dashboard reporting actions are implemented. In general, an approved plan is the start of the sustainability journey, but regular reporting of progress, accomplishments and setbacks must be documented. Again it is helpful to keep track of how the relevant federal government agencies benchmark and report their progress.

If the facility manager is responsible for only part of the corporation's building portfolio, peer managers should be made aware of the strategic planning effort that is being undertaken. Ideally this will motivate the full team to develop similar plans so the total global portfolio is incorporated.

3.4 Current Reporting Requirements for Federal Agencies

While there are many templates and sample energy plans available, what follows is one approach the authors feel is suitable to meet the needs of both government and private sector facility managers. Such a plan would follow the goals of Executive Order (EO) 13514 but be customized so as to be appropriate to the building portfolio. The plan should also adopt the framework that agencies are following in compliance with EO 13514 mandates so that any future benchmarking progress is more easily accomplished.

There are over 50 agency strategic sustainability plans covering 429,000 buildings. It is reasonable to assume that all classes and conditions of buildings are included in this inventory. It therefore makes sense for facility managers to select agency plans that most closely resemble their building portfolios. This allows facility managers to pay closer attention to the initiatives and progress at these agencies with the obvious opportunities to benchmark and, where available, ask advice from agency experts working on similar buildings.

The first visible effort by agencies to support the goals and specific requirements of EO 13514 is the development of their strategic sustainability performance plans. Almost all agencies have now completed their plans, and they are available on the Council on Environmental Quality's website (www.whitehouse.gov/administration/eop/ceq/sustainability/plans). These plans respond to Executive Order 13514's request to develop, implement and annually update a plan that prioritizes actions based on a positive return on investment for the American taxpayer and to meet energy, water and waste reduction targets. These follow a consistent framework, and while much of the plans relate to "plans to plan," they remain an excellent source of ideas for facility managers when completing plans for their building portfolios. Each plan addresses:

- Sustainability improvement goals and targets, including GHG reduction targets
- Activities, policies, plans, procedures, goals, schedules and milestones needed to implement the EO
- Performance metrics and evaluation of projects based on life cycle return on investment
- Climate change adaptation planning

Facility managers that construct their plans using a similar outline and include similar actions to those in the crosswalk will be able to benchmark their progress against that of other federal agencies, more easily identify new tools and knowledge as they are made available, and identify agencies and individuals to contact for additional advice.

3.5 Current Reporting Requirements for Commercial Entities

While sustainability reports do not need to be audited yet, external stakeholders, such as institutional investors, increasingly expect it. Over 3,000 companies worldwide and two-thirds of the Fortune 500 currently develop sustainability reports (Ernst & Young 2010).

In 2010, the Securities and Exchange Commission (SEC) issued interpretive guidance regarding disclosure requirements by public companies related to business or legal developments driven by climate change (Securities and Exchange Commission 2010). The trend toward transparent sustainability reporting is becoming the norm even though there is no legal obligation to do so at this time. Facility managers who lead the development of companywide strategic sustainability performance plans and manage their implementation are not only improving the profitability of their companies and making positive environmental stewardship advances, but also positively impacting how their companies present themselves to their stakeholders.

3.6 Reporting Templates and Resources

For facility managers to gain consensus and approvals within their organizations, including senior management, it is important to develop a comprehensive strategic sustainability performance plan for the built environment. Such a plan should reflect the goals of the organization, since the enactment of the plan impacts all actions of that company and involves support from both the operational and capital budgets.

3.6.1 Strategic Sustainability Performance Plans

A typical outline for a corporate strategic sustainability plan should contain the components detailed in Table 3.

Table 3: Corporate strategic sustainability performance plan components

Plan section	Components
Executive summary	
Corporate sustainability mission statement & objectives	
Sustainability goals, measures, planned actions and targeted accomplishments	• High-performance sustainable design/ upgrades to achieve "green building" status • Energy & water use efficiency • Scope 1 & 2 greenhouse gas reduction • Scope 3 greenhouse gas reduction • Develop/maintain comprehensive greenhouse gas inventory • Pollution prevention • Electronic stewardship & data centers • Green procurement and sustainable acquisition • Regulatory compliance
Return on investment	• Economic life cycle cost/return on investment • Environmental costs & benefits • Social costs & benefits • Summary triple bottom line (TBL) scorecard & dashboard
Implementation planning – organizing for success	• Leadership & accountability • Project management • Internal coordination & communication • Reporting progress & self-evaluation • External communications

As discussed earlier, over 50 strategic sustainability performance plans have been developed by federal agencies and organizations following a common set of goals and objectives. They follow a similar format, and facility managers that refer to them will find information that can be used to assist their own plans. The plans:

- Identify areas and actions to pursue
- Provide guidance, definitions and explanations that assist in plan completion
- Give guidance on how to present the business case for all categories: societal, environmental and economic
- Demonstrate how to report progress
- Identify benchmarks
- Provide insight on how to communicate to all stakeholders, internal and external to the organization

Exhibit 1 depicts the table of contents for the sustainability performance plan for the Department of Energy. Note how similar it is to the typical outline detailed in Table 3. This plan is available as a PDF download (www.energy.gov/sites/prod/files/edg/media/DOE_Sustainability_Plan_2010.PDF).

Exhibit 1

Department of Energy

Strategic Sustainability Performance Plan

Discovering Sustainable Solutions to Power and Secure America's Future

Table of Contents

Section 1: Department Policy and Strategy 1
I. Department Policy Statement 1
II. Sustainability and the Department's Mission 2
III. Greenhouse Gas Reduction Goals 4
IV. Plan Implementation 6
V. Evaluating Return on Investment 10
VI. Transparency 12

Section 2: Performance Review & Annual Update 13
I. Summary of Accomplishments 13
II. Goal Performance Review 17
1. GOAL: Scope 1 & 2 Greenhouse Gas Reduction 19
2. GOAL: Scope 3 Greenhouse Gas Reduction 33
3. GOAL: Comprehensive Greenhouse Gas Inventory 37
4. GOAL: High-Performance Sustainable Design (HPSB) 38
5. GOAL: Regional and Local Planning 43
6. GOAL: Water Use Efficiency and Management 46
7. GOAL: Pollution Prevention and Waste Elimination 50
8. GOAL: Sustainable Acquisition 57
9. GOAL: Electronic Stewardship and Data Centers 61
10. GOAL: Department Innovation 65

Section 3: Department Self Evaluation 69

3.6.2 Balanced Scorecard

It is important for facility managers to develop a balanced scorecard to communicate progress to all levels in the organization. While this "How-to" guide recommends using the balanced scorecard framework (Figure 4) as detailed in the IFMA Foundation Sustainability How-to Guide – Getting Started, there are lessons to be gained by studying and also adopting some of the approaches taken by agencies in their EO 13423 compliance reports.

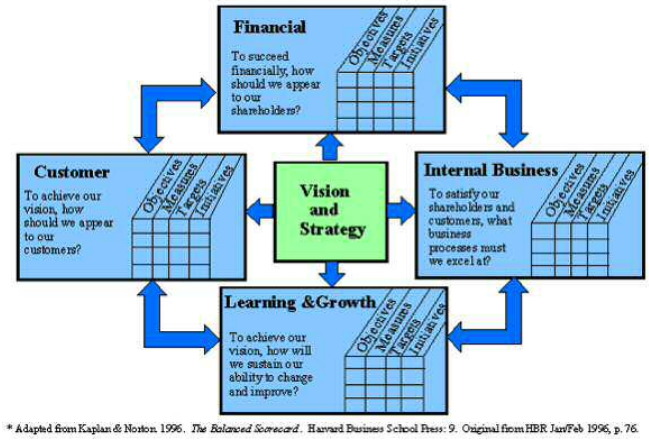

Figure 4: Balanced scorecard framework

As the final strategic sustainability performance plans are just now being completed by the agencies (as of May 2011), it is too early to evaluate the reporting in fulfillment of EO 13514 requirements. Staying in close contact with the reports as they appear will provide additional ideas on how best to execute an organization's approved plan. For agencies, in reporting progress against EO 13423, the decision was taken to adopt a "traffic light" (i.e., red, yellow, green) approach toward compliance. This approach provides a visual reporting of progress and is easily understood by management. Examples of various types of agency reporting can be found via the following links:

- Overall agency performance
  - Scorecard – traffic lights: www.fedcenter.gov/_kd/Items/actions.cfm?action=Show&item_id=14814&destination=ShowItem
  - Scorecard summary comments and highlights: www.fedcenter.gov/admin/itemattachment.cfm?attachmentid=296
- Energy report to the Department of Energy (DOE)
  - Reporting guidance: www1.eere.energy.gov/femp/pdfs/energyreportingguidance_2009.pdf
  - Energy management data reporting: www1.eere.energy.gov/femp/docs/energydatareportfy09.xls

3.7 Strategic Sustainability Performance Program Summary

A facility manager develops and executes a strategic sustainability performance program with several objectives in mind, including:

- Developing a plan that best contributes to the company's strategic mission, plans and goals
- Ensuring that the plan is thoroughly reviewed and subsequently approved
- Demonstrating that the returns on all investments and payback periods are acceptable and realizable

Some of the key questions facility managers have include the following:

- How best can I develop a strategic sustainability performance plan whereby my plan clearly contributes to the achievement of my company's strategy and business goals?
- How can I present my plan as a business case taking into account environmental stewardship and prioritized energy efficiency initiatives?
- Once my plan is approved, how can I best communicate my actions, progress, accomplishments, setbacks and support needs?
- How can I identify and use benchmarks so that I know that our achievements are being realized?
- For new initiatives, where can I identify best-in-class content to include in my requests for approval?
- Where can I identify available incentives, subsidies, rebates and grants so that I achieve the best ROIs for my projects?
- Where can I find advice and support in both developing my plan and executing the approved programs?

As stated in the introduction to the guide, answering these questions ensures that facility managers lead strategically and operationally to:

- Optimize the life cycle costs of the building portfolios under their control
- Ensure building operations comply with all environmental regulations
- Implement environmental improvement actions even if not mandated

- Be part of an environmental stewardship ecosystem by embracing transforming technologies and procuring green products
- Contribute to the organization's business goals by taking advantage of available incentives and grants

Many times it is difficult for facility managers to get their facility plans approved because of competing needs or limited capital funds. It is even more difficult to obtain approval for plans that follow the triple bottom line when some or many of the initiatives have long payback periods or result in soft savings. By aligning the plan with those of relevant federal agencies, it will add additional confirmation and credibility to the plan. It is also often beneficial to include high-performance building benchmarks from the 61-building "High Performance Buildings Database" (femp.buildinggreen.com). Each building's best-in-class attributes are also cross-referenced to the DOE's Commercial Building Initiative whose goal is to significantly improve the energy efficiency of new and existing commercial buildings (www1.eere.energy.gov/buildings/commercial_initiative/index.html).

4 MAKING THE BUSINESS CASE

Facility managers often have a requirement to cost justify the case for sustainability investments in light of alternative demands on limited capital funds. This section of the guide identifies government-developed financial tools that facility managers can use to justify financial requests.

4.1 Federal Business Case Resources

Detailed below are several federal business case resources:

- DOE – Federal Energy Management Program (FEMP): An earlier paper by FEMP, "The Business Case for Sustainable Design in Federal Buildings" provides an outline of business benefits and case study discussions (evanmills.lbl.gov/pubs/pdf/bcsddoc.pdf).
- National Institute of Building Sciences – Whole Building Design Guide (WBDG): This site is focused on being the "one-stop access to up-to-date information on a wide range of building-related guidance, criteria and technology from a 'whole-buildings' perspective" (WBDG 2011). From the perspective of "presenting the sustainability business case," the site discusses how best to take a life cycle approach to building cost-effectiveness. It provides advice on how best to utilize cost planning throughout the planning, design and development phases, using economic analysis to evaluate design alternatives, and how to consider nonmonetary benefits, such as aesthetics, historic preservation, security and safety (www.wbdg.org/design/cost_effective.php).
- U.S. Green Building Council (USGBC): The USGBC has issued a paper "Making the Business Case for High Performance Green Buildings" that documents 10 reasons for pursuing a green building strategy (www.usgbc.org/Docs/Member_Resource_Docs/makingthebusinesscase.pdf) There are also a number of papers documenting the business case for green buildings in the "Real Estate Management & Value" part of the "Research Publications" section (www.usgbc.org/DisplayPage.aspx?CMSPageID=77#real_estate).
- National Institute of Building Sciences – Whole Building Design Guide (WBDG) – "Measuring Performance of Sustainable Buildings" (cost benefit tools): The WBDG examines various perspectives and challenges associated with measuring performance of sustainable buildings. There is also an extensive list of resources that support measurement, including the triple bottom line, new and existing buildings, specific measurement parameters, measurement approaches and benchmarking (www.wbdg.org/resources/measperfsustbldgs.php).
- Environmental Protection Agency – ENERGY STAR (financial tools): Two tools that are particularly worthwhile are the "Financial Value Calculator" and the "Building Upgrade Value Calculator" (www.energystar.gov/index.cfm?c=assess_value.financial_tools). The "Financial Value Calculator" presents energy investment opportunities in terms of key financial metrics to convey the value of improved energy performance to senior financial decision-makers and other stakeholders. The "Building Upgrade Value Calculator" is a product of the partnership between ENERGY STAR, Building Owners and Managers Association (BOMA) International and the BOMA Foundation. The calculator estimates the financial impact of proposed investments in energy efficiency for office properties.

- High performance buildings (case studies): The DOE's "High Performance Database" includes 126 projects and is a shared resource for industry. It is a repository of in-depth information and data on high-performance, green projects across the United States. The database includes information on federal projects, USGBC LEED certified projects, buildings featured in the American Institute of Architects Committee on the Environment's annual Top Ten Green Projects competition, and best practice buildings as determined by BuildingGreen, LLC. The case studies outline the attributes that each building exemplifies.

4.2 Benefits Resources

There are a number of studies documenting expected returns from pursuing a green building strategy. Two such studies are:

- "High Performance Green Building: What's It Worth? Investigating the Market Value of High Performance Green Buildings" (2009) by Theddi Wright Chappell (Cushman & Wakefield) and Chris Corps (Vancouver Valuation Group) and project managed by Brandon Smith (Cascadia Region Green Building Council) available at cascadiagbc.org/news/GBValueStudy.pdf.
- "Assessing Green Building Performance: Post Occupancy Analysis of 12 GSA Buildings" (July 2008) by Kim M. Fowler and Emily M. Rauch from the Pacific Northwest National Laboratory and available at www.wbdg.org/research/sustainablehpbs.php?a=8.

5 CASE STUDY

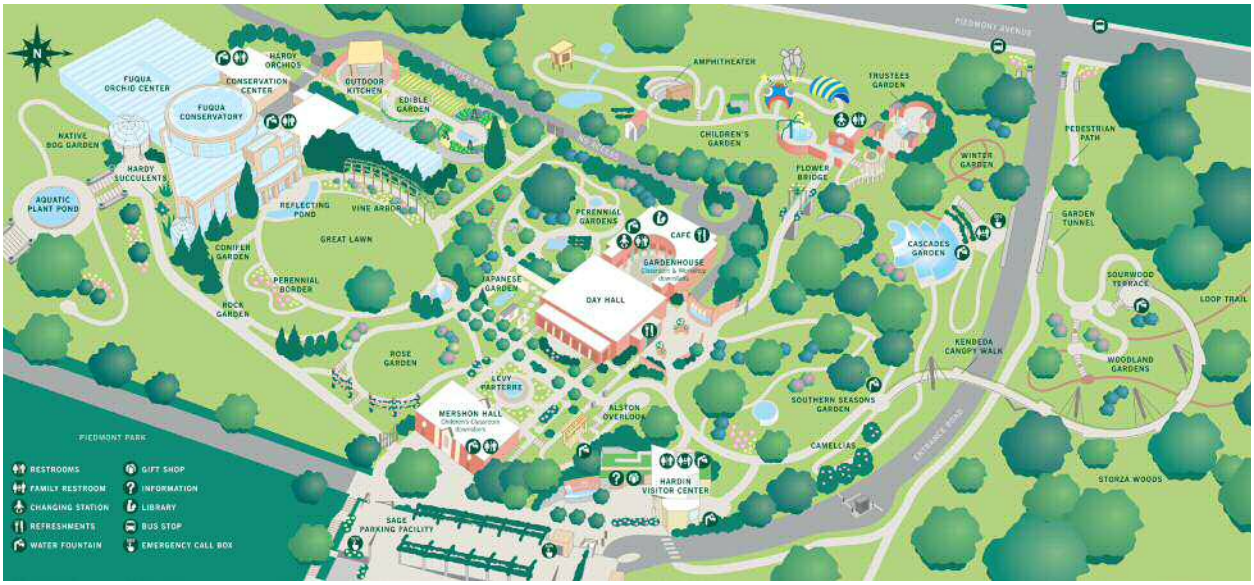

Figure 5: The Atlanta Botanical Gardens

5.1 Atlanta Botanical Gardens

The Atlanta Botanical Gardens (Garden) (www.atlantabotanicalgarden.org) is a 30-acre (12 hectare) botanical garden in Midtown Atlanta. The Garden is both a "botanical museum" and a sustainability learning laboratory (Figure 5).

Every aspect of The Atlanta Botanical Gardens is driven by what the Garden calls "sustainability in action," which has, as its goal, the achievement of responsible environmental stewardship, as well as energy and water conservation. The sustainability achieved encompasses not only the Garden and its interaction with visitors, employees and vendors, but also in its interaction with the City of Atlanta and with other local and national cultural institutions.

Since 1976, the garden's mission has been to "Develop and maintain plant collections for the purposes of display, education, conservation, research and enjoyment."

To advance its mission, the Garden's board initiated a multiphase "green expansion plan" at a cost of $55 million (US dollars). During the construction phase the plan emphasized five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Figure 6: Green roof covering a part of the Hardin Visitor Center

Completed in early 2010, the green expansion plan resulted in:

- The U.S. Green Building Council (USGBC) awarding its LEED Gold certification to two elements of the project: the SAGE parking facility, built into a steeply sloped hillside, and the Hardin Visitor Center.
- The construction of the Hardin Visitor Center, a visually impressive, transparent structure filled with natural light. It contains three green roofs (Figure 6) that absorb rainfall and provide both sound and thermal insulation. Runoff is eliminated, as rainwater falling on the green roof is absorbed by the plants.
- The design includes natural day lighting, green roof overhead, insulated glass, and local and sustainable wood.
- The plantings that cover nearly 50 percent of the Hardin Visitor Center roof area provide natural cooling, sound insulation, additional garden area for visitors and a new wildlife habitat.
- The installation of three green roofs: one intensive green roof that contains deep soil (as much as 18 inches [46 cm]), which allows for shrubs and perennials to grow and create a garden-like landscape; and two extensive green roofs that are shallow and provide just enough soil mix for low growing plants, like sedum and native grasses.
- An increased focus on water conservation with a 100,000-gallon (379,000 liters) capacity cistern installed underground. The cistern harvests storm water from a 7-acre (3 hectares) watershed and provides irrigation for 40 percent of the new gardens.
- Recycling granite curbs and reusing materials from the site to preserve the Garden's history.
- A minimum damage to trees, critical root zones and tree canopies because nontraditional construction practices were used and resulted in the recycling of removed trees into mulch for use on the job site.
- The expansion enhanced the Garden's plant offerings while reducing the overall heat island effect and increased its sustainability features. For example, the new multilevel parking facility, which the Garden shares with neighboring Piedmont Park, occupies only 1 acre (0.5 hectares) and allows both the Garden and the park to convert existing parking lots to green space.
- Energy efficiency focus through which the Garden has been active in approving and implementing a variety of programs, including a comprehensive lighting study, deploying lighting sensors, as well as a program to deploy solar panels. While the Garden is not yet energy self-sufficient due to the Conservatory and Orchid Center's requirements, it has already implemented initiatives that have had a major positive impact on the reduction of energy costs.

Noteworthy best practices include:

- New capital projects: All current projects consider the implementation needs of future sustainability projects. For example, the SAGE parking facility was constructed using framing that would accommodate the future deployment of solar panels.
- Visitors: The Garden requests that visitors take their waste home with them and support the Garden's efforts to achieve a zero-trash environment, while events and concerts emphasize the use of recyclable materials.
- Transportation: Incentives are provided to employees to use alternative transportation.
- Outsourced services: Sustainability is built into all service level agreements, and when contracts are renewed, vendors are required to document their sustainable practices and their plans to achieve additional improvements. These factors are given considerable weight in awarding contracts.

Sustainability attributes exhibited by the Garden:

- Energy credits: Measuring and analyzing energy consumption to improve energy efficiency.
- Energy efficiency: Using less energy to provide the same level of energy service.

- Environmental stewardship: Promoting environmental stewardship through the safeguarding and effective use of energy, water, soil and other natural resources.
- Green education: Educating how natural ecosystems function, including how human beings can best interact with them in order to live in a sustainable manner.
- Green expansion plan: The development and execution of a strategic sustainable performance plan.
- Green procurement of products and services: Procurement of environmentally friendly products and services, the selection of contractors and the embedding of environmental requirements in contracts.
- Green roof – extensive & intensive: A green roof is one that includes vegetation and a growing medium, planted over a waterproofing membrane. Extensive green roofs are virtually self-sustaining and require minimum maintenance. Intensive green roofs are labor-intensive, requiring irrigation, feeding and other maintenance.
- Green space: Green space generally refers to any land area covered with vegetation.
- Heat island effect: This occurs in developed areas where the elimination of natural land cover results in an increase in outdoor temperatures. The effect can be offset by vegetation, green roofs and light colored materials that reflect heat.
- Indoor environmental quality (IEQ): A term used to describe the relative health of the air in an indoor environment.
- LEED Certification: The Leadership in Energy and Environmental Design (LEED) Green Building Rating System was developed by the U.S. Green Building Council (USGBC). LEED certification is based on a variety of categories, including site sustainability, energy, materials and indoor quality, and divides buildings into four categories: certified, silver, gold and platinum.
- Lighting study: Studies that lead to more energy efficient lighting that result in lower electricity usage.
- Natural ventilation: Natural ventilation uses outside air without the use of a fan or other mechanical system.
- Natural daylight: The use of natural daylight to reduce energy usage in buildings.
- Recycled/reused materials: The cycle where discarded materials are collected, sorted, processed and converted into materials that can be reused. Also referred to as cradle to cradle.
- Solar panels: Solar panels are also referred to as photovoltaic panels and are a packaged interconnected assembly of solar cells. In combination with other panels they generate and supply electricity.
- Sustainability learning laboratory: The use of an environment as a dynamic learning laboratory for sustainability initiatives.
- Sustainable site development: This is the process of ecologically planning and implementing with regards to all aspects of a site's development (Figure 7).
- Water conservation: Water conservation refers to actions that reduce water usage and recycles waste water.
- Zero-trash environment: A philosophy that encourages the redesign of resource life cycles so that all products are reused.

Figure 7: Evening view of Atlanta Botanical Garden

Table 4 is a quick reference guide that lists specific sustainability attributes and references Web sources for further information.

Table 4: Corporate strategic sustainability performance plan components

Sustainability attribute	Guide support available for future projects with similar goals
Energy credits	DSIRE: www.dsireusa.org
Energy efficiency	ACEEE: www.aceee.org BuildingRating.org: www.buildingrating.org
Environmental stewardship	FedCenter.gov: www.fedcenter.gov
Green education	GreenBiz.com: www.greenbiz.com
Green expansion plan	Council on Environmental Quality: www.whitehouse.gov/administration/eop/ceq/sustainability/plans
Green procurement – products & services	EPA - Comprehensive Procurement Guidelines: www.epa.gov/epawaste/conserve/tools/cpg/index.htm FedCenter.gov: www.fedcenter.gov/programs/buygreen
Green roof – extensive & intensive	Federal Energy Management Program (FEMP): www1.eere.energy.gov/femp/pdfs/fta_green_roofs.pdf
Green space	EPA: www.epa.gov/gateway/learn/landcleanup.html
Heat island effect	EPA: www.epa.gov/heatisld
Indoor environmental quality	Whole Building Design Guide (WBDG): www.wbdg.org/design/ieq.php EPA: www.epa.gov/iaq
LEED certification	USGBC: www.usgbc.org/DisplayPage.aspx?CategoryID=19
Lighting study	FEMP: www1.eere.energy.gov/femp/technologies/eep_lighting_guidance.html
Natural ventilation	Whole Building Design Guide (WBDG): www.wbdg.org/resources/naturalventilation.php
Natural daylight	DOE: apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/sustainable_guide_ch4.pdf
Recycle/reuse materials	EPA: www.epa.gov/osw/conserve/rrr/recycle.htm
Sustainability learning laboratory	National Laboratories and Technology Centers: www.energy.gov/organization/labs-techcenters.htm
Sustainable site development	Whole Building Design Guide (WBDG): www.wbdg.org/references/fhpsb.php and www.wbdg.org/resources/lidsitedesign.php
Water conservation	FEMP Program: www1.eere.energy.gov/femp/program/waterefficiency.html Resources: www1.eere.energy.gov/femp/program/waterefficiency_resources.html#fr
Zero-trash environment	EPA: www.epa.gov/osw/rcc/web-academy/2009/sep09.htm

6 APPENDICES

6.1 Appendix A: References

Depart of Energy (2009). "Crosswalk of Sustainability Goals and Targets in Executive Orders and Statutes." DOE Office of Environmental Policy and Assistance. December 2, 2009. www.fs.fed.us/sustainableoperations/documents/crosswalk-sus-goals-eo.pdf

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6.2 Appendix B: Additional Resources

6.2.1 IFMA Foundation Resources

One of the roles of a facility manager is project management, and other IFMA Foundation "How-to" guides may prove useful in the area of project planning and execution. All guides are available for free download at the IFMA Foundation's website (www.ifmafoundation.org). The purpose of this section is to identify additional support information available from federal, state or government sites that complement the specific guide being referenced.

Getting Started Guide

In this guide, the starting point is a sustainability audit that aims to create and prioritize sustainability initiatives. There are a number of places to find support for the elements of an audit, including the Federal Energy Management Program (FEMP) website:

- Energy Assessment Training Manual: www1.eere.energy.gov/femp/pdfs/esa_manual.pdf
- Energy and Energy Efficiency Measures in Covered Facilities: www1.eere.energy.gov/femp/pdfs/draft_EISA_project_guidance.pdf

As many of the agencies are allocating resources to implement their own strategic sustainability performance plans, by putting "energy efficiency," "water efficiency measures," "federal sustainability audit" or similar phrases into one of the popular search engines, it is most likely new manuals will surface. Some of these manuals may still be in draft form, but the value of the information and the new ideas presented make such a search worthwhile.

At the same time, there are a number of libraries and repositories of information immediately available to facility managers, including:

- The ENERGY STAR Tools and Resources Library: www.energystar.gov/index.cfm?c=tools_resources.bus_energy_management_tools_resources
- The EPA National Library Network: www.epa.gov/libraries

Finally, there are suitable training programs available for online access and completion, including the FEMP website: apps1.eere.energy.gov/femp/training.

ENERGY STAR Guide

This guide provides an excellent roadmap for entering buildings in the ENERGY STAR Portfolio Manager and then analyzing the results. For additional information, ENERGY STAR provides a Portfolio Manager overview at www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager.

Food Service Guide

A comprehensive guide to sustainability in food services, for additional information, it is worth referring to the EPA site, including the sections for:

- Environmentally Preferable Purchasing (EPP) – Overall: www.epa.gov/epp/index.htm
- Environmentally Preferable Purchasing (EPP) – Food Services: www.epa.gov/epp/pubs/products/foodservice.htm
- Food Waste Management Tools and Resources: www.epa.gov/osw/conserve/materials/organics/food/fd-res.htm

No-Cost/Low-Cost Guide

There are a large number of sites that complement this guide to no-cost/low-cost energy savings, including:

- SBA.gov – State and Local Energy Efficiency Programs: www.sba.gov/content/state-and-local-energy-efficiency-programs
- Commercial Building Initiative Resources: www1.eere.energy.gov/buildings/commercial_initiative
- Department of Energy – Building Energy Software Tools Directory: apps1.eere.energy.gov/buildings/tools_directory
- Department of Energy – Building Technologies Program: www1.eere.energy.gov/buildings/information_resources.html
- FEMP – A useful database of training materials, much of which can be referred to and taken online: apps1.eere.energy.gov/femp/training
- GSA Content Portal: www.gsa.gov/portal/content/105304
- GSA Carbon Footprint & Green Procurement Tool: www.carbonfootprint.gsa.gov
- National Institute of Building Science – Whole Building Design Guide – Tools (by category): www.wbdg.org/tools/tools_cat.php

Lighting Guide

In addition to this lighting guide, facility managers can receive guidance from the FEMP website on energy efficient lighting: www1.eere.energy.gov/femp/technologies/eep_lighting_guidance.html

Landscaping Guide

The EPA website is an excellent source of complementary information to the landscaping guide, including:

- EPA Green Landscaping Program – Greenacres: www.epa.gov/greenacres
- Beneficial and Environmentally Friendly Landscaping: www.epa.gov/greenkit/landscap.htm
- Large Scale Landscaping: www.epa.gov/epawaste/conserve/rrr/greenscapes/lrgscl.htm
- Water Efficiency Tips in Landscaping: www.epa.gov/watersense/pubs/tips.html

Water Guide

This is comprehensive guide to water conservation. Water conservation is an area that both the Environmental Protection Agency (EPA) and FEMP emphasize, so it is useful to look to them for complementary information, including:

- EPA - Using Water Efficiently: www.epa.gov/watersense/pubs/businesses.html
- FEMP – Water Efficiency:
  - Program: www1.eere.energy.gov/femp/program/waterefficiency.html
  - Resources: www1.eere.energy.gov/femp/program/waterefficiency_resources.html#fr

Green Building Rating Guide

This guide looks at several of the major private and nonprofit green building certification programs in the marketplace.

The EPA's ENERGY STAR label addresses energy, one of the most important aspects of green building. ENERGY STAR qualifies new and renovated buildings as energy efficient.

In general, the federal government looks to independent third-party standards bodies to provide advice, direction and accreditation in the area of standards.

The GSA continues to consider the Leadership in Energy and Environmental Design (LEED) from the USGBC as being the most credible rating system (www.gsa.gov/portal/category/25999). Facility managers should continue to look to the USGBC site for the most up-to-date information and resource support for LEED certification.

Data Centers Guide

Data centers are a major consumer of energy, so it is not surprising that FEMP and ENERGY STAR have a specific focus in this area. For complementary information to the data centers guide, the following are useful sources:

- FEMP – Data Center Energy Efficiency: www1.eere.energy.gov/femp/program/data_center.html
- ENERGY STAR – Data Center Energy Efficiency Initiatives: www.energystar.gov/index.cfm?c=prod_development.server_efficiency
- Lawrence Berkeley National Laboratory – Data Center Energy Training-Assessment Process Manual: www1.eere.energy.gov/industry/datacenters/pdfs/cepprocessmanual.pdf

6.2.2 Federal Agency Support

There are many support programs within the federal government whose goals are to assist agencies in executing their strategic sustainability performance plans. Many of these resource and training programs are readily available for reuse by the private sector. Some excellent sources of such support information are included in this section.

Department of Energy – Energy Efficiency and Renewable Energy:
www.eere.energy.gov

- DOE – Building Technologies Library: www1.eere.energy.gov/library/default.aspx?page=2
- DOE – Building Technologies Program: www1.eere.energy.gov/buildings/information_resources.html
- DOE – Tax Incentives for Commercial Building: www1.eere.energy.gov/buildings/tax_commercial.html
- DOE – Solid State Lighting: www1.eere.energy.gov/buildings/ssl/information_resources.html
- DOE – National Laboratories: www1.eere.energy.gov/buildings/labs.html#anl
- DOE – Federal Energy Management Program: The Department of Energy's (DOE) Federal Energy Management Program (FEMP), with support from the DOE National Laboratories, is the primary source of support to federal energy managers for the implementation of energy policy. FEMP's mission is to facilitate the federal government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship. FEMP has developed a wide-ranging set of support tools and guidance that can be readily adapted for commercial buildings. Major FEMP resources include the following:
  - Publications, Software and Conference Proceedings: www1.eere.energy.gov/femp/information/index.html
  - Sustainable Buildings: www1.eere.energy.gov/femp/program/sustainable_resources.html
  - Operations & Maintenance: www1.eere.energy.gov/femp/program/om_resources.html
  - Greenhouse Gas: www1.eere.energy.gov/femp/program/greenhousegases_resources.html
  - Water Efficiency: www1.eere.energy.gov/femp/program/waterefficiency.html
  - Data Center Energy Efficiency: www1.eere.energy.gov/femp/program/data_center.html
  - Industrial Facilities: www1.eere.energy.gov/femp/program/industrial_facilities_resources.html

Commercial Building Initiative (CBI) – Building Design and Evaluation:
www1.eere.energy.gov/buildings/commercial_initiative

The Commercial Building Initiative (CBI) aims to significantly improve the energy efficiency of new and existing commercial buildings. To achieve this goal, CBI researches technologies, strategies and tools to improve energy savings over existing building codes. CBI also engages commercial building owners and operators to ensure these technologies are market-ready.

The Environmental Protection Agency (EPA): www.epa.gov

The EPA is primarily responsible for ensuring that a business complies with all applicable federal and state environmental laws. EPA's focus and mission is to protect human health and the natural environment. A few resources from the EPA include:

- EPA for Business and Non-Profits: www.epa.gov/epahome/business.htm
- EPA – ENERGY STAR: www.energystar.gov

FedCenter.gov

This site is the federal government's home for comprehensive environmental stewardship and compliance assistance information. Resources and support for EOs 13514 and 13423 can be found at www.fedcenter.gov/programs/eo13514/ and www.fedcenter.gov/programs/eo13423.

Labs21: www.labs21century.gov

LABS FOR THE 21ST CENTURY

Labs21 is a voluntary partnership program dedicated to improving the environmental performance of US laboratories and is sponsored by the EPA and DOE.

6.2.3 General Resources
The American Council for an Energy-Efficient Economy (ACEEE):
aceee.org

ACEEE
American Council for an Energy-Efficient Economy

ACEEE is a nonprofit, 501(c)(3) organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security and environmental protection.

BuildingRating.org: www.buildingrating.org

BuildingRating.org is a joint project of the Institute for Market Transformation (www.imt.org) and the Natural Resources Defense Council (www.nrdc.org). The website is a growing online library of building energy performance rating and disclosure resources, including information on policies, programs, impact analyses, and rating systems and tools.

Department of Energy (DOE): www.energy.gov

- Building Energy Codes Program: www.energycodes.gov/links.stm
- Commercial Building Initiative (CBI) – Building Design & Evaluation: www1.eere.energy.gov/buildings/commercial_initiative/whole_building.html
- Complex-Wide Sustainable Design Program: www.pnl.gov/doesustainabledesign
- Energy Efficiency and Conservation Block Grant – State & Local Government Applications: www.eecbg.energy.gov/grantalloc.html
- Whole Building Design Guide: www.wbdg.org

Department of Energy – Federal Energy Management Program (FEMP)

- High Performance Federal Buildings: femp.buildinggreen.com

Environmental Protection Agency (EPA): www.epa.gov

- Find and evaluate information about green products and services
- Identify federal green buying requirements
- Calculate the costs and benefits of procurement choices
- Manage green procurement processes
- Comprehensive Procurement Guidelines (CPG): The CPG program is separate from the EPP program. Its focus is to promote the use of materials recovered from solid waste and recycled-content products. www.epa.gov/epawaste/conserve/tools/cpg/index.htm
- ENERGY STAR: www.energystar.gov
- ENERGY STAR Tools and Resources: www.energystar.gov/index.cfm?c=tools_resources.bus_energy_management_tools_resources

FedCenter.gov

- Federal Environmental Executive (OFEE) – Green Product Compilation. Products for which EPA, DOE and USDA have provided recommendations: www.fedcenter.gov/_kd/go.cfm?destination=ShowItem&item_id=11767

Included in the "buy green" programs are links to, and descriptions of, programs that enable agencies to meet green procurement goals including (www.fedcenter.gov/programs/buygreen):

- Environmentally Preferable Purchasing (EPP)
- Comprehensive Procurement Guidelines (CPG)
- ENERGY STAR
- The Green Procurement Program (GPP)

Federal Energy Regulatory Commission: www.ferc.gov

General Services Administration: www.gsa.gov/portal/category/100000

Greenbiz.com: www.greenbiz.com

Greenbiz is a leading source for news, opinion, best practices and other resources on the greening of mainstream business.

The International Code Council (ICC): www.iccsafe.org/cs/IGCC/Pages/default.aspx

The first public version of the International Green Construction Code (IGCC) is available. It aims to be a comprehensive standard for improving the environmental performance of commercial buildings.

IFMA – Government Relations: www.ifma.org/about/government-relations.htm

IFMA maintains an aggressive issue monitoring and advocacy program in Washington, D.C., and regularly hosts and facilitates seminars, meetings and forums on topics aimed at magnifying the importance of the facility management profession and professionals.

National Council on Competition and the Electric Industry: www.ncouncil.org

National Association of Regulatory Utility Commissioners: www.naruc.org

National Association of State Energy Officials (NASEO): www.naseo.org

SBA.gov: www.sba.gov

The official business link to the US government, provides a collection of resources available from the federal government that help businesses understand their responsibilities under the nation's environmental laws (www.sba.gov/category/navigation-structure/starting-managing-business/starting-business/business-law-regulations/environmental-regulations).

Whitehouse.gov – Strategic Sustainability Performance Plans

- Council on Environmental Quality – Federal Agency Strategic Sustainability Performance Plans: www.whitehouse.gov/administration/eop/ceq/sustainability/plans
- Council on Environmental Quality – Example Strategic Sustainability Performance Plans – Dept. of Energy: www.energy.gov/media/DOE_Sustainability_Plan_2010.PDF

6.2.4 Grants and Incentives

There are a large number of programs, initiatives and available incentives to improve energy efficiency, increase renewable energy investment and positively impact environmental changes. These exist at the state, region, city and local community levels. Below are references that identify opportunities for most building portfolios. These references consist of databases that, in general, monitor events nationally but include the ability to filter the information by state and local jurisdiction:

- **EPA – Green Building Funding Opportunities:** www.epa.gov/greenbuilding/tools/funding.htm
- **DSIRE:** www.dsireusa.org
  The focus of DSIRE is on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency. It is possible to access, by state, renewable energy and/or energy efficiency incentives that are available, as well as available federal incentives. This site also contains relevant references and links to national, federal, state, regional and international organizations.

- **Pew Center on Global Climate Change:** www.pewclimate.org
  In addition to international and federal initiatives, the Pew Center provides a comprehensive view on climate policies and actions being adopted by states and regions across the US. These actions include the development of regional greenhouse gas reduction markets, the creation of state and local climate action and adaptation plans and, most recently, renewable energy generation data. On Pew's "U.S. States & Regions" Web page (www.pewclimate.org/states-regions) users can link to various initiatives to access maps and descriptions of specific actions taking place across the nation.
- **SBA.gov – State and Local Energy Efficiency Programs:**
  www.sba.gov/content/state-and-local-energy-efficiency-programs

- **U.S. Green Building Council (USGBC):**
  www.usgbc.org/PublicPolicy/SearchPublicPolicies.aspx?PageID=1776
  The USGBC provides a search tool that identifies all public policies adopting or referencing LEED. The most recent update to the database (September 24, 2010) covers legislation, executive orders, resolutions, ordinances, policies and incentives found in 45 states, including 442 localities (384 cities/towns and 58 counties), 35 state governments (including the Commonwealth of Puerto Rico), 14 federal agencies or departments, and numerous public school jurisdictions and institutions of higher education across the United States.

6.2.5 Green Procurement

Various agencies are tasked with leveraging green procurement policies, programs and contracts to address the requirements placed on them by the several active EOs. There is a significant amount of research available and of value to commercial and industrial facility managers. Resources for green procurement are available at the following agencies:

Environmental Protection Agency – Environmentally Preferable Purchasing (EPP):
www.epa.gov/opptintr/epp/index.htm

The primary focus of the Environmentally Preferable Purchasing (EPP) website is to help the federal government "buy green." At the same time, the site can help green vendors and both large and small businesses to:

- Find and evaluate information about green products and services
- Identify federal green buying requirements
- Calculate the costs and benefits of procurement choices
- Manage green procurement processes

Resource Conservation – Comprehensive Procurement Guideline
www.epa.gov/epawaste/conserve/tools/cpg/index.htm

The CPG program is separate from the EPP program. Its focus is to promote the use of materials recovered from solid waste and recycled-content products.

FedCenter.gov www.fedcenter.gov/programs/buygreen/
Included in the "buy green" programs are links to and descriptions of programs which enable agencies to meet green procurement goals including:

- Environmentally Preferable Purchasing (EPP)
- Comprehensive Procurement Guidelines (CPG)
- ENERGY STAR
- The Green Procurement Program (GPP)
- The Federal Energy Management Program (FEMP)

Federal Electronics Challenge: www.federalelectronicschallenge.net/index.htm

The Federal Electronics Challenge (FEC) is a partnership program that encourages federal facilities and agencies to:

- Purchase greener electronic products
- Reduce impacts of electronic products during use
- Manage obsolete electronics in an environmentally safe way

While technical assistance is reserved for federal facilities, the site provides a benefits calculator, presentations, case studies and advisory materials.

6.3 Appendix C: Glossary

There are a large number of general and industry-specific glossaries available. Following are a selection that will be helpful to facility managers when sustainability terms need to be defined.

- Department of Energy (DOE) – Solar Energies Technologies Program Glossary: www1.eere.energy.gov/solar/solar_glossary.html
- Environmental Protection Agency Glossary of Climate Change Terms: www.epa.gov/climatechange/glossary.html
- Georgetown University IT Sustainability Glossary: uis.georgetown.edu/greenit/greenitglossary.html
- IFMA Foundation FMpedia: fmpedia.org/gv.aspx
- The Dictionary of Sustainable Management: www.sustainabilitydictionary.com
- Sustainable Buildings Industry Council (SBIC) www.sbicouncil.org/glossary-sustainable-building-terms

6.4 Appendix D: Certifications Supporting Sustainability

The following links lead to information on topic- or product-specific certifications for sustainability efforts. For example, Green Seal certifies goods and services that meet the highest standards of environmental quality and performance, while the Green Label Plus Program symbolizes the carpet industry's commitment to a better environment for living, working, learning and healing.

This list is from a presentation by Deborah Fuller of HOK. It appeared as part of a Building Operating Management webinar on January 27, 2011 (Fuller 2011).

Multiple Attributes

- Scientific Certification Systems (SCS): www.scscertified.com/index.php
- Cradle to Cradle (C2C): www.mbdc.com/default.aspx
- SmaRT: www.smartcertifiedproducts.com
- Green Seal: www.greenseal.org
- Ecologo: www.ecologo.org/en/index.asp
- The Business and Institutional Furniture Manufacturer's Association (BIFMA): www.bifma.org/standards/index.html
- NSF-140-2007 Sustainable Carpet Assessment Standard: www.nsf.org/business/newsroom/pdf/Sustainability2.pdf

Energy

- ENERGY STAR: www.energystar.gov
- Cool Roof Rating Council (CRCC): www.interwest.org/crcc_overview.htm
- Water Sense: www.epa.gov/WaterSense
- Green-e: www.green-e.org
- Cleaner and Greener: www.cleanerandgreener.org
- Climate Neutral Network: www.unep.org/climateneutral

Indoor Air Quality

- Greenguard: www.greenguard.org/en/index.aspx
- The Business and Institutional Furniture Manufacturer's Association (BIFMA): www.bifma.org/standards/index.html
- Green Seal: www.greenseal.org
- Blue Angel: www.aqs.com/Product_sheets/2010_Blue_Angel_Testing.pdf
- South Coast Air Quality Management District (SCAQMD): www.aqmd.gov/Default.htm
- Floor Score: www.rfci.com

Wood Forestry

- Forest Stewardship Council (FSC): www.fsc.org
- Sustainable Forestry Initiative (SFI): www.sfiprogram.org
- Composite Panel Association Environmentally Preferable Product (CPA/EPP): www.pbmdf.com/Certification
- American Tree Farm (ATFS): www.treefarmsystem.org/
- Canadian Standards Association (CSA): www.csa.ca/cm/ca/en/home

Furniture

- Greenguard: www.greenguard.org/en/index.aspx
- The Business and Institutional Furniture Manufacturer's Association (BIFMA): www.bifma.org/standards/index.html
- Scientific Certification Systems (SCS) Indoor Advantage Gold: www.scscertified.com/gbc/indooradvgold.php

Carpet

- Carpet and Rug Institute (CRI) Green Label Plus: www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus
- Floor Score: www.rfci.com
- NSF-140-2007 Sustainable Carpet Assessment Standard: www.nsf.org/business/newsroom/pdf/Sustainability2.pdf

Green Housekeeping

- Green Seal: www.greenseal.org
- Green Shield: www.greenshieldcertified.org
- Greenguard: www.greenguard.org/en/index.aspx
- CRI Green Label and CRI Green Label Plus: www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/index.cfm
- SCS Indoor Advantage Gold: www.scscertified.com/gbc/indooradvgold.php

6.5 Appendix E: EO 13423 and 13514 Crosswalk

This crosswalk (Exhibit 2) was developed by the Department of Energy's Office of Environmental Policy and Assistance with assistance from the Federal Energy Management Program as a way to visually align goals and targets across various authorities. This document is supplemental information and is not to be used as a substitute for existing requirements and policy in EO 13514 (Department of Energy 2009).

Exhibit 2

Crosswalk of Sustainability Goals and Targets in Executive Orders and Statutes

Goal / Target	EO 13423	EO 13514	Existing Statute
GHG Baseline		Prepare baseline of GHG emissions for scope 1 and 2 emissions for FY 2008 by January 3, 2010 for scope 3 GHG emissions by June 2, 2010 [§7((b)(i)]. (Headquarters Lead).	
HG Emission Reductions	Reduce GHG emissions through reduction of energy intensity by (1) 3% annually through FY 2015 or (2) 30% by FY 2015 (baseline 2003). [§2(a)]	Establish agency-wide GHG emission percentage reduction targets by FY 2020 (baseline FY 2008) for: • Scope 1 and scope 2 GHG emissions by FY 2020 (due January 4, 2010). • Scope 3 GHG emissions (due June 2, 2010). [§2(a) and (b)]	
GHG Emission Reporting		Report comprehensive GHG emission inventory for FY 2010 by January 5, 2011, and annually thereafter by the end of January. [§2(c)]	[EISA §527]: Each Federal agency must issue an annual report that describes the status of initiatives to improve energy efficiency, reduce energy costs, and reduce GHG emissions. [EPA MGGRR]: Facilities and suppliers of fossil fuels or industrial GHGs that emit more than 25,000 metric tons of CO2-e per year must report their emissions by March 31, 2011, for 2010 emissions. Reports submitted annually thereafter.
Building Energy	Reduce building energy intensity 3% annually through FY 2015, or 30% total reduction by FY 2015 (baseline FY 2003). [§2(a)]	Reduce energy intensity in buildings to achieve GHG reductions. [§2(a)(i)]	[EISA §431]: Reduce building energy intensity 3% annually through 2015, or 30% total reduction by 2015 (baseline 2003).

Goal / Target	EO 13423	EO 13514	Existing Statute
Renewable Energy Consumption	Ensure that 50% of statutorily required renewables comes from "new" (as of 1999) sources. [§2(b)]	Increase use of renewable energy. [§2(a)(ii)]	[EPAct 2005 §203]: Defines "renewable energy." [EPAct 2005 §203]: Increase renewables 3% in FY2007-2009; • Increasing to 5% in FY 2010-2012. • Increasing to 7.5% in FY 2013 and beyond. [EISA §523]: 30% of hot water demand in new Federal buildings and major renovations must be met with solar hot water if life-cycle cost effective.
Fleet Petroleum Use	Reduce by 2% vehicle petroleum annually through FY2015 (baseline FY2005). [§2(g)] Achieve 10% increase in non-petroleum fuel consumption annually (baseline FY2005). [§2(g)] Use plug-in hybrids when PIH are commercially available at a life-cycle cost reasonably comparable to non-PIH vehicles. [§2(g)]	Reduce fleet's consumption of petroleum products 2% annually through end of FY 2020 (baseline FY 2005). [§2(a)(iii)(C)] Use low-GHG-emitting vehicles. [§2(a)(iii)(A)] Optimize number of vehicles in fleet. [§2(a)(iii)(B)]	[EISA §142]: Reduce vehicle petroleum reduction 20% by FY 2015 (baseline FY2005). [EISA §142]: Achieve 10% increase in non-petroleum fuel use annually by 2015 (baseline 2005). [EISA §246]: Install at least one renewable fuel pump at each Federal fleet fueling center by 2010. [EISA §141]: Federal agencies are prohibited from acquiring any light-duty motor vehicle or medium-duty passenger vehicle that is not a "low greenhouse gas emitting vehicle." Alternatively, an agency may demonstrate that it has adopted cost-effective policies to reduce petroleum consumption to achieve a comparable reduction in GHGs. [EPAct 2005 §701]: Dual-fueled vehicles to be operated on alternative fuel unless waivered.
Renewable Energy Generation	Implement new renewable energy generation projects on agency property for agency use. [§2(b)]	Implement renewable energy generation projects on agency property. [§2(a)(ii)]	[EPAct 2005 §203]: Double count renewable energy produced on Federal or Indian lands and used on-site at Federal facilities.
Supply Chain GHG Emissions	[Indirect] In agency acquisition of goods and services, use of sustainable environmental practices, including energy-efficient products, is encouraged. [§2(d)]	Pursue opportunities with vendors and contractors to reduce GHG emissions. (§2(b)(i))	[EISA §526]: Federal agencies are prohibited from procuring synfuel unless its life-cycle GHG emissions are less than those for conventional petroleum sources.

Goal / Target	EO 13423	EO 13514	Existing Statute
Scope 3 Emissions		Implement transit, travel, training, and conferencing strategies to support low-carbon commuting and travel. [§2(b)(ii)] Implement innovative policies to address scope 3 emissions unique to agency operations. [§2(b)(iv)]	
Potable Water Consumption	Reduce water consumption intensity 2% annually through FY 2015 or 16% total reduction by the end of FY 2015 (baseline FY 2007). [§2(c)]	Reduce 2% annually potable water consumption intensity through FY 2020 or 26% by the end of FY2020 (baseline FY 2007 water consumption). [§2(d)(i)]	
Industrial, Landscaping, and Agricultural Water Consumption	Reduce water consumption intensity 2% annually through FY 2015 or 16% total reduction by the end of FY 2015 (baseline FY 2007). [§2(c)]	Reduce industrial, landscaping, and agricultural water consumption by 2% annually or 20% by the end of FY 2020 (baseline FY 2010 industrial, landscaping, and agricultural consumption). [§2(d)(ii)]	
Water Re-use		Identify, promote, and implement water reuse strategies that reduce potable water consumption. [§2(d)(iii)]	
Stormwater Management		Achieve EPA's stormwater management objectives. [§2(d)(iv)] [EPA is to provide guidance on this requirement by December 4, 2009.]	[EISA §438]: Maintain or restore, for Federal properties over 5,000 square feet, the property's pre-development hydrology as to temperature, rate, volume, and duration of flow.
Pollution Prevention	Maintain cost effective waste prevention and recycling programs. [§2(e)]	Minimize generation of waste and pollutants through source reduction. [§2(e)(i)]	Source reduction is required through SARA Title III and waste minimization is required through RCRA generator requirements.
Solid Waste Diversion	Increase diversion of solid waste as appropriate. [§2(e)]	Divert 50% of non-hazardous solid waste from disposal by the end of FY 2015. [§2(e)(ii)] Does not include diversion to waste-to-energy plants. [§7] Divert 50% of construction and demolition materials and debris from disposal by the end of FY 2015. [§2(e)(iii)]	[Sites: Check state and local laws and regulations related to solid waste diversion.]
Paper	Use paper containing at least 30% postconsumer fiber content. [§2(d)]	Acquire uncoated printing and writing paper containing at least 30% postconsumer fiber. Reduce printing paper use. [§2(e)(iv)]	[Solid Waste Disposal Act, § 6002 and 40 CFR Part 247]: Purchase paper with the highest amount of postconsumer fiber practicable.

Goal / Target	EO 13423	EO 13514	Existing Statute
Toxic Materials and Chemicals	Reduce acquisition, use, and disposal of toxic materials and chemicals. [§2(e)]	Reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, and disposed FY 2015. [§2(e)(v)]	[Pollution Prevention Act]: Federal facilities are required to deploy pollution prevention as the first choice in environmental management.
Compostable and Organic Material		Increase diversion of compostable and organic material from waste streams. [§2(e)(vi)]	
Landscaping Management		Implement pest management and other landscaping management practices. [§2(e)(vii)]	
Chemical Use	Reduce acquisition, use, and disposal of toxic materials and chemicals. [§2(e)]	Increase use of acceptable alternative chemicals and processes. [2(e)(viii)] Decrease chemical use to assist in achieving GHG reduction targets. [§2(e)(ix)]	[Montreal Protocol]: The reduction of most ozone-depleting substances also leads to a reduction in GHGs released.
Sustainable Communities		Participate in regional transportation planning and recognize existing community transportation infrastructure. [§2(f)(i)] Align Federal policies to increase the effectiveness of local planning for energy choices such as locally-generated renewable energy. [§2(f)(ii)] Ensure planning for new facilities/leases considers pedestrian-friendly sites near existing employment centers and accessible to public transit. [§2(f)(iii)] Identify and analyze impacts from energy use and alternative energy sources in EAs and EISs for new or expanded facilities. [§2(f)(iv)] Coordinate with regional programs for Federal, tribal, state, and local ecosystem, watershed, and environmental management. [§2(f)(v)]	

Goal / Target	EO 13423	EO 13514	Existing Statute
Energy Efficiency in New Construction and Major Renovations		Achieve by 2030 zero-net-energy in buildings entering the planning process after 2020. [§2(g)(i)]	[EPAct 2005 §109]: Achieve energy performance 30% beyond ASHRAE 90.1-2004. [EISA §433]: New Federal buildings and Federal buildings undergoing major renovations shall reduce their fossil fuel-generated energy consumption (baseline 2003) by 55% (2010), 65% (2015), 80% (20202), 90% (2025), and 100% (2030).
High Performance Sustainable Buildings	Ensure all new agency construction and renovation complies with the *Guiding Principles*. [§2(f)] Ensure 15% of existing Federal building inventory incorporate the *Guiding Principles* by 2015. [§2(f)]	Ensure all new construction, major renovation, or repair and alteration complies with the *Guiding Principles*. [§2(g)(ii)] Ensure 15% of existing facilities and building leases (above 5,000 gross square feet) meet the *Guiding Principles* by FY 2015. [§2(g)(iii)] Make annual progress towards 100% conformance with the *Guiding Principles*. [§2(g)(iii)]	[EISA §433]: Requires sustainable design principles be applied to the siting, design, and construction of buildings subject to the standards. [EISA §434]: Ensure major replacements of installed equipment, renovation, or expansion of existing space employ the most energy-efficient designs, systems, equipment, and controls life-cycle cost effective. [EISA §435]: As of December 19, 2010, Federal agencies are prohibited from leasing buildings that have not earned the ENERGY STAR label (some exemptions apply). [EPAct 2005 §109]: Includes application of sustainable design principles for new buildings.

Goal / Target	EO 13423	EO 13514	Existing Statute
Advanced Metering and Measurement			[EPAct 2005 §103]: Federal buildings must be metered by October 1, 2012 with data provided at least daily and electricity consumption measured hourly. [EISA §432]: Identify "covered facilities" constituting at least 75% of the agency's facility energy use. Each covered facility must have an energy manager designated and meet additional requirements. Energy and water evaluations must be completed every 4 years for each facility. Facility energy managers are also responsible for commissioning equipment and establishing O&M plans for measuring, verifying, and reporting energy and water savings. [EISA §434(b)]: By October 16, 2016, each agency shall provide for equivalent metering of natural gas and steam.
Green Roofs		Minimize consumption of energy, water, and materials through cost-effective, innovative strategies, such as highly reflective and vegetated roofs. [§2(g)(iv)]	
Building Portfolio Management		Manage existing building systems to reduce consumption of energy, water, and materials. [§2(g)(v)] Identify alternatives to renovation that reduce existing assets' deferred maintenance costs. [§2(g)(v)] Identify opportunities to consolidate and dispose of existing assets, optimize real property portfolio performance, and reduce environmental impacts. [§2(g)(vi)]	
Historic Buildings		Promote long-term viability of agency-owned historic buildings by ensuring that rehabilitation utilizes best practices and technologies in retrofitting. [§2(g)(vii)]	

Goal / Target	EO 13423	EO 13514	Existing Statute
Sustainable Acquisition	Purchase products that are: • Recycled, • Biopreferred • ENERGY STAR • FEMP-designated, • EPEAT • WaterSense (and other water-efficient) [§2(d)]	Ensure 95% of new contract actions for products and services are: • Energy efficient • Water efficient • Biobased-content • Environmentally preferable • Non-ozone depleting, • Recycled-content • Non-toxic or less-toxic than alternatives [§2(h)(i)]	[EPAct 2005 §104]: Requires Federal agencies to incorporate energy efficiency criteria consistent with ENERGY STAR and FEMP-designated products for all procurements involving energy-consuming products and services. [EISA §525]: Requires procurement to focus on ENERGY STAR and FEMP-designated products. [EISA §524]: Encourages agencies to minimize standby energy use in purchases of energy-using equipment. *NOTE: Preferences in RCRA 6002, FSRIA 9002, and EPCRA not included.*
Electronics Stewardship	Ensure that 95% of agency electronic product acquisitions are EPEAT registered. [§2(h)] Enable the ENERGY STAR feature on agency computers and monitors. (§2(h)) Establish and implement policies to extend the useful life of agency electronic equipment. (§2(h)) Use environmentally sound disposal practices for electronics. (§2(h))	Ensure procurement preference for EPEAT-registered electronic products. [§2(i)(i)] Enable power management, duplex printing, and other energy-efficient or environmentally preferable features on all eligible DOE electronic products. [§2(i)(ii)] Employ environmentally sound disposition of excess or surplus electronic products. [§2(i)(iii)] Ensure procurement of ENERGY STAR and FEMP-designated electronic equipment. [§2(i)(iv)] Implement best management practices in energy-efficient management of servers and Federal data centers. [§2(i)(v)]	[EISA §431]: Reduce building energy intensity 3% annually through 2015, or 30% total reduction by 2015 (baseline 2003).
Environmental Management Systems	Implement EMSs to support goals of EO. [§3(b)] [See also CEQ *Instructions* 3/28/2007]	Continue implementation of EMSs; ensure they are maintained to achieve the goals of the EO. [§2(j)]	

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6.6 Appendix F: January 2011 State of the Union Address: Better Buildings Initiative

Exhibit 3 contains the full text of the news release describing President Obama's plan for "winning the future" through the "Better Buildings Initiative" (The White House 2011). The news release can also be accessed at www.whitehouse.gov/the-press-office/2011/02/03/president-obama-s-plan-win-future-making-american-businesses-more-energy.

Exhibit 3

The White House

Office of Media Affairs

For Immediate Release February 03, 2011

President Obama's Plan to Win the Future by Making American Businesses More Energy Efficient through the "Better Buildings Initiative"

In his State of the Union, President Obama laid out his vision for winning the future by investing in innovative clean energy technologies and doubling the share of electricity from clean energy sources by 2035. Alongside that effort, the President is proposing new efforts to improve energy efficiency in commercial buildings across the country. Last year, commercial buildings consumed roughly 20 percent of all energy in the U.S. economy. Improving energy efficiency in our buildings can create jobs, save money, reduce our dependence on foreign oil, and make our air cleaner. The President's Better Buildings Initiative will make commercial buildings 20 percent more energy efficient over the next decade by catalyzing private sector investment through a series of incentives to upgrade offices, stores, schools and other municipal buildings, universities, hospitals, and other commercial buildings. This initiative builds on our investments through the American Recovery and Reinvestment Act (ARRA), and our continued commitment to passing the President's proposed "HOMESTAR" legislation to encourage American families to make energy saving upgrades in their homes.

- **Achieve a 20 percent improvement in energy efficiency by 2020**: Under the President's plan, by 2020, we will make commercial building space in the United States 20 percent more energy efficient through cost-effective upgrades.
- **Reduce companies' and business owners' energy bills by about $40 billion per year**: By making buildings more energy efficient we will save business owners money by reducing their energy bills by about $40 billion at today's prices. That money that can be put to better use hiring more workers, inventing new products, and creating shareholder value.
- **Save energy by reforming outdated incentives and challenging the private sector to act**: The President is calling for an aggressive reform of existing tax and other incentives for commercial building retrofits and proposing a new competitive grant program. In turn, he is asking corporate leaders to commit to making progress toward his energy goals.

The President's Plan for Better Buildings

The President's Budget will propose to make American businesses more energy efficient through a series of new initiatives:

- **New tax incentives for building efficiency**: The President is calling on Congress to redesign the current tax deduction for commercial building upgrades, transforming the current deduction to a credit that is more generous and that will encourage building owners and real estate investment trusts (REITs) to retrofit their properties. These changes could result in a ten-fold increase in commercial retrofit take up, leveraging job-creating investments.
- **More financing opportunities for commercial retrofits**: Access to financing is an important barrier to increased retrofit investment in some market segments. To address these gaps, the Small Business Administration is working to encourage existing lenders to take advantage of recently increased loan size limits to promote new energy efficiency retrofit loans for small businesses. The President's Budget will also propose a new pilot program through the Department of Energy to guarantee loans for energy efficiency upgrades at hospitals, schools and other commercial buildings.
- **"Race to Green" for state and municipal governments that streamline regulations and attract private investment for retrofit projects**: Much of the authority to alter codes, regulations, and performance standards relating to commercial energy efficiency lies in the jurisdiction of states and localities. The President's Budget will propose new competitive grants to states and/or local governments that streamline standards, encouraging upgrades and attracting private sector investment.
- **The Better Buildings Challenge**: The President is challenging CEOs and University Presidents to make their organizations leaders in saving energy, which will save them money and improve productivity. Partners will commit to a series of actions to make their facilities more efficient. They will in turn become eligible for benefits including public recognition, technical assistance, and best-practices sharing through a network of peers.
- **Training the next generation of commercial building technology workers**: Using existing authorities, the Administration is currently working to implement a number of reforms, including improving transparency around energy efficiency performance, launching a Building Construction Technology Extension Partnership modeled on the successful Manufacturing Extension Partnership at Commerce, and providing more workforce training in areas such as energy auditing and building operations.

Building on Progress

The Better Buildings Initiative will complement the initiatives the President has already launched for government and residential buildings, including the $20 billion in funding for building energy efficiency in ARRA:

- Through ARRA investments in programs like the Weatherization Assistance Program, Better Buildings, and the Energy Efficiency and Conservation Block Grant, we will retrofit 600,000 residential homes.
- In last year's State of the Union, the President called on Congress to pass a package of incentives to encourage Americans to make their homes more energy efficient. We remain committed to the passage of the "HOMESTAR" program.
- The Penn State-led Greater Philadelphia Innovation Cluster is the winner of the federal Energy-Regional Innovation Cluster (E-RIC) competition. The E-RIC competition is a ground-breaking $129.7 million multi-agency grant program that delivers coordinated, targeted grants to spark the growth of innovative, energy-efficient building systems and technologies. This effort involves extensive collaboration across agencies, including Commerce and the Small Business Administration.
- ARRA provided GSA $5.5 billion to improve the energy performance of existing buildings and to start building a new generation of energy efficient buildings.
- The President signed an Executive Order directing federal agencies to achieve zero net energy by 2030 and employ high-performance and sustainable design principles for all new construction and alterations. At least 15 percent of existing buildings need to meet these guiding principles by FY 2015.

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