



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Federal Energy Management Program

High Performance and Sustainable Building: *A Federal lay of the land*



Matt Gray, LEED AP

*DOE's Federal Energy Management Program
Chair, Interagency Sustainability Working Group*

OFEE East Symposium, June 3, 2008

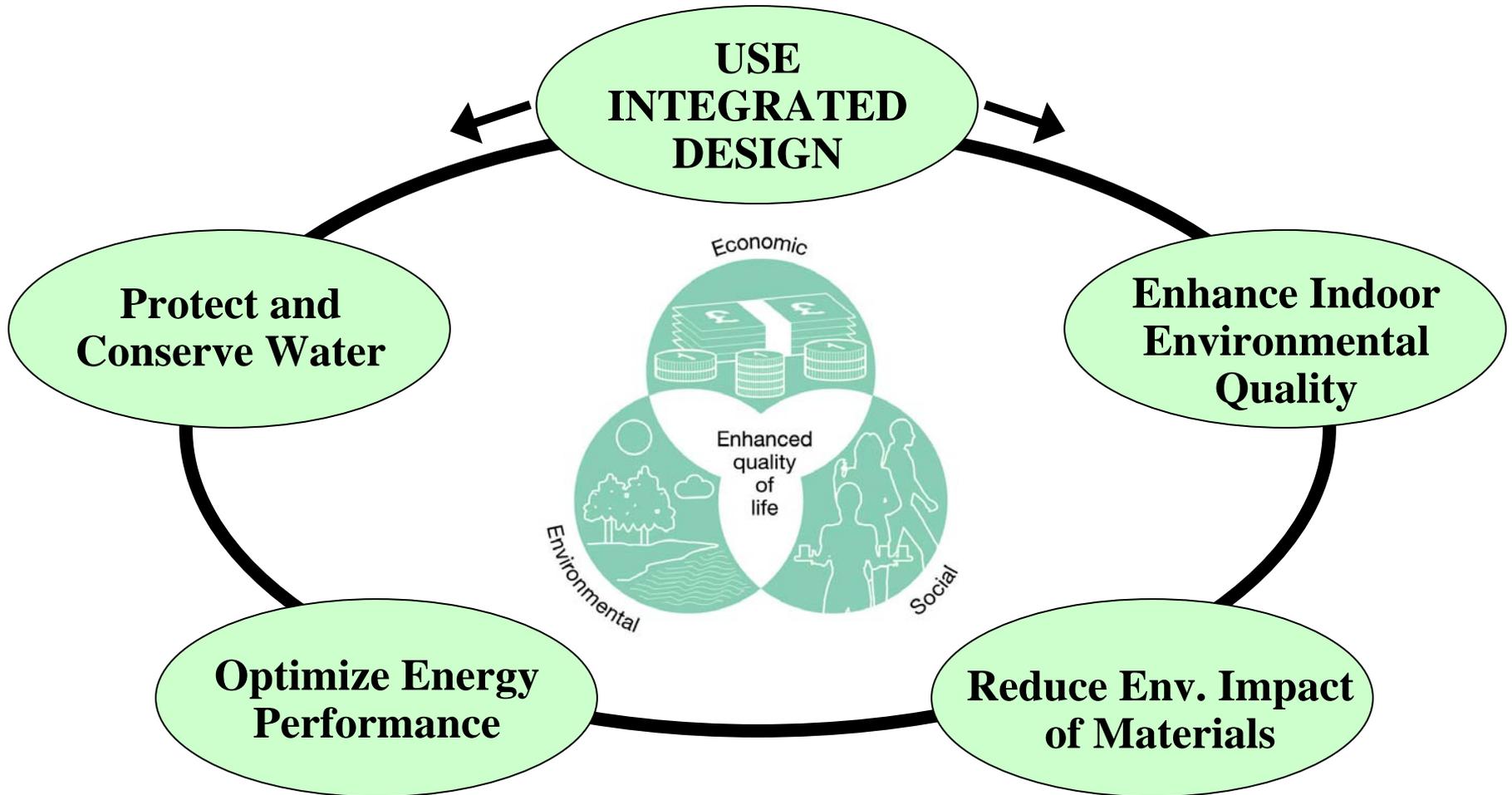


- Guiding Principles
- The Policy Landscape
- Interagency Sustainability Working Group (ISWG)
- The Feds and LEED
- Tools and Resources
- Focus on Existing Buildings



Sandia National Lab

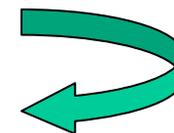
JCEL Building

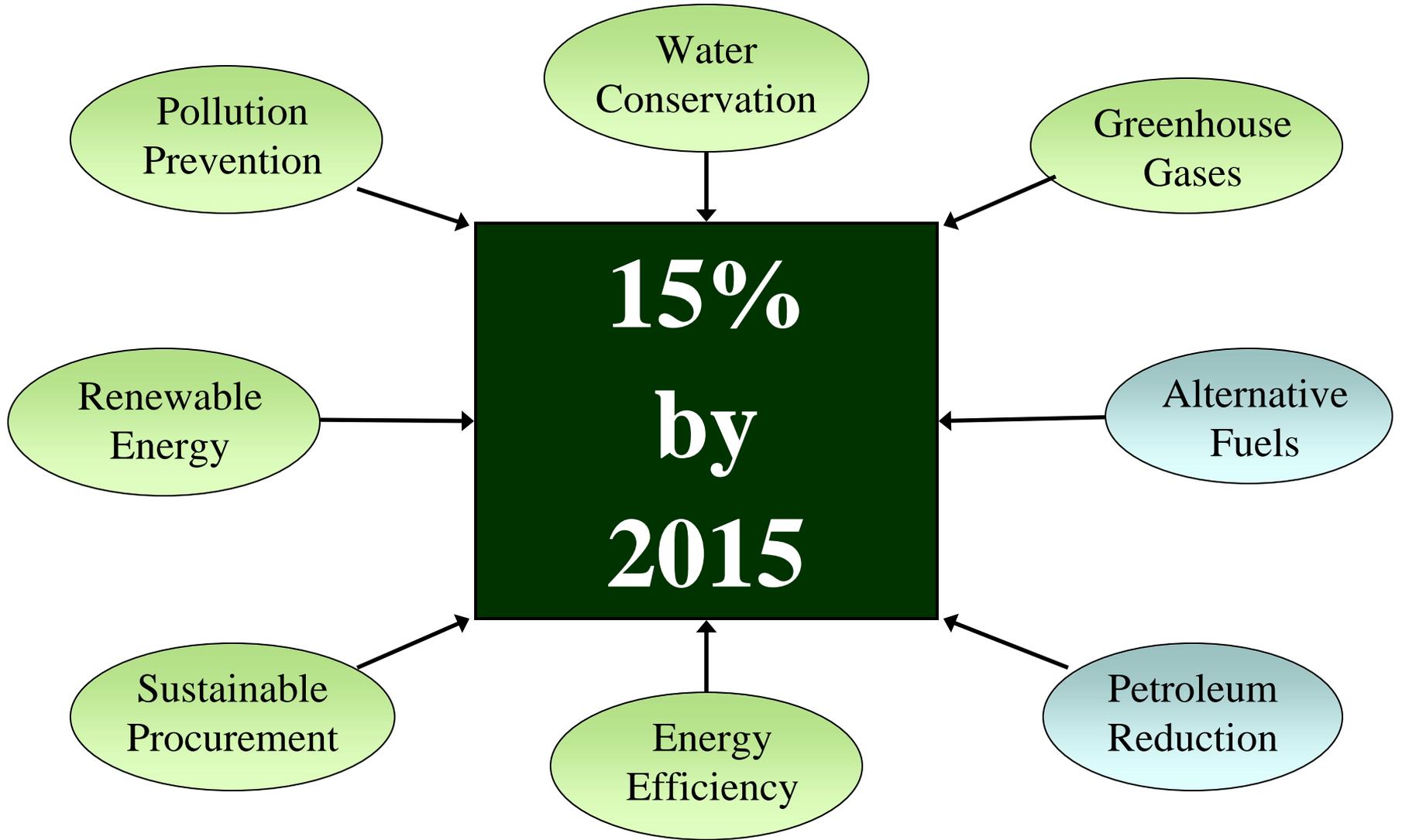


Sustainable buildings balance the triple bottom line by utilizing an integrated approach to design, construction, operation and decommissioning



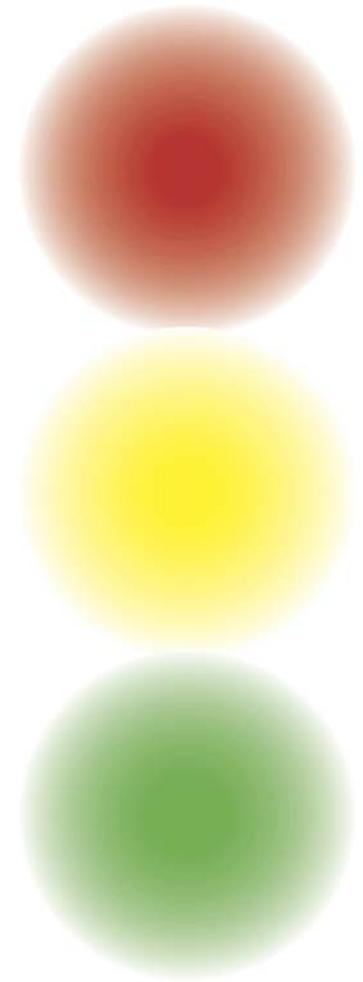
- **OMB A-11 (2002)** – Section 300 Planning, Budgeting, Acquisition, and Management of Capital Assets
- **EPACT, Section 109 (2005)** – 30% below ASHRAE 90.1-2004; Cost effective sustainable design for new and replacement buildings
- **OMB Environmental Scorecard** – Metric #3 on HPSB
 - Real Property Asset Management Scorecard
- **MOU on Federal Leadership in HPSB (2006)**
- **EO 13423 and Implementing Instructions (2007)**
- **Energy Independence and Security Act (2007)**







- Due in early July and January with all Scorecard reporting
- Tracks and assesses agency implementation of 15% by 2015 requirement
- “Stand-alone” document or incorporate into the agency Asset Management Plan
- Required components include:
 - clear, quantifiable, achievable, and communicated vision
 - HPSB performance targets for all buildings
 - HPSB assessment of the existing building portfolio
 - cross functional team responsible for decision-making on results-oriented action items





Management and Oversight

Office of Management and Budget (OMB) – Scorecards

Office of the Federal Environmental Executive (OFEE) – EO 13423

Guidance

Interagency Sustainability Working Group (ISWG)

Office of High Performance Federal Green Buildings (GSA)

Implementation

Agency Working Groups, Offices, ISWG reps

Site-level Facility / Energy Managers and HPSB staff

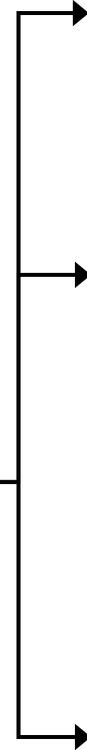
Office of High Performance Commercial Green Building (DOE)

Private Sector and Non-Profits

e.g. USGBC, ASHRAE, etc

Technical Expertise

- *Whole Building Design Guide*
- *EPA Green Building Program*
- *Labs21*
- *Data Centers*
- *Building Technologies R&D Subcommittee*
- *National Institute of Standards and Technology*





Interagency Sustainability Working Group (ISWG)

- **Authority**
 - Working Group under the Interagency Energy Management Task Force since 2001
- **280 members (~65 core) from across the Federal government and industry**
- **Bi-monthly meetings**
- **Purpose:**
 - Serves as forum for information exchange
 - Advocates for sustainable building practices in new construction and existing buildings
 - Eliminates barriers to sustainable design in the Federal sector by developing policy, technical guidance and other resources



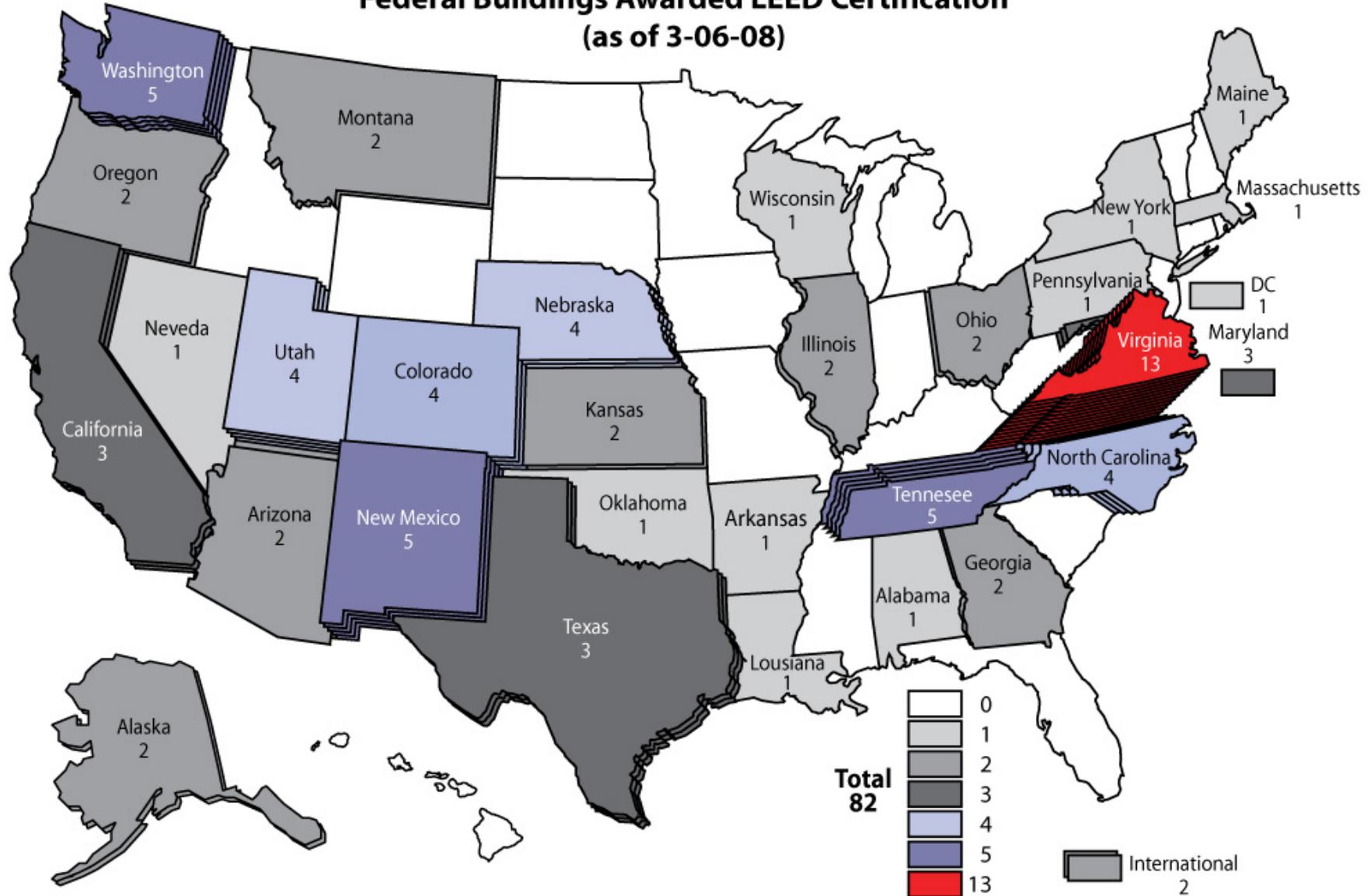
Tour at USGBC Headquarters
Washington, DC



ISWG Bi-Monthly Meeting



Federal Buildings Awarded LEED Certification (as of 3-06-08)



**Total
82**



Agency Totals

• DOD	15
• DOE	13
• DOI	9
• GSA	8
• EPA	7
• DOC	3
• HHS	3
• NASA	3
• SSA	3
• DHS	3
• USDA	3
• DOJ	2
• DOT	2
• DOL	1
• DOS	1
• DVA	1

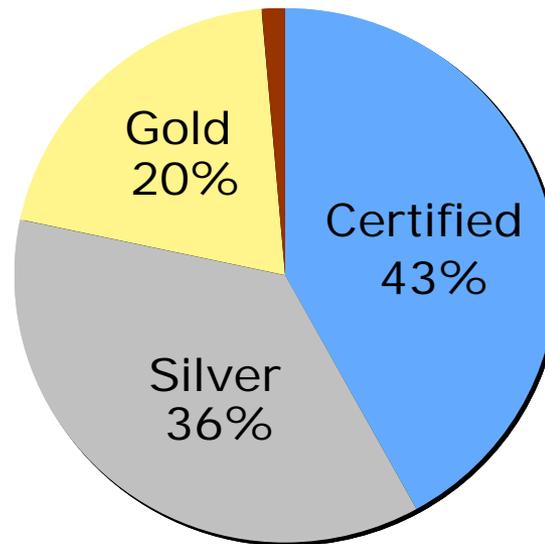
Building Types

• Office	37
• Laboratory	13
• Dormitory	5
• Warehouse	4
• Courthouse	4
• School	4
• Recreation	3
• Visitor Center	2
• Medical Center	1
• Transit Station	1
• Prison	1
• Rescue Station	1
• Restaurant	1

Rating Systems

• New Construction	77
• Existing Buildings	2
• Commercial Interiors	2
• Core & Shell	1

Certification Level



* GSA managed 18 additional projects with other federal agencies

** 5 buildings are listed as confidential

*** 23 certified buildings non-Federally owned (mostly build-to-suit lease)



Rating Systems and Agency Policies for NC (draft)

Agency	LEED Goal	Goal Notes
DOE	Gold	Required for NC/MR > \$5M; LEED Gold preference for leases
EPA	Gold	Required for NC > 20,000 sqft
NASA	Silver	Silver is required, strive for Gold
State	Silver	Required by 2009 for major assets, new embassies for next 10 yrs
Defense – Army	Silver	Vertical construction required; LEED for Homes adopted
Commerce – NWS	Silver	“Shall strive for minimum of LEED Silver”
USDA – Forest Service	Silver	Required for offices, visitor centers, research facilities >2500 sqft
USDA	Silver	Design for LEED Silver
GSA	Certified	Required for NC/MR, Silver recommended (some regions require)
Defense – Navy	Certified	Required now, potentially Silver in near future
HHS	Certified	LEED or Green Globes for projects > \$3M
Defense - Pentagon	Certified	Long-term goal of LEED rating for entire Pentagon
Smithsonian	Certified	NC/MR to aim for a minimum of LEED certification
Defense - Air Force	Certified	Required by FY '09, self-certified
Interior	-	Incorporating LEED criteria for NC and EB, not required



- Interagency cooperation managed by NIBS
- Design Guidance focused on Federal facilities
- Federal Green Construction Guide for Specifiers
- *FREE* Continuing Education
 - 1) Integrated Design
 - 2) Whole Building Approach to Labs
 - 3) Planning for Secure Buildings
 - 4) Optimizing O&M
- Feb 2008: about 33,500 hits and 57,000 downloads *per day*

WBDG The Gateway to Up-To-Date Information on Integrated 'Whole Building' Design Techniques and Technologies

...over 230,000 users and 1.6 million downloads a month

Design Guidance Project Management Operations & Maintenance Documents & References

The Whole Building Design Approach

The goal of 'Whole Building' Design is to create a successful high-performance building. To achieve that goal, we must apply the integrated design approach and the integrated team approach to the project during the planning and programming phases. [Read more](#)

WBDG Focus

New National BIM Standard Released

The NBIMS Executive Committee has released the National BIM Standard Version 1 - Part 1: Overview, Principles, and Methodologies for public use. This document, which includes contributions by more than thirty subject-matter experts in the capital facilities industry, incorporates industry comments and now contains new and expanded information about the NBIMS production and use process. [Read more](#)

Services

Construction Criteria Base

Popular Links

- [Construction Waste Management Database](#)
- [Building Envelope Design Guide](#)
- [Executive Order 13423 Technical Guidance](#)
- [Federal Green Construction Guide for Specifiers](#)
- [Unified Facilities Criteria](#)
- [Unified Facilities Guide Specifications \(UFGS\)](#)

New and Updated Pages

[Mechanical Insulation Design Guide](#)

The National Institute of Building Sciences (NIBS) Mechanical Insulation Committee (NMIC) has developed the Mechanical Insulation Design Guide (MIDG) to provide a comprehensive source of information on the performance and standardization of mechanical insulation in buildings.

News and Events

BIM Storm Hits LA

On January 31, 133 design professionals from 11 different organizations participated in an online design charrette in which another 700 people were involved.

New Version of the United States National CAD Standard

AIA, CSI and NIBS unveil version 4.0 with greater enhancements. [Read more](#)

Periodicals

www.wbdg.org



FEMP's High Performance Federal Buildings Database: 43 Federal Case Studies

BT's High Performance Buildings Database: 99 Total Case Studies

Address: <http://www.eere.energy.gov/femp/highperformance/>

U.S. Department of Energy
Energy Efficiency and Renewable Energy
 Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

FEMP

Federal Energy Management Program

About the Program | Program Areas | Information Resources | Financing Mechanisms | Technologies | Services | Home

High Performance Federal Buildings

Using the Database

Search by Project Name

Search by Owner

Search by Location

Search by Building Type & Size

List All Projects

Detailed Search

Many federal facilities have succeeded in creating high performance buildings that save energy and reduce the environmental impact on our lives. We have captured a sampling of these successes in this High Performance Federal Buildings Database, a database showcasing examples of sustainable building projects in the federal government. Use the database to examine project details or to explore some construction or retrofit ideas for your facility.

FEMP is sponsoring this federal portal to the High Performance Buildings Database. FEMP also supports the [Interagency Sustainability Working Group](#). This database contributes to the working group's purpose of exchanging information about federal agency sustainable design activities as demonstrated in these high performance federal building projects. The High Performance Buildings Database is research sponsored by the U.S. Department of Energy; it seeks to improve building performance measuring methods by collecting data on various factors that affect a building's performance, such as energy, materials, and land use. The database includes information from buildings around the world, ranging from homes and commercial interiors to large buildings and even whole campuses and neighborhoods. These may be certified "green" projects, or simply projects that have one or more notable environmental features. The information has been reviewed for consistency and presentation, but in most cases, the details have not been independently verified.

To find projects of interest, use any of the search options listed on the left or select "High Performance" from the entire list. Each project description page...

www.eere.energy.gov/femp/highperformance

www.eere.energy.gov/buildings/highperformance/

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
 Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

High Performance Buildings

An Initiative of the U.S. Department of Energy Building Technologies Program

Related Topics

[Buildings Database](#)

[Performance Metrics](#)

[See Residential building information](#)

[Building industry's technology roadmap](#)

[Green Building Challenge](#)

[Laboratory implementation](#)

About High Performance Buildings

- Design Approach: Whole-building design, costs and benefits
- Toolbox: Design guidelines, software, and resources
- Technologies: Methods, materials, and equipment

About the High Performance Initiative

- Goals and Objectives: Overview of the Initiative
- How to Participate: Criteria, application, and contact information
- Research Projects: Case Studies, Performance Metrics, and High-Performance Buildings Database

News & Events

Jun 2003 National Building Museum Presents

The US Department of Energy is proud to sponsor "Big and Green," an exhibit at the National Building...

[News & Events](#)

www.eere.energy.gov/buildings/database



High Performance Federal Buildings

◀ Federal Projects Home

Using the Database

Search by Project Name

Search by Owner

Search by Location

Search by Building Type & Size

List All Projects

Detailed Search

Selected Projects

Your 43 currently selected project(s) are shown in the table below. ([click here](#) for help).

	Picture	Name ▲	Owner	Location	Building Type	Floor Area (ft ²)	Annual Purchased Energy (kBtu/ft ²)
<input type="checkbox"/>		Alfred A. Arraj U.S. Courthouse	General Services Administration	Denver, CO	Public order & safety	319,000	101
<input type="checkbox"/>		Annie Creek Restaurant and Gift Shop	Xanterra Parks and Resorts	Crater Lake, OR	Restaurant; Retail	10,400	785
<input type="checkbox"/>		Assateague Island National Seashore	National Park Service	Chincoteague, VA	Recreation; Interpretive Center; Park		
<input type="checkbox"/>		Assateague Mobile Bathhouse Project	National Park Service	Chincoteague, VA	Park; Other		
<input type="checkbox"/>		BPA Ampere Annex	Bonneville Power Administration (BPA)	Vancouver, WA	Commercial office; Industrial	3,000	
<input type="checkbox"/>		Baca/Dlo'ay azhi Community School	Bureau of Indian Affairs	Prewitt, NM	K-12 education	78,900	33
<input type="checkbox"/>		Bremerton BEQ Building 1044	Naval Base Kitsap-Bremerton	Bremerton, WA	Multi-unit residential	99,800	46.2
<input type="checkbox"/>		CDC Headquarters	Centers for Disease Control and Prevention	Atlanta, GA	Commercial office; Public order & safety	355,000	22.3



New Construction /
Major Renovations

**Existing
Buildings**

Sites, Campuses,
Bases, etc

1. Sustainable Building Guiding Principles for EB (in development)
2. Incorporating HPSB into Real Property Asset Management and Environmental Management Systems
3. Assessment tools for EB and Training (e.g. LEED EB workshops)
4. Addressing additional first cost for some HPSB Guiding Principles



Matt Gray

DOE/FEMP

202-586-0067

Matthew.gray@ee.doe.gov

www.ofee.gov

www.wbdg.org/sustainableEO

www.wbdg.org/design/greenspec.php

<http://www1.eere.energy.gov/femp/sustainable/>

www.eere.energy.gov/femp/highperformance/index.cfm



Employ Integrated Design Principles

Integrated Design

- Use integrated teams in all stages of a project
- Establish environmental performance goals

Commissioning

- Employ total building commissioning practices to verify performance of building components and systems and ensure that design requirements are met



Optimize Energy Performance

Energy Efficiency

- Establish a whole building performance target
- Design to earn ENERGY STAR.
- For new construction, reduce the energy cost budget by 30 percent compared to the baseline building performance rating per ASHRAE Std 90.1-2004.
- For major renovations, reduce the energy cost budget by 20 percent below pre-renovations 2003 baseline.

Commissioning

- Install building level utility meters in construction and renovation projects.
- Measure all new major installations after 1 year using the ENERGY STAR Benchmarking Tool.
- Enter data and lessons learned into the High Performance Federal Buildings Database



Protect and Conserve Water

Indoor Water

- Reduce indoor potable water use by a minimum of 20%

Outdoor Water

- Reduce outdoor potable water use by a minimum of 50%
- Reduce storm water runoff and polluted site water runoff



Enhance Indoor Environmental Quality

During Construction

- SMACCNA IAQ Guidelines for Occupied Buildings under Construction, 1995
- Prior to occupancy, conduct a minimum 72-hour flush-out

During Occupancy

- ASHRAE 55-2004, Thermal Env. Conditions
- ASHRAE 62.1-2004, Ventilation for Acceptable IAQ
- Implement a moisture control strategy
- Achieve a minimum daylight factor of 2 percent
- Provide lighting controls and appropriate glare control
- Specify materials and products with low pollutant emissions



Reduce Environmental Impact of Materials

- Use materials with recycled content for at least 10% of the total value of the materials in the project
- Use biobased products made from rapidly renewable resources and certified sustainable wood products
- Recycle or salvage at least 50 percent construction, demolition, and land clearing waste, excluding soil
- Eliminate the use of ozone depleting compounds