

# Going Green in 2007:



## *An Overview of New Requirements for Sustainable Facility Design and Construction*



**Project Officer Awareness Training  
ORFDO Division of Environmental Protection**

# What is sustainability?

There are many definitions. A widely used definition of sustainable development is that which:

***“Meets the needs of the present without compromising the ability of future generations to meet their own needs”.***

--Norwegian Prime Minister Gro Harlem Brundtland

# What is sustainable or green design?

***“To significantly reduce or eliminate the negative impact of buildings on the environment and on the building occupants, green building design and construction practices address: sustainable site planning, safeguarding water and water efficiency, energy efficiency, conservation of materials and resources, and indoor environmental quality.”***

---U.S. Green Building Council

# Why Go **Green** at NIH?

- **Sustainable design and construction addresses significant NIH issues:**
  - Rapidly increasing energy costs
  - Looming water shortages
  - Waste generation and pollution
  - Occupant health and productivity
- For ALL federal facilities **GREEN DESIGN IS NOW MANDATORY!**



# Past Approaches and Lessons Learned

- **To often, sustainability or green building was**
  - Not clearly defined;
  - Communicated in project requirements in a vague, esoteric message;
  - Optional and
  - Assumed to be too expensive.
- **The result was confusion, anxiety, missed opportunities and failure.**
- **Primary reasons for failure were a lack of:**
  - Knowledge, experience and detail in approach and implementation.
  - Planning for operation and maintenance of sustainability features after construction.

# New Approaches Improve Chances of Success

- Minimum performance requirements now have been established.
- More experience is available:
  - Case histories involving lab and health care facilities
  - Improved certification systems
  - Accredited AEs
  - Experts now required members of integrated project teams established at beginning of project.
- Increasing recognition that significantly higher first cost for sustainable design is a myth.
- Sustainable design and construction of all federal facilities is now mandatory.

# New Mandates for Sustainable Design

- **Statutes:** *Federal Energy Policy Act of 2005*
- **Memorandum of Understanding:** *Federal Leadership in High Performance and Sustainable Buildings*
  - Signed by HHS January 24, 2006
- **Executive Order:** 13423
  - Signed by President on January 26, 2007
- **OMB Scorecards**
- **HHS Policy**
  - Signed September 8, 2006
- **HHS Implementation Plan**
  - Signed December 2006; Updated March 2007

# The FLHPSBMOU

*Full title:*

## ***The Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU)***

- Committed signatories to leadership in implementing common strategies for planning, acquiring, siting, designing, building, operating, and maintaining high performance and sustainable buildings
- Established common set of Guiding Principles (GPs)
- HHS signed the MOU on January 24, 2006
- All new project starts after this date must comply.

# Goals of the MOU



- **Reduce** the total ownership cost of facilities;
- **Improve** energy efficiency and water conservation;
- **Provide** safe, healthy, and productive built environments; and
- **Promote** sustainable environmental stewardship.

# MOU Guiding Principles

## I. **Employ Integrated Design Principles**

- A. Use collaborative, integrated design process in all stages
- B. Establish performance goals
- C. Consider all stages of building life cycle including deconstruction
- D. Use total building commissioning practices to verify performance

# Guiding Principles

Continued

## **II. Optimize Energy Performance - Energy Efficiency**

- A. Establish whole building performance target.
- B. Reduce energy cost budget by 30% compared with baseline rating per ASHRAE and IESNA standards.
- C. For renovations, reduce energy cost budget by 20% below pre-renovation

# Guiding Principles

Continued

## **Optimize Energy Performance - Measurement and Verification**

- A. Install building level utility meters**
- B. Track and optimize actual performance data from first year against targets**
- C. Enter data and lessons learned in database**

# Guiding Principles

Continued

## III. Protect and Conserve Water

- A. Indoor water – employ strategies to reduce potable water use by 20% over calculated baseline for bldg.
- B. Outdoor water – use water efficient landscaping, recycle water, reduce storm water runoff and pollution.

# Guiding Principles

Continued

## **IV. Enhance Indoor Environmental Quality (IEQ)**

- A. Ventilation and Thermal Comfort – meet ASHRAE Std. 55-2004
- B. Moisture Control – establish control strategy
- C. Daylighting – achieve specified daylight factor

# Guiding Principles

Continued

## IAQ Continued

- D. Specify low-emitting materials
- E. Protect indoor air quality during construction – follow recommendations of SMACC Indoor Air Quality Guidelines for Occupied Buildings Under Construction AND minimum 72-hour flush out after.

# Guiding Principles

Continued

## **V. Reduce Environmental Impact of Materials**

- A. Meet or exceed EPA recycled content recommendations**
- B. Meet or exceed USDA biobased content recommendations**
- C. Increase recycling of construction waste**
- D. Eliminate use of ozone depleting chemicals**

# HHS Policy

Effective September 8, 2006

- **Requires compliance with mandates AND certification of projects to ensure minimum sustainability goals are met.**
- **Provides flexibility to OpDivs in determining specific design requirements and specifications for various building types.**
- **OpDivs also determine certification level (minimum, silver, gold, platinum) sought**
- **Policy to be reviewed annually.**

# HHS Policy Requirements

- **Implement MOU Guiding Principles on all projects.**
- **Obtain sustainability certification under projects over specified limits.**
- **Incorporate primary elements of the MOU in existing facilities to the extent feasible in improvements or repair projects.**
- **Adherence to primary elements must be a criterion in lease selection.**

# Applicability of HHS Certification Requirements

## **ALL Projects – New Construction, Improvements and Leases**

- Apply GPs to maximum extent feasible.



## **New Construction**

- Certify projects with total cost  
Equal to or greater than \$1 million

## **Improvement and Repair Projects**

- Certify projects with total cost  
Equal to or greater than \$3 million

# Implementation Timing

- At least one project by FY08
- 50% of projects requiring FPAA submittals by FY09
- 100% of eligible projects by FY10

# HHS Policy

## Acceptable Certification Systems

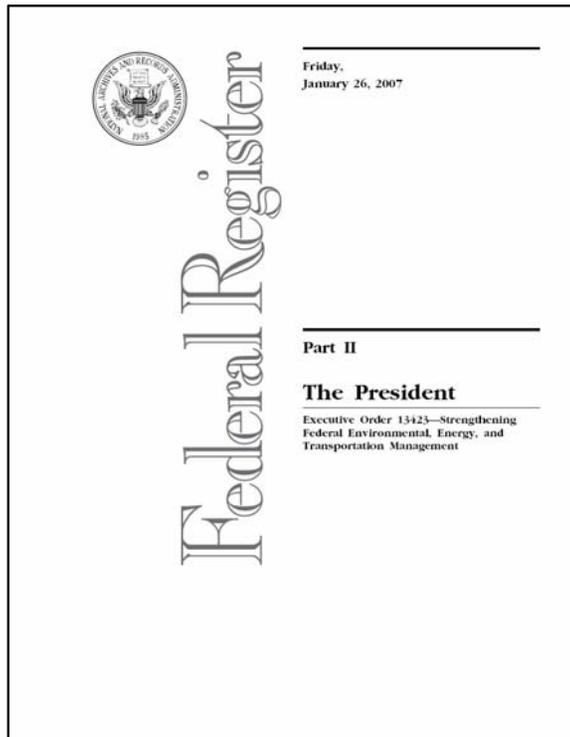
- **Two certification and rating systems may be used:**
  - U.S. Green Building Council's *Leadership in Energy and Environmental Design* (LEED™)
  - OR
  - Green Building Initiative's *Green Globes*
- **Fees for certification to be included in project budget**

# Waivers – Not Easily Obtained

- At NIH waiver requests will be submitted by the Project Officer and reviewed by existing NIH process.
- Director, ORF reviews and submits them to HHS Office of Facilities Management and Planning (OFMP).
- Deputy Assistant Secretary OFMP considers requests on a case-by-case basis and has final approval authority.

# Executive Order 13423:

## Strengthening Federal Environmental, Energy and Transportation Management



- **Combines multiple previous Executive Orders**
- ***Requires* all agencies to meet MOU GPs in:**
  - All new construction and renovations AND
  - By end of FY 2015 at least 15% of the inventory of existing buildings must comply.

# Executive Order 13423:

## Other Federal Facility Mandates

- Energy efficiency.
- Use of renewable energy
- Acquisition of recycled content, energy efficient, bio-based, and environmentally preferable products and services.
- Pollution prevention and recycling .
- Reduction or elimination of toxics and hazardous chemicals, greenhouse gas emissions and use of petroleum products.
- Water conservation.

# Increasing Role of Office of Management and Budget (OMB)

- Role clarified in Executive Order 13423
- Measures and reports success in meeting sustainability goals.
- Provides guidance for Integrated Project Teams.
- Required development of implementation plans by each agency.
- Requires incorporation of sustainability in budget guidance supporting documents in business case for each new project beginning in FY 2008 budget cycle.

# HHS Implementation Plan

(Updated March 2007)

- The Plan provides general guidance and sets milestones to ensure that all mandates and goals will be met.
- Representatives of the facilities programs of all OpDivs develop and continually revise the Plan to meet new requirements.
- It is updated at least annually and reported semiannually.

# HHS Implementation Plan Elements

- It is too voluminous to review in detail here.
- Project Officers should become familiar with the major plan requirements and review specific sections applicable to their projects.
- The Plan consists of several documents as listed on the following slides:

- A. Memorandum of Understanding
- B. Guidance for Measuring Sustainable Building Program Implementation Progress
- C. HHS Policy
- D. Definitions – Applicable Building Projects
- E. Integrated Project Team Definition & Project Charter

- F. Sustainability Performance Targets
- G. Sustainability Checklist for Leased Properties
- H. Existing Building Sustainability Evaluation & Prioritization Matrix
- I. Abbreviations & Acronyms
- J. Matrix of Current Status of Implementation Within OPDIV's

# Existing Buildings Strategy

# Emphasis Moving to Existing Buildings

- With very limited funding for new construction in the Federal budget much of the emphasis of the sustainability initiatives will be on existing facilities.
- Goal is to assess the entire inventory of facilities, prioritize improvements needed and bring them into conformance with the MOU GPs

# OMB Requires the Strategy to Include

- Method of assessing and prioritizing facility improvements and environmental aspects including:
  - Energy Use
  - Indoor Environmental Quality
- Utilization of recommissioning as a tool to identify and implement GPs

# Strategy Development

- HHS has developed framework for OpDivs to include strategy costs in FY09 budget submittal and is working on pre-budget guidance.
- NIH Strategy under development
  - Determine prioritization criteria in consultation with ICs
  - Modify existing Building Condition Index to include all sustainability criteria in assessments
  - Conduct new assessments
  - Collect results and establish priority list
  - Prepare budget submissions
  - Determine recommissioning frequency

# NIH Implementation

## Environmental Management System

# NIH Environmental Management System (NEMS)

- Four active working groups for implementation sustainability initiatives:
  - Design and Construction
  - Facility Operation and Maintenance
  - Acquisition of Leased Facilities
  - Decommissioning
- Representatives from ORF Divisions will lead the groups

# Role of NEMS in Sustainability Initiatives

## **NEMS Working Groups –**

- Set goals and targets
- Monitor progress
- Coordinate with HHS:
  - NEMS working groups include all NIH representatives on the HHS Working Group

## **Division of Environmental Protection –**

- Provides contractor support to working groups and compliance assistance.
- Provides outreach and training



# GREEN F A Q's

# Where can I get a copy of the HHS Implementation Plan?

**We have hard copies...  
That rapidly become obsolete**



**Better yet... Go to the HHS website and download the latest version:**

<http://www.hhs.gov/asam/ofmp/SustainableBldgsImpPlan.pdf>

# Are any facilities are exempt from these requirements?

**No.**

Sustainable design, construction and procurement requirements apply to ALL facilities designed, constructed or operated with federal funds:

- NIH Owned
- NIH Owned/Contractor Operated
- Leased Facilities

## Can these requirements be applied to laboratories and health care facilities?

**Yes!**

- While some specific performance requirements may have to be modified to accommodate lab ventilation and other special needs in limited areas of labs, a wide variety of lab facilities have been designed and constructed to meet or exceed minimum requirements for certification.
- The building envelope and much of the internal infrastructure of laboratory facilities consists of conventional construction and materials.
- Specific guidance and rating systems are available or under development for laboratories e.g., Labs 21.
- Lab facilities *are not* exempt from sustainable design and construction requirements.

Does certification ensure that the MOU Guiding Principles have been met?

**No.**

*Total credits achieved for a design or construction may be sufficient to achieve certification but do not assure that all of the specific performance requirements of the GPs have been met.*

# Are there specific NIH design requirements?

- Current design requirements are under review. Significant modifications may be required to assure compliance with regulatory requirements and goals set by the NIH Environmental Management System (NEMS).
- Requirements for laboratories and vivaria are currently under development. These should appear in the next edition of the NIH Design Requirements Manual (DRM).
- Office Fit Out requirements have been revised to include sustainability features and are now available from DPPA.

# What about the extra cost?

- Recent data suggests that features required to meet minimum sustainability requirements add negligible additional first cost to projects.
- Payback is less than 5 years based upon easily measurable indicators such as energy and water cost savings; faster if health and productivity gains are considered.
- Additional features (above minimum requirements) should be selected if justified by assessment of life cycle costs and environmental benefits.
- Value engineering decisions must be based on life cycle cost not first cost.

# Please get involved!!!

## We need your expertise:



- Join a NEMS Sustainable Facilities Workgroup
- Provide input to ORF Division Representatives on the HHS Sustainability Working Group
- Disseminate, present and publish case studies and lessons learned.

# Redefining Green

A final thought...

*"Why not shift the focus of green design from managing the environmental impact of a destructive system to creating buildings and materials that generate wholly positive effects for people and nature.*

*This changes the entire context in which design decisions are made. Rather than asking, 'How do I meet today's environmental standards?' designers would begin to ask, 'How do my design decisions make sense in the overarching context of the natural world?'"*

--William McDonough

# And a Prescription for You to Fill

**PRESCRIPTION FOR A HEALTHIER ENVIRONMENT**  
**Sustainable Biomedical Facility Design and Operations**

**Offices**

- Use natural light.
- Purchase recycled content paper, print on both sides and recycle waste paper.
- Better yet, avoid paper use by digitizing and sharing documents electronically.
- Put computers to sleep when not in use to save energy.

**Clinics**

- Use mercury-free thermometers and blood pressure devices.
- Reduce usage of pharmaceuticals to the maximum.
- Handle, store and dispose of needles and medical waste properly.

**Laboratories**

- Use low-toxicity disinfectants and apparatus avoid unnecessary chemicals to reduce waste.
- Where possible use alternatives to radioactive isotopes in research.
- Use molecular research techniques to minimize waste.
- Keep chemical waste containers closed and in trays.
- Dispose of hazardous materials safely and properly.

**Buildings**

- Install "green roofs" to decrease heat, reduce erosion and improve water quality.
- Use building materials with recycled content.
- Use renewable energy from sources like solar and wind turbines.
- Maximize use of sustainable energy and water conserving features.
- Use permeable paving to reduce runoff, reduce ground water and improve surface water quality.

**Surroundings**

- Use public transportation to reduce air pollution and conserve land.
- Avoid adding to environmental pollution with such as wetlands.
- Reduce use of toxic chemicals to prevent pollution of lakes and streams.
- Facilitate environmental stewardship of forests, cultural and trails.

**Together We Can Make a Difference!**

**Division of Environmental Protection**  
 Office of Research Facility Development and Operations  
 National Institutes of Health  
 U.S. Department of Health and Human Services  
 Call 301-496-6537  
 Visit our website: <http://rt.ed.nih.gov>

# References:

Federal Regulations, Guidance and Policy

***Comprehensive listings may be found on these websites:***

## **FedCenter**

- <http://www.fedcenter.gov/programs/greenbuildings/>

## **Office of the Federal Environmental Executive**

- <http://www.ofee.gov/sb/sb.htm>

# References:

## Supporting Information and Tools

- **Energy Star for New Building Design**
  - [http://www.energystar.gov/index.cfm?c=new\\_bldg\\_design.new\\_bldg\\_design](http://www.energystar.gov/index.cfm?c=new_bldg_design.new_bldg_design)
- **Green Building Initiative; Green Globes**
  - <http://www.thegbi.org/gbi/>
- **Green Guide for Health Care**
  - <http://www.gghc.org/>
- **Greening Federal Facilities**
  - <http://www1.eere.energy.gov/femp/pdfs/29267.pdf>
- **Hospitals for a Healthy Environment**
  - <http://www.h2e-online.org/>
- **Labs for the 21<sup>st</sup> Century**
  - <http://www.labs21century.gov/>
- **U. S. Green Building Council:  
Leadership in Energy and Environmental Design (LEED)**
  - <http://www.usgbc.org/>
- **Whole Building Design Guide**
  - <http://wbdg.org/>

# References:

## HHS and NIH Policies and Guidelines

- **HHS Office of Facilities Management and Policy**
  - <http://www.hhs.gov/asam/ofmp/index.html>
- **HHS Facilities Program Manual – Sustainable Design**
  - <http://www.hhs.gov/asam/ofmp/Vol1CH3PlanDesignConsid.pdf>
- **HHS Sustainable Buildings Implementation Plan**
  - <http://www.hhs.gov/asam/ofmp/SustainableBldgsImpPlan.pdf>
- **HHS Policy for Sustainable and High Performance Buildings**
  - <http://www.hhs.gov/asam/ofmp/hiperfbldngpol.pdf>
- **NIH Office Fit-Out Guidelines**
  - [http://www.nems.nih.gov/aspects/sus\\_facilities/Revised\\_NIH\\_Office\\_Fitout\\_Guidelines\\_071506.pdf](http://www.nems.nih.gov/aspects/sus_facilities/Revised_NIH_Office_Fitout_Guidelines_071506.pdf)
- **NIH Environmental Management System – Sustainable Facilities**
  - [http://www.nems.nih.gov/aspects/sus\\_facilities/](http://www.nems.nih.gov/aspects/sus_facilities/)