

# FEDERAL SUSTAINABILITY MANDATES

## Introduction

In recent years, as the environmental and resource impacts of the construction and operation of federal facilities have become well known, both the legislative and executive branches of the Federal government have established a series of mandates and orders requiring energy and sustainability performance in Federal Buildings. These mandates affect both the operation of Federal Agencies, and construction work (both new and major remodel) undertaken on Federal Buildings.

In addition to the government-wide mandates, many individual agencies have their own sustainability guidelines or requirements. Many of these were adopted prior to the recent mandates, and broadly mirror LEED, although often they have not kept up with the changes from LEED 1.1 to 2.2. Because of this, individual agency requirements are likely to be similar to, but subtly different from the Federal Mandates. It is beyond the scope of this paper to address specific agency requirements. It is important, therefore, to analyze the individual agency requirements alongside the Federal Mandates.

## Description of Mandates

Both the legislative and the executive branches have created mandates. The Legislative branch mandate is the EAct; the Executive branch mandate is the Executive Order.

### **Energy Policy Act of 2005 (EAct)**

In August of 2005 the Energy Policy Act of 2005 (EAct) was signed into law. This act, which covers a wide range of topics, including requirements for federal building projects, is considered the most sweeping change in energy policy seen in the United States since the 1930s.

Section 3(A) of EAct addresses federal building requirements, and establishes a minimum 30 percent improvement in energy cost savings from a baseline, as stated in the excerpt below:

“Not later than 1 year after the date of enactment of this paragraph, the Secretary shall establish, by rule, revised Federal building energy efficiency performance standards that require that—

(i) if life-cycle cost-effective for new Federal buildings—



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(I) the buildings be designed to achieve energy consumption levels that are at least 30 percent below the levels established in the version of the ASHRAE Standard or the International Energy Conservation Code, as appropriate, that is in effect as of the date of enactment of this paragraph; and

(II) sustainable design principles are applied to the sitting, design, and construction of all new and replacement buildings; and

“(ii) if water is used to achieve energy efficiency, water conservation technologies shall be applied to the extent that the technologies are life-cycle cost-effective.”

Section 3(A) does not specify the measurement basis (energy use or cost) for the reduction, nor the calculation method.

The full text of the EAct is available in PDF format here:[http://www.epa.gov/OUST/fedlaws/publ\\_109-058.pdf](http://www.epa.gov/OUST/fedlaws/publ_109-058.pdf)

### **Interim Final Rule**

In early January of 2007 the Department of Energy (DOE) issued an Interim Final Rule, as required by EAct, to establish specific rules governing compliance with the Act's broad mandates. Amendments were added in December of 2007, following a comment period for the original ruling.

The DOE Interim Final Rule specifies that federal commercial and high rise residential buildings must use ASHRAE 90.1-2004, excluding process and receptacle load, and that low rise residential buildings must use Section 404 of the International Energy Conservation Code, 2004. All other building types remain under the broad EAct mandate, with no specific direction from DOE.

The Interim Final Rule maintains the requirement that the energy reduction measures must be life cycle cost effective, and specifies the Life Cycle Cost analysis process that should be used if a lesser reduction is being sought. It does not address the water conservation requirement.

The full text of the Interim Final Rule is available from the DOE.

### **Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management (EO)**

On January 24, 2007, Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management (EO) was signed into law. This Executive Order consolidates five prior Executive Orders and adopts the text of the Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding, to integrate earlier orders and agreements by federal agencies for sustainable practices into a more cohesive approach to environmental and energy management. It outlines the following objectives:

- Reduction in life-cycle cost of facilities' environmental and energy attributes
- Improvement in energy efficiency, water conservation, and utilization of renewable energy
- Provision of safe, healthy, and productive built environments
- Promotion of sustainable environmental stewardship.

Section 2(f) of the Executive Order applies specifically to federal construction projects, to "ensure that (i) new construction and major renovation of agency buildings comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006), and (ii) 15 percent of the existing Federal capital asset building inventory of the agency as of the end of fiscal year 2015 incorporates the sustainable practices in the Guiding Principles"

The full text of the Executive Order is included in Appendix A of this report.

### **Memorandum of Understanding**

The Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding (MOU) was adopted in 2006 as an agreement between 18 Federal agencies to establish a specific set of measurable sustainable design requirements for new construction and major renovations of Federal building projects. The goals of the MOU are to provide save, healthy, and productive buildings, while also reducing the total cost of the facilities and improving energy efficiency and water conservation.

The Memorandum of Understanding has been effectively superseded by Executive Order 13423, which adopted it wholesale and converted it from being an agreement among agencies to a legal requirement binding on all agencies.

The full text of the MOU is included in Appendix B of this report.

### **Compliance**

The Federal mandates for sustainability and energy reduction require all construction projects to comply with sustainability and energy reduction requirements. These mandates apply to new buildings, existing buildings, leased space, grants, and land development projects such as parks and cemeteries. In addition to meeting the Federal mandates, some agencies also require a LEED NC Silver equivalency and registration with USGBC for new construction and major renovations.

Individual agencies are charged with demonstrating compliance, and all compliance is subject to audit by the Government Accountability Office. As neither mandate specifies any sort of documentation requirements, Federal agencies are free to establish their own approach to documentation; in the absence of specific guidelines, we recommend following LEED protocols. To that end, the following text maps the Federal mandates to applicable LEED credits and provides guidance to that application.

### **Integrated Design**

#### *Mandated Requirements*

Section I of the MOU states that agencies must "use a collaborative, integrated planning and design process that

- Initiates and maintains an integrated project team in all stages of a project's planning and delivery

- Establishes performance goals for sitting, energy, water, materials, and indoor environmental quality along with other comprehensive design goals; and, ensures incorporation of these goals throughout the design and lifecycle of the building; and,
- Considers all stages of the building's lifecycle, including deconstruction."

#### *Applicable LEED-NC Requirements*

There are no specific requirements under LEED – NC in this section, although compliance with the mandates will generally be sufficient to achieve one or more of the LEED Innovation credits.

### **Commissioning**

#### *Mandated Requirements*

Section I of the MOU states the federal agencies must “employ total building commissioning practices tailored to the size and complexity of the building and its system components in order to verify performance of the building components and systems and help ensure that design requirements are met. This should include a designated commissioning authority, inclusion of commissioning requirements in construction documents, a commissioning plan, verification of the installation and performance of systems to be commissioned, and a commissioning report.”

#### *Applicable LEED-NC Requirements*

- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems
- EA Credit 3: Enhanced Commissioning

### **Optimize Energy Performance**

This is one of the more challenging sections to interpret correctly, since there are overlapping requirements which are not always consistent.

#### *Mandated Requirements*

The primary requirement is the EPAAct, which mandates a 30% reduction in energy use. For commercial and high rise residential buildings, this has been codified by the Interim Final Rule to mean a 30% reduction in Energy Cost, using ASHRAE 90.1-2004, Appendix G, excluding process and plug load. Low rise residential buildings must achieve a 30% reduction in energy use using the ICC International Energy Conservation Code, 2004 Supplement Edi-

tion, as stated in Section 435.4 of the Interim Final Rule. For commercial, high rise and low rise residential buildings, the Interim Final Rule (as amended in December of 2007 in sections 433.4 and 435.4) requires the 30% reduction in energy use only where life-cycle cost-effective; for all other situations, the building design must achieve a level of energy efficiency that is at least at, or better, than the maximum that would be life-cycle cost-effective for that particular facility. For all other building types, the EPAAct is open to interpretation by the agency, but it would appear sensible to use energy cost, not usage, and ASHRAE 90.1-2004 Appendix G where possible.

The Executive Order has broader language. Section 1 states that “it is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.” Sections 2 (a) and 2 (b) of the Executive Order establish the following goals for federal agencies concerning energy use:

“(a) improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency’s energy use in fiscal year 2003;

(b) ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and (ii) to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use.”

These are based on measured usage, not cost. Highly efficient new construction can help achieve this target, by improving the agency’s overall average performance, without requiring retrofits to existing buildings.

In addition, section II of the MOU states that agencies must “establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the Energy Star7 targets for new construction and major renovation where applicable. For new construction, reduce

the energy cost budget by 30 percent compared to the baseline building performance rating per the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy cost budget by 20 percent below pre-renovations 2003 baseline.”

Both Federal mandates require energy reduction to be measured in terms of energy consumption (BTU/SF/YR) and energy cost savings (\$/SF/YR). LEED-NC and the EPAct/DOE Interim Final Rule state that energy reduction targets are based on energy costs.

The following table summarizes the different requirements between the Federal mandates, and LEED-NC:



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	<b>EPAct / Interim Final Rule / MOU</b>	<b>LEED-NC</b>
Target	30% reduction in Energy Cost, excluding plug load	17.5% to 40% reduction in energy cost, including plug load
Unit of Measure	\$/SF/Year	\$/SF/Year
Model	ASHRAE 90.1-2004 Appendix G without plug load	ASHRAE 90.1-2004 Appendix G with plug load
Output	Percentage Reduction in Energy Cost, individually and cumulatively	Percentage Reduction in Energy Cost, individually and cumulatively
Decrement Analysis	Life Cycle Cost using cost of EEMs compared with potential savings	Not Required

The methods to achieve the primary goal of energy reduction, as specified by EPAct Interim Final Rule Sections 433-433.8 are:

- Establish a whole building consumption performance target to earn the Energy Star® targets where applicable.
- ASHRAE / IESNA Standard 90.1 – 2004 Energy Standard, Appendix G shall be used to create the baseline building performance ratings.
- For new construction, reduce the energy consumption by 30 percent if lifecycle cost effective compared to the baseline.
- For major renovations, reduce the energy consumption cost budget by 20 percent below pre-renovations 2003 baseline if lifecycle cost effective compared to the baseline, providing building functions remain similar.
- If the 30 percent energy reduction is not life-cycle cost effective (using OMB Circular Number A – 94 “Guidelines and Discount Rates for Benefit – Cost Analysis of Federal Programs”), evaluate the cost-effectiveness of alternative designs at successive decrements below 30 percent (e.g., 25 percent, 20 percent, etc) in order to identify the most energy-efficient design that is life-cycle cost effective for that building.
- To the extent feasible and life-cycle cost effective, implement renewable energy generation and bioenergy projects on agency property for agency use.
- Where life-cycle cost effective, each agency shall implement distributed generation systems in new construction or retrofit projects, including renewable systems such as solar electric, solar lighting, geo (or ground coupled) thermal, small wind turbines, as well as other generation systems such as fuel cell, co-generation, or highly

efficient alternatives. Projects are encouraged to use distributed generation systems when a substantial contribution is made towards enhancing energy reliability or security.

- Utilize products that have the Energy Star® rating identified by DOE and EPA and/or FEMP-designated energy-efficient products.

#### *Applicable LEED-NC Requirements*

- EA Prerequisite 2: Minimum Energy Performance
- EA 1.1 – 1.5: Optimize Energy Efficiency
- EA 2: On-site Renewable Energy
- SS 7-2: Heat Island Roof
- EA 6: Green Power

In addition to establishing specific levels of energy efficiency to be achieved, the mandates also encourage the use of renewable energy (both on and off site), and also encourage the use of distributed generation systems such as fuel cells, cogeneration, combined heat and power systems, etc., where lifecycle cost effective. These measures can provide significant energy use reductions as well as improving the passive survivability of the facility. In addition, the systems can contribute to an overall reduction in source energy usage and carbon emissions.

The recommendations for use of onsite renewable energy, as detailed in section 2 (b) of the Executive Order as well as Section 203 of the EAct, do not include any specific measures of the amount of on-site generation to be achieved. In order to meet the agency-wide goals established by the Executive Order, however, it is likely that projects will need to attain the first level LEED – NC Energy credit (EA 1.1 – Optimize Energy Efficiency).

### **Measurement and Verification**

#### *Mandated Requirements*

Section II of the MOU specifies that federal agencies must comply with DOE guidelines issued under section 103 of EAct, which specifies that all buildings must be equipped with the most advanced metering system practical, capable of collecting hourly data on electricity usage; this data must then be incorporated into existing Federal energy tracking systems and be made available to facility managers. The MOU goes on to specify that actual performance data captured by this metering must be analyzed after the first year of operation, using the Energy Star<sup>7</sup> Benchmarking Tool, as a means to assess, and then optimize, actual building performance. Data collected is to be

entered into the High Performance Buildings Database, for use by other federal agencies.

#### *Applicable LEED-NC Requirements*

- EA 5: Measurement and Verification

### **Water Use and Conservation**

Section 2(c) of the Executive Order lays out goals for all federal agencies regarding water consumption; specifically that “beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency’s water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015.”

This is further detailed in the MOU, with specific requirements regarding indoor versus outdoor water consumption, as detailed below.

#### **Indoor Water Use**

##### *Mandated Requirements*

Section III of the MOU states that all Federal agencies must “employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the Energy Policy Act of 1992 fixture performance requirements.”

#### *Applicable LEED-NC Requirements*

- WE 3-1: Water Use Reduction – 20 Percent Reduction

#### **Outdoor Water Use**

##### *Mandated Requirements*

Section III of the MOU states that all federal facilities must “use water efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities). Employ design and construction strategies that reduce storm water runoff and polluted site water runoff.”

#### *Applicable LEED-NC Requirements*

- SS Prerequisite 1: Construction Activity Pollution Prevention
- SS 6-1: Stormwater Management – Quantity Control
- SS 6-2: Stormwater Management – Quality Control
- WE 1-1: Water Efficient Landscaping – Reduce potable water by 50 Percent



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### Indoor Environmental Quality

Section IV of the MOU includes a number of indoor environmental quality requirements. Each requirement is listed with the corresponding requirements from LEED-NC, where applicable.

#### Thermal Comfort and Ventilation:

Meet the current ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, including continuous humidity control within established ranges per climate zone, and ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality.

#### Applicable LEED-NC Requirements

- EQ 1: Outdoor Air Delivery Monitoring
- EQ 7.1 Thermal Comfort (Design)

#### Moisture Control

Establish and implement a moisture control strategy for controlling moisture flows and condensation to prevent building damage and mold contamination.

#### Applicable LEED-NC Requirements

Moisture control has no corresponding LEED credit. The mandate simply requires the implementation of a strategy to control moisture. It does not specifically require dehumidification in all cases, and so it is likely that current good design practices will fully comply with this requirement.

#### Daylighting

Achieve a minimum daylight factor of 2 percent (excluding all direct sunlight penetration) in 75 percent of all space occupied for critical visual tasks. Provide automatic dimming controls or accessible manual lighting controls, and appropriate glare control.

#### Applicable LEED-NC Requirements

The daylighting requirement is identical to LEED – CI EQ 8.1 and the Calculation option of LEED – NC EQ 8.1, but not the Simulation or Measurement options. As such, compliance may be more limited than under the LEED – NC credit.

#### Low-Emitting Materials

Specify materials and products with low pollutant emission, including adhesives, sealants, paints, carpet systems, and furnishings.

#### Applicable LEED-NC Requirements

- EQ 4.1 Low-Emitting Materials (Adhesives and Sealants)
- EQ 4.2 Low-Emitting Materials (Paints)
- EQ 4.3 Low-Emitting Materials (Carpet)
- EQ 4.4 Low-Emitting Materials (Composite Wood and Agrifiber)
- EQ 5: Indoor Chemical and Pollutant Source Control

The mandate includes furnishings within the list of low emitting products but LEED – NC does not. Generally, compliance with the requirements for the LEED credits should be sufficient for compliance with the mandates.

#### Indoor Air Quality during Construction

Follow the recommended approach of the Sheet Metal and Air Conditioning Contractor National Association Indoor Air Quality Guidelines for Occupied Buildings under Construction, 1995. After construction and prior to occupancy, conduct a minimum 72-hour flush-out with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. After occupancy, continue flush-out as necessary to minimize exposure to contaminants from new building materials.

#### Applicable LEED-NC Requirements

- EQ Prerequisite 1 Minimum IAQ Performance
- EQ Prerequisite 2 Environmental Tobacco Smoke
- EQ 3.1 Construction IAQ Management Plan (During Construction)
- EQ 3.2 Construction IAQ Management Plan (Before Occupancy)

## Materials and Resources

Section 2(e) of the Executive Order requires Federal agencies to “(i) reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increase diversion of solid waste as appropriate, and (iii) maintain cost-effective waste prevention and recycling programs in its facilities”. This is further detailed in Section V of the MOU, which includes a number of indoor environmental quality requirements. Each requirement is listed with the corresponding requirements from LEED-NC, where applicable.

### Recycled Content

For EPA-designated products, use products meeting or exceeding EPA’s recycled content recommendations. For other products, use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

#### Applicable LEED-NC Requirements

- MR 4-1: Recycled Content

### Biobased Content:

For USDA-designated products, use products meeting or exceeding USDA biobased content recommendations. For other products, use biobased products made from rapidly renewable resources and certified sustainable wood products.

#### Applicable LEED-NC Requirements

- MR 6: Rapidly Renewable Materials
- MR 7: Certified Wood

### Construction Waste

During a project planning stage, identify local recycling and salvage operations that could process site related waste. Program the design to recycle or salvage at least 50 percent construction, demolition and land clearing waste, excluding soil, where markets or on-site recycling opportunities exist.

#### Applicable LEED-NC Requirements

- MR 2-1 and 2-2: Construction Waste Management

### Ozone Depleting Compounds

Eliminate the use of ozone depleting compounds during and after construction where alternative environmentally preferable products are available, consistent with either the Montreal Protocol and Title VI of the Clean Air Act Amendments of 1990 or equivalent overall air quality benefits that take into account life cycle impacts.

#### Applicable LEED-NC Requirements

- EA Prerequisite 3: Fundamental Refrigerant Management
- EA 4: Enhanced Refrigerant Management



California Institute of Technology  
Pasadena, California  
LEED Gold

## Appendix A: Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management

By the authority vested in me as President by the Constitution and the laws of the United States of America, and to strengthen the environmental, energy, and transportation management of Federal agencies, it is hereby ordered as follows:

**Section 1. Policy.** It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

**Section 2. Goals for Agencies.** In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003;

(b) ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and (ii) to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use;

(c) beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015;

(d) require in agency acquisitions of goods and services (i) use of sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and (ii) use of paper of at least 30 percent post-consumer fiber content;

(e) ensure that the agency (i) reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increases diversion of solid waste as appropriate, and

(iii) maintains cost-effective waste prevention and recycling programs in its facilities;

f) ensure that (i) new construction and major renovation of agency buildings comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006), and (ii) 15 percent of the existing Federal capital asset building inventory of the agency as of the end of fiscal year 2015 incorporates the sustainable practices in the Guiding Principles;

(g) ensure that, if the agency operates a fleet of at least 20 motor vehicles, the agency, relative to agency baselines for fiscal year 2005, (i) reduces the fleet's total consumption of petroleum products by 2 percent annually through the end of fiscal year 2015, (ii) increases the total fuel consumption that is non-petroleum-based by 10 percent annually, and (iii) uses plug-in hybrid (PIH) vehicles when PIH vehicles are commercially available at a cost reasonably comparable, on the basis of life-cycle cost, to non-PIH vehicles; and

(h) ensure that the agency (i) when acquiring an electronic product to meet its requirements, meets at least 95 percent of those requirements with an Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product, unless there is no EPEAT standard for such product, (ii) enables the Energy Star feature on agency computers and monitors, (iii) establishes and implements policies to extend the useful life of agency electronic equipment, and (iv) uses environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.

**Section 3. Duties of Heads of Agencies.** In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) implement within the agency sustainable practices for (i) energy efficiency, greenhouse gas emissions avoidance or reduction, and petroleum products use reduction, (ii) renewable energy, including bioenergy, (iii) water conservation, (iv) acquisition, (v) pollution and waste prevention and recycling, (vi) reduction or elimination of acquisition and use of toxic or hazardous chemicals, (vii) high performance construction, lease, operation, and maintenance of buildings, (viii) vehicle fleet management, and (ix) electronic equipment management;

(b) implement within the agency environmental management systems (EMS) at all appropriate organizational levels to ensure (i) use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities, including environmental aspects of energy and transportation functions, (ii) establishment of agency objectives and targets to ensure implementation of this order, and (iii) collection, analysis, and reporting of information to measure performance in the implementation of this order;

(c) establish within the agency programs for (i) environmental management training, (ii) environmental compliance review and audit, and (iii) leadership awards to recognize outstanding environmental, energy, or transportation management performance in the agency;

(d) within 30 days after the date of this order (i) designate a senior civilian officer of the United States, compensated annually in an amount at or above the amount payable at level IV of the Executive Schedule, to be responsible for implementation of this order within the agency, (ii) report such designation to the Director of the Office of Management and Budget and the Chairman of the Council on Environmental Quality, and (iii) assign the designated official the authority and duty to (A) monitor and report to the head of the agency on agency activities to carry out subsections (a) and (b) of this section, and (B) perform such other duties relating to the implementation of this order within the agency as the head of the agency deems appropriate;

(e) ensure that contracts entered into after the date of this order for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order with respect to such facilities or vehicles to the same extent as the agency would be required to comply if the agency operated the facilities or vehicles;

(f) ensure that agreements, permits, leases, licenses, or other legally-binding obligations between the agency and a tenant or concessionaire entered into after the date of this order require, to the extent the head of the agency determines appropriate, that the tenant or concessionaire take actions relating to matters within the scope of the contract that facilitate the agency's compliance with this order;

(g) provide reports on agency implementation of this order to the Chairman of the Council on such schedule and in such format as the Chairman of the Council may require; and

(h) provide information and assistance to the Director of the Office of Management and Budget, the Chairman of the Council, and the Federal Environmental Executive.

Section 4. Additional Duties of the Chairman of the Council on Environmental Quality. In implementing the policy set forth in section 1 of this order, the Chairman of the Council on Environmental Quality:

(a) (i) shall establish a Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management to advise the Director of the Office of Management and Budget and the Chairman of the Council on the performance of their functions under this order that shall consist exclusively of (A) the Federal Environmental Executive, who shall chair, convene and preside at meetings of, determine the agenda of, and direct the work of, the Steering Committee, and (B) the senior officials designated under section 3(d)(i) of this order, and (ii) may establish subcommittees of the Steering Committee, to assist the Steering Committee in developing the advice of the Steering Committee on particular subjects;

(b) may, after consultation with the Director of the Office of Management and Budget and the Steering Committee, issue instructions to implement this order, other than instructions within the authority of the Director to issue under section 5 of this order; and

(c) shall administer a presidential leadership award program to recognize exceptional and outstanding environmental, energy, or transportation management performance and excellence in agency efforts to implement this order.

Section 5. Duties of the Director of the Office of Management and Budget. In implementing the policy set forth in section 1 of this order, the Director of the Office of Management and Budget shall, after consultation with the Chairman of the Council and the Steering Committee, issue instructions to the heads of agencies concerning:

(a) periodic evaluation of agency implementation of this order;

(b) budget and appropriations matters relating to implementation of this order;

(c) implementation of section 2(d) of this order; and

(d) amendments of the Federal Acquisition Regulation as necessary to implement this order.

Section 6. Duties of the Federal Environmental Executive. A Federal Environmental Executive designated by the President shall head the Office of the Federal Environmental Executive, which shall be maintained in the Environmental Protection Agency for funding and administrative purposes. In implementing the policy set forth in section 1 of this order, the Federal Environmental Executive shall:

(a) monitor, and advise the Chairman of the Council on, performance by agencies of functions assigned by sections 2 and 3 of this order;

(b) submit a report to the President, through the Chairman of the Council, not less often than once every 2 years, on the activities of agencies to implement this order; and

(c) advise the Chairman of the Council on the Chairman's exercise of authority granted by subsection 4(c) of this order.

Section 7. Limitations. (a) This order shall apply to an agency with respect to the activities, personnel, resources, and facilities of the agency that are located within the United States. The head of an agency may provide that this order shall apply in whole or in part with respect to the activities, personnel, resources, and facilities of the agency that are not located within the United States, if the head of the agency determines that such application is in the interest of the United States.

(b) The head of an agency shall manage activities, personnel, resources, and facilities of the agency that are not located within the United States, and with respect to which the head of the agency has not made a determination under subsection (a) of this section, in a manner consistent with the policy set forth in section 1 of this order to the extent the head of the agency determines practicable.

Section 8. Exemption Authority. (a) The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10,

to the extent the Director determines necessary to protect intelligence sources and methods from unauthorized disclosure.

(b) The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10, to the extent the head of an agency determines necessary to protect undercover operations from unauthorized disclosure.

(c) (i) The head of an agency may exempt law enforcement, protective, emergency response, or military tactical vehicle fleets of that agency from the provisions of this order, other than this subsection and section 10.

(d) The head of an agency may submit to the President, through the Chairman of the Council, a request for an exemption of an agency activity, and related personnel, resources, and facilities, from this order.

Section 9. Definitions. As used in this order:

(ii) Heads of agencies shall manage fleets to which paragraph (i) of this subsection refers in a manner consistent with the policy set forth in section 1 of this order to the extent they determine practicable.

(a) "agency" means an executive agency as defined in section 105 of title 5, United States Code, excluding the Government Accountability Office;

(b) "Chairman of the Council" means the Chairman of the Council on Environmental Quality, including in the Chairman's capacity as Director of the Office of Environmental Quality;

(c) "Council" means the Council on Environmental Quality;

(d) "environmental" means environmental aspects of internal agency operations and activities, including those environmental aspects related to energy and transportation functions;

(e) "greenhouse gases" means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride;

(f) "life-cycle cost-effective" means the life-cycle costs of a product, project, or measure are estimated to be equal to or less than the base case (i.e., current or standard practice or product);

(g) “new renewable sources” means sources of renewable energy placed into service after January 1, 1999;

(h) “renewable energy” means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project;

(i) “energy intensity” means energy consumption per square foot of building space, including industrial or laboratory facilities;

(j) “Steering Committee” means the Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management established under subsection 4(b) of this order;

(k) “sustainable” means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans; and

(l) “United States” when used in a geographical sense, means the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Northern Mariana Islands, and associated territorial waters and airspace.

Section 10. General Provisions. (a) This order shall be implemented in a manner consistent with applicable law and subject to the availability of appropriations.

(b) Nothing in this order shall be construed to impair or otherwise affect the functions of the Director of the Office of Management and Budget relating to budget, administrative, or legislative proposals.

(c) This order is intended only to improve the internal management of the Federal Government and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by a party against the United States, its departments, agencies, instrumentalities, entities, officers, employees or agents, or any other person.

Section 11. Revocations; Conforming Provisions. (a) The following are revoked:

(i) Executive Order 13101 of September 14, 1998;

(ii) Executive Order 13123 of June 3, 1999;

(iii) Executive Order 13134 of August 12, 1999, as amended;

(iv) Executive Order 13148 of April 21, 2000; and

(v) Executive Order 13149 of April 21, 2000.

(b) In light of subsection 317(e) of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107 107), not later than January 1 of each year through and including 2010, the Secretary of Defense shall submit to the Senate and the House of Representatives a report regarding progress made toward achieving the energy efficiency goals of the Department of Defense.

(c) Section 3(b)(vi) of Executive Order 13327 of February 4, 2004, is amended by striking “Executive Order 13148 of April 21, 2000” and inserting in lieu thereof “other executive orders”.

## Appendix B: Federal Leadership In High Performance And Sustainable Buildings: Memorandum Of Understanding

**PURPOSE:** With this Memorandum of Understanding (MOU), signatory agencies commit to federal leadership in the design, construction, and operation of High-Performance and Sustainable Buildings. A major element of this strategy is the implementation of common strategies for planning, acquiring, siting, designing, building, operating, and maintaining High Performance and Sustainable Buildings. The signatory agencies will also coordinate with complementary efforts in the private and public sectors.

**BACKGROUND AND FEDERAL POLICY:** The Federal government owns approximately 445,000 buildings with total floor space of over 3.0 billion square feet, in addition to leasing an additional 57,000 buildings comprising 374 million square feet of floor space. These structures and their sites affect our natural environment, our economy, and the productivity and health of the workers and visitors that use these buildings.

Therefore, the Federal government is committed to designing, locating, constructing, maintaining, and operating its facilities in an energy efficient and sustainable manner that strives to achieve a balance that will realize high standards of living, wider sharing of life's amenities, maximum attainable reuse and recycling of depletable resources, in an economically viable manner, consistent with Department and Agency missions. In doing so and where appropriate, we encourage the use of life cycle concepts, consensus-based standards, and performance measurement and verification methods that utilize good science, and lead to sustainable buildings.

**GOALS AND OBJECTIVES OF THIS MOU:** Consistent with and in addition to Federal policy, statutes, executive orders and supplemental agency policies and guidance, the Parties to this MOU collaboratively seek to establish and follow a common set of sustainable Guiding Principles (attached) for integrated design, energy performance, water conservation, indoor environmental quality, and materials aimed at helping Federal agencies and organizations:

- 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.

**OTHER LAWS AND MATTERS:** This MOU is for internal management purposes of the Parties involved. It is not legally enforceable and shall not be construed to create any legal obligation on the part of any of the signatories. This MOU shall not be construed to provide a private right or cause of action for or by any person or entity. This MOU in no way restricts the Parties from participating in any activity with other public or private agencies, organizations or individuals.

The Parties mutually recognize and acknowledge that MOU implementation will be subject to financial, technical, and other mission-related considerations. It is not intended to create any rights, benefits, or trust responsibilities, either substantive or procedural, nor is it enforceable in law by a party against the US, its agencies, its officers, or any other person.

Collaboration under this MOU will be in accordance with applicable statutes and regulations governing the respective Parties. Nothing in this MOU is intended to affect existing obligations or other agreements of the Parties.

**EFFECTIVE PERIOD:** This MOU will become effective upon signature. It shall remain in effect unless otherwise modified or terminated. Any Party may withdraw upon 30 days written notification to the others.

**MODIFICATIONS:** This MOU can be modified through mutual written agreement among the Parties.

**ADMINISTRATION:** Agencies will strive to incorporate and adopt, as appropriate and practical, the attached Guiding Principles into existing agency policy and guidance within 180 days of signature. To assist with this effort, the Interagency Sustainability Working Group (ISWG) will provide technical guidance and updates for the Guiding Principles. The Office of the Federal Environmental Executive will work with the ISWG and Federal Green Building Council to develop methods of reporting on progress towards this MOU in a manner that is least burdensome to the agencies. This may include incorporating reporting into existing mechanisms, such as executive order reports; but in any case with a goal of avoiding a separate reporting process.

## **GUIDING PRINCIPLES FOR FEDERAL LEADERSHIP IN HIGH PERFORMANCE AND SUSTAINABLE BUILDINGS**

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

**Integrated Design.** Use a collaborative, integrated planning and design process that

- Initiates and maintains an integrated project team in all stages of a project's planning and delivery;
- Establishes performance goals for siting, energy, water, materials, and indoor environmental quality along with other comprehensive design goals; and, ensures incorporation of these goals throughout the design and lifecycle of the building; and,
- Considers all stages of the building's lifecycle, including deconstruction.

**Commissioning.** Employ total building commissioning practices tailored to the size and complexity of the building and its system components in order to verify performance of building components and systems and help ensure that design requirements are met. This should include a designated commissioning authority, inclusion of commissioning requirements in construction documents, a commissioning plan, verification of the installation and performance of systems to be commissioned, and a commissioning report.

## II. Optimize Energy Performance

**Energy Efficiency.** Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the Energy Star7 targets for new construction and major renovation where applicable. For new construction, reduce the energy cost budget by 30 percent compared to the baseline building performance rating per the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy cost budget by 20 percent below pre-renovations 2003 baseline.

**Measurement and Verification.** In accordance with DOE guidelines issued under section 103 of the Energy Policy Act of 2005 (EPAAct), install building level utility meters in new major construction and renovation projects to track and continuously optimize performance. Compare actual performance data from the first year of operation with the energy design target. After one year of occupancy, measure all new major installations using the Energy Star7 Benchmarking Tool for building and space types covered by Energy Star7. Enter data and lessons learned from sustainable buildings into the High Performance Buildings Database. ([www.eere.energy.gov/femp/highperformance/index.cfm](http://www.eere.energy.gov/femp/highperformance/index.cfm))

## III. Protect and Conserve Water

**Indoor Water.** Employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the Energy Policy Act of 1992 fixture performance requirements.

**Outdoor Water.** Use water efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities). Employ design and construction strategies that reduce storm water runoff and polluted site water runoff.

## IV. Enhance Indoor Environmental Quality

**Ventilation and Thermal Comfort.** Meet the current ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, including continuous humidity control within established ranges per climate zone, and ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality.

**Moisture Control.** Establish and implement a moisture control strategy for controlling moisture flows and condensation to prevent building damage and mold contamination.

**Daylighting.** Achieve a minimum of daylight factor of 2 percent (excluding all direct sunlight penetration) in 75 percent of all space occupied for critical visual tasks. Provide automatic dimming controls or accessible manual lighting controls, and appropriate glare control.

**Low-Emitting Materials.** Specify materials and products with low pollutant emissions, including adhesives, sealants, paints, carpet systems, and furnishings.

**Protect Indoor Air Quality during Construction.** Follow the recommended approach of the Sheet Metal and Air Conditioning Contractor's National Association Indoor Air Quality Guidelines for Occupied Buildings under Construction, 1995. After construction and prior to occupancy, conduct a minimum 72-hour flush-out with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. After occupancy, continue flush-out as necessary to minimize exposure to contaminants from new building materials.

## V. Reduce Environmental Impact of Materials

**Recycled Content.** For EPA-designated products, use products meeting or exceeding EPA's recycled content recommendations. For other products, use materials with recycled content such that the sum

of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

**Biobased Content.** For USDA-designated products, use products meeting or exceeding USDA's biobased content recommendations. For other products, use biobased products made from rapidly renewable resources and certified sustainable wood products.

**Construction Waste.** During a project's planning stage, identify local recycling and salvage operations that could process site related waste. Program the design to recycle or salvage at least 50 percent construction, demolition and land clearing waste, excluding soil, where markets or on-site recycling opportunities exist.

**Ozone Depleting Compounds.** Eliminate the use of ozone depleting compounds during and after construction where alternative environmentally preferable products are available, consistent with either the Montreal Protocol and Title VI of the Clean Air Act Amendments of 1990, or equivalent overall air quality benefits that take into account life cycle impacts.