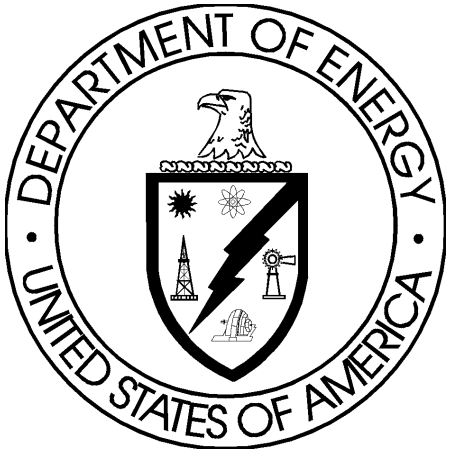
Technical Assistance Tool: Integrating Sustainable Practices into Environmental Management Systems



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1. INTRODUCTION

This Technical Assistance Tool (Tool) provides assistance for developing site environmental management systems (EMSs) to 1) implement sustainable practices for enhancing environmental, energy, and transportation performance, and 2) include the environmental, energy, and transportation objectives and measurable targets that contribute to achieving the Department of Energy's (DOE) sustainable environmental, energy, and transportation goals.

This Tool was developed to complement sustainable practices training for DOE sites. The objectives of the training are to 1) create awareness of sustainability and its relationship to the site's mission and activities, 2) introduce the content of this Tool, *Integrating Sustainable Practices into Environmental Management Systems*, 3) assist in identification of near term sustainable practices for site programs, and 4) offer strategies for coordination and communication that can be used to expand relationships among EMS managers and site operations and activities managers.

2. BACKGROUND

Compliance with Federal environmental regulations remains an important element of a DOE site's environmental protection approach in the EMS. The EMS contains the elements of an Environmental Compliance Management Plan committing senior leadership to achieve and maintain compliance with applicable environmental protection requirements, including required pollution abatement environmental controls, such as treatment technologies or engineering controls used to meet release or discharge limits in permits.

This Tool focuses on the use of sustainable practices for addressing the environmental aspects related to site operations and activities to prevent pollution and promote the sustainability of site missions. Sustainable practices are actions that enhance or "green" a site's environmental, energy, and transportation management performance. In addition to moving from "compliance to sustainability," incorporating sustainable practices in site operations and activities contributes to reduced energy and water use and reduced waste management costs.

The primary users of this Tool are the "owners" of site operations and activities that may cause adverse environmental impacts in the conduct of mission requirements. The secondary users are the site EMS coordinators and EMS team members who are developing or enhancing the site EMS to contribute to achieving their energy, environment, and transportation goals. Most sites will already have selected someone to be responsible for coordinating the site's EMS. Both user groups should use this Tool to jointly identify environmental aspects, suggest applicable sustainable practices to address them, and integrate specific objectives and measurable targets into the site EMS.

Sustainable practices used as objectives and measurable targets in site EMSs may include:

- **Electronics Stewardship**—the life-cycle environmental management of electronic assets, involving the acquisition of environmentally preferable electronics; operation and maintenance

- practices that maximize energy efficiency and extend the life of electronic assets; and the reuse and recycling of surplus and end-of-life electronics, respectively.

- **Energy Efficiency**—measures, practices, or programs that reduce the energy used by specific devices and systems, typically without adversely affecting the services provided. Such reductions are generally achieved by substituting technically more advanced equipment or by improving operating procedures (e.g., operations and maintenance procedures) to produce the same level of end-use services (e.g., lighting, heating, motor drive) with less energy input.

- **Environmentally Preferable Purchasing (Green Acquisition)—**acquiring products or services that have a reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.

- **High Performance and Sustainable Building**—using integrated design principles to optimize energy performance, water efficiency, indoor environmental quality, recycling, and the use of environmentally preferable materials in constructing, leasing, operating, and maintaining buildings.

- **Pollution Prevention**—"source reduction" as defined in the Pollution Prevention Act of 1990 (42 U.S.C. 13102), and other practices that reduce or eliminate the creation of pollutants at the source through (a) increased efficiency in the use of raw materials, energy, water, or other resources, or (b) the protection of natural resources by conservation.

- **Recycling**—the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion.

- **Renewable Energy**—energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), hydrokinetic, geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.

- **Toxic or Hazardous Chemicals and Materials Use Reduction**—eliminating or reducing the use, purchase, and release of toxic and hazardous chemicals and materials.

- **Vehicle Fleet Management**—to reduce use of petroleum products by increasing fuel fleet economy and using alternative fuel and hybrid technology vehicles.

- **Water Conservation**—the use of cost-effective and environmentally sound processes or technologies to reduce water use.

3. THE ENVIRONMENTAL MANAGEMENT SYSTEM

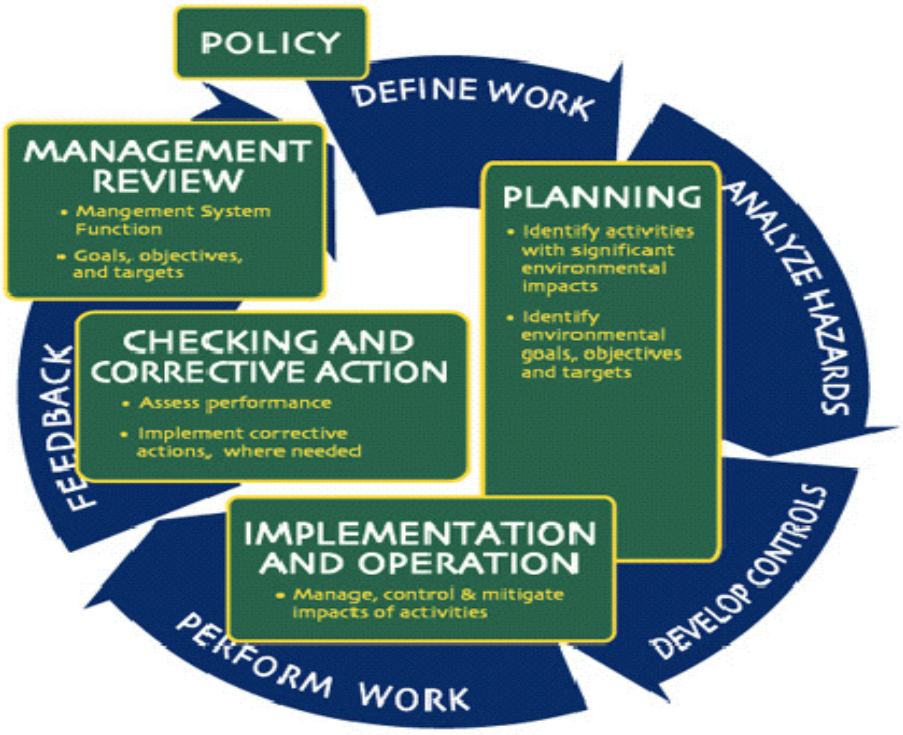
A short synopsis of EMSs follows to provide a picture of how the environmental aspects, sustainable practices, objectives, and measurable targets fit into the EMS. The Office of Health, Safety and Security Web-site at http://www.hss.energy.gov/pp/bestpractices.html will provide details and more in-depth information on EMSs.

An EMS is a set of processes and practices that enable an organization to increase its operating efficiency, continually improve overall environmental performance, and better manage and reduce its environmental impacts, including those environmental aspects related to energy and transportation functions. An EMS promotes long-term stewardship of a site's natural and cultural resources throughout its design and construction, operation, closure, and post-closure life cycle.

Because the EMS addresses a site's significant environmental aspects and the processes and practices needed to address them, all site operations and activities with environmental impacts should be brought into the EMS development and implementation process. Headed by the site EMS coordinator, the site EMS team should consist of individuals with knowledge of the site's operations and activities (such as design and construction, building operations and maintenance, fleet management, etc.) and experience in environmental and energy programs (such as site Green Acquisition Advocates, pollution prevention specialists, waste managers, and energy and water utility managers, etc.). Comprised of these individuals, the site EMS team should identify the significant environmental aspects of the operations and activities and the sustainable practices that can address them.

The EMS is also the basis for continual improvement in a site's overall environmental performance. The Plan-Do-Check-Act EMS process depicted in Figure 1 ensures that environmental aspects are identified, plans are developed to address them, and the plans are checked periodically to determine their effectiveness.

Figure 1 EMS Model



This Technical Assistance Tool applies to the EMS planning phase depicted in Figure 1. As illustrated in Figure 2, planning begins with identifying site activities, environmental aspects resulting from those activities, their impacts on the environment, their significance, and objectives and measurable targets that can address the aspect.

Figure 2 Developing Objectives and Measurable Targets

Activity	Aspect	Impact	Significance	Objective/ MeasurableTargets
Use of formamide in genetic sequencing	Hazardous waste generation	Degrading effect on air, soil, and water; emissions from hazardous waste storage and disposal	Significant: Based on regulatory implication and harmful effects	Objective: Identify possible alternatives to formamide Measurable Target 1: Form opportunity assessment team in X quarter of FYXX Measurable Target 2: Complete opportunity assessment by the end of FYXX Measurable Target 3: Implement cost effective alternative(s) by the end of FYZZ
Procuring new office furniture	Use of virgin material in production	High energy and resources used in developing products with virgin content	Significant: Based on regulatory implication and greenhouse gas emissions reductions	Objective: Increase the procurement of office furniture made with recycled-content materials by X% over the base year of FYZZ by FYWW. Measurable Target 1: Establish the FYZZ base year. Measurable Target 2: Establish protocol with purchasing department to build a preference for recycled-content products in all procurements. Measurable Target 3: Track procurements to measure progress in reaching the goal.

Environmental aspects are any element of an organization's activities, products, or services that can interact with (or cause an impact on) the environment. These interactions have the potential to improve or degrade the environment. By looking at legal or regulatory compliance requirements, such as permits, and other requirements to which the organization subscribes, such as DOE Orders 450.1A and 430.2B, the site EMS team should identify which aspects are significant and consider which appropriate sustainable practices can help achieve the Department's sustainable goals.

The EMS contains the objectives and measurable targets sites developed to address the significant aspects. Objectives are the site's environmental performance goals. These goals could flow from DOE O 450.1A, DOE O 430.2B or from more specific goals established by the site in its contracts or the voluntary programs it has joined.

Targets are the specific, measurable actions necessary to achieve the objectives. Establishing baselines is required in order to establish meaningful, measurable targets. Often, pollution prevention or other operational assessments are conducted to identify methods, services or products that prevent pollution at the source. Examples of environmental aspects, objectives, and targets are provided in subsequent chapters of this Tool. Measurable targets are put into action through environmental management programs that describe required organizational resources, timeframes, operational controls, roles and responsibilities, and any training that might be necessary.

The effectiveness of the EMS is checked through annual reviews, management reviews, and periodic audits. DOE 450.1A requires that objectives and measurable targets be reviewed annually and updated as necessary. Periodic management reviews of the EMS ensure that site-specific objectives and targets contribute to achieving DOE's sustainable environmental, energy, and transportation goals. In addition, to ensure that a site's environmental aspects are addressed by objectives and targets in the EMS, periodic audits may be conducted by qualified parties who are outside the control or scope of the EMS.

4. "OWNERS" OF SITE OPERATIONS AND ACTIVITIES

In the conduct of their responsibilities, the owners of site operations and activities may have environmental aspects which may be addressed by implementing appropriate sustainable practices, in addition to complying with regulatory requirements**.** The key to integrating sustainable practices into the site EMS is to involve the owners of the site operations and activities in the site EMS team from the start.

Site personnel understand how their responsibilities, operations, and activities impact the environment. They are also able to implement sustainable practices or other appropriate environmental protection measures to mitigate any negative environmental aspects and help the site achieve the Department's sustainable environmental, energy, and transportation goals.

4.1 Site Operations and Activities

This Tool is organized by operations and activities that occur at most sites. These titles represent broad characterizations of general site operations and activities:

- building operations and maintenance
- design and construction
- fleet management
- information technology (IT) management
- procurement/purchasing
- production and process operations
- security
- utility management
- waste management

4.2 Matrix of DOE Site Operations and Activities, DOE's Sustainable Goals, and Sustainable Practices

Table 1 uses a matrix to illustrate the potential interrelatedness of site operations and activities, the Department's sustainable environmental, energy, and transportation goals and requirements, and the sustainable practices to achieve these goals. The operations and activities listed in the table represent broad characterizations of the types of operations and activities that occur at most sites. The Department's sustainable goals are listed in bold and are followed with corresponding sustainable practices from DOE O 450.1A. More detailed information on these sustainable practices is provided in Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A." While DOE O 430.2B does not contain sustainable practices, the Office of Energy

Efficiency and Renewable Energy proposed some as examples which are included in the following chapters.

In the matrix, the filled circle denotes the direct role of the specified site operation and activity in implementing the specified sustainable practices to achieve the specified goal; the open circle denotes a supporting role in implementing specified sustainable practices to achieve the specified goal.

Contractors and other entities at each DOE site may use the matrix in Table 1 or develop their own matrix that connects the various DOE goals to the applicable organizations, activities, facilities, and/or operations at their site that are within the scope of their EMS. Where there are multiple contractors working on the site, the DOE site office could prepare the matrix in consultation with the contractors. In addition to the nine operations and activities already identified, sites could also include the following operations and activities in their matrix: Safety, Property & Asset Management, Fire Protection, Medical Services, and ES&H Sampling and Monitoring.

Table 1. Matrix Showing Sustainable Practices for Achieving DOE's Sustainable Goals and Linking Them to Site Operations and Activities

Key: the filled circle denotes the direct role of the specified site operation and activity in implementing the specified sustainable practices to achieve the specified goal; the open circle denotes a supporting role in implementing specified sustainable practices to achieve the specified goal.

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
ELECTRONICS STEWARDSHIP: "**Reduce or eliminate the environmental impacts of electronic assets."** (*450.1A goal)*				●	●	●	○	○	●
"Establish electronics stewardship objectives and measurable targets in site environmental management systems."				●	●			○	●
Specify environmentally preferable electronics qualified through the Electronic Procurement Environmental Assessment Tool (EPEAT), or its successor, in the solicitation and acquisition of desktop computers, notebooks, monitors, and other electronic products for which there are EPEAT standards. Use the EPEAT network to identify desktop computers, notebooks and monitors listed as bronze, silver, and gold and other products (e.g., servers, printers, copiers) registered in the future.				●	●	●			
"Strive to purchase EPEAT silver-rated electronic products or higher (gold) as available."				●	●	●			
Enable Energy Star features (power management capabilities) on all computers, monitors, printers, copiers, and other electronic equipment or, based on mission needs, to the maximum degree.				●				○	
Extend the useful lifespan of computer systems and other electronic products through software upgrades to extend the useful life of electronic equipment to four (4) or more years.				●					
Reuse surplus and recycle end-of-life electronics through recycling services that are environmentally compliant means to dispose of end-of-life electronics. Use the GSA				●			○		●

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Computers for Learning Program to transfer surplus electronics to eligible schools.									
Specify "take back" provisions in IT contracts for leased equipment so it is reused, refurbished, donated, or recycled using environmentally sound management practices at the end of the lease period.				●	●		○		
Participate in the Federal Electronics Challenge, the Electronics Reuse and Recycling Challenge, and the Plug-in to eCycling Partnership where there is a programmatic benefit from doing so.				●					●
ENERGY EFFICIENCY: **Reduce energy intensity 30% by 2015 relative to FY 2003.** *(430.2B goal)*	○	○		●		○		●	
Install advanced electric metering systems in accordance with the DOE metering plan for site monitoring of electric energy and standard metering systems for steam and natural gas. *(430.2B goal)*	○	●						●	
Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities. (*430.2B at section 4.c(11)*	○	○		●	○			●	
Implement Section 432 of the Energy Independence and Security and Act (EISA) of 2007 which establishes a framework for facility project management benchmarking. *(Energy Independence and Security Act (EISA), Section 432)*	●	○		○	○	○		○	

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective. *(EISA, Section 434)*	○	○		○	●			●	
Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures having long- and short-term payback periods that can be incorporated into life-cycle cost effective contracts.	○	○			●	○		●	
ENVIRONMENTALLY PREFERABLE PURCHASING (GREEN ACQUISITION): "Maximize the acquisition and use of environmentally preferable products in the conduct of operations." *(O 450.1A goal)*	●	●	●	●	●	●	●	●	●
"Establish environmentally preferable purchasing objectives and measurable targets in site environmental management systems."	●	●	●	●	●	●	●	●	●
Specify environmentally preferable products (EPP) in the acquisition of site supplies and services.	●	●	●	●	●	●	●	●	●
Procure environmentally preferable products, when available, affordable, and effective. Examples of these products are:									
- "Environmental Protection Agency (EPA) designated recycled-content products," (Purchase of paper with at least 30% post-consumer fiber content is required; no exceptions.)	●	●	●		●	●	●	●	●
- "Department of Agriculture designated biobased-content products,"	●	●	●		●	●	●	●	●

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
- EPA Significant New Alternatives Policy (SNAP) Program products that are acceptable substitutes for ODS, and	●	●			●			●	
- "EPA Energy Star® labeled and FEMP-designated products"	●	●		●	●	●	○	●	●
- 0ther environmentally preferable products such as those certified by Green Seal, EPA, etc.	●	●	○		●	○			●
Use American Petroleum Institute (API)-rated re-refined oil, retread truck tires, antifreeze/engine coolant recyclers, water recycling/reclamation vehicle wash facilities, and biobased lubricants, fuels and degreasers/cleaners.	●		●		●				
Integrate environmentally preferable purchasing into new construction and major renovation projects, pursuant to the High Performance Sustainable Building requirements of DOE 413.3A, Program and Project Management for the Acquisition of Capital Assets, and, where life-cycle cost-effective, into construction and renovation-related general plant projects and institutional general plant projects.	○	●			●				
Participate in voluntary environmental partnership programs where there is a programmatic benefit from doing so	●	●	●	●	●	●	●	●	●
Incorporate a preference for WaterSense labeled products or products of similar water efficiency in procurements related to new and refurbished facilities.	●	●	○		●	○	○	○	○
HIGH PERFORMANCE AND SUSTAINABLE BUILDING: **Install sustainable building materials and practices throughout the Department's existing building assets.** *(430.2B goal)*	●	●			●	●	○		●

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Achieve LEED Gold certification for all new construction and major renovations in excess of $5 million. *(430.2B goal)*		●			○	●	○		○
Comply with Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings for buildings below $5 million. *(430.2B goal)*		●			○	●	○		○
Ensure 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water related principles. *(430.2B goal and OMB guidance)*	●	●		○	○	●	○	●	○
Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement; identify actions to be taken to meet the goals, and Tool compliance.	●	●		○	○		○	●	○
Use programs such as the Labs21 partnership to encourage the development of sustainable, high performance, and low-energy laboratories. (*430.2B at section 4.c(7))*	○	●				●			
Include a preference for buildings certified as LEED Gold in all procurement specifications and selection criteria for acquiring new leased space, including build-to-suit lease solicitations. *(430.2B at section 4.d(4))*		●			●				
Reduce energy use 30% beyond the ASHRAE 90.1-2004 standard for new construction. (*2005 Energy Policy Act, section 109)*		●			○	○			

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Reduce the fossil fuel-generated energy consumption of new buildings according to EISA Section 433. (EISA, section 433)		●			○	○			
POLLUTION PREVENTION: Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source. *(450.1A goal)*	●	●	●	●		●	●	●	●
"Establish operational assessments, such as pollution prevention opportunity assessments, of waste generating activities, as objectives and targets in site environmental management systems."	●	●	●	●		●	●	●	●
Based on site operational assessments, establish objectives and measurable targets in site environmental management systems for the prevention, reduction, reuse, and recycling of waste streams generated at sites.	●	●	●	●		●	●	●	●
Participate in voluntary environmental partnership programs (e.g., National Waste Minimization Program, Waste Wise, National Environmental Performance Track, etc.) where there is a programmatic benefit from doing so.	●	●	●	●		●	●	●	●
RECYCLING: Reduce the degradation and depletion of environmental resources through post-consumer recycling. *(450.1A goal)*	●	●	●	●	●	●	●	●	●
"Establish post-consumer material recycling objectives and measurable targets in site environmental management systems."	●	●	●	●	●	●	●	●	●
"Recycle office paper, cardboard, aluminum, plastics, and glass."	●	●	●	●	●	●	●	●	●
"Recycle spent oil, hydraulic fluid, lubricants, and solvents."	●		●				●		●

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Recycle construction and demolition debris by crushing demolition rubble to stone for grading, laying utilities, and building roads, driveways, and parking areas and pulverizing and reusing gravel asphalt and sub-base.	○	●					○		●
Use the GSA Construction Waste Management Database to identify recyclers of commonly-recycled construction and demolition debris; specify recycling of construction materials into new construction and major renovation projects.		●			●				●
Specify recycling of construction materials in new construction and major renovation projects and into construction and renovation-related general plant projects and institutional general plant projects, where life-cycle cost-effective.		●			●				●
Recycle empty, non-refillable, high-density polyethylene (HDPE) plastic pesticide product containers; use the Ag Container Recycling Council to collect and gather professional end-users' containers.	●								●
"Collect spent toner cartridges and batteries for remanufacturing."	●	●	●	●	●	●	●	●	●
"Recycle surplus commodities and by-products." *(*	●	●	●	●	●	●		●	●
Use material exchange programs such as Recycler's World Network or the DOE Materials Exchange Network to transfer unwanted materials to alternate users.	●	●	○	○		●	○	○	●
RENEWABLE ENERGY: Install on-site renewable energy (electric and thermal) generation at all Department sites. *(430.2B goal)*	●	●			○			●	
Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs), Utility Energy Services Contracts (UESCs), and Power Purchase Agreements (PPAs), to the maximum extent practicable, to implement renewable energy projects with energy conservation measures having long- and short-term payback periods that can be	●	●			●			●	

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
incorporated into life-cycle cost effective contracts.									
TOXIC OR HAZARDOUS CHEMICALS AND MATERIALS USE REDUCTION: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials." *(450.1A goal)*	●	●	●	●	●	●	●	●	●
"Establish operational assessments, such as pollution prevention opportunity assessments, of activities using toxic and hazardous chemicals and materials, as objectives and measurable targets in site environmental management systems."	●	●	●	●	●	●	●	●	●
Based on site operational assessments, establish objectives and measurable targets in site environmental management systems for minimizing the acquisition, use, and disposal of toxic and hazardous chemicals and materials to reduce releases of pollutants to the environment. Examples include using more environmentally benign solvents and solvent-less systems and designing analytical products and processes that reduce or eliminate the use and/or generation of hazardous substances.	●	●	●	●	●	●	●	●	●
Ensure the site's environmental management system includes practices to maximize the use of safe alternatives to ODS whereby the use of ODS in new equipment and facilities is eliminated; use in existing equipment is phased out as the equipment reaches its expected service life; maintenance is conducted to prevent or fix leaks; leaking equipment is replaced when leak repair is not cost-effective or replacement is cost-effective. Coordinate DOE actions with DoD prior to disposal of ODS removed or reclaimed from equipment.	○	○	●		○	○		●	●
Use tools such as the Green Chemical Alternatives Purchasing Wizard to identify more environmentally benign alternatives and substitutes for laboratory-related chemicals and processes.					●	●			●

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
"Implement a chemical inventory tracking system that integrates information throughout the entire chemical lifecycle covering procurement, storage, use, transfer/movement, and final disposition					●	●			●
Participate in voluntary environmental partnership programs (e.g., Adopt Your Watershed, Climate Leaders, Green Chemistry and Engineering Programs, National Environmental Performance Track, National Partnership for Environmental Priorities, etc.) where there is a programmatic benefit from doing so.	●	●	●	●	●	●	●	●	●
VEHICLE FLEET MANAGEMENT: Ensure all alternative fuel vehicles operate on alternative fuels to the greatest extent practicable and that DOE conventional-fuel vehicles are replaced with alternative fuel and hybrid technology vehicles, including plug-in hybrid vehicles as they become available. *(430.2B goals)*			●		●				
WATER CONSERVATION: **Reduce potable water use by no less than 16% by 2015 relative to FY 2007.** *(430.2B goal)*	●	●	●			●		●	
Increase use of non-potable water sources such as reclaimed, recycled, and gray water for appropriate applications. *(430.2B goal)*	●	●	●			●		●	●
Install standard metering systems for water. *(430.2B goal)*	●	●	●			●		●	

	Building Operations and Maintenance	Design and Construction	Fleet Management	IT Management	Procurement / Purchasing	Production and Process Operations	Security	Utility Management	Waste Management
Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement water management projects having long- and short-term payback periods that can be incorporated into life-cycle cost effective contracts.	●	●	●		●	●		●	

4.3 Environmental Aspects, Sustainable Practices, and Objectives and Measurable Targets Identified for DOE Site Operations and Activities

The following chapters describe site operations and activities in a broad, generic sense, and flesh out the information depicted in Table 1. Along with the front sections of this Tool, they are intended to be stand-alone Tools. They provide an opportunity to encourage workers and managers to look at the environmental aspects associated with their job responsibilities and take ownership of their site's EMS.

Chapters 5-13 are devoted to several different types of site operations and activities that could apply at DOE and National Nuclear Security Administration (NNSA) sites or organizations whether they are in full operational or closure mode or are a business (office) operation. Each chapter provides examples of site environmental aspects that could result from a specific operation or activity, and lists the DOE goals and sustainable practices that could apply and be used to address them. Examples are provided for how the sustainable practices could be embedded in the site's EMS as objectives and measurable targets to help the site achieve the DOE Orders' goals.

In addition to developing a site-specific matrix, each DOE site could use these chapters as tools to help identify applicable sustainable practices, objectives, and targets. Along with goals, these sustainable practices, objectives, and targets could apply either to specific operations/activities or be assigned site-wide if they apply to multiple operations/activities.

5. INTEGRATING BUILDING OPERATIONS AND MAINTENANCE INTO THE SITE EMS

As used in this Technical Assistance Tool, the building operations and maintenance activity is defined as all the actions associated with keeping fixed assets in an acceptable condition. These actions include preventative maintenance, normal repairs, replacement of parts and structural components, and all other actions needed to preserve the asset so that it continues to provide acceptable services and achieve its expected life. At some sites, utilities management may also be included.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to building operations and maintenance.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, applicable sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

5.1 Environmental Aspects of Products Selected

Building operations and maintenance activities can interact with (or cause an inpact on) the environment based on a site's product acquisition process. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing products with virgin content. The use of biobased products contributes to reducing dependence on petroleum-based products and often reduces or eliminates hazardous components found in them.

5.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in building operations and maintenance activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A." Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Specify environmentally preferable products (EPP) when acquiring supplies and services.*
- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture-designated biobased content products, EPA Significant New Alternatives Policy (SNAP) program acceptable substitutes for ODS, EPA- Energy Star® labeled, and Federal Energy Management Program (FEMP)-designated products, and other EPP when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)
- *Use products such as American Petroleum Institute (API)-rated re-refined oil, retread truck tires, and biobased lubricants, fuels, and degreasers/cleaners.*
- *Integrate EPP purchasing into new construction and renovation projects.*
- *Integrate EPP objectives and measurable targets in the EMS.*
- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Build pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*
- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*
- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*
- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*
- *Use environmentally benign solvents and solvent-less systems.*

- *Include in the EMS practices that will maximize the use of safe alternatives to ozone depleting substances (ODS) with the end result of phasing out equipment that uses ODS.*

- *Participate in voluntary partnerships.*

5.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase the purchase of environmentally preferred cleaning products by XX% using FYZZ as a baseline.

Measurable Target 1: Establish the FYZZ baseline by identifying all environmentally preferred cleaning products used that year.

Measurable Target 2: Establish a group of users of the environmentally preferred products and charge them with identifying new or additional uses for environmentally preferably products.

Measurable Target 3: Work with the Procurement Office to implement a preference for procuring environmentally preferred cleaning products to achieve the XX% goal and a tracking system to assess performance.

Example B.

Objective: Identify opportunities to eliminate or reduce the use of the most toxic and hazardous chemical in greatest use at the site.

Measurable Target 1: Identify, by the end of the second quarter of FYXX, the chemical to be targeted.

Measurable Target 2: Form, by the end of the third quarter of FYXX, a team to conduct operational assessments of all site uses of the targeted chemical.

Measurable Target 3: Implement, within one year of the conclusion of the operational assessment process, the chemical use reduction/elimination opportunity recommended by the team and monitor and track its performance.

Example C.

Objective: Eliminate leaks of ODS from equipment.

Measurable Target 1: Conduct an inventory of all equipment still using ODS.

Measurable Target 2: Implement a routine inspection and maintenance schedule for all identified equipment to identify ODS releases.

Measurable Target 3: Replace ODS-leaking equipment with equipment that does not use ODS if a safe alternative to ODS cannot be used in the repaired equipment.

5.2 Environmental Aspects of Waste Produced

Building operations and maintenance activities can interact with the environment through the waste generated on a daily basis. Reusing or recycling waste has less environmental impact than disposal.

5.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in building operations and maintenance activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Recycle items such as office paper; aluminum; cardboard; plastics; glass; spent oil, hydraulic fluid, lubricants, and solvents; construction debris; and non-refillable high-density polyethylene (HDPE) containers.*
- *Reuse demolition rubble for grading, laying utilities, and building roads.*
- *Collect toner cartridges and batteries for remanufacturing.*
- *Implement programs to recycle surplus commodities.*
- *Develop and use material exchange services to promote product recycle and reuse.*
- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*

5.2.2 Examples of Objectives and Measurable Targets: Wastes Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase recycling rates for office paper, plastics, and glass by XX% from the FYZZ recycling rate.

Measurable Target 1: Establish the FYZZ recycling rate for these products to establish a baseline.

Measurable Target 2: Place color-coded and labeled receptacles next to waste generation areas (e.g., locate bins for recyclable plastics and glass near vending machines and cafeteria exits) by the end of the first quarter of FYAA.

Measurable Target 3: Implement by the end of the first quarter of FYAA programs to promote recycling and track recycling rates.

Example B.

Objective: Establish a recycling program for spent lubricants and solvents.

Measurable Target 1: Identify type and amounts of lubricants and solvents available for recycling.

Measurable Target 2: Locate, in conjunction with site waste management personnel, area recycling companies and establish contracts with them.

Measurable Target 3: Establish goals for the recycling of spent solvents and lubricants and measure progress towards achieving them.

5.3 Environmental Aspects of Systems and Equipment

The systems and equipment selected to maintain optimal building functioning can affect the environment through the amount of energy used and the source of that energy. The amount of water used, water quality, and opportunities for water re-use are also dependent on equipment choices.

5.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must also develop, maintain and annually update an Executable Plan that defines how the site's building operations and maintenance programs are designed to achieve the order's Department-wide goals.

Several of the goals of DOE O 430.2B relate to the environmental aspects associated with building operations and maintenance activities. The goals applicable to decisions related to the types of systems and equipment used in building operations and maintenance are listed below.

Goals

Reduce energy intensity, by FY 2015, by no less than 30 percent on average across the entire Department, relative to the Department's energy use in FY 2003.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.

Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities.

Install advanced electric metering systems in accordance with the DOE metering plan for site monitoring of electric energy and standard metering systems for steam and natural gas.

Install sustainable building materials and practices throughout the Department's existing building assets.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Use programs such as the Labs21 partnership to encourage the development of sustainable, high performance, and low-energy laboratories.

Install on-site renewable energy (electric and thermal) generation at all Department sites.

Reduce potable water use, by FY 2015, by no less than 16 percent, relative to the Department's potable water use in FY 2007.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Install standard metering systems for water.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below,

DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs, UESCs, and Power Purchase Agreements (PPAs), to the maximum extent practicable, to implement renewable energy projects with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs and UESCs, to the maximum extent practicable, to implement water management projects.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement for incorporating the Guiding Principles, identify actions to be taken to meet the goals, and Tool compliance.*

- *Conduct assessments of high-energy and high-water use facilities to identify opportunities to reduce energy intensity and water use.*

- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in building operations.*

- *Use FEMP-designated products when designing, constructing, and renovating buildings and infrastructure.*

- *Conduct assessments of the non-potable water to identify opportunities for its reuse.*

5.3.2 Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Reduce energy use by XX% site-wide.

Measurable Target 1: Establish a baseline of energy use per building.

Measurable Target 2: Develop and implement a Web-based training program and outreach campaign on work-based energy saving tips to encourage employees to reduce energy use.

Measurable Target 3: Assess, every six months, the effectiveness of the outreach campaign in reaching the XX% goal.

Note: DOE O 430.2B requires by FY2015 an energy intensity reduction of at least 30% on average across the entire Department relative to its FY2003 energy use.

Example B.

Objective: Reduce potable water use by XX% every year until FYZZ.

Measurable Target 1: Install metering systems by the end of FYAA.

Measurable Target 2: Conduct an operational assessment of the 10 largest potable water users by the end of the second quarter of FYBB.

Measurable Target 3: Complete a five-year plan by the end of FYBB to achieve and maintain a minimum reduction of XX% use of potable water each subsequent year.

Note: DOE O 430.2B establishes a Departmental goal of reducing potable water use by no less than 16% by FY2015 relative to the Department's potable water use in FY2007.

Example C.

Objective: Increase the use of grey water for landscaping/grounds maintenance.

Measurable Target 1: Form a working group with waste and utility management to identify cost-effective opportunities for grey water reuse.

Measurable Target 2: Implement at least two of the most cost-effective opportunities by the end of FYZZ and monitor their performance.

6. INTEGRATING DESIGN AND CONSTRUCTION OPERATIONS AND ACTIVITIES INTO THE SITE EMS

In this Technical Assistance Tool, the terms "design and construction" are used in a very broad sense and go beyond the design and construction of capital assets addressed in O 413.3A, *Program and Project Management for the Acquistion of Capital Assets*. They encompass designing, constructing, and renovating site laboratories, office buildings, support facilities, and other infrastructure, similar to what is done by Architect, Engineering, and Construction firms. These terms include selecting such items as construction materials, building furnishings (e.g., paint, carpeting, chairs, lighting), heating and cooling systems, and landscaping. At some sites, razing buildings and infrastructure as well as erecting new ones as part of the decontaminating and decommissioning process might also be included.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to design and construction.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

6.1 Environmental Aspects of Products Selected

Design and construction operations and activities can interact with (or cause an impact on) the environment through the products that are selected for use therein. For example, the selection of interior furnishings for a building, such as wall covers, furniture, and carpets, will affect indoor-air quality through their emissions. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing products with virgin content.

6.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in design and construction activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Specify environmentally preferable products (EPP) when acquiring supplies and services.*
- *Integrate EPP purchasing into new construction and renovation projects.*
- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture-designated biobased content products, EPA Significant New Alternatives Policy (SNAP) program acceptable substitutes for ODS, EPA- Energy Star® labeled, and Federal Energy Management Program (FEMP)-designated products, and other EPP when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)
- *Integrate EPP objectives and measurable targets in the EMS.*
- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Integrate pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*
- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*
- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*
- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*
- *Include in the EMS practices that will maximize the use of safe alternatives to ozone depleting substances (ODS) with the end result of phasing out equipment that uses ODS.*
- *Participate in voluntary partnerships.*

6.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase the use of EPP building furnishings site-wide by XX% by the end of FYZZ using FYWW as a baseline.

Measurable Target 1: Ensure that site design and construction standards incorporate a preference for EPA designated recycled-content products and Department of Agriculture designated bio-based products.

Measurable Target 2: Work with procurement and purchasing to incorporate a preference for EPP in all procurements in order to achieve the XX% goal and track EPP procurement.

Example B.

Objective: Eliminate the use of ODS in new construction and major renovations.

Measurable Target 1: Investigate alternatives to ODS and maintain a list of approved and preferred substances for all future uses.

Measurable Target 2: Implement a ban on procuring new equipment that uses ODS.

6.2 Environmental Aspects of Waste Produced

Design and construction operations and activities can interact with the environment through the construction, renovation, or demolition activities that generate waste. Reusing or recycling waste has less environmental impact than disposal.

6.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in design and construction activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle items such as office paper, aluminum, cardboard, plastics, and glass.*
- *Recycle construction and demolition debris.*
- *Use the General Services Administration Construction and Waste Management Database to identify recyclers of commonly-recycled construction and demolition debris.*
- *Specify recycling of construction materials in new construction and renovation projects.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Implement programs to recycle surplus commodities and by products.*
- *Develop and use material exchange services to promote product recycle and reuse.*

6.2.2 Examples of Objectives and Measurable Targets: Wastes Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Recycle a minimum of XX% of the demolition rubble generated in FYZZ.

Measurable Target 1: Crush all usable demolition concrete and use on site or store until use arises.

Measurable Target 2: Identify and establish contracts with local companies to recycle construction debris that cannot be re-used or recycled on site.

Example B.

Objective: Reduce the amount of construction and renovation debris disposed as waste.

Measurable Target 1: Work with procurement and purchasing to develop a protocol so that usable but unwanted construction and demolition materials are made available for reuse through the DOE Materials Exchange Network listed in DOE O 450.1A, attachment 2.

Measurable Target 2: Establish a tracking system to determine the types and amounts of unwanted construction material disposed through the network.

6.3 Environmental Aspects of Systems and Equipment

The systems and equipment selected for new and renovated structures can affect the environment through the amount of energy used and the source of that energy. The amount of water used, water quality, and opportunities for water re-use are also dependent on equipment choices.

6.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must also develop, maintain and annually update an Executable Plan that defines how the site's design and construction programs are designed to achieve the order's Department-wide goals.

Several of the goals of DOE O 430.2B relate to the environmental aspects associated with design and construction operations and activities. The goals applicable to decisions related to the types of systems and equipment associated with design and construction activities are listed below.

Goals

Reduce energy intensity, by FY 2015, by no less than 30 percent on average across the entire Department, relative to the Department's energy use in FY 2003.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Reduce energy use 30% beyond the ASHRAE 90.1-2004 standard for new construction.

Reduce the fossil fuel-generated energy consumption of new buildings according to EISA Section 433.

Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.

Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities.

Install advanced electric metering systems in accordance with the DOE metering plan for site monitoring of electric energy and standard metering systems for steam and natural gas.

Install sustainable building materials and practices throughout the Department's existing building assets.

Achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification for all new construction and major building renovations in excess of $5 million.

Comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) for buildings below $5 million.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Use programs such as the Labs21 partnership to encourage the development of sustainable, high performance, and low-energy laboratories.

Include a preference for buildings certified as LEED Gold in all procurement specifications and selection criteria for acquiring new leased space, including build-to-suit lease solicitations.

Install on-site renewable energy (electric and thermal) generation at all Departmental sites. Reduce potable water use, by FY 2015, by no less than 16 percent, relative to the Department's potable water use in FY 2007.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Install standard metering systems for water.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs, UESCs, and Power Purchase Agreements (PPAs), to the maximum extent practicable, to implement renewable energy projects with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs and UESCs, to the maximum extent practicable, to implement water management projects.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*

- *Conduct assessments of high-energy and high-water use facilities to identify opportunities to reduce energy intensity and water use when renovating facilities.*

- *Use FEMP-designated products when designing, constructing, and renovating buildings and infrastructure.*

- *Incorporate a preference for WaterSense[SM] labeled products or products of similar water efficiency in procurements related to new and renovated facilities.*

- *Include in solicitations a preference for architect, engineering, and construction firms with proven expertise in building LEED Gold or Platinum certified buildings.*

- *Evaluate, when planning new buildings or renovations, the types and amount of non-potable water that will be generated to identify opportunities for water reuse.*

6.3.2 Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Identify energy intensity reduction opportunities that could be implemented when Building AA is refurbished in FYZZ to achieve an energy use reduction of at least XX% over the base year of FYWW.

Measurable Target 1: Establish an operational assessment expert team in the first quarter of FYVV to identify these opportunities.

Measurable Target 2: Complete and report operational assessment findings by the end of the fourth quarter of FYVV.

Note: DOE O 430.2B requires a reduction in energy intensity of no less than 30% on average across the entire Department by FY15 relative to its FY03 energy use.

Example B.

Objective: Reduce potable water use, in accordance with the Guiding Principles for High Performance Sustainable Buildings, by XX% by FYZZ over the base year of FYWW through procurement of water efficient products.

Measurable Target: Include in construction and renovation contracts a preference that XX% of the products used are WaterSense[SM] labeled.

Note: DOE O 430.2B establishes a Departmental goal of reducing potable water use by no less than 16% by FY2015 relative to the Department's potable water use in FY2007.

7. INTEGRATING FLEET MANAGEMENT INTO THE SITE EMS

For the purposes of this Technical Assistance Tool, fleet management refers to acquiring, operating, maintaining, repairing, fueling and disposing the vehicles used at DOE sites to complete site missions and maintain site infrastructure. It may also include vehicles used for safety and security.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to fleet management.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

7.1 Environmental Aspects of Products Selected

Fleet management operations and activities can interact with (or affect) the environment through the products that are selected. For example, the selection of cleaning and lubricating products and solvents will affect air quality through their emissions. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing products with virgin content; the use of biobased products can lessen the use of petroleum-based products thereby reducing or eliminating the hazardous components found in them.

7.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in fleet management activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate environmentally preferable products (EPP) objectives and measurable targets in the EMS.*
- *Specify EPP when acquiring supplies and services.*

- *Buy Environmental Protection Agency (EPA)-designated re-cycled content products, Department of Agriculture designated biobased content products, and other EPP when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)

- *Use products such as American Petroleum Institute (API)-rated re-refined oil, retread truck tires, and biobased lubricants, fuels, and degreasers/cleaners.*

- *Integrate antifreeze/engine coolant recyclers and water recycling/reclamation vehicle wash facilities in site operations.*

- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Build pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*

- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*

- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*

- *Use the results of the operational assessments to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*

- *Include in the EMS practices that will maximize the use of safe alternatives to ozone depleting substances (ODS) with the end result of phasing out equipment that uses ODS.*

- *Use environmentally benign solvents and solvent-less systems.*

- *Participate in voluntary partnerships.*

7.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase the use of biobased solvents and lubricants by XX% over the preceding year.

Measurable Target 1: Assess the performance of biobased products presently in use to identify those products whose use could be expanded.

Measurable Target 2: Conduct an informal survey of other fleet operations to gain information on biobased products that can replace the most widely used non-biobased products.

Measurable Target 3: Establish a preference for procuring biobased lubricants and products and track their procurement.

Example B.

Objective: Increase water recycling.

Measurable Target 1: Conduct by the end of the second quarter of FYXX an operational assessment of the opportunities to implement a water recycling/reclamation vehicle wash facility.

Measurable Target 2: Implement the most life cycle cost-effective opportunity by the second quarter of FYXX.

7.2 Environmental Aspects of Waste Produced

Fleet management operations and activities can interact with the environment through the wastes produced during vehicle operation, repairs and maintenance. Reusing or recycling waste has less environmental impact than disposal.

7.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in fleet management activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle items such as office paper, aluminum, cardboard, plastics, glass, and spent oil, hydraulic fluid, lubricants, and solvents.*
- *Implement programs to recycle surplus commodities.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Develop and use material exchange services to promote product recycle and reuse.*

7.2.2 Example of an Objective and Measurable Targets: Waste Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Recycle a minimum of XX% of the spent oil generated in FYZZ.

Measurable Target 1: By the end of the first quarter of FYAA, identify all cost-effective spent-oil recycling opportunities.

Measurable Target 2: Establish a contractual arrangement by the end of the second quarter of FYAA with an approved/certified oil-recycler and initiate the recycling program.

7.3 Environmental Aspects of Systems and Equipment

The types of vehicles and fueling systems used in the fleet can affect the environment through air emissions and reliance on petroleum-based products. The amount of water used, water quality, and opportunities for water re-use as part of fleet management are also dependent on system and equipment choices.

7.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's fleet management programs are designed to achieve the order's Department-wide goals.

Several of the goals of DOE O 430.2B relate to the environmental aspects associated with fleet management operations and activities. The goals applicable to decisions related to the types of systems and equipment associated with fleet management are listed below.

Goals

Ensure all alternative fuel vehicles operate on alternative fuels to the greatest extent practicable and that DOE conventional-fuel vehicles are replaced with alternative fuel and hybrid technology vehicles, including plug-in hybrid vehicles as they become available.

Reduce potable water use, by FY 2015, by no less than 16 percent, relative to the Department's potable water use in FY 2007.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Install standard metering systems for water.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPC) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement water management projects.*
- *Promote maximum use of alternative fuels and alternative fuel vehicles.*
- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in procurements related to new and renovated facilities.*
- *Conduct operational assessments to identify uses of reclaimed or recycled water in systems such as vehicle wash facilities.*

7.3.2 Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Ensure that alternative fuel fleets operate on alternative fuels at least XX% of the time.

Measurable Target 1: By the end of the second quarter of FYZZ complete a study of the barriers to the current use of alternative fuels.

Measurable Target 2: By the end of the fourth quarter of FYZZ, conduct an assessment of the opportunities to increase the use of alternative fuels.

Measurable Target 3: By the end of the second quarter of FYAA, implement at least one of the identified opportunities.

Example B.

Objective: Reuse XX% of non-potable water generated by fleet operations.

Measurable Target 1: Conduct an operational assessment of the sources and volume of non-potable water.

Measurable Target 2: Consult with site waste water operation managers to identify possible non-potable water reuse opportunities.

8. INTEGRATING INFORMATION TECHNOLOGY INTO THE SITE EMS

Information technology (IT) operations and activities, for purposes of this Technical Assistance Tool, are defined as the actions associated with electronic equipment acquisition and procurement, operations and maintenance, and reuse and recycling of surplus and end-of-life electronics. This broad definition encompasses decisions related to the design, specifications, material choices, distribution, and use of new electronic equipment and reuse and recycling of surplus and end-of-life electronics.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4 the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to information technology.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

8.1 Environmental Aspects of Products Selected

Information technology operations and activities can interact with (or cause an impact on) the environment through the products that are selected. Energy efficient electronics contribute to reducing the amount of electricity generated from non-renewable resources (such as coal) and eliminating the associated air emissions. Environmentally preferable electronic equipment earns that designation by demonstrating its reduced environmental impact.

8.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used and waste produced through IT activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Integrate electronics stewardship objectives and measurable targets in the site EMS.*
- *Specify Electronic Procurement Environmental Assessment Tool (EPEAT)-qualified electronics in the solicitation and acquisition of desktop computers, notebooks, monitors, and other electronic products for which there are EPEAT standards. Use the EPEAT*

network to identify specific models of desktop computers, notebooks and monitors and their ranking as bronze, silver, or gold.

- *Refer to the EPEAT network to identify environmentally preferable products (EPP) electronic products such as servers, printers, and copiers.*
- *Purchase EPEAT silver-rated electronic products or higher (gold) to the extent feasible.*
- *Enable Energy Star® power management features on all computers, monitors, printers, copiers, and other electronic equipment.*
- *Extend the useful lifespan of computer systems and other electronic products.*
- *Reuse surplus electronics and recycle end-of-life electronics.*
- *Use environmentally compliant recycling services to dispose of end-of-life electronics.*
- *Use programs such as the General Services Administration (GSA) Computers for Learning Program (GSAXcess) to transfer surplus computer systems and other surplus electronics to eligible schools.*
- *"Specify in the Common Operating Environment IT contracts for electronic equipment, "take-back" provisions where the equipment is reused, refurbished, donated, or recycled using environmentally sound management practices."*
- *Participate in the Federal Electronics Challenge and other voluntary environmental programs.*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate EPP objectives and measurable targets in the EMS.*
- *Specify EPP when acquiring supplies and services.*
- *Buy EPA-Energy Star® labeled and Federal Energy Management Program (FEMP)-designated products when they are available, affordable, and effective.*
- *Participate in the Federal Electronics Challenge and other voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Build pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*

- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*

- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*

- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*

- *Participate in voluntary partnerships.*

8.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Ensure that XX% of the desktop computers, notebooks, and monitors used on site will be EPEAT gold-rated.

Measurable Target: Establish a requirement that all purchases of computers, notebooks, and monitors will be gold-rated unless the requesting party can demonstrate that the gold-rated product is not available or does not meet performance needs.

Example B.

Objective: Ensure that Energy Star® features are enabled on computers, monitors, printers, and copiers.

Measurable Target: Energy Star® features will be the default setting on all computers, monitors, printers, and copiers.

Example C.

Objective: Reduce the number of personal printers/scanners by X% by FYZZ based on a FYWW baseline to increase the use of shared resources.

Measurable Target 1: Establish the FYWW baseline.

Measurable Target 2: Establish and implement procurement policies restricting procurement of personal printers/scanners to users with a demonstrated mission need or mobility limitations.

Measurable Target 3: Audit compliance with the procurement policy.

8.2 Environmental Aspects of Waste Produced

Information technology operations and activities can interact with the environment through the management of electronics which no longer meet users' needs. Reusing or recycling surplus or waste equipment has less environmental impact than disposal.

8.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in information technology related activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling." Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle office paper, cardboard, aluminum, plastics, glass, and surplus commodities.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Develop and use material exchange services to promote product recycle and reuse.*
- *Use material exchange programs to transfer unwanted materials to alternate users.*

8.2.2 An Example of an Objective and Measurable Target: Waste Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

*Objective***:** Maximize the transfer of unwanted electronics to alternate users.

Measurable Target 1: Implement a protocol establishing the use of the DOE Materials Exchange Network and the Recycler's World Network to transfer electronics not suitable for donation to eligible schools.

Measurable Target 2: Assist the recipient school to set up an environmentally safe electronics recycling program or organize a DOE takeback program to ensure non-functioning equipment is safetly recycled.

8.3 Environmental Aspects of Systems and Equipment

The equipment and systems related to a site's data centers and server operations can affect the environment due to the extremely large amount of energy used and the source of that energy.

8.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's IT management programs are designed to achieve the order's Department-wide goals.

The following goals from DOE O 430.2B relate to the environmental aspects associated with IT management operations and activities.

Goals

Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities.

Reduce energy intensity, by FY 2015, by no less than 30 percent on average across the entire Department, relative to the Department's energy use in FY 2003.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Ensure standard operating procedures for data centers and server operations produce the most energy efficient operation.*
- *Insert energy efficiency requirements in the specifications given to procurement and purchasing when acquiring data centers.*
- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*

8.3.2 An Example of an Objective and Measurable Target: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Increase the energy efficiency of existing data centers by XX% by FYAA.

Measurable Target 1: Develop an expert panel of data center users and IT personnel to identify, by the first quarter of FYZZ, energy use reduction opportunities.

Measurable Target 2: Implement, by the end of the first quarter of FYXX, the two most feasible energy use reduction opportunities to achieve the XX% goal.

9. INTEGRATING PROCUREMENT AND PURCHASING INTO THE SITE EMS

The procurement and purchasing activities encompass all the actions associated with drafting solicitations and contracts for products, systems, and services and administering the contracts until completed and closed out. This entails understanding the user's requirements and ensuring that procurement policies and procedures promoting acquisition of recycled-content and biobased-content materials, EPEAT-registered electronics, and other environmentally preferable products and services such as the use of EnergyStar and WaterSense products are followed (see FAR Part 23). Procurement and purchasing is also responsible for incorporating the Contractor Requirements Tool (CRD) into each affected contract via the Laws, Regulations, and DOE Directives clause of the contract (48 CFR 970.5204-2). That clause is used in contracts for the operation of DOE facilities and ensures that the contractor will follow the same policies and procedures as DOE in promoting environmentally preferable purchasing.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to procurement and purchasing. Procurement representation in the EMS Team will ensure that the procurement organization will be aware of the facilities' needs as they relate to environmentally preferable products and practices.

9.1 Environmental Aspects of Goods and Services Procured

Products and services selected to meet the facilities' needs can interact with (or cause an impact on) the environment. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing virgin products; biobased product use reduces the reliance on petroleum-based products and often reduces or eliminates hazardous components found in them. Procurement and purchasing personnel can **assist** in securing products and services that create minimal environmental aspects and waste production.

9.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

Several DOE goals and sustainable practices apply to the decisions and processes put in place at sites to procure goods and services. The following sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Build electronics stewardship objectives and measurable targets in the site EMS.*
- *Specify Electronic Procurement Environmental Assessment Tool (EPEAT)-qualified electronics in the solicitation and acquisition of desktop computers, notebooks, monitors, and other electronic products for which there are EPEAT standards. Use the EPEAT network to identify specific models of desktop computers, notebooks and monitors and their ranking as bronze, silver, or gold.*
- *Refer to the EPEAT network to identify environmentally preferable products (EPP) electronic products such as servers, printers, and copiers.*
- *Purchase EPEAT silver-rated electronic products or higher (gold) to the extent feasible.*
- *"Specify in the Common Operating Environment IT contracts for electronic equipment, "take-back" provisions where the equipment is reused, refurbished, donated, or recycled using environmentally sound management practices."*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate EPP objectives and measurable targets in the EMS.*
- *Specify EPP when acquiring supplies and services.*
- *Buy EPA-designated recycled content products, Department of Agriculture- designated biobased content products, EPA Significant New Alternatives Policy (SNAP) acceptable ODS products, EPA- Energy Star® labeled, and Federal Energy Management Program (FEMP)-designated products, and other EPP when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)
- *Procure products such as American Petroleum Institute (API)-rated re-refined oil, retread truck tires, and biobased lubricants, fuels, and degreasers/cleaners and systems such as antifreeze/engine coolant recyclers and water recycling/reclamation vehicle wash facilities.*
- *Integrate EPP purchasing into new construction and renovation projects.*
- *Participate in voluntary environmental partnership*

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle office paper, cardboard, aluminum, plastics, and glass.*
- *Use the General Services Administration Construction Waste Management Database to identify recyclers of 15 commonly-recycled construction and demolition debris items.*
- *Specify recycling of construction materials in new construction and renovation projects.*
- *Implement programs to recycle surplus commodities.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*
- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*
- *Identify more environmentally benign alternatives and substitutes for laboratory-related chemicals or processes.*
- *Include in the EMS practices that will maximize the use of safe alternatives to ODS with the end result of phasing out equipment that use ODS.*
- *Implement a chemical tracking system that encompasses actions from procurement through final disposition.*
- *Participate in voluntary partnerships.*

9.1.2 Examples of Objectives and Measurable Targets: Goods and Services Procured

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Maximize site use of environmentally preferable products.

Measurable Target 1: Establish GreenSeal cleaning products and/or EPA's list of green cleaning resources as the standard for acquisition of all site cleaning products.

Measurable Target 2: Include a preference in all new construction and major renovation projects for recycled-content products.

Example B.

Objective: Reuse or recycle XX% of construction or demolition debris.

Measurable Target: Ensure all contracts for construction, renovation, and demolition contain provisions requiring reuse or recycling of at least XX% of debris the project generates.

Example C.

Objective: Reduce the acquisition of toxic chemicals by XX% by the end of FYAA using FYWW as the baseline and an additional ZZ% by the end of FYBB.

Measurable Target 1: Develop a list of environmentally benign substitutes for the site's most frequently used chemicals by the end of the second quarter of FYVV and establish the FYWW baseline.

Measurable Target 2: Require acquisition of chemicals from that list unless the purchaser can demonstrate that the preferred product cannot meet required performance criteria.

Measurable Target 3: Implement a chemical tracking inventory system by the end of FYVV.

9.2 Environmental Aspects of Systems and Equipment

The procurement of water- and energy-efficient systems and equipment can reduce demands on natural resources. Purchasing alternative fuel vehicles and alternative fuels can reduce air emissions and reliance on petroleum-based products. Procurement and purchasing personnel can **assist** in buying systems and equipment that have minimal environmental aspects and waste production.

9.2.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's procurement and purchasing operations and activities are designed to achieve the order's Department-wide goals.

The following goals of DOE O 430.2B relate to procurement and purchasing decisions affecting natural resource use, energy efficiency, and air quality.

Goals

Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Reduce energy use 30% beyond the ASHRAE 90.1-2004 standard for new construction.

Reduce the fossil fuel-generated energy consumption of new buildings according to EISA Section 433.

Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.

Install sustainable building materials and practices throughout the Department's existing building assets.

Achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification for all new construction and major building renovations in excess of $5 million.

Comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) for buildings below $5 million.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Install on-site renewable energy (electric and thermal) generation at all Departmental sites.

Ensure all alternative fuel vehicles operate on alternative fuels to the greatest extent practicable and that DOE conventional-fuel vehicles are replaced with alternative fuel and hybrid technology vehicles, including plug-in hybrid vehicles as they become available.

Include a preference for buildings certified as LEED Gold in all procurement specifications and selection criteria for acquiring new leased space, including build-to-suit lease solicitations.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs, UESCs, and Power Purchase Agreements (PPAs), to the maximum extent practicable, to implement renewable energy projects with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs and UESCs, to the maximum extent practicable, to implement water management projects.*

- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in procurements.*

- *Include in solicitations a preference for Architect, Engineering, and Construction firms with proven expertise in building LEED Gold or Platinum certified buildings.*

- *Procure and install water and energy metering systems to enable decision making regarding opportunities to reduce energy and water use.*

- *Implement all feasible opportunities to increase the use of alternative fuel vehicles and maximize their use of alternative fuels.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*

9.2.2 An Example of an Objective and Measurable Target: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Assist utility managers in reducing water use.

Measurable Target 1: Work with utility managers to identify and procure water metering systems for the largest water-using facilities by the end of FYXX, and for all water using facilities by the end of FYZZ.

10. INTEGRATING PRODUCTION AND PROCESS OPERATIONS INTO THE SITE EMS

For purposes of this Technical Assistance Tool, production and process operations and activities refers to all the actions associated with designing, implementing, and undertaking research projects and facility processes or operations, including remedial actions and spill cleanups. It includes all actions related to project close out. The term also includes decontaminating and decommissioning buildings and razing facilities and infrastructure.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to its production and process operations.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

10.1 Environmental Aspects of Products Selected

Site production and process operations and activities can interact with (or cause an impact on) the environment through the products that are selected. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing products with virgin content, and biobased products can reduce the use of petroleum-based products thereby reducing or eliminating the hazardous components in them.

10.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in production and process operations and activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Specify Electronic Procurement Environmental Assessment Tool (EPEAT)-qualified electronics in the solicitation and acquisition of desktop computers, notebooks, monitors,*

and other electronic products for which there are EPEAT standards. Use the EPEAT network to identify specific models of desktop computers, notebooks and monitors and their ranking as bronze, silver, or gold.

- *Refer to the EPEAT network to identify environmentally preferable products (EPP) electronic products such as servers, printers, and copiers.*

- *Purchase EPEAT silver-rated electronic products or higher (gold) to the extent feasible.*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate environmentally preferable products (EPP) objectives and measurable targets in the EMS.*

- *Specify EPP when acquiring supplies and services.*

- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture-designated biobased content products, and EPA-Energy Star® labeled, and Federal Energy Management Program (FEMP)-designated products, and other EPP when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)

- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Build pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*

- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*

- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*

- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*

- *Use environmentally benign solvents and solvent-less systems.*

- *Design analytical products and processes that reduce or eliminate the use and/or generation of hazardous substances.*

- *Employ the Green Chemical Alterntives Purchaing Wizard to identify more environmentally benign alternative for lab-related chemicals or processes.*

- *Include in the EMS practices that will maximize the use of safe alternatives to ozone depleting substances (ODS) with the end result of phasing out equipment that uses ODS.*

- *Implement a chemical tracking system that encompasses actions from procurement through final disposition.*

- *Participate in voluntary partnerships.*

10.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Minimize the use of toxic and hazardous chemicals and materials to the greatest extent possible in site research projects and programs.

Measurable Target 1: Require completion of a pollution prevention opportunity assessment for all proposed research projects in order to identify substitutes for toxic and hazardous chemicals and materials.

Measurable Target 2: Participate in the next annual Labs21® conference.

Measurable Target 3: Join Labs21®.

Example B.

Objective: Decrease the acquisition of toxic and hazardous chemicals and materials by X% by the end of FYAA using FYZZ as a baseline.

Measurable Target 1: Make the Green Chemical Alternatives Purchasing Wizard available to researchers and procurement and purchasing personnel to aid in the identification of more environmentally benign alternatives.

Measurable Target 2: Establish protocols with the purchasing department to build a preference for environmentally preferable products in all procurements and track procurements to measure progress in reaching the goal.

10.2 Environmental Aspects of Waste Produced

Production and process operations and activities can interact with (or cause an impact to) the environment through the waste the activities generate. Reusing or recycling waste has less environmental impact than disposal.

10.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in production and process operations and activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle office paper, cardboard, aluminum, plastics, glass and surplus commodities.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Develop and use material exchange services to promote recycle and reuse.*

10.2.2 An Example of an Objective and Measurable Target: Waste Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Reduce waste management costs by XX% by FYAA.

Measurable Target 1: Conduct, with waste management personnel, an operational assessment of the two highest cost waste streams to identify opportunities for chemical or product substitution and/or reuse or recycling.

Measurable Target 2: Implement, within one year of the assessment, at least one of the identified opportunities.

Measurable Target 3: Monitor performance of the implemented opportunity to assess its contribution to achieving the goal.

10.3 Environmental Aspects of Systems and Equipment

The systems and equipment selected to maintain optimal production and process operations can affect the environment through the amount of energy used and the source of that energy. The amount of water used, water quality, and opportunities for water re-use is also dependent on equipment choices.

10.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's production and process operations are designed to achieve the order's Department-wide goals.

Several of the goals of DOE O 430.2B relate to the environmental aspects associated with production and process operations. The goals applicable to decisions related to the types of systems and equipment are listed below.

Goals

Reduce energy intensity, by FY 2015, by no less than 30 percent on average across the entire Department, relative to the Department's energy use in FY 2003.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Reduce energy use 30% beyond the ASHRAE 90.1-2004 standard for new construction.

Reduce the fossil fuel-generated energy consumption of new buildings according to EISA Section 433.

Install sustainable building materials and practices throughout the Department's existing building assets.

Achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification for all new construction and major building renovations in excess of $5 million.

Comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) for buildings below $5 million.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Reduce potable water use, by FY 2015, by no less than 16 percent, relative to the Department's potable water use in FY 2007.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Install standard metering systems for water.

Use programs such as the Labs21 partnership to encourage the development of sustainable, high performance, and low-energy laboratories.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs and UESCs, to the maximum extent practicable, to implement water management projects.*

- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in procurements related to new and renovated facilities.*

- *Assess high-energy and high-water use operations to identify opportunities to reduce energy intensity and water use.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*

10.3.2 Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing their objectives and measurable targets, sites should also include measurable targets that address budgeting and implementation actions.

Example A.

Objective: Decrease use of potable water in site experiments and processes.

Measurable Target 1: Require a water use/water source operational assessment in all applications for approvals for experiments and site processes to identify feasible opportunities to reduce potable water use.

Measurable Target 2: Implement the most cost effective options.

Measurable Target 3: Make available to the Principle Investigators and other users of experimental facilities the best practices for reduction of potable water use.

Example B.

Objective: Reduce site potable water use by XX% by FYAA.

Measurable Target 1: Install standard metering systems to the extent practicable to establish water use baselines.

Measurable Target 2: Conduct an operational assessment of the two highest water users to identify water-use reduction possibilities.

Measurable Target 3: Develop by the end of FYZZ a plan to implement the options that are life-cycle cost effective.

NOTE: DOE O 430.2B establishes a Departmental goal of reducing potable water use by no less than 16% by FY2015 relative to the Department's potable water use in FY2007.

11. INTEGRATING SECURITY OPERATIONS AND ACTIVITIES INTO THE SITE EMS

Security operations and activities, for purposes of this Technical Assistance Tool, are defined as the actions associated with protecting DOE sites from theft, sabotage, and other hostile acts that could adversely impact national security, worker and public safety, and property. These actions include training, routine operations, and exercises. The term does not include fleet management and local or regional law enforcement authorities who may provide security support on request. Whenever EMS objectives or targets conflict with Safeguards and Security (S&S) requirements, the S&S requirements will not be diminished unless approved by the appropriate S&S authority (consistent with DOE 470-Series Directives) and Tooled accordingly.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to security operations and activities.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

11.1 Environmental Aspects of Products Selected

Security operations and activities can interact with (or affect) the environment through the products that are selected. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing products with virgin content. Biobased-content product use reduces reliance on petroleum-based products and often reduces or eliminates the hazardous components found in them.

11.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in security operations and activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Use environmentally compliant recycling services to dispose of end-of-life electronics.*

- *Specify "take-back" provisions in IT contracts for leased electronic equipment to ensure the equipments is reused, refurbished, donated, or recycled using environmentally sound management practices at the end of the lease period.*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate environmentally preferable purchasing (EPP) objectives and measurable targets in the EMS.*

- *Specify EPP when acquiring supplies and services.*

- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture- designated biobased content products, EPA-Energy Star® labeled, and Federal Energy Management Program (FEMP)-designated products when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)

- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Build pollution prevention operational assessments of waste generating activities into the EMS as objectives and measurable targets.*

- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*

- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*

- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*

- *Participate in voluntary partnerships.*

11.1.2 An Example of an Objective and Measurable Target: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Conduct an assessment of the feasibility of using currently available "green" ammunition while still meeting the performance requirements of 10 CFR Part 1046; DOE Order 470.4-1, Chg. 1, *Safeguards and Security Program*; DOE Order 470.4-3A, *Contractor Protective Force*; and DOE Order 470.4-8, *Federal Protective Force*.

Measurable Target 1: Assemble a team, with membership from other sites, to conduct a review of where "green" ammunition has been used and the difficulties encountered.

Measurable Target 2: Complete a report on the most feasible uses of green ammunition at the site by the end of FYXX.

Measurable Target 3: Prepare options with schedule and budget for management approval by third quarter of FYZZ.

11.2 Environmental Aspects of Waste Produced

Security operations and activities can interact with the environment through the wastes that are generated. Reusing or recycling waste has less environmental impact than disposal.

11.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to the waste produced in security operations and activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*

- *Recycle items such as office paper, aluminum, cardboard, plastics, glass, and spent oil, hydraulic fluid, lubricants, and solvents.*
- *Reuse demolition rubble for grading, laying utilities, and building roads and parking areas.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Develop and use material exchange services to promote product recycle and reuse.*

11.2.2 An Example of an Objective and Measurable Target: Waste Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Reduce the amount of security-related equipment and supplies disposed as waste.

Measurable Target 1: Implement a procedure whereby all unwanted equipment and products are made available for reuse through the DOE Materials Exchange Network.

Measurable Target 2: Track the types and amounts of unwanted equipment and products that are exchanged through the network.

11.3 Environmental Aspects of Systems and Equipment

The facilities used in site security operations and activities and the equipment in them can affect the environment through air emissions, natural resource use, and energy and water use.

11.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's security operations and activities are designed to achieve the order's Department-wide goals.

Goals

Install sustainable building materials and practices throughout the Department's existing building assets.

Achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification for all new construction and major building renovations in excess of $5 million.

Comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) for buildings below $5 million.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Assess high-energy and high-water use facilities to identify opportunities to reduce energy intensity and water use when renovating facilities.*
- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*
- *Use FEMP-designated products when designing, constructing, and refurbishing buildings and infrastructure.*
- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in procurements related to new and refurbished facilities.*
- *Include in solicitations a preference for Architect, Engineering, and Construction firms with proven expertise in building LEED Gold or Platinum certified buildings.*
- *Evaluate, when planning for new buildings or major renovations, the types and amount of non-potable water that will be generated to identify opportunities for water reuse.*

11.3.2 An Example of an Objective and Measurable Target: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Objective: Require use of appropriate FEMP-designated security related products.

Measurable Target: Establish a protocol with procurement and purchasing to build a preference for FEMP-designated products in all procurements.

12. INTEGRATING UTILITY (Energy and Water) MANAGEMENT INTO THE SITE EMS

For the purposes of this Technical Assistance Tool, utility management refers to all actions associated with managing energy and water utilities such as electricity, water, and natural gas. Utility management encompasses a variety of aspects including utility purchasing and procurement, utility account monitoring, and efficiency improvement. As used here, utility management does not include maintenance activities.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to utility management operations and activities.

The products selected, wastes produced, and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

12.1 Environmental Aspects of Products Selected

Utility management operations and activities can interact with (or affect) the environment through the products that are selected. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing virgin products; biobased product use reduces the reliance on petroleum-based products and often reduces or eliminates the hazardous components found in them.

12.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in utility management operations and activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Integrate electronics stewardship objectives and measurable targets in the site EMS.*

- *Enable Energy Star® power management features on all computers, monitors, printers, copiers, and other electronic equipment.*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate environmentally preferable products (EPP) objectives and measurable targets in the EMS.*

- *Specify EPP when acquiring supplies and services.*

- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture-designated biobased-content products, EPA Significant New Alternatives Policy (SNAP) Program acceptable substitutes for ODS, and EPA-Energy Star® labeled and Federal Energy Management Program (FEMP)-designated products when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)

- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*

- *Use the results of the operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*

- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate into the EMS as objectives and measurable targets operational assessments of the site activities using toxic and hazardous chemicals and materials.*

- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*

- *Include in the EMS practices that will maximize the use of safe alternatives to ozone depleting substances (ODS) with the end result of phasing out equipment that uses ODS.*

- *Participate in voluntary partnerships.*

12.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase the use of Department of Agriculture designated biobased-content products by XX% by FYZZ.

Measurable Target: Establish a protocol with procurement and purchasing to require the use of biobased products unless the purchaser can demonstrate that no appropriate biobased products are available.

Example B.

Objective: Eliminate the use of ODS by FYXX.

Measurable Target: Work with procurement and purchasing to implement a ban on procuring new equipment that uses ODS.

12.2 Environmental Aspects of Waste Produced

Utility management operations and activities can interact with the environment through the wastes that are generated. Reusing or recycling waste has less environmental impact than disposal.

12.2.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goal and sustainable practices applicable to waste produced in utility management operations and activities are listed below. Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle office paper, cardboard, aluminum, plastics, glass, and surplus commodities.*
- *Collect spent toner cartridges and batteries so they can be remanufactured.*
- *Develop and use material exchange services to promote product reuse and recycle.*

12.2.2 Example of an Objective and Measurable Targets: Waste Produced

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following example. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example

Objective: Reduce the amount of utilities equipment and supplies disposed as waste.

Measurable Target 1: Implement a procedure whereby all unwanted utilities equipment and products are made available for reuse through the DOE Materials Exchange Network.

Measurable Target 2: Track the types and amounts of unwanted utilities equipment and products that are disposed through the network.

12.3 Environmental Aspects of Systems and Equipment

Utility systems and equipment can affect the environment through the amount of energy used and the source of that energy. The amount of water used, water quality, and opportunities for water re-use are also dependent on equipment choices.

12.3.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's utility management programs are designed to achieve the Order's Department-wide goals.

Several of the goals of O 430.2B relate to the environmental aspects associated with utility management operations and activities. The goals applicable to decisions related to the types of systems and equipment associated with utility management are listed below.

Goals

Reduce energy intensity, by FY 2015, by no less than 30 percent on average across the entire Department, relative to the Department's energy use in FY 2003.

Implement Section 432 of the Energy Independence and Security Act (EISA) of 2007 which establishes a framework for facility project management benchmarking.

Ensure that major replacements of installed equipment (such as heating and cooling systems) or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.

Install advanced electric metering systems in accordance with the DOE metering plan for site monitoring of electric energy; install standard metering systems for steam and natural gas.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Install on-site renewable energy (electric and thermal) generation at all Departmental sites.

Reduce potable water use, by FY 2015, by no less than 16 percent, relative to the Department's potable water use in FY 2008.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Install standard metering systems for water.

Reduce the energy consumption of data center and server operations by specifying the acquisition of energy efficient electronic equipment for data centers, operating the equipment to improve load management and server innovation, and configuring the cooling operations to maximize energy efficiency opportunities.

Sustainable Practices

The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Use appropriated funds in combination with Energy Savings Performance Contracts (ESPCs) and Utility Energy Services Contracts (UESCs), to the maximum extent practicable, to implement energy efficiency management programs with energy conservation measures.*

- *Use appropriated funds in combination with ESPCs, UESCs, and Power Purchase Agreements (PPAs), to the maximum extent practicable, to implement renewable energy projects with energy conservation measures.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance*

- *Incorporate a preference for WaterSense[SM] labeled products or products of similar water efficiency in building operations.*

- *Use appropriated funds in combination with ESPCs and UESCs, to the maximum extent practicable, to implement water management projects.*

- *Assess high-energy and high-water use facilities to identify opportunities to reduce energy intensity and water use.*

- *Incorporate a preference for WaterSense[SM] labeled products or products of similar water efficiency in procurements.*

- *Implement energy efficiency retrofits and replacements to decrease the demand for utilities where they are cost effective.*

12.3.2 Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Identify energy intensity reduction opportunities that could be implemented in the site's highest energy use facility.

Measurable Target 1: Establish an operational assessment expert team in the first quarter of FYXX to identify these opportunities.

Measurable Target 2: Complete and report operational assessment findings by the end of the fourth quarter of FYXX.

Measurable Target 3: Implement at least one of the identified projects by FYZZ.

Example B.

Objective: Install a renewable energy project on site.

Measurable Target 1: Assemble a site team to conduct a site-wide study of the feasibility of an on-site renewable energy project.

Measurable Target 2: Conduct a life-cycle assessment of the most feasible projects.

Measurable Target 3: Implement at least one of the identified feasible projects by FYXX.

Example C.

Objective: Implement all cost-effective systems for reusing non-potable water in the five facilities with the highest non-potable water use.

Measurable Target 1: Conduct operational assessments of the five facilities by the end of FYXX and identify re-use opportunities; assessments will include life-cycle assessments of the re-use opportunities.

Measurable Target 2: Implement one of the cost-effective opportunities by the end of FYZZ.

Measurable Target 3: Implement one of the remaining cost-effective opportunities in each subsequent FY.

13. INTEGRATING WASTE MANAGEMENT INTO THE SITE EMS

For the purposes of this Technical Assistance Tool, waste management operations and activities consist of all the actions related to the management, disposition or recycling of site wastes. These actions can include handling or packaging the waste and evaluating waste disposition or recycling and reuse alternatives. As a member of the EMS team, waste managers encourage and assist other team members to use products, equipment, systems, and processes that are environmentally preferable, eliminate or minimize the types and amounts of waste, and are energy and water efficient. Waste managers also provide assistance in identifying opportunities to reuse or recycle waste or products that are no longer needed for a particular mission. Waste types include solid, hazardous, radioactive, and mixed. At some sites, decontaminating and decommissioning buildings and razing facilities and infrastructure might also be included.

DOE O 450.1A requires that site EMSs include objectives and measurable targets that contribute to achieving its Sustainable Environmental Stewardship goals and the energy and transportation goals in DOE O 430.2B. As described in chapter 4, the site EMS Team should identify which environmental aspects are significant and consider which appropriate sustainable practices can help the site achieve the Department's sustainable goals relating to waste management operations and activities.

The products selected, waste produced and systems and equipment used at a site provide a useful way to identify the site's environmental aspects, appropriate sustainable practices, and objectives and measurable targets that can be integrated into the site EMS.

13.1 Environmental Aspects of Products Selected

Site operations and activities can interact with (or affect) the environment through the products that are selected to complete site missions. Products containing toxic or hazardous materials can increase health hazards and environmental degradation through air emissions or their disposal. The use of products made with recycled content can reduce the resources and energy used in developing virgin products; biobased product use reduces the reliance on petroleum-based products and often reduces or eliminates hazardous components found in them. Waste managers can suggest products and processes that have minimal environmental aspects and waste production.

13.1.1 Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

The DOE goals and sustainable practices applicable to the types of products used in waste management activities are listed below. The sustainable practices are paraphrased; for complete text, including Web sites, see Appendix A, "Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A". Additional sustainable practices and projects implemented at DOE and other Federal agency sites are available at http://www.hss.energy.gov/pp/bestpractices.html.

Goal: "Reduce or eliminate the environmental impacts of electronic assets."

Sustainable Practices

- *Build electronics stewardship objectives and measurable targets in the site EMS.*
- *Reuse surplus electronics and recycle end-of-life electronics.*
- *Use environmentally compliant recycling services to dispose of end-of-life electronics.*
- *Use programs such as General Services Administration (GSA) Computers for Learning Program (GSAXcess) to transfer surplus computer systems and other surplus electronics to eligible schools.*
- *Participate in voluntary environmental programs.*

Goal: "Maximize the acquisition and use of environmentally preferable products in the conduct of operations."

Sustainable Practices

- *Integrate environmentally preferable products (EPP) objectives and measurable targets in the EMS.*
- *Buy Environmental Protection Agency (EPA)-designated recycled content products, Department of Agriculture-designated biobased-content products, and EPA Energy Star®-labeled and Federal Energy Management Program (FEMP)-designated products when they are available, affordable, and effective.* (Purchase of paper with at least 30% post-consumer fiber content is required, there are no exceptions.)
- *Specify EPP in the acquisition of goods and services.*
- *Participate in voluntary environmental partnerships.*

Goal: "Reduce or eliminate the generation and/or toxicity of waste and other pollutants at the source through pollution prevention."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*
- *Use the results of operational assessments to integrate into the EMS objectives and measurable targets that prevent, reduce, reuse, and recycle waste streams.*
- *Participate in voluntary environmental partnership programs.*

Goal: "Reduce degradation and depletion of environmental resources through post-consumer material recycling."

Sustainable Practices

- *Build into the EMS objectives and measurable targets for recycling and reuse programs.*
- *Recycle office paper; cardboard; aluminum; plastics; glass; spent oil, hydraulic fluid, lubricants, and solvents; construction and demolition debris; and non-refillable, high-density polyethylene (HDPE) plastic pesticide product containers.*
- *Recycle surplus commodities.*
- *Use the General Services Administration Construction Waste Management Database to identify recyclers of 15 commonly-recycled construction and demolition debris types.*
- *Collect spent toner cartridges and batteries for remanufacturing.*
- *Specify recycling of construction materials in new construction and major renovation projects.*
- *Develop and use material exchange programs to promote product recycle and reuse.*

Goal: "Reduce or eliminate the acquisition, use, and release of toxic and hazardous chemicals and materials."

Sustainable Practices

- *Integrate operational assessments of site activities using toxic and hazardous chemicals and materials as objectives and measurable targets in the EMS.*
- *Use the operational assessment results to establish objectives and measurable targets in the EMS to minimize acquiring, using, and disposing toxic and hazardous chemicals and materials.*
- *Use environmentally benign solvents and solvent-less systems and designing processes that reduce or eliminate the use and/or generation of hazardous substances.*
- *Include in the EMS practices that ensure ozone depleting substances (ODS) disposition is coordinated with the Department of Defense.*
- *Use tools such as the Green Chemical Alternatives Wizard to identify more environmentally benign alternatives.*
- *Implement a chemical inventory tracking system that integrates information from procurement through final disposition.*

- *Participate in voluntary environmental partnership programs.*

13.1.2 Examples of Objectives and Measurable Targets: Products Selected

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Recycle annually a minimum of XX% of the site's surplus electronics.

Measurable Target 1: Transfer all appropriate surplus electronics to eligible schools through the GSA Computers for Learning Program.

Measurable Target 2: Establish contractual relationships with recyclers in good standing with professional associations to receive electronics that are not appropriate for the GSC Computers for Learning Program.

Example B.

Objective: Increase the site's re-use of surplus office materials by XX% by FYAA.

Measurable Target 1: Develop by FYZZ, promote, and maintain a Web-based "office supply want ads" system to facilitate the transfer of surplus materials.

Measurable Target 2: Develop and implement a process to measure the effectiveness of the system put in place.

Example C.

Objective: Reduce the costs of managing/disposing hazardous chemicals by XX% over the baseline year of FYZZ.

Measurable Target 1: Establish a Web-based chemical inventory tracking system available throughout the site.

Measurable Target 2: Include access to the Green Chemical Alternatives Purchasing Wizard in the system to alert users to the availability of more benign products.

13.2 Environmental Aspects of Systems and Equipment

The systems and equipment implemented at sites have the potential to impact the environment through the amount of energy used and the source of that energy. The amount of water used, water quality, and opportunities for water re-use are also dependent on equipment choices.

13.2.1 Leadership Goals of DOE O 430.2B

DOE O 430.2B states that the EMS must contain targets and objectives that contribute to achieving its sustainable practice goals. DOE O 430.2B contains Department-wide leadership goals, some of which are quantitative. Sites must develop, maintain and annually update an Executable Plan that defines how the site's waste management operations and activities are designed to achieve the order's Department-wide goals.

The following goals of DOE O 430.2B relate to the environmental aspects associated with the materials associated with constructing and renovating buildings and waste management decisions regarding management of non-potable water used at the site. Decisions to reuse or recycle the water can benefit the environment by making less of a demand on potable water.

Goals

Install sustainable building materials and practices throughout the Department's existing building assets.

Achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Gold certification for all new construction and major building renovations in excess of $5 million.

Comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) for buildings below $5 million.

Ensure that 15% of the Department's full building inventory, by square footage, incorporates the Guiding Principles for energy and water and related principles.

Increase the use of non-potable water sources such as reclaimed, recycled and grey water for appropriate applications.

Sustainable Practices

DOE O 430.2B, section 4c, states that the Department "must use a variety of energy and water management strategies and tools" to meet the goals of the order. The following suggested sustainable practices are some of the strategies and tools that could be included in the Executable Plan to help sites achieve those goals, and also in the EMS in the form of objectives and measurable targets. In addition to the sustainable practices listed below, DOE O 430.2B contains several goal-related requirements that are not listed here. Compliance with those requirements should contribute to achieving the order's Departmental goals.

- *Assess highest water users and investigate the possibility of reclaiming or recycling their waste water.*
- *Incorporate a preference for WaterSense^{SM} labeled products or products of similar water efficiency in building operations.*

- *Assess the site's building portfolio to identify and prioritize those buildings to meet the 15% requirement, identify actions to be taken to meet the goals, and Tool compliance.*

- *Conduct operational assessments of grey water generation to identify opportunities to reclaim or recycle it.*

13.2.2. Examples of Objectives and Measurable Targets: Systems and Equipment

The sustainable practices listed above could be turned into objectives and measurable targets in the EMS as described in the following examples. When developing the objectives and measurable targets, sites should include budgeting for pollution abatement controls and implementation actions as well.

Example A.

Objective: Increase the use of recycled, reclaimed, or grey water for dust suppression by FYXX.

Measurable Target 1: Form a working group of personnel from utility management and building operations and maintenance to identify uses of this water for dust suppression.

Measurable Target 2: Implement within one year the group's cost effective suggestions and track their performance.

Example B.

Objective: Increase amount of water recycled or reclaimed on site by XX% within three years using FYWW as a baseline.

Measurable Target 1: Identify the four highest water users on site not currently reclaiming or recycling water.

Measurable Target 2: Conduct surveys to identify options for implementing reclamation or recycling.

Measurable Target 3: Based on the survey results, conduct operational assessments of the most feasible reclamation or recycling projects by the end of FYXX.

Note: DOE O 430.2B establishes a Departmental goal of reducing potable water use by no less than 16% by FY2015 relative to the Department's potable water use in FY2007.

Appendix A Sustainable Environmental Stewardship Goals and Sustainable Practices of DOE O 450.1A

1. Purpose

a) To establish Department of Energy (DOE) Sustainable Environmental Stewardship goals that advance the sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in Executive Order (E.O.) 13423, *Strengthening Federal Environment, Energy, and Transportation Management*.

b) To integrate sustainable practices into DOE operations as cost-effective business practices that will:
   (1) prevent pollution,
   (2) reduce environmental hazards,
   (3) protect public health and the environment,
   (4) avoid pollution control and waste disposal costs, and
   (5) improve operational capability and overall mission sustainability.

2. Goals, Objectives, and Sustainable Practices

The Department is to achieve these performance-based Sustainable Environmental Stewardship goals through site implementation of the accompanying sustainable practices, as appropriate, and their integration into environmental management systems pursuant to DOE 450.1A and its Contractor Requirements Tool (CRD). DOE sites are to consider legal requirements, requirements in E.O. 13423 and its Implementing Instructions, mission performance, and life-cycle costs when selecting specific sustainable practices for achieving the Sustainable Environmental Stewardship goals. Additionally, sites may identify other sustainable practices appropriate to site-specific operations and activities, as necessary to achieve the goals.

3. Performance Measures

Measure progress toward meeting the requirements of paragraph 4 of this Order and paragraph 1 of its CRD, and make such information available annually through the Pollution Prevention Tracking and Reporting System to the Senior Agency Official and the Chief Health, Safety and Security Officer pursuant to paragraphs 5c(8) and 5d(7) of this Order and paragraph 2 of its CRD.

GOAL	REDUCE OR ELIMINATE THE GENERATION AND/OR TOXICITY OF WASTE AND OTHER POLLUTANTS AT THE SOURCE THROUGH POLLUTION PREVENTION
OBJECTIVE	Reduce environmental hazards, protect environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational capability by eliminating or minimizing the generation of wastes and other pollutants, through source reduction including segregation, substitution, and reuse, that would otherwise require storage, treatment, disposal, and long-term monitoring and surveillance (i.e., future environmental legacies).
SUSTAINABLE PRACTICES	• Establish operational assessments, such as pollution prevention opportunity assessments, of waste generating activities, as objectives and measurable targets in site environmental management systems. • Based on operational assessments, establish objectives and measurable targets in site environmental management systems for the prevention, reduction, reuse, and recycling of waste streams generated at sites. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through Energy Savings Performance Contracts (ESPCs). • Participate in voluntary environmental partnership programs (e.g., National Waste Minimization Program, Waste Wise, National Environmental Performance Track, etc.) where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE OR ELIMINATE THE ACQUISITION, USE, AND RELEASE OF TOXIC AND HAZARDOUS CHEMICALS AND MATERIALS
OBJECTIVE	Reduce environmental hazards, protect environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational sustainability by eliminating or minimizing the acquisition, use, and associated release of toxic and hazardous chemicals and materials, including hazardous substances, ozone-depleting substances (ODS), and other pollutants, that would otherwise require control, treatment, monitoring, and reporting.
SUSTAINABLE PRACTICES	• Establish operational assessments, such as pollution prevention opportunity assessments, of activities using toxic and hazardous chemicals and materials, as objectives and measurable targets in site environmental management systems. • Based on operational assessments, establish objectives and measurable targets in site environmental management systems for minimizing the acquisition, use, and disposal of toxic and hazardous chemicals and materials to reduce releases of pollutants to the environment (air, water, soil, biota). For example, – using more environmentally benign solvents and solvent-less systems that reduce or eliminate the use and/or generation of hazardous substances; or – designing analytical products and processes that reduce or eliminate the use and/or generation of hazardous substances. Employ tools such as the Green Chemical Alternatives Purchasing Wizard to identify more environmentally benign alternatives and substitutes for laboratory-related chemicals or processes. (http://web.mit.edu/environment/academic/purchasing.html) • Ensure sites' environmental management systems include practices to maximize the use of safe alternatives to ODS whereby. – the use of ODS in new equipment and facilities is eliminated. – the use of ODS in existing equipment is phased out as the existing equipment reaches its expected service life, and the maintenance of equipment is conducted to prevent or fix leaks;

GOAL	**REDUCE OR ELIMINATE THE ACQUISITION, USE, AND RELEASE OF TOXIC AND HAZARDOUS CHEMICALS AND MATERIALS**
	– the replacement of leaking equipment is carried out when leak repair is no longer cost-effective, or where it is life-cycle cost-effective, to replace the equipment; and – coordination is conducted within DOE and with the Department of Defense's (DoD) Defense Supply Center Richmond, a component of the Defense Logistics Agency (DLA), as appropriate, before disposal of ODS removed or reclaimed from equipment (including disposal as part of a contract, trade, or donation). For situations in which the recovered ODS is a critical requirement for DoD missions, the DOE facility transfers the ODS to DoD. (See DLA's ODS Web-site at www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/Ozone/contact.htm) – Implement a chemical inventory tracking system that integrates information throughout the entire chemical lifecycle covering procurement, storage, use, transfer/movement, and final disposition. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs. • Participate in voluntary environmental partnership programs (e.g., Adopt Your Watershed, Climate Leaders, Green Chemistry and Engineering Programs, National Environmental Performance Track, National Partnership for Environmental Priorities, etc.) where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	MAXIMIZE THE ACQUISITION AND USE OF ENVIRONMENTALLY PREFERABLE PRODUCTS IN THE CONDUCT OF OPERATIONS
OBJECTIVE	Reduce or eliminate environmental hazards, conserve environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational capability through the procurement of recycled-content, biobased-content, and other environmentally preferable products thereby minimizing the economic and environmental impacts of managing toxic by-products and hazardous wastes generated in the conduct of site activities.
SUSTAINABLE PRACTICES	• Establish environmentally preferable purchasing objectives and measurable targets in site environmental management systems. • Specify environmentally preferable products in the acquisition of site supplies and services. • Procure the following environmentally preferable products, when available, affordable, and effective. – Environmental Protection Agency (EPA) designated recycled-content products – Department of Agriculture designated biobased-content products – EPA Significant New Alternatives Policy (SNAP) Program acceptable substitutes for ODS – EPA ENERGY STAR labeled and FEMP-designated products – Other environmentally preferable products, such as. o Cleaning products certified by GreenSeal, a U.S. standard setting and environmental labeling organization (www.greenseal.org); o EPA's list of green cleaning resources (http://www.epa.gov/epp/pubs/products/cleaning.htm); o GreenGuard indoor air quality certified office supplies, furniture, and building materials (www.greenguard.org); o General Services Administration Advantage "environmental aisle" providing access to green products online (www.gsaadvantage.gov);

GOAL	**MAXIMIZE THE ACQUISITION AND USE OF ENVIRONMENTALLY PREFERABLE PRODUCTS IN THE CONDUCT OF OPERATIONS**
	○ EcoLogo, the Canadian government's green product certification mark (www.environmentalchoice.com). • Utilize American Petroleum Institute (API-) rated re-refined oil, retread truck tires, antifreeze/engine coolant recyclers, water recycling/reclamation vehicle wash facilities, and biobased lubricants, fuels and degreasers/cleaners. • Integrate environmentally preferable purchasing into new construction and major renovation projects, pursuant to the High Performance Sustainable Building requirements of DOE Order 413.3A. Program and Project Management for the Acquisition of Capital Assets, and into construction and renovation-related general plant projects and institutional general plant projects, where life-cycle cost-effective. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs. • Participate in voluntary environmental partnership programs where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
OBJECTIVE	Reduce or eliminate environmental hazards, conserve environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational capability through the incorporation of electronics stewardship practices thereby minimizing the economic and environmental impacts of managing toxic by-products and hazardous wastes generated in the conduct of site activities.
SUSTAINABLE PRACTICES	• Establish electronics stewardship objectives and measurable targets in site environmental management systems. • Specify environmentally preferable electronics qualified through the Electronic Procurement Environmental Assessment Tool (EPEAT) or its successor, in the solicitation and acquisition of desktop computers, notebooks, monitors, and other electronic products for which there are EPEAT standards. – Utilize the EPEAT network to identify specific models of desktop computers, notebooks and monitors registered by manufacturers and vendors as environmentally preferable and listed according to three tiers of ascending environmental performance and order of preference - bronze, silver, and gold (www.epeat.net). – Utilize the EPEAT network to identify other electronic products (e.g. servers, printers, copiers, etc.) registered in the future by manufacturers and vendors as environmentally preferable. – Strive to purchase EPEAT silver-rated electronic products or higher (gold) as available. • Enable Energy Star® features (power management capabilities) on all computers, monitors, printers, copiers, and other electronic equipment, or to the maximum degree based on mission needs. • Extend the useful lifespan of computer systems and other electronic products through software upgrades and use of EPA's Guidance to Improve the Operation of Electronic Products provided at www.federalelectronicschallenge.net/docs/oamdm.pdf. Strive to extend the useful life of electronic equipment to four (4) or more years. • Reuse surplus and recycle end-of-life electronics.

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
	– Utilize the recycling services available through the following sources as an environmentally compliant means for disposition of end-of-life electronics. o Environmental Protection Agency Recycling Electronics and Asset Disposition (READ) Services Government Wide Acquisition Contract (www.epa.gov/oam/read/index.htm); o Department of Justice UNICOR Electronic Recycling Program (www.unicor.gov/recycling); o General Services Administration Federal Supply Service Multiple Award Schedule 899, Reclamation, Recycling and Disposal Services; o Recyclers who meet or exceed EPA's guidelines for materials management; safe electronics recycling (www.epa.gov/plugin). o Recyclers that are members, in good standing, of one or more of the following professional associations. International Association of Electronic Recyclers Institute of Scrap Recycling Industries National Recycling Coalition Electronic Industries Alliance – Utilize GSA's Computers for Learning Program (GSAXcess) for transferring surplus computer systems and other surplus electronics to eligible schools (http://gsaxcess.gov); – Specify in IT contracts for leased electronic equipment "take-back" provisions where, at the end of the lease period, the equipments is reused, refurbished, donated, or recycled using environmentally sound management practices.

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
	• Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not addressed through ESPCs. • Participate in the Federal Electronics Challenge, the Electronics Reuse and Recycling Challenge, and the Plug-in to eCycling Partnership where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE DEGRADATION AND DEPLETION OF ENVIRONMENTAL RESOURCES THROUGH POST-CONSUMER MATERIAL RECYCLING
OBJECTIVE	Protect environmental resources, minimize life-cycle cost of DOE programs, and maximize operational capability by diverting materials suitable for reuse and recycling from landfills thereby minimizing the economic and environmental impacts of waste disposal and long-term monitoring and surveillance.
SUSTAINABLE PRACTICES	• Establish post-consumer material recycling objectives and measurable targets in site environmental management systems. • Recycle office paper, cardboard, aluminum, plastics, and glass. • Recycle spent oil, hydraulic fluid, lubricants, and solvents. • Recycle construction and demolition debris. – Reuse demolition rubble (concrete, brick, and other masonry) on-site by crushing the material to stone for grading, laying utilities, and building roads, driveways, and parking areas. Pulverize and reuse gravel asphalt and sub-base. – Utilize the General Services Administration Construction Waste Management Database to identify recyclers of 15 commonly-recycled construction and demolition debris such as concrete, asphalt, masonry, metal, plastic, and wood (http://cwm.wbdg.org). – Specify recycling of construction materials into new construction and major renovation projects, pursuant to the High Performance Sustainable Building requirements of DOE Order 413.3A, and into construction and renovation-related general plant projects and institutional general plant projects, where life-cycle cost-effective. • Recycle empty, non-refillable, high-density polyethylene (HDPE) plastic pesticide product containers. – Utilize the Ag Container Recycling Council (ACRC), a non-profit organization that collects and recycles professional end-users' containers of EPA registered pesticide products to include agricultural, turf, forestry, vegetative management, specialty pest control, adjuvants, crop oils, and surfactants (www.acrecycle.org).

GOAL	REDUCE DEGRADATION AND DEPLETION OF ENVIRONMENTAL RESOURCES THROUGH POST-CONSUMER MATERIAL RECYCLING
	• Collect spent toner cartridges and batteries for remanufacturing. • Recycle surplus commodities and by-products. • Utilize material exchange programs such as Recycler's World Network (www.recycle.net) or the DOE Materials Exchange Network (www.er.doe.gov/epic/recycle.html) to transfer unwanted materials to alternate users. • Identify, through the annual Department budgetary process, the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs.