



Developing Tools and Strategies to Get to 15% HPSB Inventory by 2015

Josh Silverman
Office of Environmental Policy
and Assistance
U.S. Department of Energy



Overview



- EO 13423 Requirements
- DOE Policy Framework
- Getting to 15% Step by Step
- Demonstration of Assessment Tools
- Tracking and Reporting
- Guidance, Training, and Assistance
- Observations



EO 13423 and HPSB



- **New Construction:**
“new construction and major renovation of agency buildings comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings...” *E.O. 13423, sec. 2(f)(1)*
- **Existing Buildings:**
“15 percent of the existing Federal capital asset building inventory of the agency as of the end of fiscal year 2015 incorporates the sustainable practices in the Guiding Principles.” E.O. 13423, sec. 2(f)(2)
- **Leases:**
“each agency shall include a preference for buildings that meet the goals of the Guiding Principles in the selection criteria for acquiring leased buildings.” *E.O. 13423 Instructions, sec. X(D)*



DOE Policy Framework



- July 2006: DOE required incorporating the HPSB Guiding Principles into new capital asset acquisition projects
- Feb. 2008: DOE required LEED Gold for new construction projects; established lease preference for LEED Gold
- Top-Level commitment from Secretary Bodman



DOE Policy Framework: 15% by 2015



- Feb. 2008: established Agency requirement to address the “15% by 2015” goal
 - No pre-existing sustainability requirements for existing buildings
 - Top-down commitment to meet EO Goals
 - Requirement flowed down to Programs and Sites
- Intra-agency working group developing strategies to meet all the HPSB goals, including “15% by 2015”
 - Working group developed a multi-step approach to get to 15%
 - Planning began shortly after issuance of EO 13423



Getting to 15% by 2015: Step by Step



1. Identify existing buildings already conforming to the HPSB Guiding Principles (based on LEED certification)
2. Track planned and in-process projects expected to conform to the Guiding Principles (include new construction and building demolition)
3. Assess Existing Buildings to identify:
 - a) buildings conforming to the Guiding Principles
 - b) candidates for “greening” to enable conformance
4. Develop action plan to address those buildings targeted for upgrade
5. Provide guidance, training and assistance



5 Steps to 15%



1. Form team and determine list of appropriate buildings
2. Conduct initial HPSB assessments of selected buildings
3. Select best buildings to achieve 15 % goal
4. Refine project costs/schedules estimates to achieve 15% goal
5. Implement projects and track annual progress



HPSB Assessment



- Assessment: a combination of a visual inspection and measurements to determine performance levels. The Assessment determines building performance by utilizing a set of standards to identify:
 - Site characteristics
 - Water use
 - Energy use
 - Materials and Resources, and
 - Indoor Environmental Quality
- Critical to assign responsibility and accountability to this process.
- Assessment is required to document HPSB performance.
- Quality control and quality assurance is important.



HPSB Assessment

Project Team

- 
- 
- Site Manager
 - Facility Energy Manager
 - LEED AP (or equiv)
 - Construction or Operations Manager
 - Third party

Pre - Planning

- 
- 
- Determine Appropriate Buildings
 - Quick Targeting of existing building performance
 - Current and past bills, polices, recent audits, ESCO contracts

Documentation

- 
- 
- Visual inspection, pictures, policies and calculations
 - Complete Checklists & Compliance Forms
 - Maintain documentation on site

Annual Assessment



DOE ASSESSMENT TOOLS

Integrating the Guiding Principles
with the LEED NC and EB
Worksheets



New Construction



- The High Performance and Sustainable Buildings Guiding Principles (HPSB GP) have been matched with the LEED® New Construction (NC) credits.
- The LEED® credits that relate to the HPSB Guiding Principles are highlighted. Achieving all of the HPSB GP related credits will result in a potential LEED® Certified rating.
- Additional credits must be achieved to achieve LEED® GOLD.

LEED-NC has established credit scoring system and technical criteria

High Performance and Sustainable Buildings Guiding Principles Checklist for New Construction



Building Name:

Address:

These fields will populate as corresponding guiding principles and LEED credits are marked

% HPSB Guiding Principles Achieved

100%

Total LEED Credits (Yes column)

27

Assessment

Initial

Final

LEED

Sustainable Sites

14 Points

HPSB

YES Maybe No

Y				LEED Rqd	
		Prereq 1	Construction Activity Pollution Prevention		<input checked="" type="checkbox"/>
1		Credit 1	Site Selection	1	<input checked="" type="checkbox"/>
		Credit 2	Development Density & Community Connectivity	1	
		Credit 3	Brownfield Redevelopment	1	
		Credit 4.1	Alternative Transportation, Public Transportation Access	1	
		Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
		Credit 4.3	Alternative Transportation, Low-Emitting & Fuel-Efficient Vehicles	1	
		Credit 4.4	Alternative Transportation, Parking Capacity	1	
		Credit 5.1	Site Development, Protect or Restore Habitat	1	
		Credit 5.2	Site Development, Maximize Open Space	1	
1		Credit 6.1	Stormwater Design, Quantity Control	1	<input checked="" type="checkbox"/>
1		Credit 6.2	Stormwater Design, Quality Control	1	<input checked="" type="checkbox"/>
		Credit 7.1	Heat Island Effect, Non-Roof	1	
		Credit 7.2	Heat Island Effect, Roof	1	
		Credit 8	Light Pollution Reduction	1	
3	0	0	Subtotal		

LEED

Water Efficiency

5 Points

HPSB

YES Maybe No

1		Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	<input checked="" type="checkbox"/>
		Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
		Credit 2	Innovative Wastewater Technologies	1	
1		Credit 3.1	Water Use Reduction, 20% Reduction	1	<input checked="" type="checkbox"/>
		Credit 3.2	Water Use Reduction, 30% Reduction	1	
2	0	0	Subtotal		

LEED

Energy & Atmosphere

17 Points

HPSB

YES Maybe No

Guiding Principles:
27 LEED® Credits
5 Prerequisites

DOE requires
LEED® Gold as
minimum



Existing Building Portfolio—15% by 2015



- Created assessment tool to facilitate & document compliance procedure
- DOE has modified the LEED® Existing Building (EB) –project checklist to serve as an assessment tool to match LEED credits to the corresponding Guiding Principles.
- The LEED® project checklist is a “planning and assessment tool” to identify measures for buildings.
- Created Summary Checklist to track Compliance.

DOE Assessment Tool (Excel base model)

HIGH PERFORMANCE and SUSTAINABLE BUILDINGS

U.S. DEPARTMENT OF ENERGY



NREL's Science & Technology Facility



Sandia's MESA Microsystems Fabrication

DOE Assessment Tool (Excel base model)

High Performance and Sustainable Buildings (HPSB)

Table of Contents

1	Instructions for New Construction	13	Moisture Control
2	HPSB Checklist for New Construction	14	Daylighting
3	Instructions for Existing Buildings	15	Low-Emitting Materials
4	HPSB Checklist for Existing Buildings	16	Protect Indoor Air Quality During Construction
6	Integrated Design	17	Recycled Content
7	Commissioning	18	Biobased Content
8	Energy Efficiency	19	Construction Waste
9	Measurement and Verification	20	Ozone Depleting Compounds
10	Indoor Water	21	Guiding Principles Compliance Summary
11	Outdoor Water	22	Frequently Asked Questions
12	Ventilation Thermal Comfort	23	DOE List of LEED APs

Implementation Strategy

Step 1: Assessors should first utilize the Tab: *Existing Buildings Checklist* to take a quick inventory of where the building stands in terms of meeting overall sustainable building practices.

High Performance and Sustainable Buildings (HPSB)	
Table of Contents	
1 Instructions for New Construction	13 Moisture Control
2 HPSB Checklist for New Construction	14 Daylighting
3 Instructions for Existing Buildings	15 Low-Emitting Materials
4 HPSB Checklist for Existing Buildings	16 Protect Indoor Air Quality During Construction
6 Integrated Design	17 Recycled Content
7 Commissioning	18 Biobased Content
8 Energy Efficiency	19 Construction Waste
9 Measurement and Verification	20 Ozone Depleting Compounds
10 Indoor Water	21 Guiding Principles Compliance Summary
11 Outdoor Water	22 Frequently Asked Questions
12 Ventilation Thermal Comfort	23 DOE List of LEED APs

► | Cover / MISSION / **Table of Contents** / Instructions New Construction / New Construction Checklist / Instructions Existing Buildings / | ◀

Existing Buildings Checklist

Guiding Principles have been matched with LEED Credits

Allows for Pre - and Final Assessment

High Performance and Sustainable Buildings Guiding Principles					
Checklist for Existing Buildings					
Building Name:					
Address:					
This field will populate as guiding principles are completed in the compliance tabs			% HPSB Guiding Principles Achieved*	0%	
			Total LEED Credits Achieved (Yes column)	24	
Assessment					
Initial					
LEED	Sustainable Sites			12 Points	
YES	Maybe	No			
			SSc1	LEED Certified Design and Construction	1
			SSc2	Building Exterior and Hardscape Management Plan	1
			SSc3	Integrated Pest Management, Erosion Control and Landscape Management Plan	1
			SSc4.1	Alternative Commuting Transportation - 10%	1
0			SSc4.2	Alternative Commuting Transportation - 25%	1
			SSc4.3	Alternative Commuting Transportation - 50%	1
			SSc4.4	Alternative Commuting Transportation - 75% or greater	1
			SSc5	Reduced Site Disturbance - Protect or Restore Open Space	1
1			SSc6	Storm Water Management	1
			SSc7.1	Heat Island Reduction - Non-Roof	1
			SSc7.2	Heat Island Reduction Roof	1
			SSc8	Light Pollution Reduction	1
1	0	0	Subtotal		
LEED	Water Efficiency			10 Points	
YES	Maybe	No			
			Prereq 1	Minimum Indoor Plumbing Fixture Efficiency	LEED Rqd
			WEc1.1	Water Performance Measurement - Whole Building Water Meter	1
			WEc1.2	Water Performance Measurement - Subsystem Metering	1
1			WEc2.1	Additional Indoor Plumbing Fixture Efficiency - 10%	1
1			WEc2.2	Additional Indoor Plumbing Fixture Efficiency - 20%	1
			WEc2.3	Additional Indoor Plumbing Fixture Efficiency - 30%	1
1			WEc3.1	Water Eff Landscape - Reduce Potable Water by 50%	1
			WEc3.3	Water Eff Landscape - Reduce Potable Water by 75%	1
			WEc3	Water Eff Landscape - Reduce Potable Water by 100%	1
			WEc4.1.2	Cooling Tower Water Management	2
3	0	0	Subtotal		



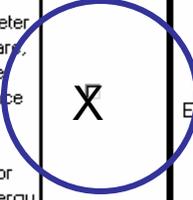
Implementation Strategy

Step 2: In order to conform to the HPSB Guiding Principles, sites shall document performance through the use of the individual tabs (integrated design, commissioning, energy efficiency, etc) to evaluate and validate each guiding principle.

High Performance and Sustainable Buildings (HPSB)	
Table of Contents	
1 Instructions for New Construction	13 Moisture Control
2 HPSB Checklist for New Construction	14 Daylighting
3 Instructions for Existing Buildings	15 Low-Emitting Materials
4 HPSB Checklist for Existing Buildings	16 Protect Indoor Air Quality During Construction
6 Integrated Design	17 Recycled Content
7 Commissioning	18 Biobased Content
8 Energy Efficiency	19 Construction Waste
9 Measurement and Verification	20 Ozone Depleting Compounds
10 Indoor Water	21 Guiding Principles Compliance Summary
11 Outdoor Water	22 Frequently Asked Questions
12 Ventilation Thermal Comfort	23 DOE List of LEED APs

► | Cover / MISSION / **Table of Contents** / Instructions New Construction / New Construction Checklist / Instructions Existing Buildings / | ◀

High Performance Sustainable Buildings
Explanation of Principle and Required Documentation for Existing Buildings

HPSB Principle	How to Comply	Documents On File?	Related LEED Credit for U.S. Department of Energy
<p>Intent: Demonstrate energy optimization performance. Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the ENERGY STAR targets for new construction and major renovation where applicable. For new construction, reduce the energy cost budget by 30 percent compared to the baseline building performance rating per the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy cost budget by 20 percent below pre-renovations 2003 baseline.</p>	<p>Document compliance with energy performance targets achieved through meter data, bills, energy usage modeling software, or data from Energy Service Performance Providers. Documentation and performance requirements are explained below. Or register with ENERGY STAR's Portfolio Manger and achieve a rating score of 75 or greater and print out the Statement of Energy Performance.</p>		<p>EAc1.1-15; Energy Optimization:</p>

Documentation Options for Intent:

Option A. Energy Usage Reduction

Reduce measured building energy use by 30% compared to measured building energy use in 2003, design (not including designated mission, non-building intensive use).

Option B. Energy Usage Reduction

Reduce energy use by 20% compared to the current ASHRAE 90.1 baseline building design (not including designated mission, non-building energy intensive usage).

Option C. Energy Star Rating

For buildings ratable by ENERGY STAR's Portfolio Manger tool, achieve an energy performance rating of at least **75**. If unable to document through Portfolio Manger benchmark use LABS21 database to demonstrate a 25% improvement above average.

****Confirmation****

Building ID:

Signed By:

Date:

Title:

Related Mandates

The Energy Independence and Security Act of 2007 (EISA)

The Energy Policy Act of 2005 (EPACT)

Resources

http://www.wbdg.org/references/mou_ee.php

<http://www.wbdg.org/pdfs/10cfr435.pdf>

<http://www.wbdg.org/ccb/BEES/dec435.pdf>

Compliance tabs



Guiding Principle V. Reduce Environmental Impact of Materials: **Biobased Content**

High Performance Sustainable Buildings
Explanation of Principle and Required Documentation for Existing Buildings

HPSB Principle	How to Comply	Documents On File?	Related LEED Credit for U.S. Department of Energy
<p>Intent: For USDA-designated products, use products meeting or exceeding USDA's biobased content recommendations. For other products, use biobased products made from rapidly renewable resources and certified sustainable wood products.</p>	<p>Establish Model Contract and Specification Language for the purchase of USDA-designated products, use products meeting or exceeding USDA's biobased content recommendations. For other products, use biobased products made from rapidly renewable resources and certified sustainable wood products.</p>	<input type="checkbox"/>	<p>MR Prerequisite 1: Sustainable Purchasing Policy (sustainable purchases of at least 40% of total purchases on cost basis)</p> <p>MR Credit 1.1 Sustainable Purchasing, Ongoing Consumables</p> <p>MR Credit 2.2 Sustainable Purchasing, Durable goods, Furniture</p>

****Confirmation****

Building ID:

Signed By:

Title :

And adhere to the following Federal Acquisition Regs:
 -FAR 52.223-1 and 2 Biobased products Preference Provision and Clause

- http://www.wbdg.org/references/mou_bc.php
- <http://www.biopreferred.gov/Default.aspx?SMSESSION=NO>
- <http://www.biopreferred.gov/Catalog.aspx>

Construction Specification:
Materials and Resources:
Recycled Content. Percentage of building materials (by cost) that contain post consumer and/or post-industrial recycled content.
Locally Manufactured. Percentage of building materials (by cost) manufactured regionally within a 500-mile radius.
Locally Harvested. Percentage of building materials (by cost) harvested and extracted within a 500 mile radius.
Rapidly Renewable. Percentage of building materials (by cost) that are rapidly renewable
Resource Reuse. Percentage of building materials (by cost) that are salvaged, refurbished or reused
 Rapidly renewable materials can be planted and harvested in less than a 10 year cycle. Examples include bamboo flooring, cotton batt insulation, poplar OSB (oriented strand board) and linoleum (i.e., marmoleum) flooring. Include table as an appendix; list all products purchased for the building and those that are rapidly renewable to determine the % of rapidly renewable building materials. The LEED™ reference template may be used.

IAQ During Construction / Recycled Content / **Biobased Content**

Contract and/or Bid specification

Existing Buildings Checklist

Step 2:

The total percent of the HPSB Guiding Principles achieved is tabulated when the Compliance Tabs for each GP is checked (integrated design, commissioning, energy efficiency, etc).

High Performance and Sustainable Buildings Guiding Principles					
Checklist for Existing Buildings					
Building Name:			 		
Address:					
This field will populate as guiding principles are completed in the compliance tabs			% HPSB Guiding Principles Achieved* 85%		
			Total LEED Credits Achieved (Yes column) 24		
Assessment					
Initial					
LEED	Sustainable Sites			12 Points	
YES	Maybe	No			
			SSc1	LEED Certified Design and Construction	1
			SSc2	Building Exterior and Hardscape Management Plan	1
			SSc3	Integrated Pest Management, Erosion Control and Landscape Management Plan	1
			SSc4.1	Alternative Commuting Transportation - 10%	1
0			SSc4.2	Alternative Commuting Transportation - 25%	1
			SSc4.3	Alternative Commuting Transportation - 50%	1
			SSc4.4	Alternative Commuting Transportation - 75% or greater	1
			SSc5	Reduced Site Disturbance - Protect or Restore Open Space	1
1			SSc6	Storm Water Management	1
			SSc7.1	Heat Island Reduction - Non-Roof	1
			SSc7.2	Heat Island Reduction Roof	1
			SSc8	Light Pollution Reduction	1
1	0	0	Subtotal		
LEED	Water Efficiency			10 Points	
YES	Maybe	No			
			Prereq 1	Minimum Indoor Plumbing Fixture Efficiency	LEED Rqd
			WEc1.1	Water Performance Measurement - Whole Building Water Meter	1
			WEc1.2	Water Performance Measurement - Subsystem Metering	1
1			WEc2.1	Additional Indoor Plumbing Fixture Efficiency - 10%	1
1			WEc2.2	Additional Indoor Plumbing Fixture Efficiency - 20%	1
			WEc2.3	Additional Indoor Plumbing Fixture Efficiency - 30%	1
1			WEc3.1	Water Eff Landscape - Reduce Potable Water by 50%	1
			WEc3.3	Water Eff Landscape - Reduce Potable Water by 75%	1
			WEc3	Water Eff Landscape - Reduce Potable Water by 100%	1
			WEc4.1,2	Cooling Tower Water Management	2
3	0	0	Subtotal		

HPSB Assessment Summary Table

Compliance Forms also tabulate a Guiding Principle Assessment Summary Table.

Provides area for comments/notes on meeting Guiding Principles.

High Performance Sustainable Buildings Existing Buildings Assessment Verification - Summary Table			
HPSB Principle	Action Required	% HPSB GPs Achieve	notes/comments
1. Employ Integrated Design Principles		0.0%	
Integrated design	LEED Accredited Professional/Inter-sustainable team	<input type="checkbox"/>	
Commissioning	Commissioning: Investigation & Analysis.	<input type="checkbox"/>	
	Commissioning: Implementation	<input type="checkbox"/>	
2. Optimize Energy Performance			
Energy Efficiency	Energy Optimization	<input type="checkbox"/>	
Measurement and Verification	Energy Star's Portfolio Manager or Labs 21, or equivalent	<input type="checkbox"/>	
	Building level utility meters	<input type="checkbox"/>	
	Data entered into High Performance database	<input type="checkbox"/>	
3. Protect and Conserve Water			
Indoor Water	Indoor Plumbing Fixture Efficiency, 20 %	<input type="checkbox"/>	
Outdoor Water	Water Efficient Landscaping, Reduce by 50%	<input type="checkbox"/>	
	Storm-water management	<input type="checkbox"/>	
4. Enhance Indoor Environmental Quality			
Ventilation and Thermal Comfort	Ashrae Standard 55 & 62.1	<input type="checkbox"/>	
Moisture Control	Moisture Control Strategy	<input type="checkbox"/>	
Daylighting	Lighting Control for 50% of building occupants	<input type="checkbox"/>	
	2% daylight factor in 75% of all spaces	<input type="checkbox"/>	
Low-Emitting Materials	Materials and products with low volatile organic compounds	<input type="checkbox"/>	

Existing Building Assessment

Assessment Tool provides easy access to FAQs and a list of DOE LEED APs

High Performance and Sustainable Buildings (HPSB)	
Table of Contents	
1 Instructions for New Construction	13 Moisture Control
2 HPSB Checklist for New Construction	14 Daylighting
3 Instructions for Existing Buildings	15 Low-Emitting Materials
4 HPSB Checklist for Existing Buildings	16 Protect Indoor Air Quality During Construction
6 Integrated Design	17 Recycled Content
7 Commissioning	18 Biobased Content
8 Energy Efficiency	19 Construction Waste
9 Measurement and Verification	20 Ozone Depleting Compounds
10 Indoor Water	21 Guiding Principles Compliance Summary
11 Outdoor Water	22 Frequently Asked Questions
12 Ventilation Thermal Comfort	23 DOE List of LEED APs

Navigation bar: Cover / MISSION / Table of Contents / Instructions New Construction / New Construction Checklist / Instructions Existing Buildings



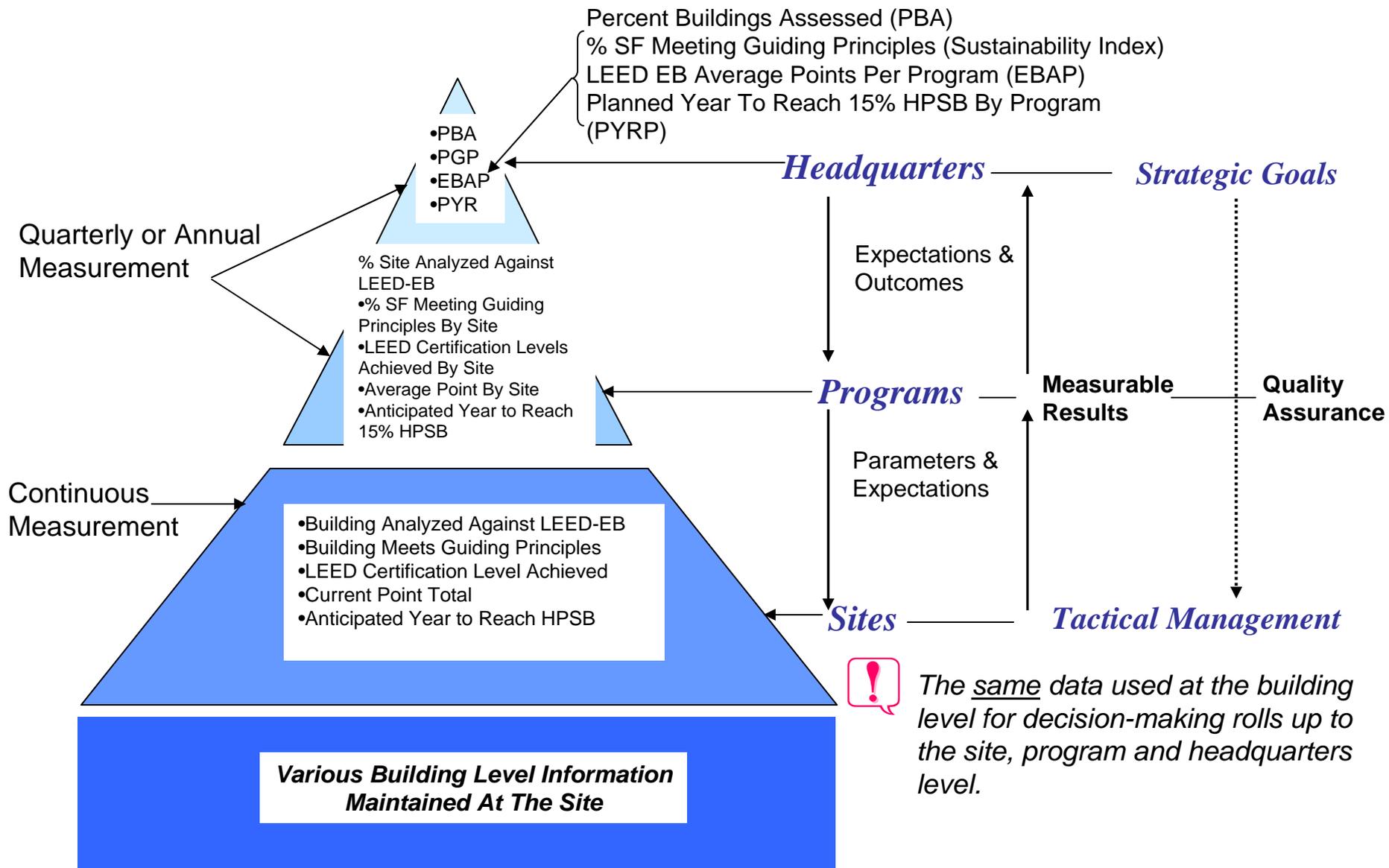
Tracking and Reporting Progress



- DOE uses FIMS (Facility Information Management System) as the sole source for its real property data
- FIMS is being modified to include sustainability metrics
 - Results from existing building assessments will go into FIMS
 - Agency can calculate its progress towards 15% using FIMS data
 - Assessment data (calculations, spreadsheets and similar information) is maintained by the site, along with all supporting

Performance Measures

(Aligns to DOE Management Processes)





Guidance, Training, and Assistance



HQ-led Working Group Develops Tools and Training

- Define population of covered buildings
- Provide tools—and training on how to use them
- Provide guidance on evaluating next steps
- Maintain centralized database

DOE Sites and Programs Own the Implementation

- Sites determine which buildings to assess
- Sites conduct assessments
- Programs/sites track progress, determine pathway to “green” their existing buildings



Key Observations



- Involve key stakeholders in process
 - Energy; Environment; Engineering & Construction; Programs & Sites
- Integration is key to success
 - HPSB requires the integration of energy and environment into design, construction, operations, and maintenance
 - Integrate through site Environmental Management Systems
- Look at organizations, not just buildings
 - Plans and policies
 - Campus-wide approaches



Questions? Comments?



Josh Silverman

Office of Environmental Policy and
Assistance (HS-22)

US Department of Energy

josh.silverman@hq.doe.gov

(202) 586-6535