

# Getting to 15%

## A DOE National Lab Experience

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# Overview

- ▶ Defining our building inventory
- ▶ Assessing the building inventory
- ▶ Identifying strategies to meet goal
- ▶ Integrating requirements into policies and procedures to ensure compliance
- ▶ Example building



# Pacific Northwest National Laboratory



# Projected Building Inventory<sup>1</sup>

## 2008 Inventory

- ▶ 96 total buildings
  - 2,015,000 gross square feet (ft<sup>2</sup>)
- ▶ 29 DOE-owned buildings
  - 762,000 ft<sup>2</sup>
  - 224,000 ft<sup>2</sup> is data center and high-end laboratory
- ▶ 39 Battelle-owned buildings
  - 407,000 ft<sup>2</sup>
- ▶ 28 Leased buildings
  - 846,000 ft<sup>2</sup>
- ▶ FIMS database: 1,566,374 ft<sup>2</sup>
- ▶ Energy reporting: 1,191,000 ft<sup>2</sup>
- ▶ Water reporting: 1,415,000 ft<sup>2</sup>

## 2015 Projected Inventory

- ▶ All buildings: 2,181,000 ft<sup>2</sup>
- ▶ DOE-owned buildings: 794,000 ft<sup>2</sup>
- ▶ Battelle-owned buildings: 407,000 ft<sup>2</sup>
- ▶ Leased buildings: 980,000 ft<sup>2</sup>
- ▶ Energy reporting: 1,287,000 ft<sup>2</sup>
- ▶ Water reporting: 1,511,000 ft<sup>2</sup>

**Possible 15% Goal:  
119,100 to 327,150 ft<sup>2</sup>**

<sup>1</sup>. Pacific Northwest National Laboratory FY2009 Laboratory Plan.

# Assessing Building Inventory

## ▶ STEP 1:

- Identify applicable buildings for baseline

## ▶ STEP 2:

- Identify buildings that may already incorporate the *Guiding Principles*
  - New radiological laboratory, LEED certification expected (201,000 ft<sup>2</sup>)
  - Two new leased chemical and biological laboratory buildings, LEED certification expected (150,000 ft<sup>2</sup>)

## ▶ STEP 3:

- Identify which building(s) had greatest potential for meeting the *Guiding Principles*

# Strategy

- ▶ Require LEED Gold for all new construction per the TEAM Initiative
- ▶ Review existing building inventory for buildings that have the potential to meet the *Guiding Principles*
  - DOE-owned provides access to ESPC funding
  - Large “office” type buildings would be simpler than laboratory space
  - Simple, non-chemistry and non-radiologically based laboratory buildings
  - Cooperative landlord for leased facilities
  - Buildings we are investing in to meet the Energy goals
  - Energy intensive laboratories with data centers and fume hoods – **IF** advances in technology allow for breakthrough in energy savings

# Potential Buildings

## ▶ New Construction

- Radiological laboratory, 201,000 ft<sup>2</sup>

## ▶ Leased Buildings

- Office, 85,000 ft<sup>2</sup>
- Office, 100,000 ft<sup>2</sup>
- Offices, 3 X 17,000 ft<sup>2</sup>
- Chemical and biological laboratory buildings, 150,000 ft<sup>2</sup>

## ▶ DOE-Owned

- Energy intensive laboratories

# Existing Laboratory-Wide Policies/Strategies Supporting the *Guiding Principles*

- ▶ Environmentally Preferable Purchasing Program
  - Requires purchase of materials with recycled content as designated by EPA
  - Requires purchase of materials with bio-based content as designated by USDA
- ▶ Using ESPCs, new construction, and overhead funded projects to meet 30% energy use reduction goal
- ▶ Working with landlords to increase number of Energy Star rated leased facilities
- ▶ On-site, trained commissioning expertise
- ▶ Site-wide outdoor water use reduction practices
- ▶ 10 LEED Accredited Professionals on-site
- ▶ Environmental Management System Core Team working across organizations to meet EO goals

# Challenges to Meeting the *Guiding Principles*

- ▶ Removing water free urinals on campus
  - Maintenance challenges
  - Changing to ultra-low flow fixtures
- ▶ Larger, DOE-owned buildings are laboratory intensive and/or data centers
  - Testing innovative energy saving technologies
- ▶ Construction waste management strategies are new to our community

# Example Building

- ▶ Leased Office Space, 85,000 ft<sup>2</sup>
- ▶ Cooperative landlord
- ▶ Re-commissioning building to achieve Energy Star rating
- ▶ Upgrading indoor water fixtures
- ▶ Optimizing outdoor water use
- ▶ Open Plan, with daylight available to almost all regularly occupied spaces

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
			WEc4.1/4.2	Cooling Tower Water Management	2
1	2	0	<b>Subtotal</b>		

# Summary Guiding Principles Checklist

Guiding Principle III. Protect and Conserve Water: **Indoor Water**

## High Performance Sustainable Buildings Assessment Compliance Form

Guiding Principle	How to Comply	Documents On File?	Related LEED Credit for U.S. Department of Energy
<p><b>Intent:</b> Employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the Energy Policy Act of 1992 fixture performance requirements.</p>	<p>Show a 20% reduction of fixture potable water use from the calculated fixture water usage baseline (Energy Policy Act of 1992). Use tools such as Watergy, the LEED water calculator, the ENERGY STAR Portfolio Manager for water savings (or similar) to establish baseline usage and calculated savings or provide documentation based on metering/bills. Provide summary pages from Watergy or other water software tools. Some Federal facilities may not have a utility water meter. Because the EO 13423 requires agencies to report potable water use, agencies that have sites without metered potable water use (or 1 meter for multiple buildings) must estimate water consumption.</p>	<input type="checkbox"/>	<p>WE Credit 2.2: Additional Indoor Plumbing Fixture Efficiency, 20 %</p>
<p><i>EO 13423 Guidance to Reduce Water Consumption</i></p>			
<p>Beginning in 2008, Federal agencies must reduce water consumption intensity through life-cycle cost-effective measures, relative to the baseline of the agency's water consumption in fiscal year 2007 by 2 percent annually through the end of FY 2015 or 16 percent by the end of FY 2015. DOE Supplemental Guidance To The Instructions for Implementing Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" Establishing Baseline and Meeting Water Conservation Goals of Executive Order 13423. Executive Order 13423 requires all Federal agency heads to develop a water-use baseline based on FY 2007 water consumption. All potable water use in covered facilities should be reported, whether used for human consumption, building process, power plant or building cooling, landscape watering, irrigation, or industrial uses.</p>			
<p><b>**Confirmation**</b></p>			
<p><b>Building ID:</b> .....</p>			
<p><b>Signed By:</b> .....</p>			
<p><b>Title</b> .....</p>		<p><b>Date:</b> .....</p>	
<p><b>Related Mandates</b></p>			
<p><a href="http://www1.eere.energy.gov/femp/pdfs/water_guidance.pdf">http://www1.eere.energy.gov/femp/pdfs/water_guidance.pdf</a></p>			
<p><b>Resources</b></p>			

# Summary Guiding Principles Checklist

## High Performance and Sustainable Buildings Guiding Principles Checklist for Existing Buildings

Building Name: **Leased Office Building**

Address: **PNNL**



This field will populate as guiding principles are completed in the compliance tabs	% HPSB Guiding Principles Achieved*	<b>75%</b>
	Total Achievable LEED Credits (Yes column)	<b>19</b>

Guiding Principle	Action Required	% HPSB GPs Achieved
<b>1. Employ Integrated Design Principles</b>		<b>75.0%</b>
Integrated design	LEED Accredited Professional-Inter-sustainable team	<input checked="" type="checkbox"/>
Commissioning	Commissioning: Investigation & Analysis.	<input checked="" type="checkbox"/>
	Commissioning: Implementation	<input checked="" type="checkbox"/>
<b>2. Optimize Energy Performance</b>		
Energy Efficiency	Energy Optimization	<input type="checkbox"/>
Measurement and Verification	Energy Star's Portfolio Manger or Labs 21, or equivalent	<input checked="" type="checkbox"/>
	Building level utility meters	<input checked="" type="checkbox"/>
	Data entered into High Performance database	<input type="checkbox"/>

# Comments or Questions?

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