



- August 15-18, 2010 • Dallas, Texas •
- Dallas Convention Center •



Department of Energy Water Conservation Efforts

Summary

DOE's Challenge

- Identifying and funding *cost effective* water conservation measures
- Large mission-specific process loads
- Diversity of facilities

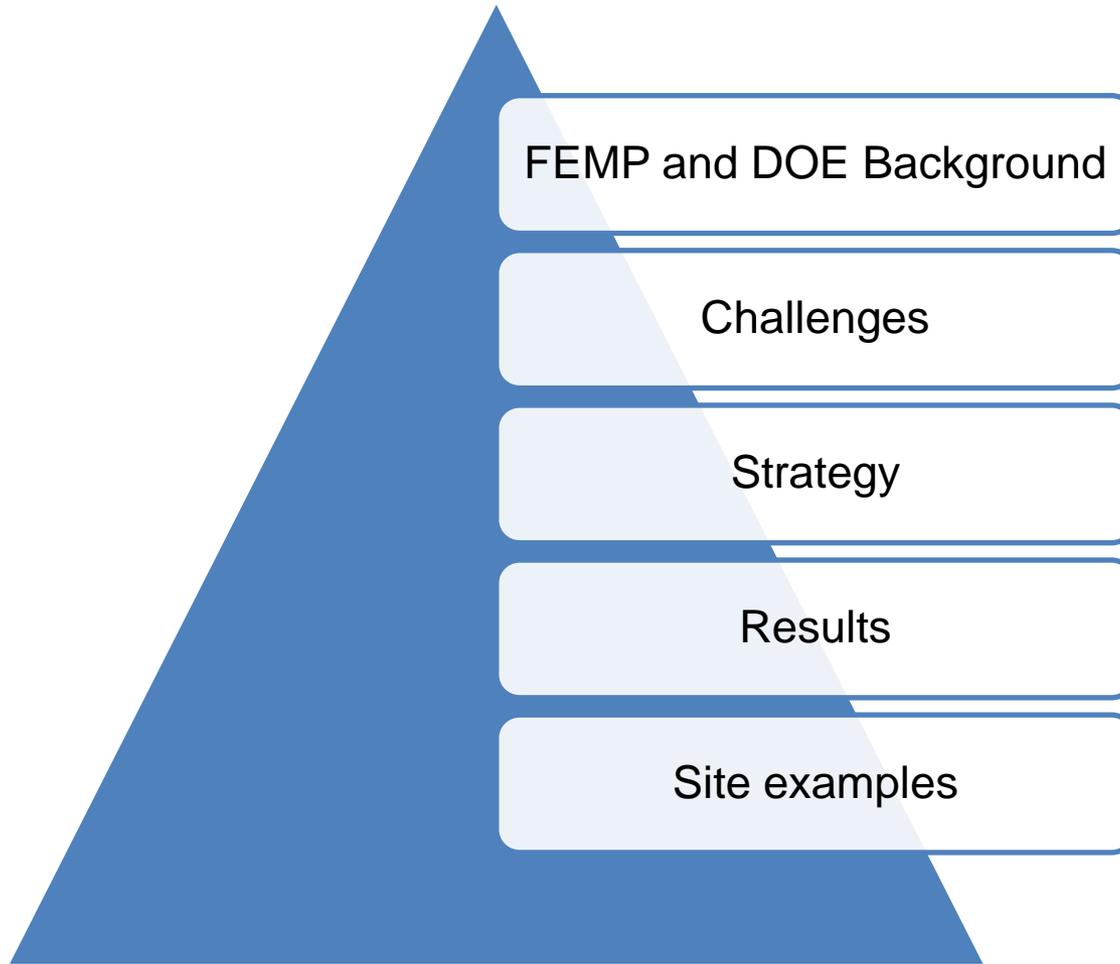
Strategy

- DOE Order 430.2B
- Focus on sites with most consumption
- Strategic Sustainability Performance Plan

Results

- Over 800 Mgal/yr in proposed savings identified or underway
 - ESPCs
 - Direct appropriations

Outline

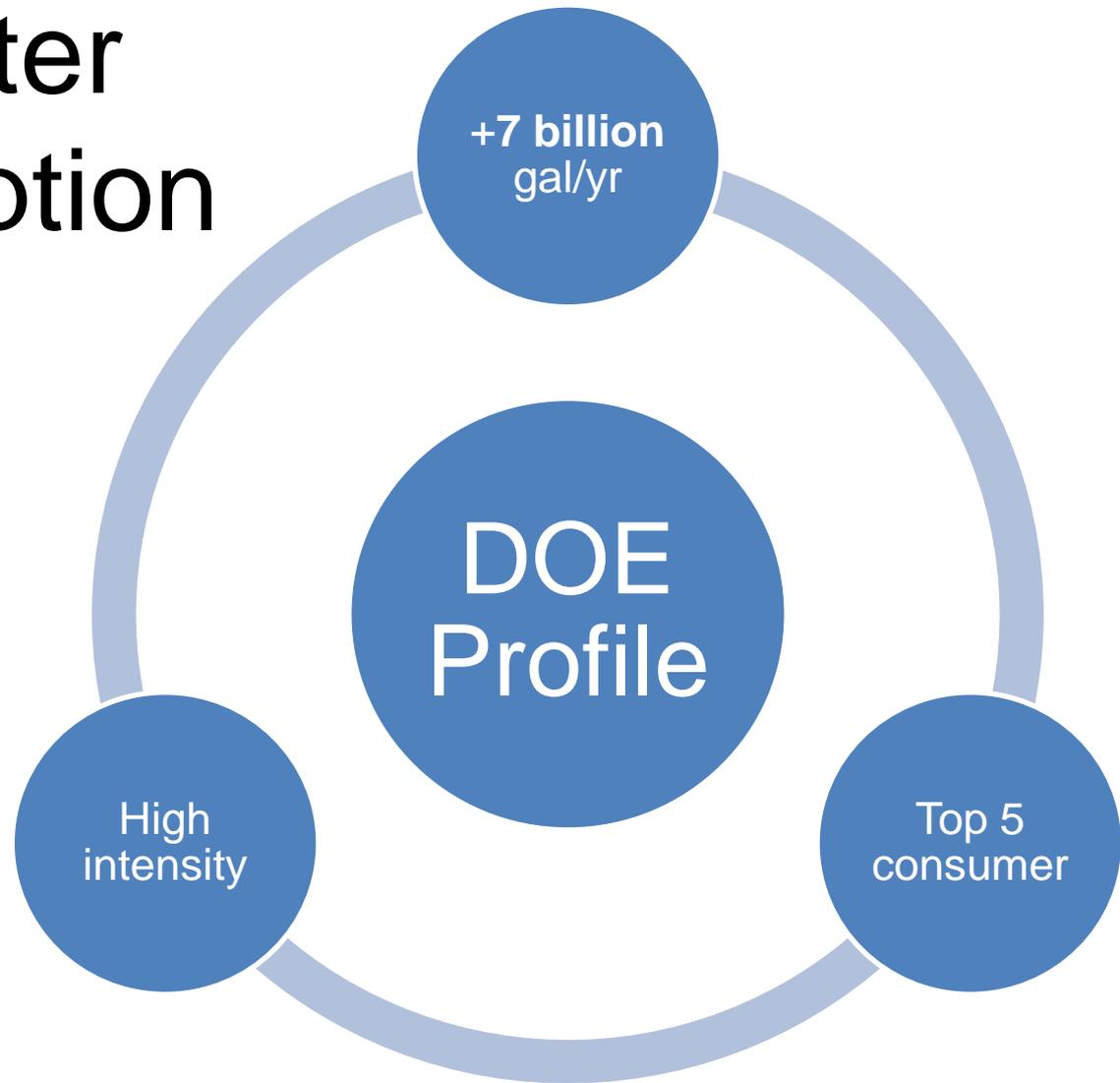


FEMP Mission and Responsibilities

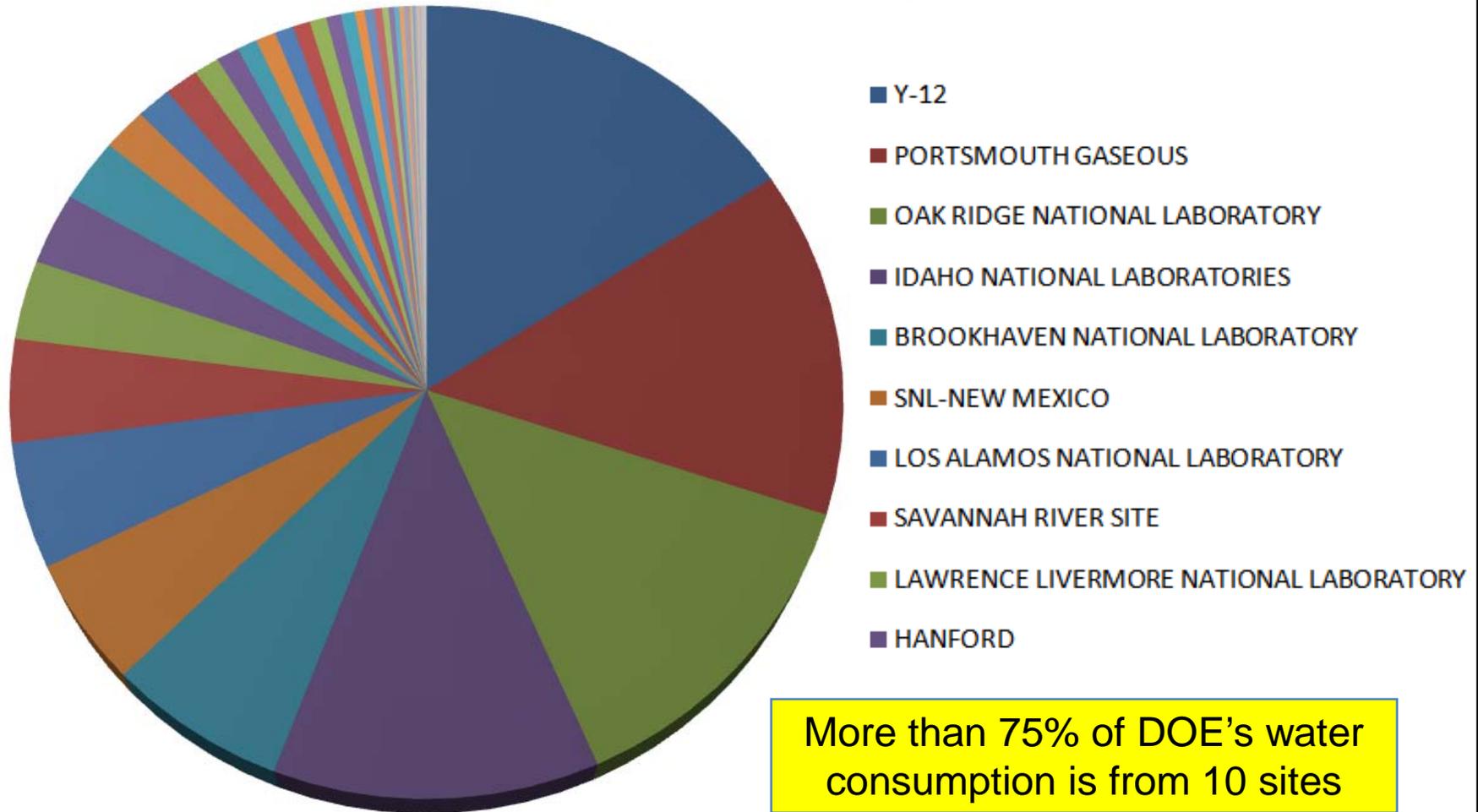


- Mission
 - To facilitate the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship.
- DOE internal energy management reporting

DOE Water Consumption Profile



80-20 Rule: DOE Water Consumption by Site



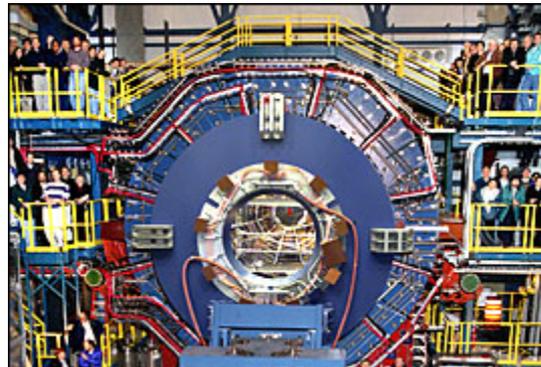
Challenges: Process Loads



Supercomputers

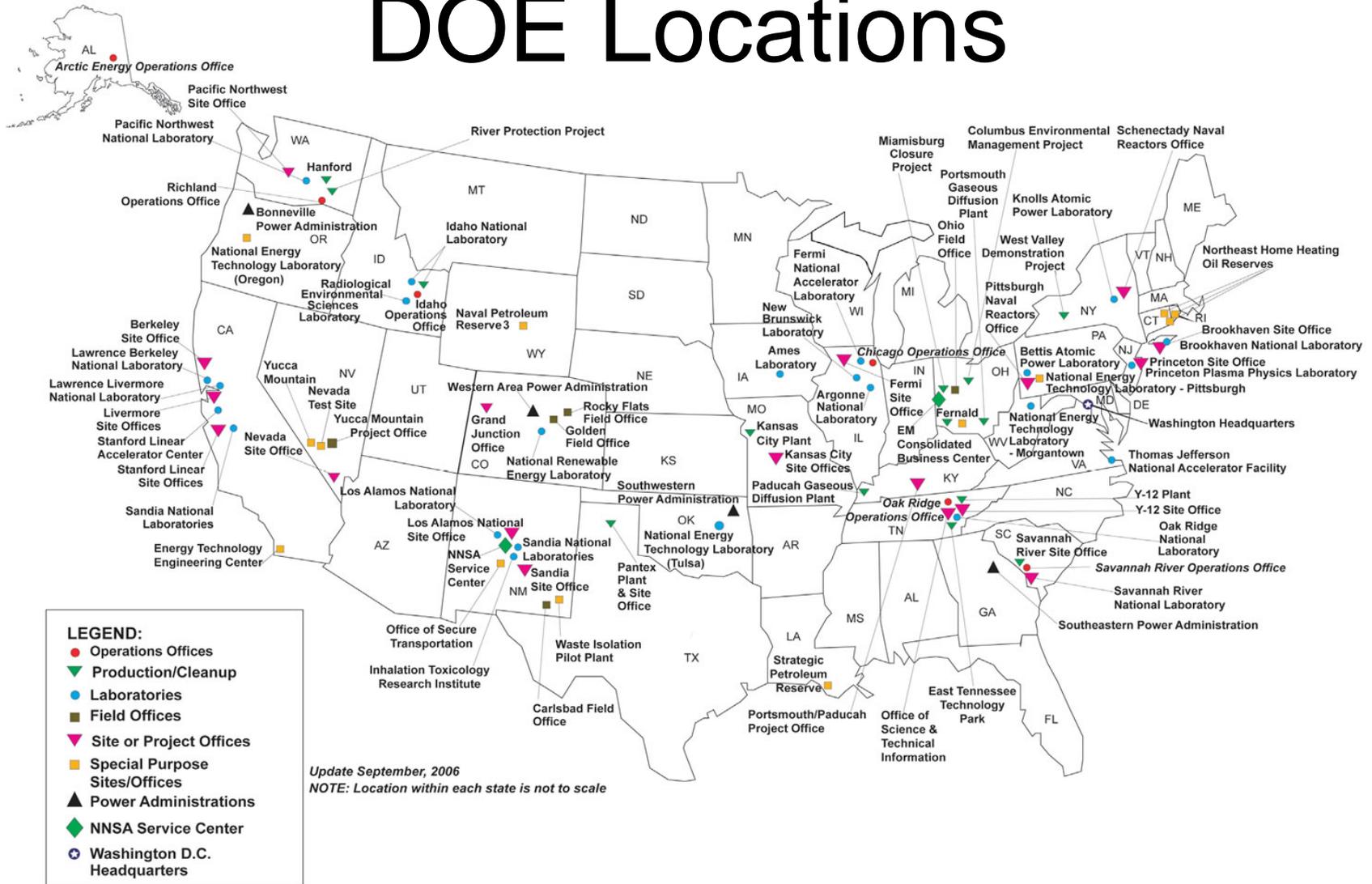


Rad waste treatment



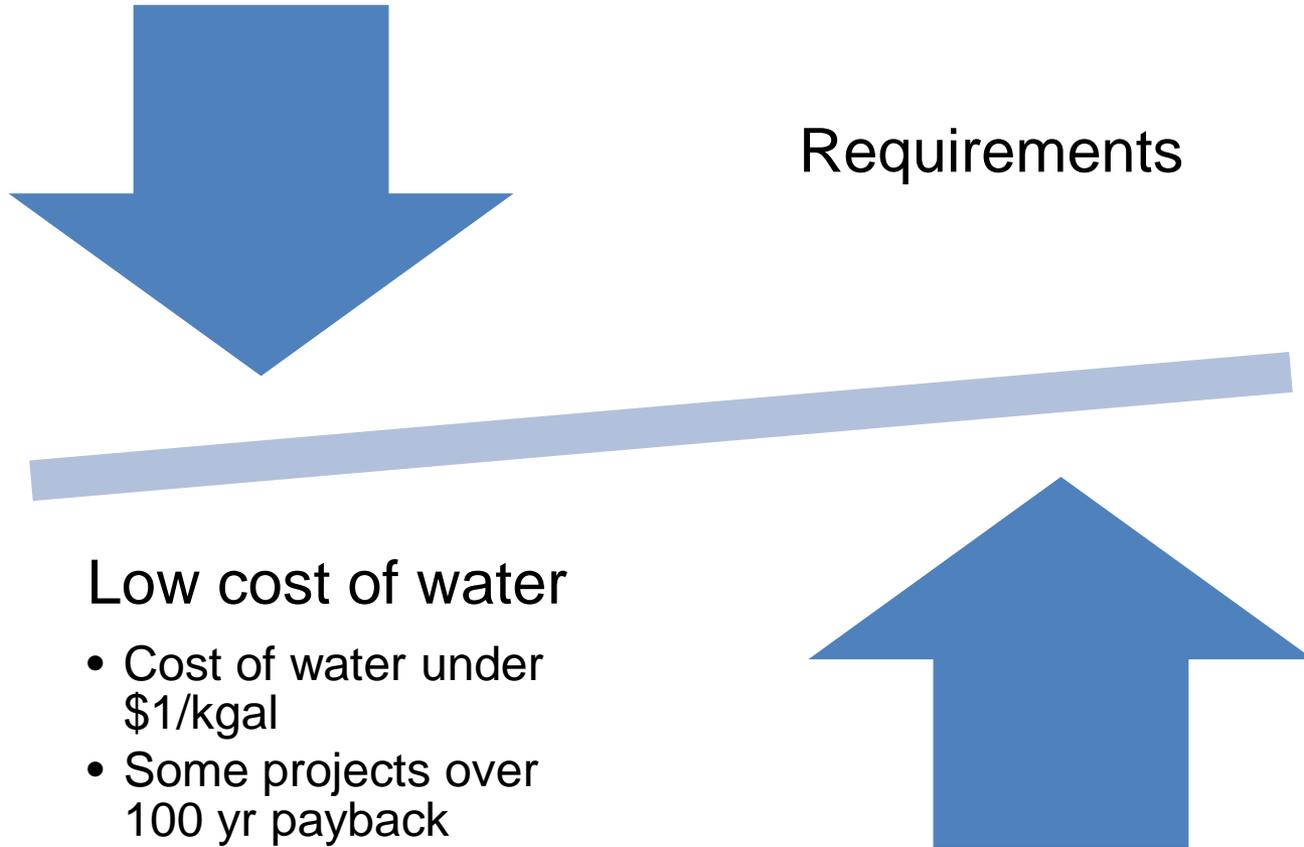
Particle Accelerators

DOE Locations

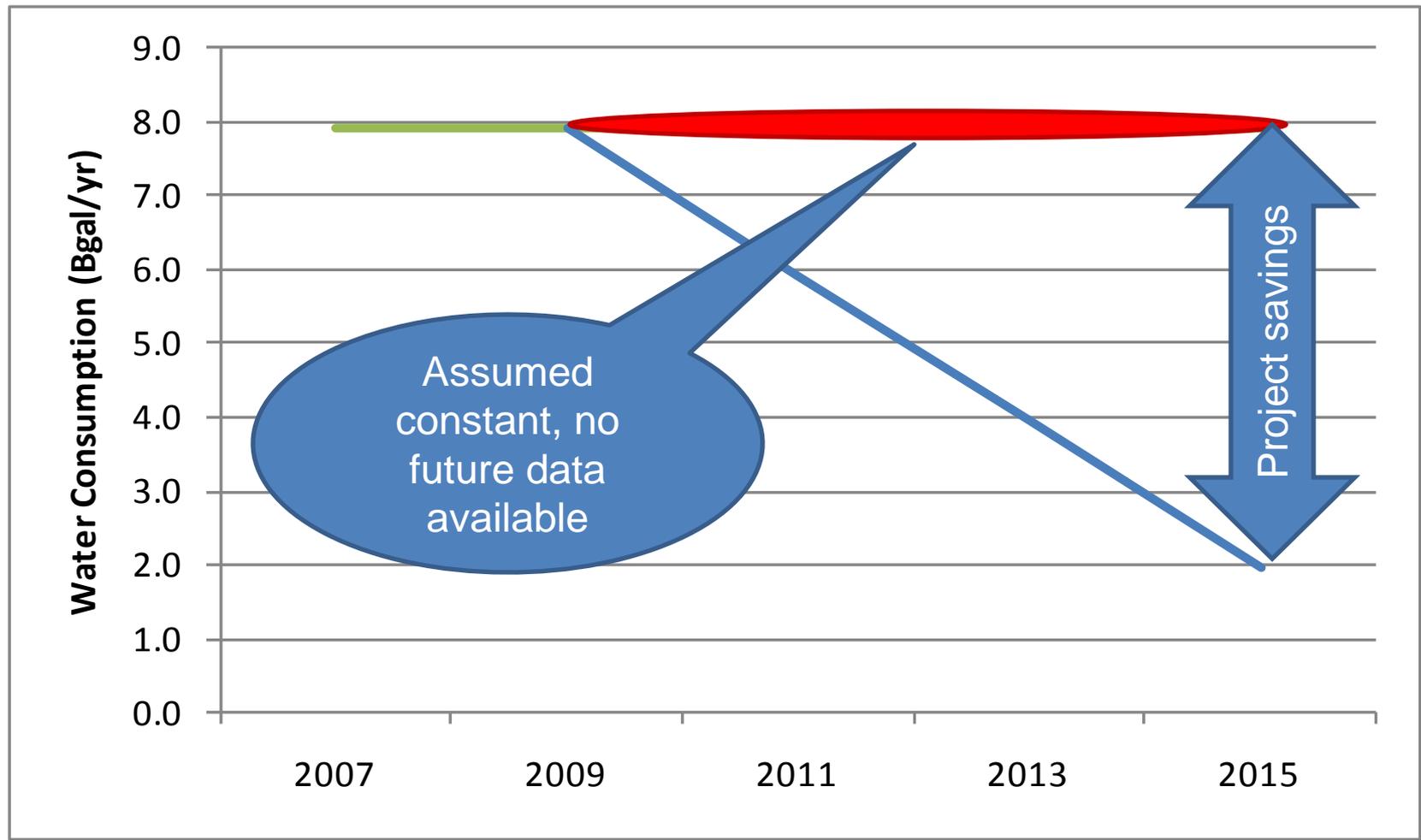


DOE facilities have wide geographical and water resource diversity

Cost Challenges

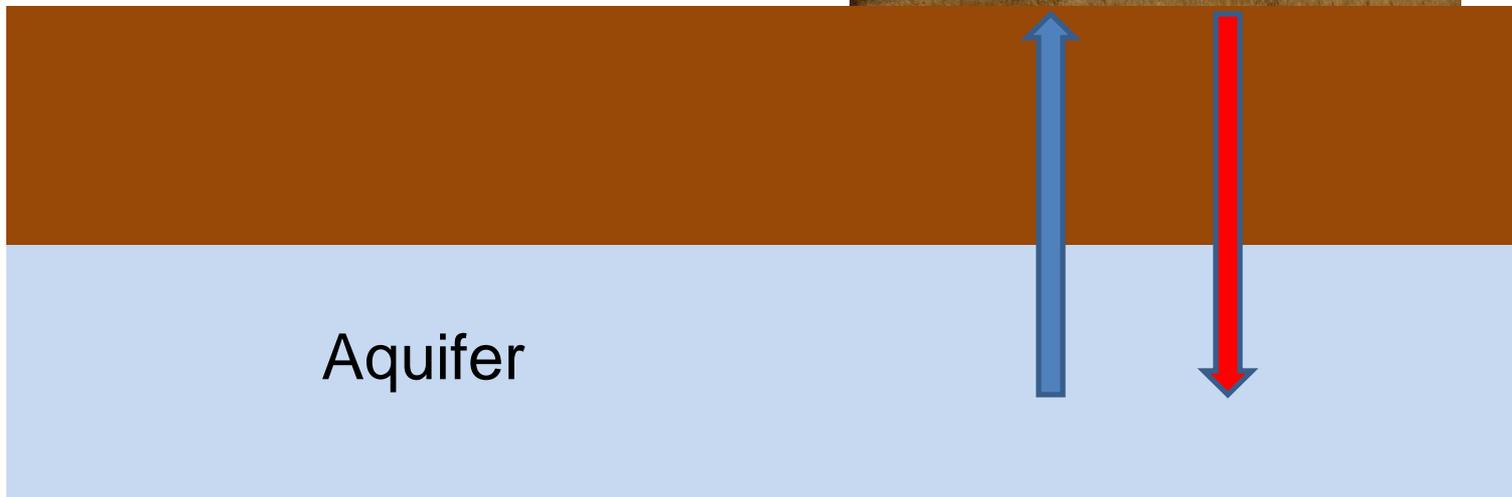


Accounting Challenges



Accounting Challenges

Defining
“consumptive”



Approach Summary

Defining Goals and Requirements

EO13423/13514, EISA Sec 432

DOE SSPP

DOE Order 430.2B

Providing Tools

Guidance: Best Management Practices

Provision of Technical Assistance

Guidance on Accounting

Site Leadership

Identification of Projects

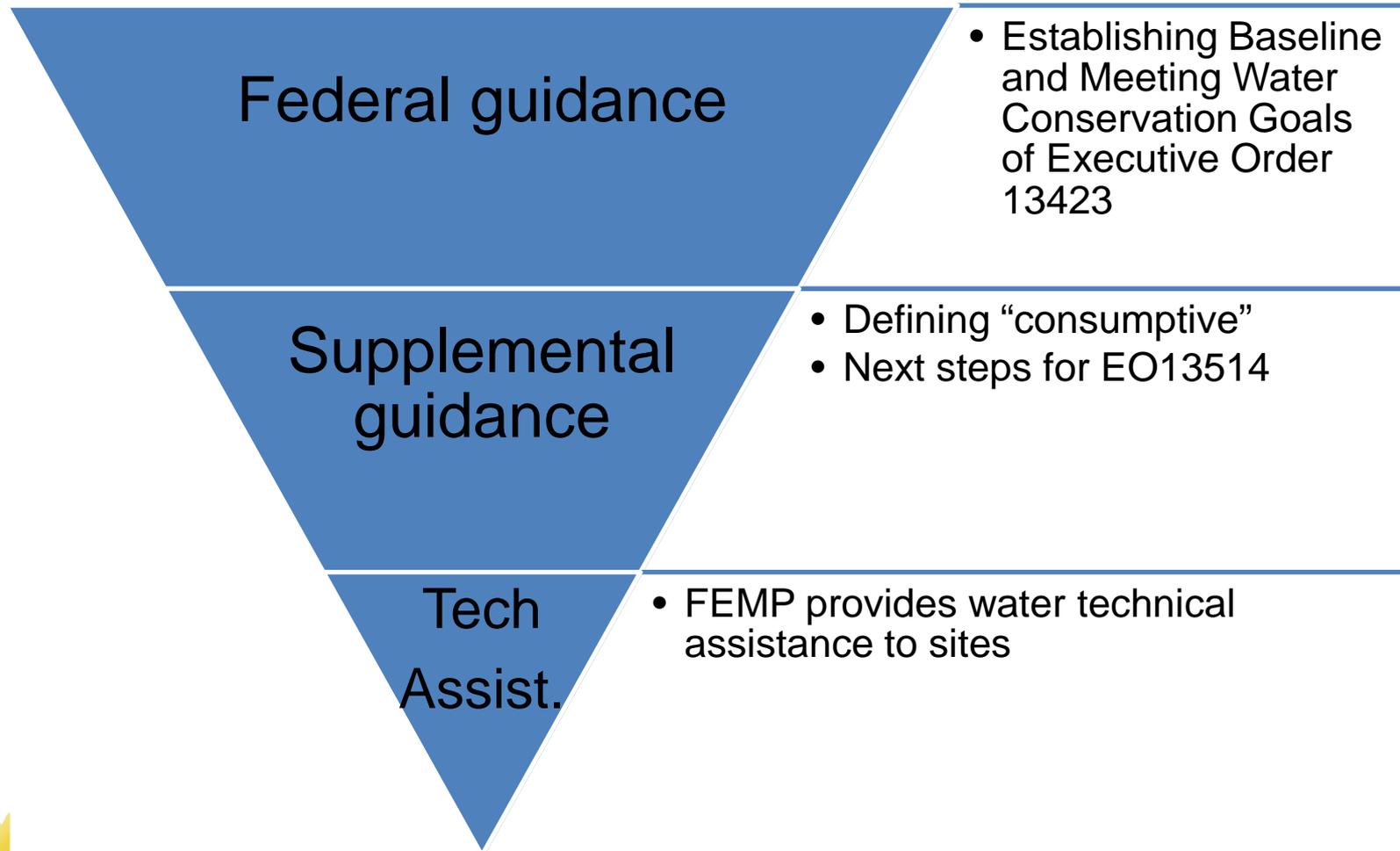
Project Execution

Monitoring and Reporting

Requirements

- DOE O 430.2B
 - Incorporated EO13423 16% water intensity goal into DOE contracts
 - Prioritized use of ESPCs
 - Directs every site to produce an “executable plan” to meet goals
 - Currently being updated to reflect EO13514 goals
- EISA Section 432
 - Requires water audits for “covered facilities”

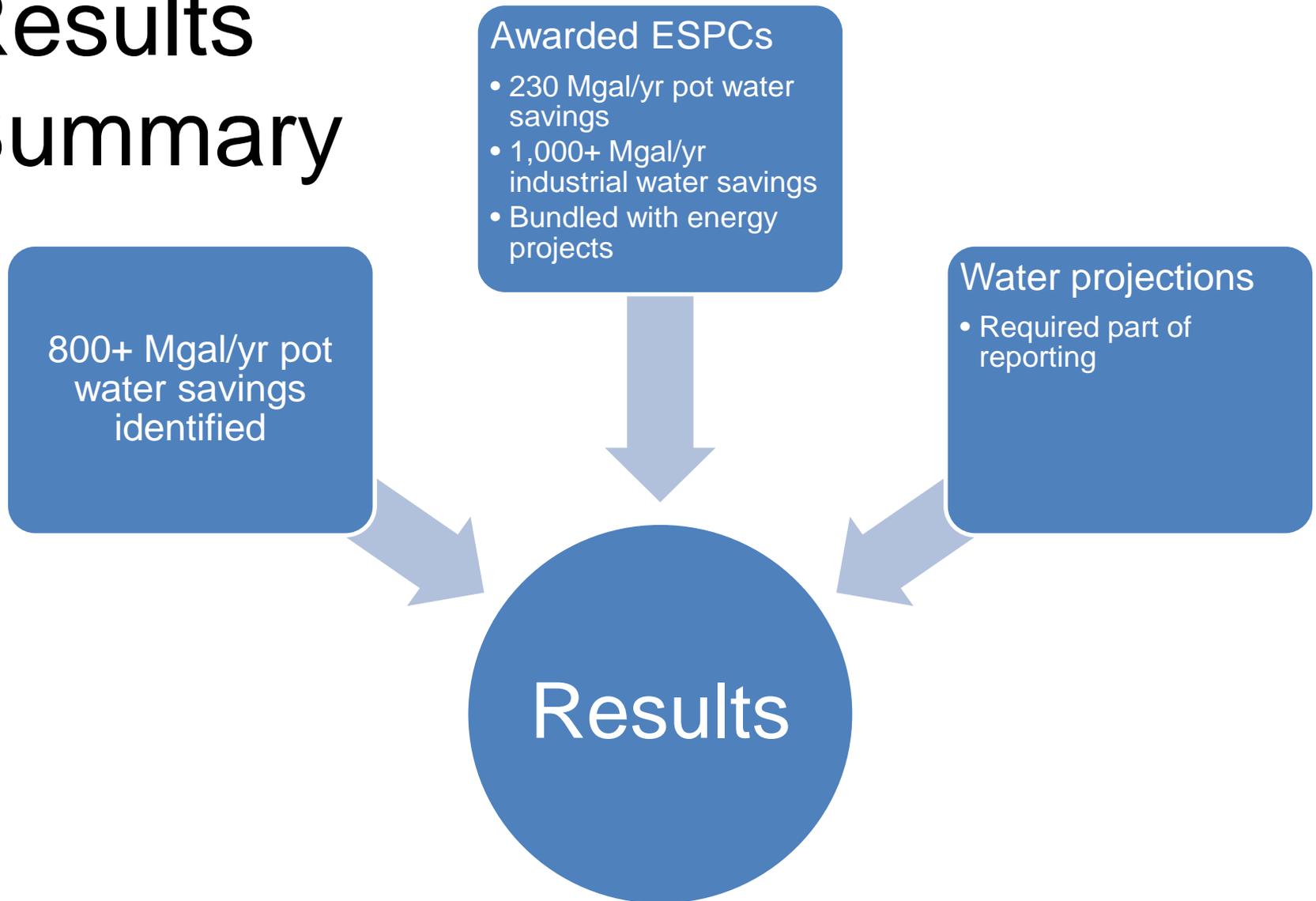
Approach: Guidance and technical assistance



Approach: guidance to sites on *What is “consumptive”?*

- Is it “Consumptive” ...
 - If a facility takes water from an **aquifer**, uses it for industrial cooling, and then returns it to the aquifer? **No**
 - If a facility takes water from a **river**, uses it for industrial cooling, and then returns it to the river with only extra heat? **Yes**
 - If a facility makes use of brackish or seawater for its processes? **No**
 - ...if the freshwater resource is significantly impacted? **Yes**

Results Summary



Results:

DOE Site leadership

Los Alamos National Laboratory



- Background
 - Established in 1943 as part of the Manhattan Project
 - Multi-program laboratory focused on science, technology and engineering
- Plans
 - Sanitary Effluent Reclamation Facility to treat wastewater for reuse to cool supercomputers, over 114 Mgal/yr savings expected

Example of site-level leadership to reduce potable water use in a mission-specific process load

Y-12 Plant



- Background
 - Constructed in 1943 as part of WWII Manhattan Project
- Plans
 - ESPC delivery order awarded in 2009 that included 49 Mgal/yr in water savings
 - Replacing of 60+ yr old piping to be complete this FY is expected to eliminate leaks
 - With FEMP support, a site-wide water audit began in CY2010 to develop a water flow balance and identify conservation measures

FEMP provides DOE sites with technical assistance

Portsmouth Gaseous Diffusion Plant

- Background
 - Constructed in 1956
 - Preparing for decommissioning
- Plans
 - Steam heating will be reduced/eliminated
 - Once through cooling to be replaced with air cooled condensers
 - Water metering on individual buildings
- Challenges
 - Expected large additions of facilities



Oak Ridge National Laboratory



- Background
 - Constructed in 1943 as part of the Manhattan Project
 - One of DOE's largest science and energy laboratories
- Plans
 - ESPC awarded delivery order
 - Guaranteed savings of nearly 170 Mgal/yr
 - Elimination of once-through cooling
- Challenges
 - Significant future mission-related water loads are expected

Idaho National Laboratory



- Background
 - In operation since 1949
 - Dedicated to supporting nuclear and energy research, science, and national defense
- Plans
 - ESPC awarded in 2008 that included 3.5 Mgal/yr water savings from a boiler improvement project
 - Decommissioning of a large facility will result in 150 Mgal/yr savings
 - A significant amount of cooling water is returned to the aquifer from which it came. May qualify for an exclusion.
- Challenges
 - Extraordinarily low cost for water, making payback difficult

Brookhaven National Laboratory



- Background
 - Established in 1947
 - Multi-program laboratory focused on basic and applied science
- Plans
 - Replacement of single-pass equipment estimated to be over 25 Mgal/yr
 - Submetering and rebilling for steam is underway
- Challenges
 - Increase in process use by over 40%, which includes an addition in datacenter operations

Summary

- Significant action being taken
 - Agency-wide goals and guidance disseminated
 - ESPCs have been a significant method of financing projects
 - Sites are taking leadership roles in conserving water, even in process loads
 - Water projections to be established to manage expectations
- Continued drive towards sustainability
 - Updating executable plans and EISA Section 432 water audits
 - Strategic Sustainability Performance Plan