



**Watercat Consulting LLC**  
[www.watercatconsulting.com](http://www.watercatconsulting.com)

## **Water and Energy and Power: Agency Roles and Involvement by Citizens and Watershed Groups**

Presented by  
**Cat Shrier, Ph.D., P.G.**  
**Watercat Consulting LLC**

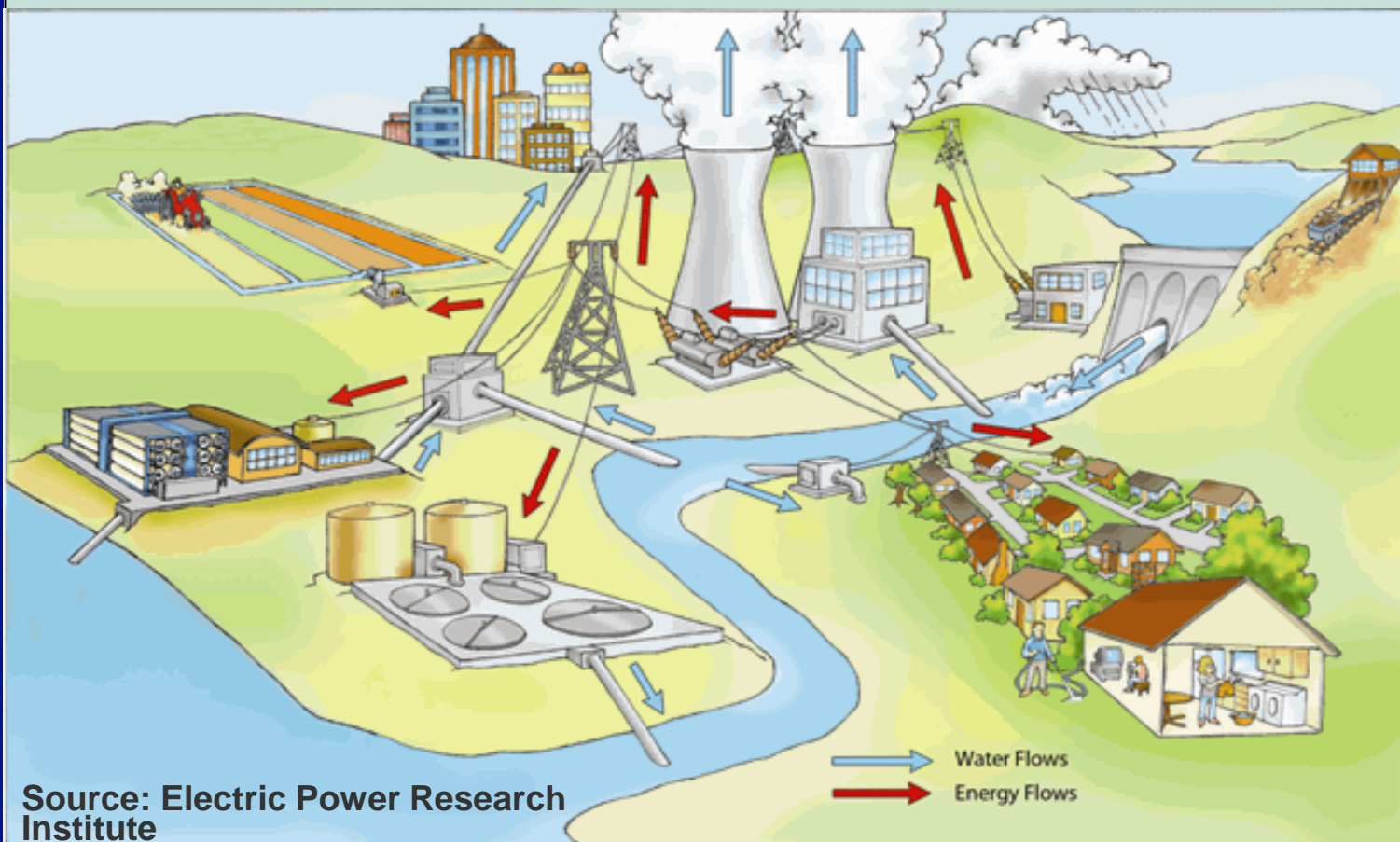
*1209 E Street SE  
Washington, DC 20003 USA  
[www.watercatconsulting.com](http://www.watercatconsulting.com)  
[cat@watercatconsulting.com](mailto:cat@watercatconsulting.com)  
(202) 344-7894*

Presented to  
**National Water Quality Monitoring  
& River Rally “Bridge Day”**  
**May 4, 2012**



# What is the Energy Water Nexus?

- Multiple “nexus points”
- Each with stakeholders and agencies
- Shared resource with water and energy stakeholders
- How to make the issue **NATIONAL and LOCAL**

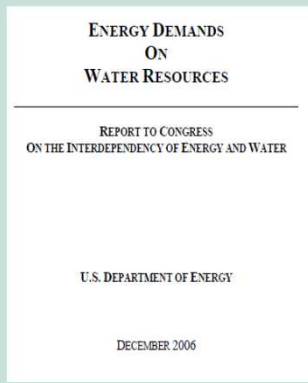


Water for energy, energy for water  
**AND** Planning/Management of Resources (rivers, power capacity, energy reserves ... and funding/facilities)

# History of Energy-Water Nexus

- Energy Lab Review 7-8 years ago
- Energy Policy Act of 2005
  - directed the USDOE to develop an Energy and Water program to include “research, development, demonstration, and commercial application” to energy for water, water for energy, and assess existing R&D programs
  - Report to Congress 12/06 and Roadmapping meetings 2005-2006
- Symposia 2009+2010 (water, energy, and power assns)+“primer”

Watercat Consulting LLC  
www.watercatconsulting.com



**Water-Energy Sustainability Perspectives and Policy Approaches**  
August 2010

On behalf of the Symposium Planning Committee. THANK YOU

**Water + Energy Are Linked**  
"Water for Energy" and "Energy for Water"

Water and energy issues are inseparable. Given the interdependencies between water and energy, our nation has a great incentive to work towards sustainable resource planning and management efforts by more coordinated and collaborative approaches. An important step towards more coordinated water and energy resource management is an improved understanding of the different issues, risks, and perspectives on water and energy from the various industries, agencies, and other stakeholders that manage these resources.

The September 2009 Water-Energy Sustainability Symposium provided a forum in which water and energy policymakers, planners, researchers, and resource managers could come together and discuss issues, risks, and activities related to more integrated and sustainable water and energy resource management and planning.

Co-sponsored by the USDOE and the National Energy Technology Laboratory (NETL), the symposium was developed as part of a continuum of activities intended to support the development of a National Water-Energy Roadmap. This symposium will equip the most completed during the 2005-2006 USDOE/National Energy-Water Nexus Roadmapping workshop.

The 2009 Water-Energy Sustainability Symposium participants worked to develop a common understanding of the need for strategies to integrate water and energy technologies, policies and regulatory frameworks and promote water conservation and efficient energy use. The summary report provides background on prior activities and feedback and findings from the symposium participants.

The Symposium was organized by Watercat Consulting LLC and Energy Policy Act of 2005 (EPA) through the National Energy Technology Laboratory (NETL) and National Water Research Institute (NWRI). The report prepared and not necessarily those of USDOE, NETL, or NWRI.

www.netl.gov / www.watercatconsulting.com Perspectives on Water-Energy Sustainability

[www.sandia.gov/energy-water/](http://www.sandia.gov/energy-water/)





# Understanding DOE & the Energy Labs



**PLUS (Report to Secretary):**

-Power Administrations

-Energy Information Administration

-Advanced Research Projects Agency – Energy (ARPA-E)

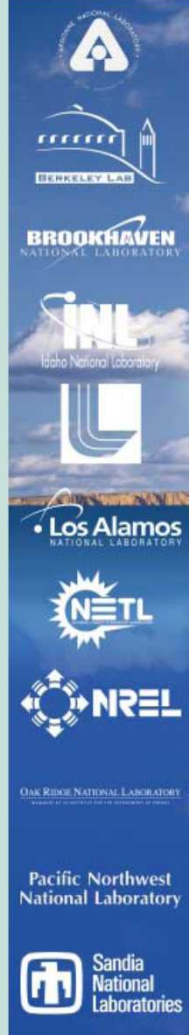
## DOE Offices:

- Office of Policy & International Affairs
- Office of Energy Efficiency & Renewable Energy (EERE)
- Office of Fossil Energy
- Office of Nuclear Energy
- Office of Environmental Management
- Office of Electricity Delivery & Energy Reliability
- Office of Science
- National Nuclear Security Administration

## National Energy Labs:

Under contract with USDOE  
Generally report to various offices

**NOT agencies, NOT policy making**



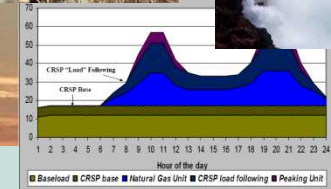
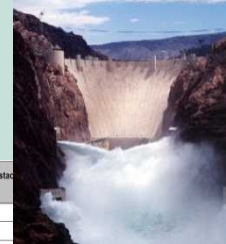


## EPA

- Publicly owned treatment works (POTW) energy efficiency
- Research for net zero energy WWTP
- Desal (energy neutral & no bring impacts)
- Water demand & supply management strategies
- Groundwater protection/underground injection control

## DOI/USGS/USBR

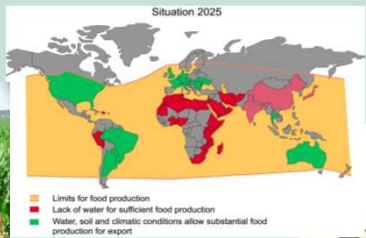
- *New Energy Frontier*: 9000 MW renewable capacity on Interior lands by 2011
- *WaterSMART* ("Title XVI" reclaimed water; USBR hydropower with renewables; Microhydro w/FERC) and USGS Water Census



## USDA



## State Dept & DOD



## GSA & Executive Order 13514

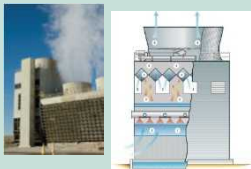
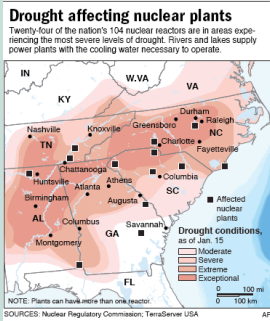
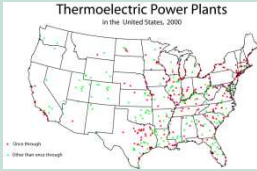
*"zero environmental footprint"*





- **QUADRENNIAL REPORT ID WATER AS PRIORITY**
- **DOE Planning Priorities:** Shift to Climate Resilient Technologies & Practices
  - **Improved Models:** Need for better climate science and predictive models to project impacts.
  - **Better Technology:** Need to develop and deploy cost effective climate resilient energy- and water-efficient technologies.
  - **Incentivize Early Action:** Need to remove the barriers.
  - **Effective Integration:** Need to integrate considerations of water use into existing programs and planning processes.
  - **Build Public Awareness:** Educate the public on more efficient energy and water use practices.

- Shift water use practices in energy/power
  - From fresh SW and GW to non-traditional sources
- Shift energy types
  - Shift from sub-critical pulverized coal plant to more advance cleaner coal technologies, such as Integrated Gasification Combined Cycle (IGCC) to create syngas – reduce water demand 40%
  - Expand use of natural gas – reduce water demand 60%
  - Shift to PV solar and wind – minimal water use (20% wind by 2030 reduces water consumption by 17%)
- Shift power plant design and operations
  - Shift from wet recirculating systems to advanced cooling technologies (dry/wet-dry hybrid)
    - demand significantly reduced
    - address constraints on power plant siting/operations





- Improvements to Federal Water Use Data Would Increase Understanding of Trends in Power Plant Water Use
- Focus on advanced cooling technologies and alternative water sources and their role in the use of freshwater for electric power generation.
- Address data collection & analysis differences
- USGS and EIA to “establish a process for regularly coordinating with each other, water and electricity industry experts, **environmental groups**, academics, and other federal agencies, to identify and implement steps to improve data collection and dissemination.







# Opportunities for Watershed Groups

## EXAMPLE:

- **Dominion North Anna Nuclear Power Plant (VA)**
- **Cooling water flows thru 3400-acre lagoon system before discharge to Lake Anna at normal temp**
- **Lagoons designed at habitat/park**
- **Lake Anna = manmade lake, leading recreation area**

- **Work with Power Plants during permitting/planning processes**
  - Opportunities for creative and collaborative approaches to local needs (education, habitat)
  - 316b? ESA Consultation? State Planning?
- **Become informed on water & energy/power, local sources and issues, and inform community**
- **Support cooperative monitoring and data collection programs**
- **Identify data needs for local water planning issues, support EIA/USGS efforts to revise survey (out for comment, opportunity for spokesperson(s) for environmental groups)**