Research & Data at the Energy-Water Nexus: Update on U.S. Dept of Energy & Federal Agency Activity

Roundtable on Science and Technology for Sustainability

Presented by National Research Council

June 6, 2013

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Federal Partners in Energy-Water Nexus Research & Data

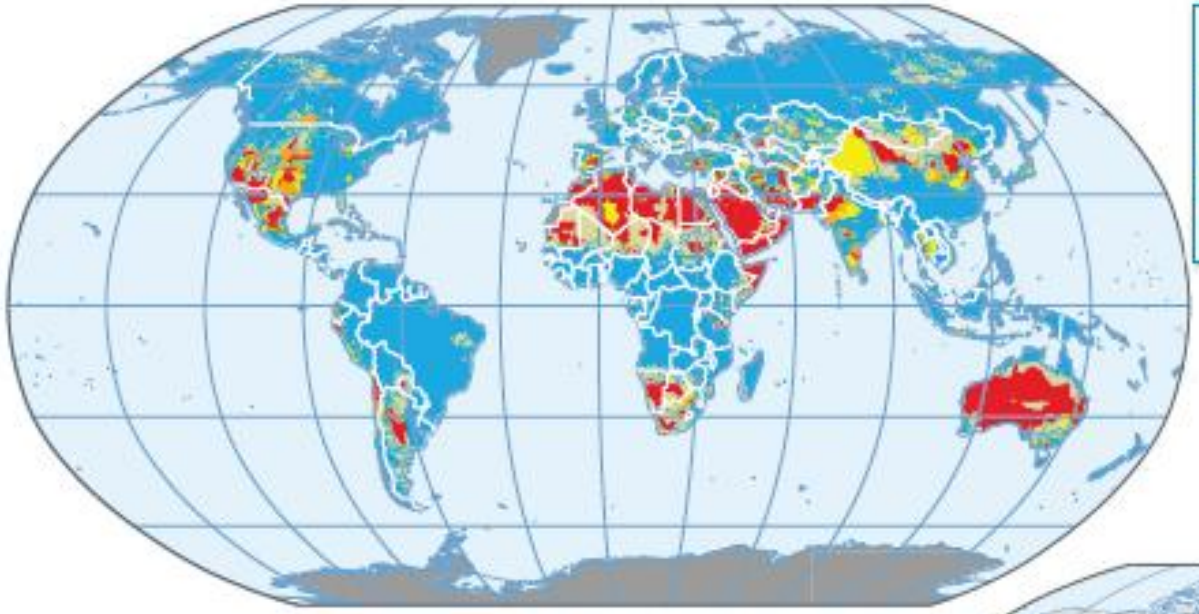
- National Interests in Intelligence in the Energy Water Nexus
- U.S. Department of Energy's Water-Energy Technology Team
- Interagency – Intergovernmental Engagement on Data

Global Water Security

INTELLIGENCE COMMUNITY ASSESSMENT

ICA 2012-08, 2 February 2012

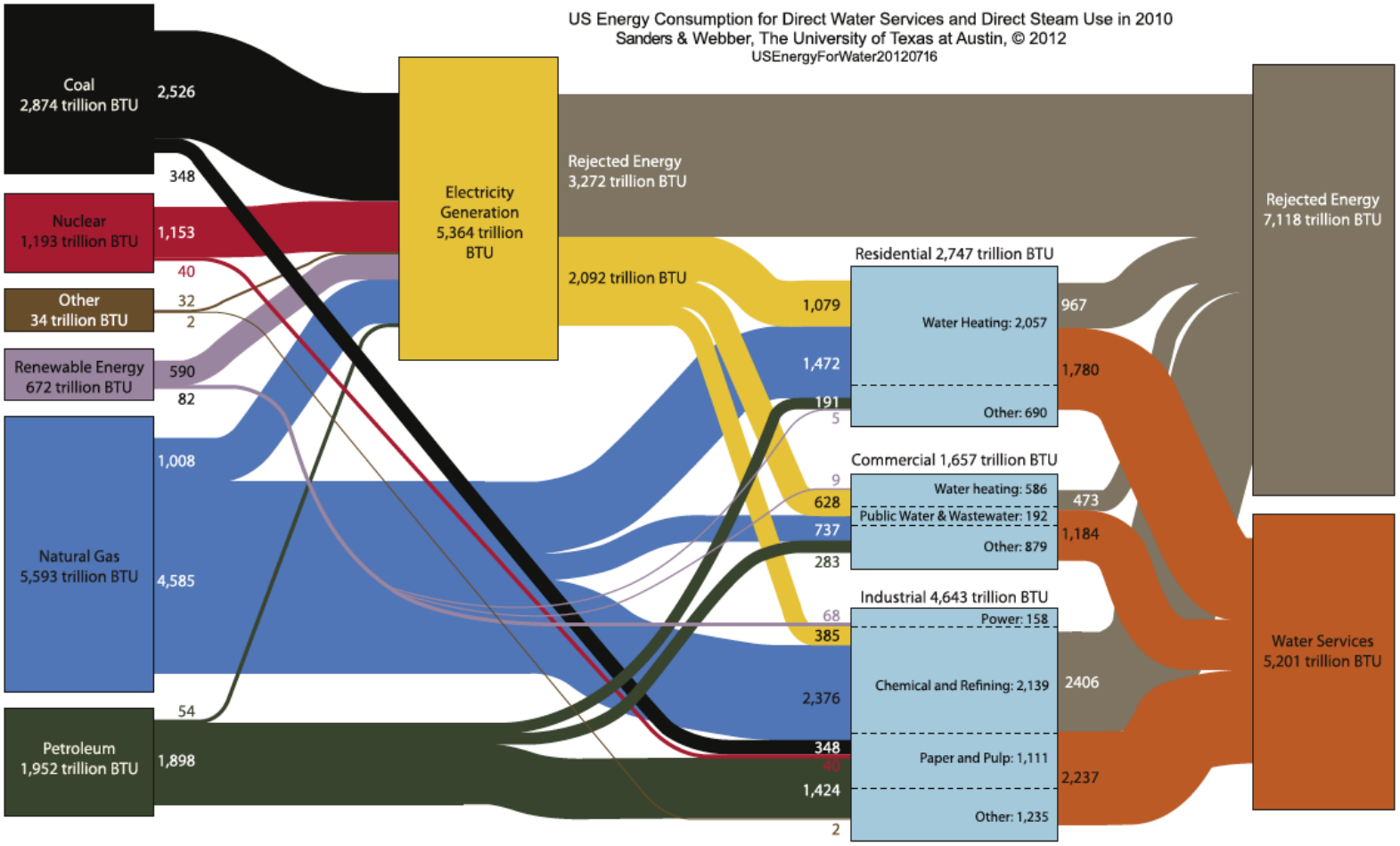
Global Water: Present to 2025



Present water stress is defined as the ratio of total freshwater withdrawals (circa 2000) to annual renewable freshwater supply (1960-90 climatological norm), a quantity often referred to as the water withdrawal ratio (WWR). This provides an assessment of freshwater availability in a typical year relative to recent levels of socioeconomic demand for fresh water. High levels of water stress indicate that socioeconomic demand for freshwater approaches (or exceeds) the annual renewable supply.

The projected change in water stress is calculated as the ratio of projected water stress to present water stress during a 10-year time frame centered on the year 2025. The analysis looks at the A1B scenario of economic and environmental change used by the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report. The projected change in water stress indicator has categories which are analogous to a drought severity scale. For example, areas with a projected category of "extremely more stressed" are projected to experience the same level of water stress as areas experiencing "extreme drought" today.

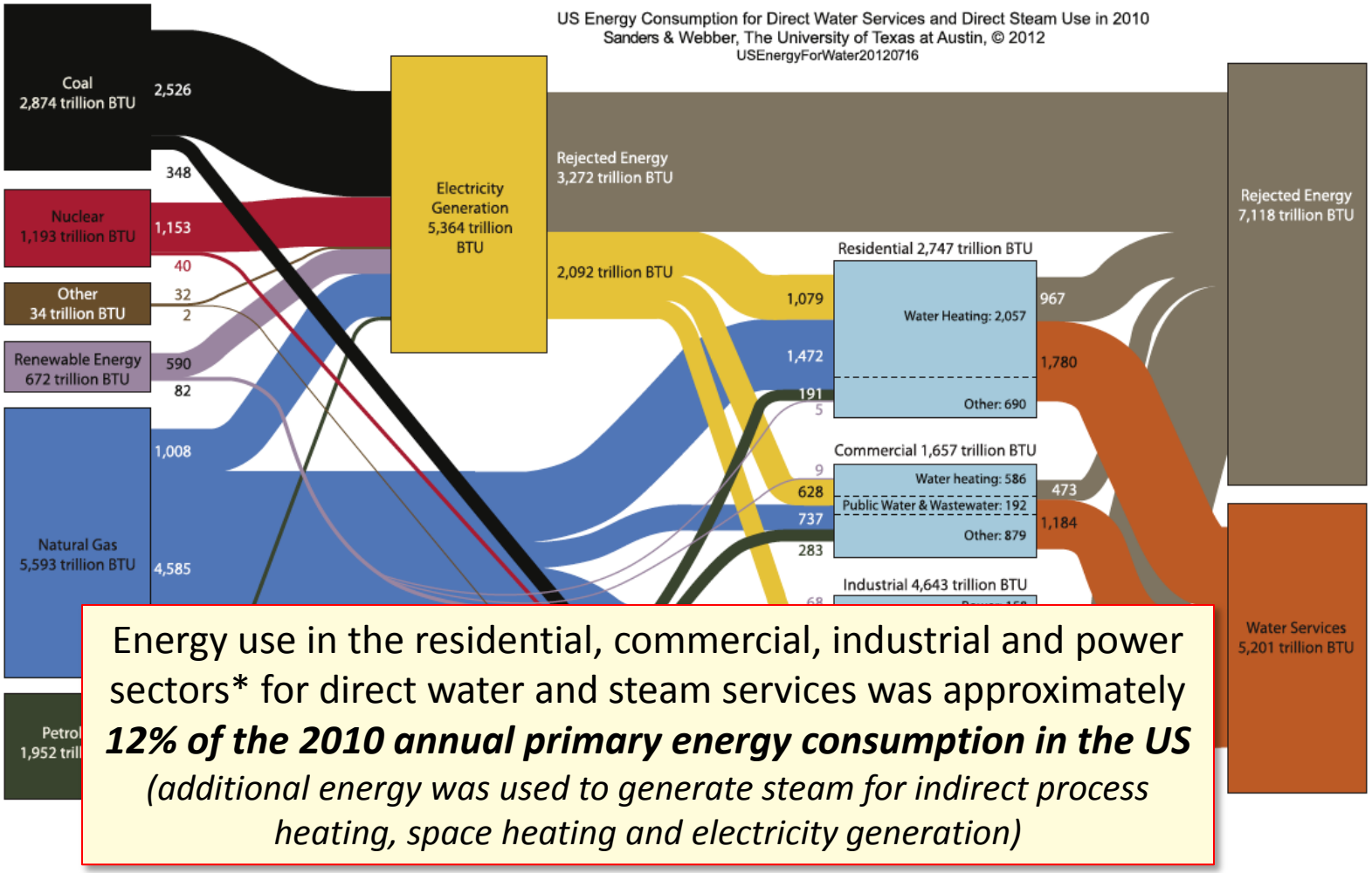
Primary energy embedded in water*: US national-level



*Residential, Commercial, Industrial and Power sectors, (~70% of total US primary energy consumption). Transportation sector not included.

Source: Sanders and Webber, 2012

Primary energy embedded in water*: US national-level



Energy use in the residential, commercial, industrial and power sectors* for direct water and steam services was approximately ***12% of the 2010 annual primary energy consumption in the US***

(additional energy was used to generate steam for indirect process heating, space heating and electricity generation)

*Residential, Commercial, Industrial and Power sectors, (~70% of total US primary energy consumption). Transportation sector not included.

Source: Sanders and Webber, 2012

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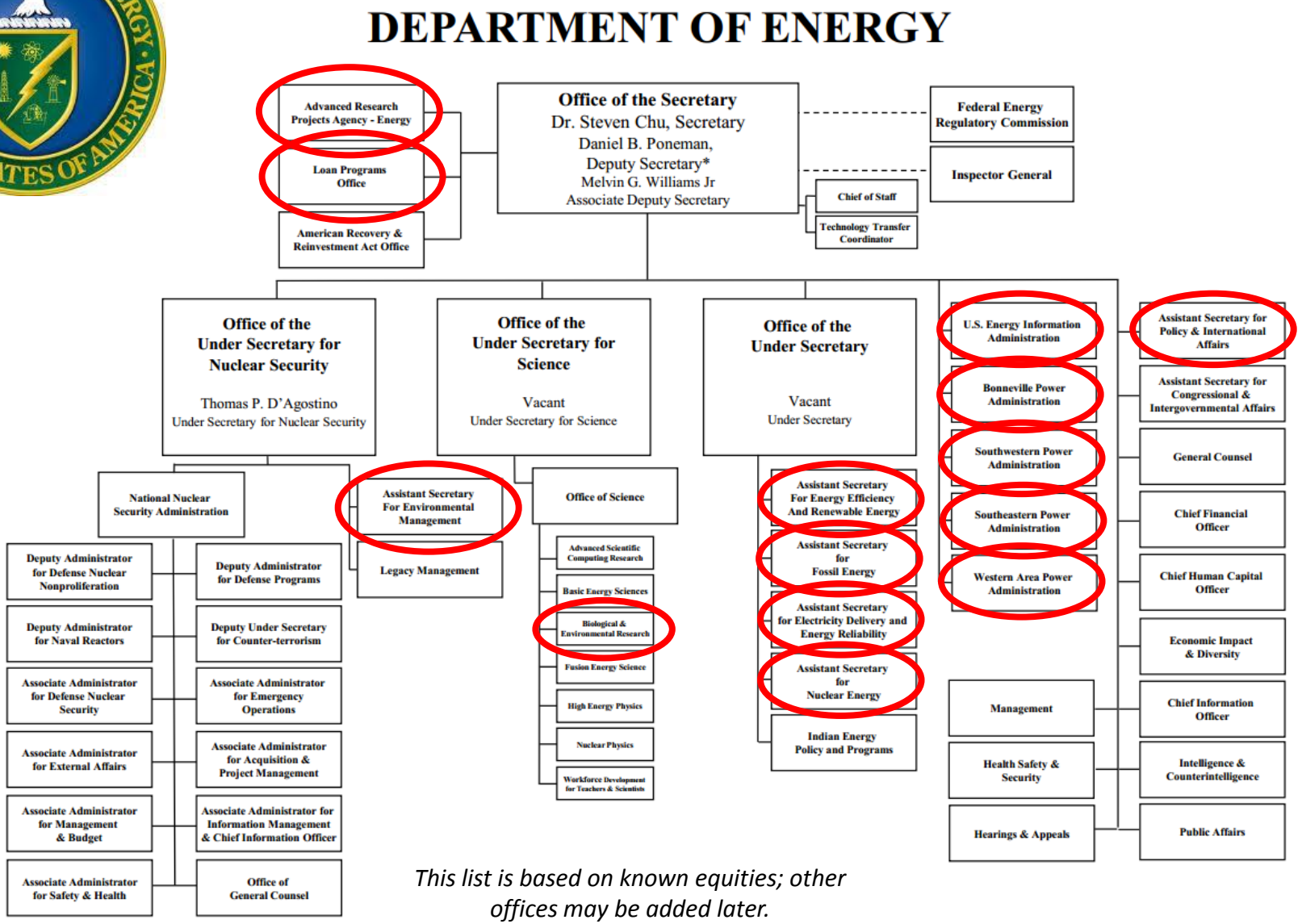
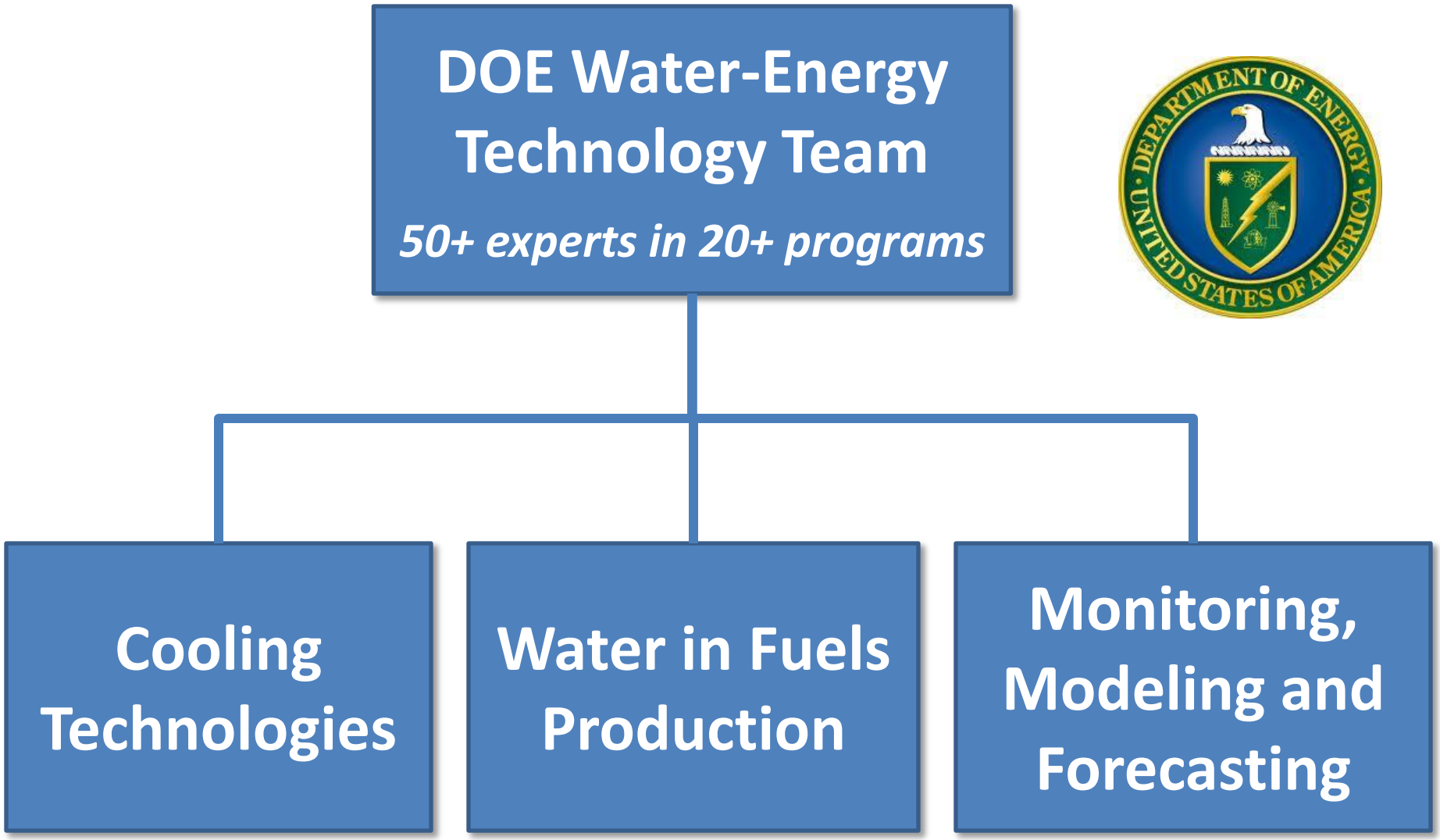
DOE Offices with Water-Energy Equities



This list is based on known equities; other offices may be added later.



Three working groups to start,
plus delegation to support EPA on wastewater treatment.

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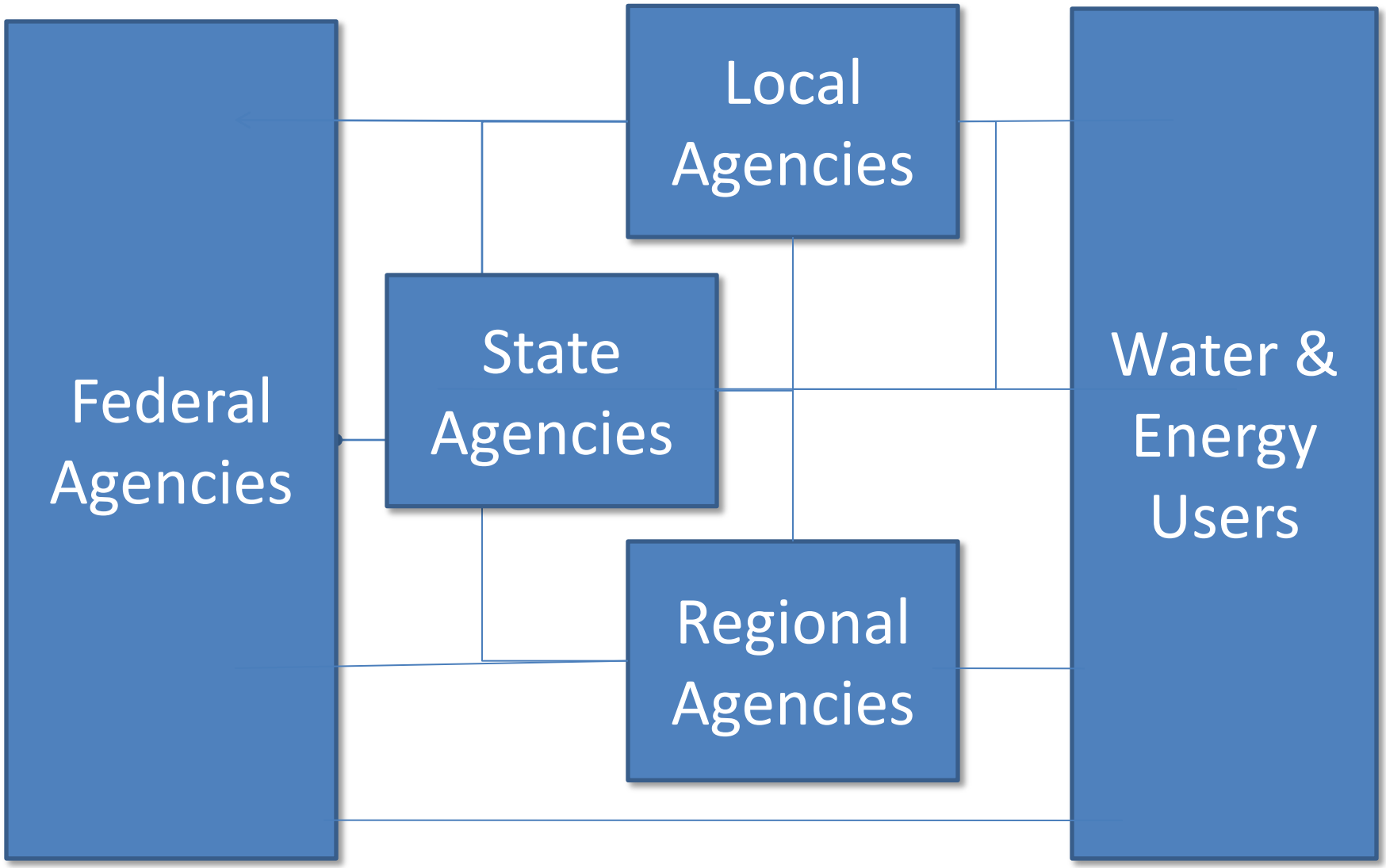
Federal Participants in the Energy-Water Landscape of Activity (partial view)

US Army Corps of Engineers®

Federal Participants in the Energy-Water Landscape of Activity (partial view)

Energy-Water Landscape of Activity (partial view)



BUILDING STRONG COLLABORATIVE RELATIONSHIPS FOR A SUSTAINABLE WATER RESOURCES FUTURE

WaterToolBox.US

DATABASES, TOOLS & MODELS

Access water resources management programs, databases and models created by the U.S. federal government, states, Tribal Nations and non-governmental organizations by keyword or map search

- Search active databases for water management
- Access models that facilitate analysis & predictions
- Acquire new tools and technologies
- Search by location for data, models and programs

COLLABORATION & COMMUNITY

Contribute and take advantage of water resource solutions

- View existing collaborations & partnerships
- Be aware of needs within the water resources community
- Visit the water resources forum to learn about water activites and issues
- Find out how to become a Federal Support Toolbox partner

GET INVOLVED

Become a part of the Water Toolbox community

- Become a Federal Support Toolbox partner
- Stay informed about the latest headline news and upcoming events
- Join in the discussion forums

WATER RESOURCES MANAGEMENT

Effective water resources management depends on acquiring deep knowledge and astute skills

- Search the list of legislative resources
- Locate specific policies and guidance
- Review best management practices
- View the list of agencies

Water and energy studies

From Open Energy Information

Author	Year	Title	Exter	Topic
UC Berkeley/M. Kiparsky	2013	Regulation of Hydraulic Fracturing in California: A Wastewater and Water Quality Perspective	Report	Hydraulic fracturing
EPRI/Revis James,R. Breckenridge	2013	Water Management Technology (P185) Program Overview	Program overvie	Water management, el power plants
IEA/Coal Industry Advisory Board	2013	21st Century Coal: Advanced Technology and Global Energy Solution	Report	Coal energy water use
CRS/K. Bracmort	2013	Hydropower: Federal and Nonfederal Investment	R42579	Hydropower
ANL/C. Harto	2013	Geothermal Energy: The Energy-Water Nexus	38th Workshop Engineering	Water intensity of ener
U. Alberta/Evan G.R. Davies	2013	An integrated assessment of global and regional water demands for electricity generation to 2095	ADVANCES IN W (2013)	Energy intensity of wat water intensity of ener planning
CPUC/R. White	2013	Rethinking the Water Energy Nexus: Moving toward Portfolio Management of the Nexus	Report	Energy intensity of wat water intensity of ener planning
Carbon Disclosure Project	2012	Collective responses to rising water challenges	Report	Energy intensity of wat water intensity of ener planning
Pacific Institute	2012	Hydraulic Fracturing and Water Resources: Separating the Frack from the Fiction	Report	Hydraulic fracturing
PNNL/R. Skaggs	2012	Climate and Energy-Water-Land System Interactions: Technical Report to the U.S. Department of Energy in Support of the National Climate Assessment	PNNL-21185	Planning
AGU	2012	Water-Energy Nexus: Solutions to Meet a Growing Demand	Report	Water intensity of ener energy intensity of wat

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