



# WATER MANAGEMENT R&D





Water Management R&D aims to reduce the amount of freshwater used by power plants and minimize the potential impacts of plant operations on water quality.

The vision for this program is to develop a 21st century America that can count on abundant, sustainable fossil energy and water resources to achieve the flexibility, efficiency, reliability, and environmental quality essential for continued security and economic health.

The Water Management program addresses the competing needs for water consumption through research in three dynamic platforms:

- **INCREASING WATER EFFICIENCY AND REUSE**
- **TREATING ALTERNATIVE SOURCES OF WATER**
- **ENERGY WATER ANALYSIS**

Thermoelectric power generation accounts for more than 40 % of freshwater withdrawals (143 billion gallons of water per day) and more than 3 % of freshwater consumption (4 billion gallons per day) in the United States. As the cost associated with water consumption increases, so will the cost of water treatment, recovery, and reuse.

### **INCREASING WATER EFFICIENCY AND REUSE**

There is an inextricable link between water and energy, it is increasingly important to use water effectively through the power generation sector. This area aims to advance concepts for both new, and existing plants to minimize water intake and use. Examining plant cycles and testing new efficient processes, not only can reduce water intake, but also lower overall operating costs.

### **TREATING ALTERNATIVE SOURCES OF WATER**

Identifying and treating alternative sources of water, such as brackish, and effluent streams, offers opportunities for scientists to address energy-water system challenges. This area focuses on furthering technology to utilize alternative water sources that span multiple facets of R&D including considerations of capital costs, operating costs, and system integration.

### **ENERGY WATER ANALYSIS**

The complex relationship between energy and water is constantly developing. The multiple components that impact the system can be modeled and analyzed to better inform decision-makers, and scientists alike. This area helps prioritize research objectives through analyses of the behavior of the water-energy system.

**The program leads a critical, national effort directed at removing barriers to sustainable, efficient, water and energy use; developing technology solutions; and enhancing the understanding of the intimate relationship between energy and water resources.**

## **WATER MANAGEMENT R&D IMPACTS THE WATER-ENERGY NEXUS AND PROVIDES NEW TECHNOLOGIES FOR EFFICIENT ENERGY PRODUCTION IN THE FOLLOWING WAYS:**

- Develops cost effective technology solutions to maintain and enhance plant efficiency while utilizing power plant discharges
- Reduces water consumption due to evaporative losses, and improved power plant conceptual designs
- Increases water availability via new water treatment technologies that economically derive clean water from alternative sources
- Data modeling and advanced analytics is being employed to examine existing water availability data on a regional basis



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