



# Water Resource Management, Efficiency, and Conservation



ICF International offers a wide range of engineering, policy, and financial services relating to water resources:

- Water Conservation
- Strategic Planning
- Voluntary Programs
- Product Evaluation

ICF International provides water resource management consulting services on a broad range of issues. Our multidisciplinary team is composed of experts in key fields including engineering, hydrology, finance, marketing, operations, and environmental management. ICF works with public and private sector clients to develop cutting-edge solutions to improve the management of valuable water resources. The innovative nature of our technical solutions enables our clients to save water and use it efficiently.

## Featured Solutions

### Water and Energy Efficient Products

ICF conducted market research to determine the potential for ENERGY STAR® labeling for the U.S. Environmental Protection Agency's (EPA) ENERGY STAR new product specification development efforts. We developed scoping reports for the following product categories that use water and energy to operate: autoclaves/sterilizers, commercial clothes washers and dishwashers, ice makers, low-flow showerheads, pre-rinse spray valves, soft-serve machines, and spa/pool pumps. Based on our findings, EPA pursued two product categories, commercial dishwashers and pre-rinse spray valves, and we conducted additional in-depth market and engineering analyses to determine the feasibility of introducing ENERGY STAR into these markets. Our additional research led to the development of a draft ENERGY STAR specification for pre-rinse spray valves. Our support of the specification development process included compiling, reviewing, and summarizing stakeholder comments; writing and revising partner and technical requirements; conducting stakeholder meetings and one-on-one manufacturer discussions; and performing additional product testing.

### Growth Patterns and Water Demand

ICF's research for the EPA found that large-lot, dispersed development patterns cost more to serve and use more water. The ICF/EPA report, *Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies*, concluded with policy options for states, localities, and utilities to reduce the cost of, and demand for, water. These policies offer opportunities for more efficient water

use at a time when an increasing number of communities face water shortages. The full report is available on ICF's Web site at [www.icfi.com/Markets/Environment/water-resources](http://www.icfi.com/Markets/Environment/water-resources).

### Reducing Water Use in Industry

ICF supported EPA's Sector Strategies Division in developing tools for planning and implementing water use reduction and other environmental performance improvements to support EPA's National Environmental Performance Track. Performance Track provides national recognition and regulatory incentives for environmental performance excellence. Our staff provided technical leadership in developing cost-benefit analyses of water use reduction objectives, gathering "best" management practices, creating action plans to achieve reductions, developing monitoring and measurement approaches, and making resource conservation part of overall operations. ICF defined measurable goals and developed schedules for industry-specific tools and management systems elements. Our staff led workshops to gather input from member companies and conducted training sessions that facilitated sharing examples among pilot facilities. We provided technical reviews of products and conducted crucial on-site visits to help facilities implement effective, sustainable management systems. Industry uses our findings to guide environmental performance improvements.

## Impact of Climate Change and Variability on Water Resources

ICF supported the EPA by:

- analyzing the impact of sea level rise on ground water supplied drinking water systems in Florida
- estimating the impact of climate change on wastewater treatment costs for publicly owned treatment works in the Great Lakes region
- developing a prototype model to analyze the effects of climate change and variability on the effectiveness of riparian strips
- developing a synthesis paper on technical and stakeholder issues in watersheds
- analyzing the potential impact of climate change on combined sewer overflows (CSO) and their effect on implementation of the CSO policy in the Great Lakes and New England regions

We developed a screening tool to identify public water supplies vulnerable to sea level rise, and analyzed potential climate change impact in terms of hydrologic effects (lower low-flows, such as those used as benchmarks for the total maximum daily load program and higher high-flow events, such as those that result in CSO and high non-point source pollutant loadings). ICF is continuing to support the EPA in developing decision tools for adapting to climate change by:

- evaluating the climate change adaptation benefits of proposed smart growth Leadership in Energy and Environmental Design—Neighborhood Development credits from a water resources and aquatic ecosystem perspective
- conducting a climate-sensitive decision assessment of regional and national EPA programs for the Global Change Research Program

EPA's goal is to enable stakeholders to use the results of our analyses to promote adaptive planning and decision-making.

## Cleaner Production for Industrial Efficiency (CPIE) Program

For the government of Thailand, ICF implemented the CPIE program, a voluntary initiative aimed at reducing industrial water use, wastewater discharge, and energy consumption by a target of 20 percent among participating industries. The program promotes the adoption of cleaner production practices for

industries in the Samut Prakarn province. ICF collaborated with local partners on pollution prevention, training, pilot programs, and policy analyses. Participants reduced their water consumption and wastewater generation by approximately 528 million gallons per year. Participating facilities gained widespread recognition as supporters of an innovative initiative to improve the quality of life for the Samut Prakarn people.

## Water and Sustainability for the 21st Century

For the Electric Power Research Institute, ICF conducted a study to address a key question: "Will there be sufficient electricity available to satisfy North America's need for fresh water?" We estimated unit electricity requirements for water supply and wastewater treatment and used these estimates in conjunction with projections of water consumption requirements for various economic sectors to develop aggregate electricity requirements from 2000 until 2020. Our analysis included several sectors: public water supply agencies; publicly owned and privately operated wastewater treatment facilities; and self-supply of water to the domestic, commercial, industrial, mining, irrigation, livestock, and power generation sectors. ICF identified issues regarding changes in unit electricity consumption (e.g., increased energy use for pumping due to lower water tables in some areas, more stringent regulatory requirements for wastewater treatment) and aggregate electricity requirements for each sector and assessed their impact on projections. Our findings indicated that electricity requirements for water supply and treatment will remain at less than five percent of the total national demand for electricity over the study period.

## Identifying the Linkage Between Energy and Water

ICF examined the links between water and energy in the United States to identify opportunities to improve efficiency in the use of both resources. Our staff addressed:

- water withdrawal and consumption in the United States
- the energy intensity of community water supplies and wastewater treatment
- the use of water in electricity production
- consumer and commercial products and processes that use both water and energy

ICF evaluated program options for promoting energy and water savings together.

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## About ICF International

ICF International (NASDAQ: ICFI) partners with government and commercial clients to deliver consulting services and technology solutions in the energy, climate change, environment, transportation, social programs, health, defense, and emergency management markets. The firm combines passion for its work with industry expertise and innovative analytics to produce compelling results throughout the entire program life cycle, from analysis and design through implementation and improvement. Since 1969, ICF has been serving government at all levels, major corporations, and multilateral institutions. More than 2,500 employees serve these clients worldwide. ICF's Web site is [www.icfi.com](http://www.icfi.com).

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