



## **WaterSense: Every Drop Counts**

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### **The Value of Water Efficiency**

Approximately 75 percent of the Earth's surface is covered with water, but less than 1 percent of that is available for human use. In the United States, our growing population is putting stress on our available water supplies, and water resource protection has become a national priority. There are many markets in the United States that already face water shortages, and the number of markets facing this issue is projected to grow in the future. A Government Accountability Office survey of water managers across the country showed that 36 states anticipate local, regional or statewide water shortages by 2013, even under non-drought conditions. In addition to water shortages, water supply infrastructure is also a growing concern. In 2002, an EPA report identified a \$224 billion gap in planned infrastructure investment as compared to needs. Water efficiency is one key way that local communities can help manage their infrastructure needs.

Using water more efficiently helps preserve water supplies for future generations, saves money, and reduces stress on water systems and the environment. Governments, utilities, manufacturers, businesses, communities, and individual consumers across the country can help protect our limited water resources by promoting the purchase of water-efficient products and adopting water-efficient practices.

WaterSense, a U.S. Environmental Protection Agency (EPA) voluntary partnership program, seeks to promote water efficiency and enhance the market for water-efficient products and services. The vision of WaterSense is to create an ethic of water efficiency by helping Americans make decisions about water and the environment. On a fundamental level, the goal of WaterSense is to decrease indoor and outdoor non-agricultural water use by making these products and services the clear and preferred choice. In addition to helping consumers identify water-efficient products and services, the program ensures product performance and encourages innovation in manufacturing.

## **How the Program Works**

WaterSense is building the national brand for water efficiency, a symbol that represents the importance of protecting water resources in the United States. Products that are independently tested to meet EPA specifications will be able to bear the WaterSense label, currently under development. This label will help consumers identify products and services that use less water than their less efficient counterparts. Generally speaking, WaterSense labeled products will be about 20 percent more water-efficient than the average product in the same category. To ensure product performance, testing protocols are included to determine whether products perform their intended function as well as, or better than, their counterparts.

## **Program Partners**

WaterSense also provides technical information and recognizes leadership in water efficiency through formal partnership agreements with program partners. Manufacturers committed to water efficiency and product innovation can differentiate their products from others in the marketplace, build consumer demand, and gain national recognition for their high-efficiency, high performance products by using the WaterSense label. Utilities will help promote the WaterSense Program through public awareness campaigns to attain local water conservation goals. Retailers and distributors will stock and promote certified water-efficient products.

Other program partners will include local, state, and federal governments; service providers; businesses; contractors; and trade associations committed to conserving water. EPA will work continuously to build brand awareness across a wide range of industrial, commercial, and consumer sectors through extensive outreach and education initiatives.

## **Indoor Water Use**

Americans use significant quantities of water inside their homes. The average family of four uses 400 gallons of water every day, and, on average, approximately 70 percent of that water is used indoors.

The bathroom is the largest consumer of indoor water. The toilet alone can use 26 percent of household water. Almost every activity or daily routine that happens in the home bathroom uses a large quantity of water. For example:

- Older toilets use between 3.5 and 7 gallons of water per flush. However, new high-efficiency toilets require 75 to 80 percent less water.
- A leaky toilet can waste about 200 gallons of water every day.
- A bathroom faucet generally runs at 2 gallons of water per minute. By turning off the tap while brushing your teeth and shaving, a person can save more than 500 gallons of water per month.

### *Plumbing fixtures*

WaterSense is currently in the process of developing specifications for labeling high-efficiency toilets (HETs) and residential faucet accessories. Toilets that bear the WaterSense label will use less than 1.3 gallons per flush and undergo independent performance testing. Specifications for HETs are expected to be final within the year. Shortly following will be specifications for residential faucets.

### **Landscape Irrigation**

Commercial and residential outdoor water use in the United States accounts for more than seven billion gallons of water each day, mainly for landscape irrigation (Vickers 2001). As much as half of that is wasted due to evaporation, wind, or improper irrigation design, installation, maintenance, and scheduling (The Saving Water Partnership 2003). An efficient irrigation system requires not only water-efficient products, but also proper design, installation, and maintenance. To address these issues and improve water efficiency in the landscape, WaterSense is labeling both the professional service side and the product side of landscape irrigation.

### *Certification Programs*

Currently, WaterSense is in the process of labeling certification programs for irrigation professionals that advance the principles and applications of water-efficient irrigation. Programs that earn the WaterSense label must meet several criteria to ensure rigorous testing and certification processes that accurately assess professional knowledge in designing, installing and maintaining, or auditing water-efficient irrigation systems. To qualify for labeling, certification programs must include an experiential requirement, have a renewal requirement, evaluate proficiency through examinations, and be subject to independent oversight. Specifications are expected to be released in the fall of 2006.

The initial categories available for WaterSense labeling are:

- *Irrigation Auditor*: Applies to programs that certify irrigation professionals who assess the proper functioning of existing irrigation systems, perform water audits, and recommend watering schedules;
- *Irrigation Installation and Maintenance Professional*: Applies to programs that certify irrigation professionals who install new irrigation systems and/or repair and maintain existing irrigation systems; and
- *Irrigation Designer*: Applies to programs that certify irrigation professionals who develop the design of new irrigation systems and/or modifications to existing irrigation systems.

## *Products*

WaterSense is also conducting research on multiple water-efficient irrigation technologies. The first product categories for labeling will be weather-based irrigation control technology and soil moisture sensors.

Weather-based irrigation control technology uses local weather and landscape conditions to tailor irrigation schedules to actual conditions on the site or historical weather data. Instead of irrigating according to a pre-set schedule, advanced irrigation controllers allow irrigation to more closely match the water requirements of plants.

Soil moisture sensors increase the water efficiency of irrigation systems by allowing them to operate only when irrigation is actually needed. Soil moisture sensors are placed beneath the soil surface at a specified depth to measure the amount of moisture in the soil. When the moisture level drops below a predetermined level, the controller is allowed to operate, watering your plants. Soil moisture sensors can be programmed for individual needs and can be fitted to most electronic automatic controllers.

These new control technologies offer significant potential to improve irrigation practices in homes, businesses, parks, and schools across the United States.

### **Water Use in New Homes**

While water managers are aware of the benefits of water efficiency programs, they need more information on water use patterns in new homes to help develop these programs.

For example,

- Do new homes use more or less water than existing homes?
- If there is a difference between new home and existing home water use, is it because of inherent differences in the efficiencies with which water is used, or simply because the new homes are different in size or the number of residents?
- Is it possible to use advanced technologies in new homes in order to reduce water demand?

To answer these questions and provide an empirical basis for understanding water use in the 14 million new homes that will likely be built nationally in the next 10 years, the EPA has funded a grant project that will collect data from several large water utilities across the United States. Water Efficiency Benchmarking for New Single Family Homes is a nine-city research study funded by EPA to establish baseline indoor and outdoor water use patterns for new homes by collecting empirical data from billing records, surveys, and indirect measurements.

The project will also demonstrate how the use of advanced technologies can reduce new home water use compared to homes with traditional water-using equipment. The study will investigate relationships between household indoor water use and key variables such

as number of residents, size of home, and types of fixtures and appliances present. Outdoor water use will be quantified from total annual use, rates of application, local plant water requirements, lot size, landscape design, and type of irrigation system controller.

The study will look at “standard” new homes and “high-efficiency” new homes built to enhance water conservation. This will assist with establishment of targets for builders who wish to provide buyers with increased water efficiency options, develop specific performance criteria, and create a special designation to help consumers identify them. The study results can also enhance the efforts of states and water utilities to establish performance criteria for water use in new homes.

EPA awarded a \$350,000 grant to the Salt Lake City Water Department to coordinate the multi-city study. Each of nine study water utilities will contribute \$20,000, for a total project budget of \$530,000. EPA anticipates the study being completed in December 2008.

### **Next Steps**

WaterSense will continue to promote water efficiency throughout the country, aiming to change how Americans think about water. Specifications will continue to be developed for new products and services, followed by consumer education and outreach aiming to change the nation’s water ethic. In addition to the program’s focus on irrigation in the landscape, WaterSense also plans to focus on other aspects of residential landscaping, such as water-efficient landscape design, water-efficient plant palettes, and landscape professional certification programs.

### **References**

American Water Works Research Foundation. 1999. Residential End Uses of Water.

Government Accountability Office. 2003. Freshwater Supply: States' View of How Federal Agencies Could Help Them Meet the Challenges of Expected Shortages.

The Saving Water Partnership. 2003. Water Efficient Irrigation Study: Final Report.

U.S. Environmental Protection Agency. 2002. The Clean Water and Drinking Water Infrastructure Gap Analysis.

Vickers, Amy. Handbook of Water Use and Conservation. Waterplow Press, Amherst MA. 2001.