

WATER CONSERVATION

A Two-Minute Briefing on Key Business Environmental Issues

The Big Picture

Less than 3% of the water on Earth is fresh; much of that is unreachable in glaciers, icecaps, or deep in the earth. Depletion of these dwindling water supplies degrades the natural environment and can necessitate costly and habitat-destroying water projects. Water conservation practices, such as efficient appliances and fixtures, behavioral changes, and changes in irrigation practices, can reduce water consumption by as much as a third.

Context

Fresh water is a finite resource and requires care, from the corporate bathroom to the front lawn sprinkler to the washing system on the assembly line. Problems associated with decreased water supply include:

- Pollution from runoff from overirrigation of agricultural and urban lands.
- Additional dams and reservoirs and additional water and wastewater treatment facilities.
- Habitat degradation from surface water withdrawals.
- Destruction of wetlands, which filter pollutants.
- Increased energy needed to treat wastewater and byproducts from power plants.

Getting Down to Business

Many firms have implemented general water-saving devices and practices, such as low-flow toilets, encouraging employees to turn off the water while washing hands, and creating water-saving landscaping. Specific industries (service businesses and some manufacturers) find ways to use less water, reuse wastewater, or revamp water-intensive processes, such as cooling systems. Examples include:

- **Gangi Brothers Packing Co.**, a tomato

processing and canning plant in Santa Clara, Calif., implemented several water conservation practices, including monitoring operations to control water use and identify areas where water could be saved. In 1983, Gangi Brothers used approximately 148 billion gallons of water during the canning season. By 1989 water use at the facility had dropped to 56.8 billion gallons, resulting in a savings of 91.4 billion gallons per season. Combined estimated capital and operating costs for water conservation at Gangi Brothers are approximately \$89,500 per year. The estimated savings from lower sewer and water costs is \$130,000 per year, so the net savings resulting from the implementation of water conservation practices at the cannery is approximately \$40,500 per year (1990 dollars).

- **Pacific Power and Light Co.'s** Wyodak Generating Station in Wyoming uses dry cooling to eliminate water losses from cooling-water blowdown, evaporation, and drift. The station was equipped with an air-cooled condenser — steam from the turbine is distributed through overhead pipes to carbon steel tubes leading to circulating fans. The fans force 45 million cubic feet per minute of air through the tubes, condensing the steam. This reduced water use from about 4,000 gallons per minute to about 300 gallons per minute.

Key Players

- **State and local governments** increasingly are offering incentives to help companies adopt water-saving techniques and technologies.
- **Water utilities** are offering help to companies to conserve water, including providing grants and loans to help industrial and commercial customers pay for water-saving technology.
- **Market-making water brokers** are developing new kinds of business opportunities, such as

competitive bidding, in which consumption levels are set by suppliers and customers bid for a chance to meet them by implementing cost-effective water-efficiency techniques.

The Upside

Water-efficiency measures can reduce water and sewer costs by up to 30%. Significant savings in energy, chemical and maintenance expenses are also possible. The typical payback period is three to seven years. Benefits of water conservation include:

- **Energy savings** by using less energy for heating, pumping, and treating water.
- **Financial savings**, particularly if the firm is on an actual-usage meter, will result from decreased water use.
- **Less wastewater**, resulting from reduced water usage, thereby cutting sewer service costs. In some areas, wastewater utilities offer financial incentives for reduced wastewater output.
- **Other environmental benefits** include increased water available to local streams, wetlands, and their natural inhabitants and fewer water projects.
- **Positive publicity** stemming from environmental protection efforts.

Reality Check

Changing water-use practices requires employee education, but requires little financial investment. Changes to infrastructure, manufacturing process, landscaping and irrigation, and other engineering changes may require an initial capital investment. They also may require time spent researching appropriate measures.

Action plan

Because water use varies widely among companies and sectors, water-conservation techniques are similarly diverse. Water reuse and recycling require following local regulations and are most relevant to industries that generate large quantities of wastewater or to a business using large amounts of water for irrigation.

General steps:

- Educate employees on water conservation measures, such as turning off water while washing hands and dishes.
- Install signs that encourage water conservation in restrooms or work areas where water is used.
- Install efficient showerheads, faucet aerators in sinks, and low-flow toilets.
- Seek employee suggestions of water conservation ideas.
- Monitor and meter the water system to determine the largest water consumption areas; monitoring also can help detect leaks in water systems (this step is more relevant to industrial water users).

Irrigation/landscaping

- Plant native plants adapted to the local climate and rainfall.
- Use mulch around plants and trees to retain moisture.
- Minimize turf grass.
- Use drip and other low-flow irrigation devices.
- Incorporate electronic controllers with precise individual timing, multiple irrigation zones, multiple cycles, and attach rain shut-off devices.
- Use Xeriscaping, an innovative approach to landscaping that combines planning and design, soil analysis, selection of suitable plants, practical

turf areas, efficient irrigation, use of mulches, and appropriate maintenance in landscaping.

Cooling water recirculation

- Use the same water to perform several cooling operations. Three cooling water conservation approaches that can be used to reduce water use are evaporative cooling, ozonation, and air heat exchange.

Water Reuse

- Reuse wastewater or reclaimed water for other industrial uses, landscape irrigation, agricultural irrigation, aesthetic uses such as fountains, and fire protection.
- Recycle water for the same application for which it was originally used.
- Collect rainwater or irrigation runoff for reuse, called water harvesting.

Rinsing

- Use deionized water to rinse products for contaminant removal.
- Eliminate some plenum flushes (a rinsing procedure that discharges deionized water from the rim of a flowing bath to remove contaminants from the sides and bottom of the bath).
- Convert from a continuous-flow to an intermittent-flow system.
- Improve control of the use of deionized water.

Leads

- **U.S. Environmental Protection Agency** **WAVE** program (U.S. EPA, 401 M St. SW (4204), Washington, DC 20460; 202-260-7288; 202-260-1827 (fax); <http://www.epa.gov/owm/faqw.htm>) is a nonregulatory water-efficiency partnership that

encourages commercial businesses and institutions to reduce water consumption while increasing efficiency, profitability, and competitiveness. New members sign a Memorandum of Understanding, agreeing to survey water-using equipment, and where profitable, install water-efficient upgrades.

- **Waterwiser Web site** (<http://www.waterwiser.org>) lists providers of water conservation products and services in a searchable database.
- **Forty-nine tips for saving water in the home** (<http://www.americanwater.com/49ways.htm>) also can be applied to office settings.
- **Cleaner Water Through Conservation** (<http://www.epa.gov/ow/you/intro.html>) is a U.S. Environmental Protection Agency document that provides an overview of water conservation and provides action steps.
- **Business for Social Responsibility** (<http://www.bsr.org/resourcecenter>) has an online resource publication on water conservation.

Bottom Line

As water use and allocation becomes a topic of growing concern around the world, companies will be required to pay greater scrutiny to the ways water is used within their operations. Fortunately, there is a great deal of information and experience in reducing water use in a cost-efficient manner. As a result, water-conserving businesses enjoy more than environmental benefits. They also enjoy the cost-saving efficiencies of a well-run operation.