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Making Every Drop Work:

Increasing Water Efficiency in California's Commercial, Industrial, and Institutional (CII) Sector

The full issue paper on the benefits of increasing water efficiency in the CII sector will be available in the spring of 2009 at www.nrdc.org/policy

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The Metropolitan Water District of Southern California offers a regional water-efficiency incentive program that provides commercial, industrial, and institutional customers a "one-stop-shop" for rebates. The program, operated in partnership with local energy utilities, offers rebates on common technologies such as ice machines, washing machines, pre-rinse spray valves, food steamers, and more. And for customers who adapt industrial processes, Metropolitan offers a Measured Water Savings Program that pays them \$195 for every acre-foot of water saved.

Reliable and adequate access to water is critical for businesses and their surrounding communities. Across the nation, water shortages are triggering growing concern and an acceleration of efforts to increase water use efficiency. Adopting water-efficient technologies and practices that reduce consumption holds great potential for commercial, industrial, and institutional (CII) water users.¹ NRDC recommends a number of available and cost-effective measures that can help stretch limited water supplies, save businesses money, reduce energy consumption, improve water quality, and protect local, regional, and statewide ecosystems.



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CII Water Users Among California's Thirstiest

In California, CII sector water use is estimated to be 2.5 million acre-feet per year—or approximately one-third of total water use in California's urban areas.² The biggest water consumers in California's commercial and institutional sectors include office buildings, golf courses, and schools. California's top industrial water users are oil refineries, food processing facilities, and high tech manufacturers.³

Increasing CII Water Efficiency is Cost Effective

Water use efficiency refers to practices, products, or systems that use less water without sacrificing performance. While great strides have been made to increase water efficiency in the residential sector during the last decade, implementing similar measures in the CII sector has lagged. Fortunately, there are numerous cost-effective strategies that can be applied to achieve significant water savings in the CII sector. Estimates indicate that this potential ranges between 710,000 acre-feet per year and 1.3 million acre-feet per year.⁴

Many water agencies are working to help CII customers reduce water use through programs that provide free water audits, equipment and technology rebates, and in some cases, free water-efficient products and installation. In doing so, agencies are able to reduce demand on existing water and energy supplies and meet long-term water reliability goals.

The benefits to businesses of improving water use efficiency include:

- lower water bills;
- reduced wastewater charges;
- lower energy costs; and
- reduced costs for chemicals and water purification.

Increasing Water Efficiency Brings Win-Win Benefits

Conserving water through greater efficiency in the CII sector can have a tremendous impact on overall water consumption and deliver a range of economic and environmental benefits.

Lowering the Cost of Business

Businesses can save money by investing in water efficiency measures and technologies—and can often receive funding from public agencies or utilities to help with initial capital costs. The average estimated payback period for investing in water-efficient technologies in the CII sector is between one and four years, with a typical time of less than two and a half years.⁶ Some investments have a payback period of less than one year when avoided wastewater and energy costs are taken into account.

Extending Limited Water Supplies

Water use efficiency will help stretch limited supplies, which is particularly important during droughts. Nationwide, 36 states have or are likely to experience local, regional, or statewide water shortages in the next five years.⁷ California is currently in the third year of a drought and facing the challenges of a growing population and increasingly unpredictable precipitation.

Saving Energy

It takes large amounts of energy to extract, treat, and deliver water—and yet more energy to use, collect, and dispose of it. Water use efficiency in the CII sector and the use of recycled water can generate significant energy savings, which reduces pressure on the power grid. The California Energy Commission (CEC) estimates that almost 20 percent of California's electricity use and more than 30 percent of non-power plant natural gas use is related to the use of water.⁸

Recycling Water Into a Nearly Drought-Proof Supply

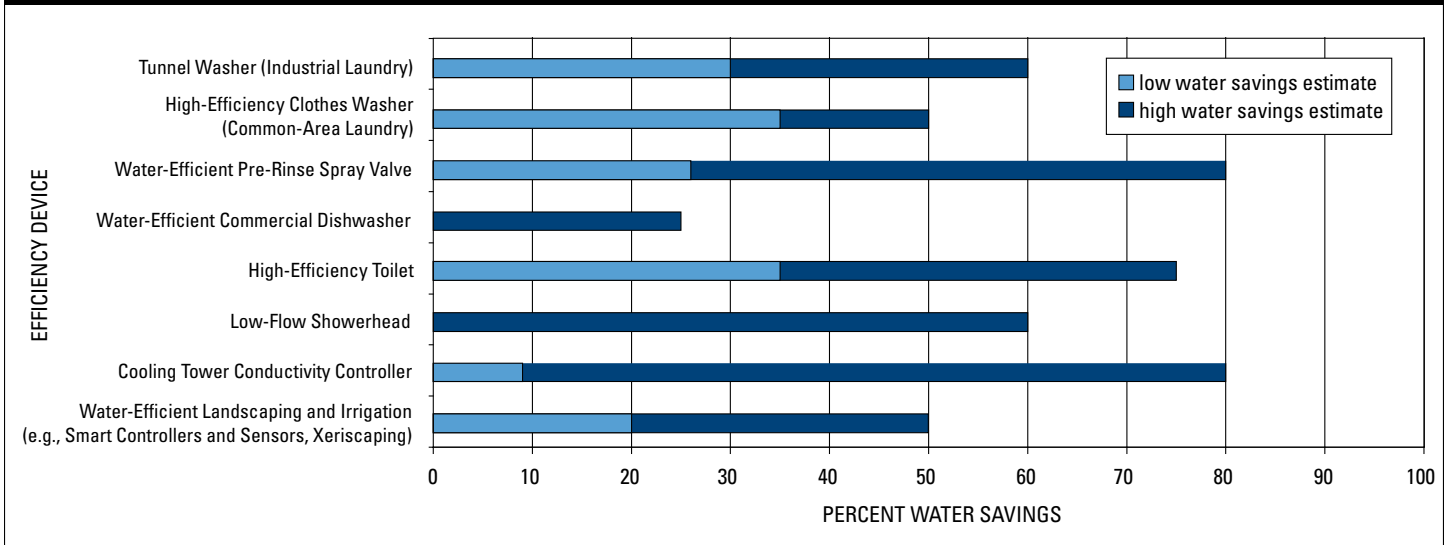
Serving the communities of Antioch, Bay Point, and Pittsburg, the Delta Diablo Sanitation District (Delta Diablo) is in the heart of the Sacramento-San Joaquin Delta—an area that provides 25 million Californians with a portion of their drinking water. The sanitation district processes and treats wastewater for tens of thousands of residents and businesses.

In 2000, Delta Diablo completed a treatment plant to produce recycled water, primarily to serve two major power plants—Delta Energy Center and Los Medanos. The treatment plant now produces 12 million gallons of recycled water per day and more than 8,600 acre-feet per year—enough water for more than 17,000 families in California.



A water recycling facility at the Delta Diablo Sanitation District.

Potential Savings from Implementing Select Water Efficient Technologies



Reducing Global Warming Pollution

Most energy production generates greenhouse gases. Reducing water use, especially hot water use, will reduce energy needs and therefore also reduce global warming pollution. The Santa Clara Valley Water District (SCVWD) showed a reduction of more than 14,000 metric tons of carbon dioxide since 2003 just by replacing pre-rinse spray valves in commercial food service operations.⁹

Adapting to the Effects of Global Warming

Increasing water efficiency in the CII sector will help businesses withstand drought and the effects of climate change. Investing in water conservation and efficiency provides businesses with more flexibility to weather these climatic uncertainties.

Restoring Fisheries and Other Ecosystems

Reducing water use in the CII sector will relieve pressure on over-tapped rivers. Using less potable water from our river system could support the recovery of the Sacramento-San Joaquin Delta ecosystem and its imperiled salmon fisheries—a \$250 million industry in California that was shut down in April 2008 due to dwindling Chinook populations.

Improving Water Quality

Improving landscape water use efficiency in the CII sector can reduce urban runoff and the flow of lawn and garden chemicals and fertilizers into bays, rivers, and streams. Use of on-site recycling also reduces the volume of wastewater discharges—including regulated pollutants and other materials—that would otherwise be sent to wastewater treatment facilities. In addition, water use efficiency can stretch limited state and federal funds available for water and wastewater treatment upgrades by enabling communities to delay or reduce the size of system expansions.

Innovation at the Vineyard

Since 1999, Fetzer Vineyard has worked hard to be water conscious in their operations. While the wine industry on average uses eight gallons of water to produce each gallon of wine, Fetzer's water-saving strategies have reduced their consumption to just 2.1 gallons for every gallon of wine and their total water usage by 24 percent (8 million gallons) annually. Water meters are located throughout the Mendocino County vineyard and are read weekly to determine where water is used and where it can be saved. As a result, the business is able to find and repair leaks more easily. They also use aeration ponds to treat their own wastewater, which is reused to irrigate the organic grapes and landscaping.⁵



Fetzer Vineyards uses recycled wastewater for irrigation.

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Recommendations for Improving CII Water Efficiency

While some progress has been made during the last decade to improve water efficiency in the CII sector—from schools, to hotels, to microchip manufacturers—there remains tremendous potential for improvement. NRDC makes the following recommendations:

■ Establish efficiency standards for water-using products.

The California Energy Commission (CEC) should establish such standards for buildings, appliances, and landscape irrigation equipment to accelerate market transformation and increase availability of water-efficient products.

■ **Set performance-based water savings targets that provide water agencies with flexibility.** The State of California should establish a savings target and allow agencies to choose the measures most appropriate for their region in order to reach established targets. A 20 percent target appears to be well within the range of cost-effective savings.

■ **Prioritize water conservation above increasing supply.** The State of California should codify the requirement that efficiency improvements precede supply side resources—as it did in the energy sector—to motivate investment in water efficiency and recycling by agencies who might otherwise be awaiting development of traditional water supplies.

■ Adopt a Public Goods Charge on water sales to provide a dedicated funding source for water efficiency programs, including expanded technical and financial assistance.

A dedicated funding source, based on a small additional charge for each gallon of water delivered, could provide a reliable source of funds for water efficiency and recycling programs.

■ **Encourage partnerships with—and financial support from—energy utilities and wastewater agencies.** Such partnerships reflect the multiple benefits of water efficiency and could help direct additional resources to efficiency programs. In addition, integrated energy and water audits save customers the time and may uncover efficiency measures that would not be cost-effective if water and energy were considered separately. The State of California should consider giving preferential funding for projects involving such partnerships.

Saving Water—and Giving It Back— in the High-Tech Sector

Intel's 1,000-acre campus in Arizona was recently honored by the EPA as a Water Efficiency Leader. Intel designed their processing equipment to use 75 percent less water than the average Intel facility.¹⁰ Instead of using up to 8 million gallons of water per day, the Arizona Plant uses just 2.5 million gallons of water per day. Additionally, Intel constructed a system that treats water used at the Intel plant and then injects it into the local aquifer. Since its inception in 2000, the system has treated and injected more than 3.5 billion gallons of drinking-quality water into the aquifer.¹¹



Intel's Corporate headquarters in Santa Clara, California.

■ **Streamline the process for recycled water use.** The State Water Resources Control Board should adopt a general permit for use of recycled water for landscape irrigation while also ensuring protection of water quality.

■ **Encourage volumetric pricing for sewer services.** Studies show that a 10 percent increase in water price results in a 2 to 3 percent reduction in demand. By increasing the price signal, volumetric rates for sewer service could dramatically reduce demand for water use and disposal.

■ **Decouple water agencies' sales from revenue.** Water agencies should not need to rely on water sales to assure their fiscal stability. Water agencies should instead adopt a structure that allows them to recover additional money from customers if sales are significantly below projections. This revenue adjustment mechanism will enable water agencies to aggressively promote efficiency and maximize the conservation price signal for customers.

■ **Improve water use data collection and management.** The state should implement comprehensive electronic statewide water use reporting and consolidate that information into a shareable central database. The data should be collected with sufficient granularity to help assess efficiency and to identify and target sectors with high potential for improvement.

¹ The CII sector is comprised of commercial water users that provide or distribute a product or a service, industrial water users that are primarily manufacturers or processors of materials, and institutional water users that include all establishments dedicated to public service.

^{2,3,4} Gleick, P. et al., *Waste Not Want Not: The Potential for Urban Water Conservation in California*. (Oakland, CA: Pacific Institute, 2003). p. 77.

⁵ Personal Communication with Ann Thrupp, sustainability specialist at Fetzer Vineyard, January 9, 2009.

⁶ Vickers, Amy, *Handbook of Water Use and Conservation*. (Amherst, Massachusetts: WaterPlow Press, 2001). p.329.

⁷ United States General Accounting Office, "Freshwater Supply: States' Views of How Federal Agencies Could Help Them Meet the Challenges of Expected Shortages," July 2003. Available at: <http://www.gao.gov/new.items/d03514.pdf>

⁸ California Energy Commission, "Water-Related Energy Use in California," available at <http://www.energy.ca.gov/2007publications/CEC-999-2007-008/CEC-999-2007-008.PDF>

⁹ Santa Clara Valley Water District, *From Watts to Water: Climate Change Response through Saving Water, Saving Energy and Reducing Air Pollution*, (Santa Clara, CA: Santa Clara Valley Water District, 2007).

^{10,11} Personal conversation with Tom Cooper, Intel Conservation Manager, November 2008.