

Why should we save water?

A few facts...

Water covers approximately 70% of the Earth's surface but less than 1% of that is available for human use. Across the globe, water consumption by humans has nearly doubled in the last 50 years.

In the last five years, nearly every region of the United States has experienced water shortages. Thirty-six states are anticipating local, regional or statewide water shortages by 2013, even under non-drought conditions.

Industrial, Commercial and Institutional (ICI) water use

Typically the potential water savings from ICI facilities are between 15 and 35%.

A 1997 study of water-use audits conducted in over nine hundred ICI facilities (hotels, restaurants, office and public buildings, schools and hospitals...) estimated the average potential water savings at 29%. Most of the opportunities to reduce water use were related to domestic plumbing fixtures and landscape irrigation.



In terms of cost effectiveness, the greatest water savings were achieved indoors with simple, easy-to-implement water conservation

measures targeting domestic plumbing fixtures - specifically, toilets, urinals, showerheads and faucets.

Residential water use

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 typical family of four spends over \$800 per year on water and sewer charges. Installing high efficiency plumbing fixtures and appliances can help the typical family reduce indoor water use by one-third, saving over \$100 per year on their water and sewer bill.

About 8% of U.S. energy demand is



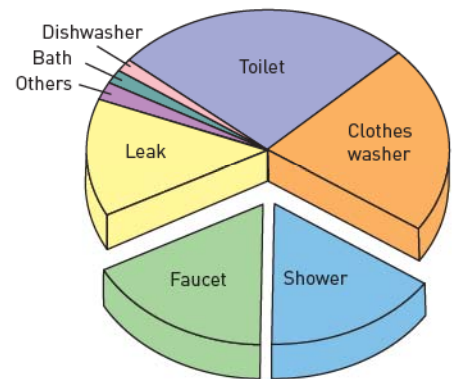
used to treat, pump and heat water. Water heating accounts for 19% of home energy use. The typical family of four spends an average of \$250 per year to heat water. By installing energy and water efficient fixtures and appliances the same family can cut their overall home energy use by as much as 6% and save over \$250 per year in cumulated water, sewer and energy costs.

Nearly 14% of the water the typical homeowner (or building operator) pays for is never used: it leaks down the drain...

Average indoor residential water use...

1	Toilet	26.7%
2	Clothes washer	21.7%
3	Shower	15.9%
4	Faucet	16.7%
5	Leak	13.7%
6	Other domestic	2.2%
7	Bath	1.7%
8	Dishwasher	1.4%

100.00%



Source:

Handbook of Water Use and Conservation by Amy Vickers

...Easiest ways to save water

(lowest cost, simple installation)

- 1 Faucet
- 2 Shower
- 3 Leak
- 4 Clothes washer
- 5 Toilet

Measuring results

Residential applications: single family and multi-family housing

How much water can be saved indoors by an average family of 4 persons? Over 30% water savings can be achieved by installing low flow fixtures throughout the house for an annual saving of over 18,000 gallons (Chart 1).



Applied to an apartment complex of 25 units with an average family size of 4 people, this would lead to over 460,000 gallons of water saved annually! (Chart 2).

Commercial and Industrial buildings

In professional buildings the baseline calculation is adjusted to integrate fixtures such as urinals and to adapt to the different pattern of water use in the workplace.



Using EPAct'92 for the baseline, the calculation reveals a potential of savings of nearly 35% with over 140,000 gallons saved annually (Chart 3).

Older buildings (prior to 1992) or buildings with damaged or vandalized plumbing fittings often have faucets and showers producing flow rates in excess of 6 gpm. The potential for water savings in these older installations can be as high as 70% !

The most effective way to measure the efficiency of a water conservation plan is to start by establishing a baseline calculation of water use for the building.

The first step is to list all water-using fixtures and their frequency-of-use. The baseline may be calculated using EPAct'92 fixture flow rates or earlier data for older buildings. The water conservation calculation draws on the same usage data but applies the lower flow rates of water efficient fixtures.

Chart 1: Residential applications - Single family housing

Fixtures	Frequency of use ¹	Flow rate ²		Water use in gallons ³	
		EPAct'92	Low flow	EPAct'92	Low flow
Toilets	5.1 times ⁵	1.6 gpf	1.0 gpf	32.6	20.4
Faucets	8.1 min ⁵	2.2 gpm	1.5 gpm ⁴	71.3	48.6
Showers	5.3 min ⁵	2.5 gpm	1.75 gpm ⁴	53.0	37.1
Daily Total				156.9	106.1
Yearly Total				57,269.0	38,727.0

Water saving 33%

Chart 2: Residential applications - Multi-family housing

Fixtures	Frequency of use ¹	Flow rate ²		Water use in gallons ⁴	
		EPAct'92	Low flow	EPAct'92	Low flow
Toilets	5.1 times ⁵	1.6 gpf	1.0 gpf	816.0	510.0
Faucets	8.1 min ⁵	2.2 gpm	1.5 gpm ⁴	1782.0	1215.0
Showers	5.3 min ⁵	2.5 gpm	1.75 gpm ⁴	1325.0	927.5
Daily Total				3,923.0	2,652.5
Yearly Total				1,431,895.0	968,163.0

Water saving 32%

Chart 3: Industrial and Commercial applications

Fixtures	Frequency of use ¹	Flow rate ²		Water use in gallons ⁸	
		EPAct'92	Low flow	EPAct'92	Low flow
Men's toilets	1 time ⁵	1.6 gpf	1.0 gpf	80.0	50.0
Men's urinals	2 times ⁵	1.0 gpf	0.5 gpf	100.0	50.0
Women's toilets	3 times ⁵	1.6 gpf	1.0 gpf	240.0	150.0
Lavatory faucets	3 min ⁷	2.2 gpm	1.5 gpm ⁴	660.0	450.0
Kitchen faucets	1 min ⁷	2.2 gpm	1.5 gpm ⁴	220.0	150.0
Showers	5.3 min ⁵	2.5 gpm	1.75 gpm ⁴	331.3	231.9
Daily Total				1,631.3	1081.9
Yearly Total				424,138.0	281,294.0

Water saving 34%

¹ Per day, per person

² gpf = gallons per flush, gpm = gallons per minute

³ Per household of 4 persons (2 adults and 2 children)

⁴ LEED® guidelines for 30% reduction in water consumption

⁵ Source: Handbook of Water Use and Conservation by Amy Vickers

⁶ Per building of 100 persons (25 families of 4 persons)

⁷ Estimated use: lavatory faucets 6 times per day for 30s, sink faucets 2 times per day for 30s

⁸ Based on 100 persons occupying the building: 50 men and 50 women, with an estimated

25 persons taking a shower daily based on 260 annual work days