



The High Energy Costs of NOT Conserving Water

Prepared by Dialectic Inc.

Conserving Energy by Conserving Water? How? Why?

At Dialectic, we are not just mechanical, electrical and plumbing engineers and designers, project managers and accountants. We are also consumers. We are men and women, moms and dads, sisters and brothers, aunts and uncles, and friends. Our common dialect is that we are all passionate about incorporating sustainability into our designs. We feel a responsibility to educate ourselves, our clients and our community for the good of the environment. Sustainability is built into our designs not only for our clients' cost savings but also because we deeply believe in a greener future for our children and grandchildren. We would like to share the "secret sauce" of our design mentality because we know you and your customers are consumers too!

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ENGINEERING

Five Stages of the Potable Water Cycle



Who hasn't heard that we need to conserve water, especially in the more drought-ridden parts of the country like California and Nevada? For all of us, advice like turning off the faucet to conserve water while brushing our teeth is almost as common as being told to turn off the lights to conserve electricity when leaving a room.

We learn very early that water and electricity don't mix. In reality, they share a very close relationship before the water reaches our homes. Almost in a chicken-and-egg scenario, water from a dam can create electricity. And that electricity can then be used to transport and treat that same water to make it safe for drinking and bathing. Although most of us don't think about our water coming from anywhere other than our faucets or showerheads, there are actually five stages of the potable water cycle.

There is an energy cost for each stage of the potable water cycle. By reducing our water usage, we reduce the total amount of energy consumed to complete the cycle.

1. Extraction and conveyance

Water utilities use energy to extract, or pump, water from sources such as rivers, lakes, streams or underground aquifers and convey it to water treatment facilities. There is an energy cost for the extraction, pumping, transporting and storage.

2. Water treatment

At the water treatment plant, water is processed to make it safe for uses such as drinking, cooking and bathing. After treatment, water is pumped to storage for later distribution. There is an energy cost for processing, pumping and storage.

3. Distribution

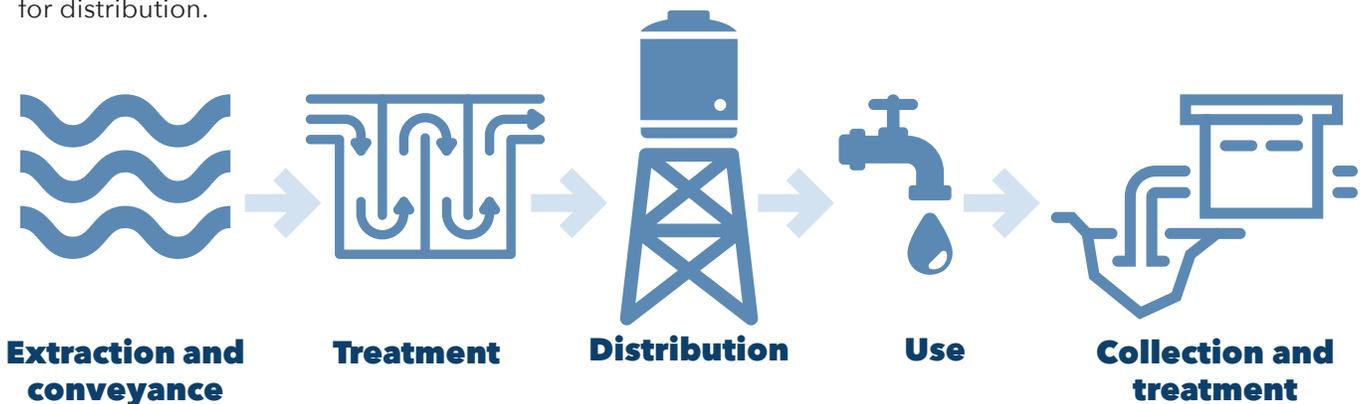
Energy is used to distribute water from storage throughout a municipal water system or to transport it to other locations for use. There is an energy cost for distribution.

4. Consumer use

Commercial and residential consumers use energy to heat and cool water. They use energy to treat water with softeners and filters, convert it to steam and ice as well as circulate and pressurize it. They use energy to pump water to their homes and to irrigate their lawns. There are many energy costs related to consumer usage, especially for industrial or commercial consumers.

5. Collection and treatment

After use, wastewater is collected through sanitary sewer systems and is treated, filtered and aerated before being released back into the environment, such as back to a river. There is an energy cost for building sewer systems, wastewater treatment plants and pumping the water back to the environment again.



By lessening our water usage – we reduce the amount of energy used in the above 5 stages of the cycle.

Simple Ways Consumers Can Save Both Water and Energy



At Dialectic, we constantly think about ways to reduce our water and energy footprint in our designs and in our behaviors and habits as people. We know every time we turn on the tap we are using not only water but energy too. And we understand that small amounts of wasted water and energy can add up over time.

Consider these simple ways consumers can save water and energy every day:

Water torture - Drip. Drip. Drip.



The Drip Calculator developed by the United States Geological Survey (USGS) shows us that one faucet dripping at one drip per minute can waste approximately 34 gallons per year, while 10 drips per minute wastes more than 347 gallons per year. ¹

Step away from that sponge!



Let your high-efficiency dishwasher do its job. Thoroughly rinsing dishes instead of just scraping them before putting them in the dishwasher will save you money – and time.

Stop that toilet!

A continuously running toilet can waste up to 1,000-4,000 gallons of water per day, or up to 535 cubic feet. ²

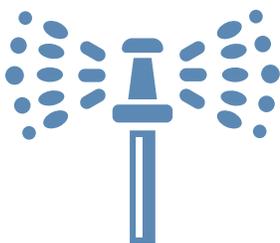


Don't water your driveway

Use a broom instead of the water hose or, worse, a water broom, to sweep your driveway and sidewalks.



The grass is always greener ...



Program your sprinkler system to run in the early morning or late evening rather than in the heat of the day to reduce evaporation. Periodically check for leaks or breaks.

A broken half-inch sprinkler pipe below ground can lose up to 13-16 gallons per minute. ³

Keep the bottle



It should be obvious but the energy cost of producing that disposable water bottle is way more than the cost of the water inside of it. Use a stainless steel or glass water bottle and refill it at home, at work or at the gym. Energy is also used to dispose of empty water bottles.

Give yourself a break

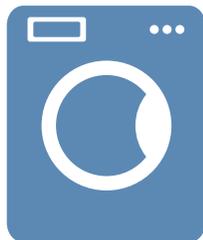


This might be the easiest tip on the list! You may want your lawn to look like a golf course, but by extending the time between mowing

you will allow your grass to grow a deeper root system, thus holding more moisture. And hopefully that moisture came from the last good rain or your rain barrel irrigation system.

Fill it up!

Regardless of full or half full – your dishwasher and clothes washer will use the same amount of water and energy. You aren't saving water or energy by doing a smaller load. Might as well fill it up!



Buy less - Eat more

According to the Natural Resources Defense Council, Americans throw away 40% of our food. That wastes 25% of all the water consumed in the country. This results in energy lost fertilizing, irrigating, storing, producing, packaging and



transporting the food. Consider shopping for perishable foods in smaller quantities, more often. Buying in bulk doesn't save you money if you're buying more than you can use. ⁴

Sing in the shower



ATS EcoSolutions has calculated that taking a bath can use up to 5 times the amount of water a shower uses, depending on tub size. A 10-minute shower uses about 35 gallons and costs about \$2. And it has better acoustics. ⁵

Don't flush that bug

Your toilet isn't a trash can. Catch and release the harmless spider. Those cigarette butts or pet waste can all go in the trash can.



Unleash your inner hipster

Compost food scraps. Feeding them down the garbage disposer wastes water and energy in your home and at the waste-treatment facility. Some facilities send their biosolids to a landfill anyway. Composting is nature's way of recycling. ⁶



Why We Should Conserve Water and Energy

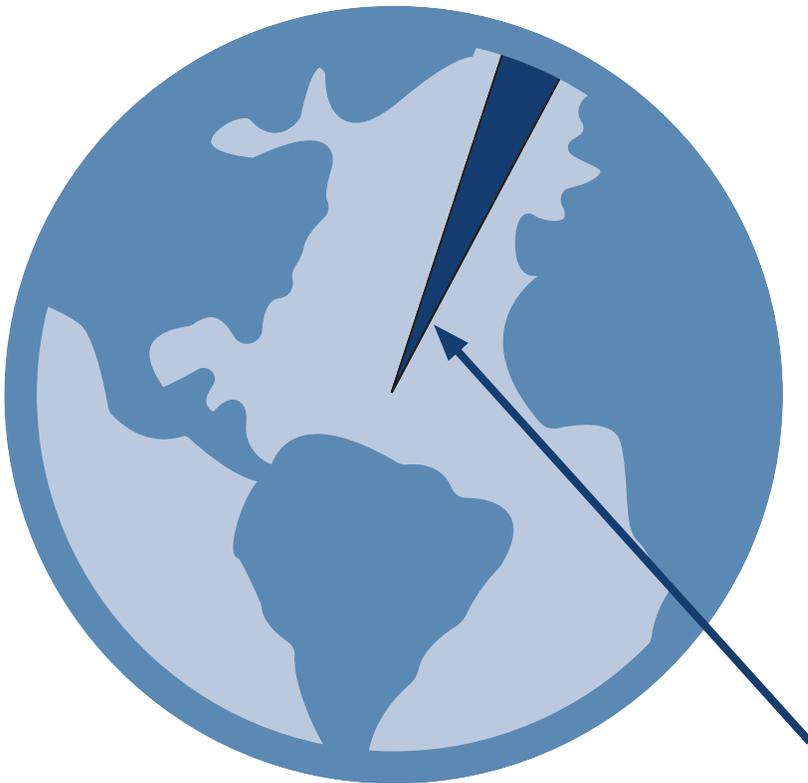


Sure, it feels good to be green. To recycle. To drive a hybrid car. To buy organic and eat clean. We know it's responsible to use low-flow showerheads and drip irrigation rather than running a hose unsupervised. It's trendy to talk about water conservation at a cocktail party and how you only use LED light bulbs at dinner with friends. But more than that, it is also very necessary to our future.

The National Oceanic and Atmospheric Administration (NOAA) reports only 3% of the earth's water is fresh water. However, not all of that 3% is easily available to humans for consumption. Much of it is contained in glaciers, below ground and in the atmosphere. Fresh, clean water is a limited resource.⁷

As consumers, it's important to avoid using more water than necessary just because someone else is footing the bill, such as when you are staying at a hotel, living in a dorm or visiting your in-laws.

Water conservation has become such a concern that the Environmental Protection Agency (EPA) would like hotels to monitor guests' water usage as a way to modify behavior and encourage conservation. The EPA suggested making actual usage available to guests as part of their bill or part of an app in order to increase usage awareness. This technology is not yet in use but hotels have implemented programs to incentivize guests to skip daily new towels and sheets to reduce water and energy used in laundering.⁸



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We Think About This Every Day



At Dialectic, we are already preparing for the day your customers will care as deeply about how much water you use as they do about where they are buying their produce, fair-trade coffee and cruelty-free cosmetics. As consumers become more educated in these areas, you will need to be ready to answer their questions about how your business conserves energy and saves water. They may not care if it saves you, and ultimately, them money. Rather, consumers today want to feel like part of a bigger whole, like saving the planet for future generations.

You won't have to ask Dialectic to take sustainability seriously because it is already woven into the fabric of how we conduct business and develop designs. As our name implies, we will have an open dialog with you about your sustainability goals and help you achieve them.



IN SUMMARY

As we brush our teeth, flush the toilet and take showers every morning, most of us use water without considering the energy cost of that water. We take for granted the fact that water will always be there. And even though we get a bill every month to remind us we are paying for the water we use, we rarely think of it in terms of energy used or, perhaps, energy wasted.

What we most often forget is that when we eat out in restaurants, stay in hotels or buy bottled water, we are using water and energy at a very high cost, and that those costs are always passed down to us, the consumer.

Water and energy are interconnected, and by conserving water we are also conserving energy. As consumers, we need to be leaders in conserving water because, unfortunately, society will not be proactive to the approaching water shortage until the opportunities we currently have for saving the water are no longer available.

By highlighting the surprising ways we consume energy through our water usage, we hope to educate all types of consumers that even small changes to their daily habits can save energy and water usage dollars for years to come. We at Dialectic are always looking for ways to be sustainable and by being sustainable we are all being good stewards for the future.

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