

The Nature of Business: The energy cost of water

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Water conservation is a face with two sides: one is the obvious side of saving a resource crucial for sustaining life; the second — which is often neglected but emerging as a national priority — is the link to energy consumption and conservation. In other words, there is an energy intensity related to water consumption just as there is a water intensity related to energy consumption.

The focus here is on the energy intensity related to water consumption — i.e., water collection, treatment, distribution and end-use. Understanding the integrated relationship between energy and water — from an energy conservation view — is vital to reducing energy consumption, energy costs and greenhouse gas (GHG) emissions.

The water we use for residential and commercial consumption requires the use of enormous quantities of energy. Again, this is different from the more limited notion of thinking about water consumption solely from the perspective of depleting a vital resource.

On average, energy used solely for pumping raw water collected from lakes, rivers, streams and aquifers through treatment facilities represents 15 percent of all the energy used in the treatment and distribution process; the remaining 85 percent of the energy used in the process is for distribution to homes, business and industry.

This doesn't even take into account the additional energy required for circulation, filtering and pumping after water is delivered to homes and businesses. When water leaves homes and businesses, it goes through an extensive wastewater treatment process.

The reason it may be difficult for many home and business owners to understand the energy-water link is that it's not a cost specifically listed on your electric bill, but is embedded in daily water use.

Consider that the energy it takes to run a faucet for five minutes is equivalent to the energy used to run a 60-watt light bulb for 14 hours. Additional energy is consumed when we heat and cool the water we use. According to the U.S. Environmental Protection Agency, we use more energy to heat the water just in our homes than to light them.

Initial and wastewater treatment is 3-4 percent of our national total electricity use, and this is expected to increase 20 percent over the next 15 years.

As the state population continues to grow, the energy-water link is emerging as a priority issue.

Colorado is expected to receive 1.7 million new residents within the next decade. And though Colorado is considered a water-rich state, the spotlight here is on energy conservation: Reduce water use and energy consumption is also reduced.

In June 2009, just one year ago, the Colorado Water Conservation Board released a report titled “Water Conservation = Energy Conservation.” Highlights of the report include the following:

- Denver water used just over 20,000,000 kWh in 2007 to treat raw water and over 31,000,000 kWh for

distribution

- The City of Parker (south metro Denver area) used 24,749,000 kWh of electricity in 2008 in connection with its water treatment process
- Some proposed water supply projects will create new significant energy demands

Although it is acknowledged that many Colorado cities have gravity-fed systems and high-quality water supplies that don't require extra energy associated with extensive treatment, population growth, new projects and the energy intensity connected with pumping water from deep aquifers — along with the other uses listed above — are driving policymakers, analysts and customers to consider the energy used in connection with daily water usage, and how reducing water use will serve energy conservation, reduce energy costs, and lower GHG emissions.

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