



# Making the Water-Energy Connection

By Paul Moinester

Building a green home or making an older home more sustainable can be a daunting task. In the past, limited choices of environmentally sustainable features and underperforming technologies made this task difficult. With recent technological developments and greater market demand for sustainable products, however consumers now can choose from an almost overwhelming number of options available to help them to live comfortably and inexpensively, while drastically reducing their environmental footprint. With so many technologies and products to choose from, what factors should homeowners consider when purchasing environmentally friendly products for their new home or remodel project? How do you evaluate the lifetime environmental impacts of a myriad “sustainable products?”

One thing to think about is the difference between inactive and active products. Once installed, an inactive product, such as a cabinet or flooring, requires no additional resource inputs. Its environmental benefit is limited to the point of installation. Replacing an existing inactive product such as flooring in favor of a more sustainable alternative is actually less eco-friendly than just sticking with the old floor, because the resources required to harvest and manufacture the materials have already been expended.

An active product like a toilet or dishwasher, on the other hand, is a functioning feature that requires resources to operate. In comparison to their less-sustainable counterparts, active high-efficiency products contribute environmental benefits every time they are used. Replacing an unsustainable active product with a more sustainable alternative often does make sense, because by doing so, lower resource consumption

over the product’s lifetime can exceed the resources required to create the product. For example, it is more resource- and cost-effective to replace a still-functioning incandescent bulb with a compact fluorescent light. In its lifetime a CFL can save 500 pounds of coal, 1,430 pounds of emitted carbon dioxide, and \$50 to \$70.

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Understanding how technologies interact with each other is another factor homeowners should consider when deciding between green products. A house consists of many different electrical, mechanical, and plumbing systems that can interact with each other to impact the resource consumption of the entire house. For example, incandescent light bulbs give off 90% of their energy as heat, which can impact a home’s cooling and heating loads. By looking at a home as a holistic system, homeowners can better understand the different ways individual products can impact the home as a whole and select those that offer the greatest overall benefit. One frequently overlooked connection is between water and energy.

In light of two of the most significant problems facing Coloradoans -- global warming and drought -- homeowners are in a position to curtail the negative implications of both of these problems simply by using water more efficiently. Water consumption and energy usage

are inexorably linked, since getting water from its source to your fixture is incredibly energy-intensive. This process of extraction, conveyance, storage, treatment, distribution, on-site pumping, heating, cooling, wastewater collection, treatment, and discharge can account for as much as 19% of a state’s electricity use, 30% of annual natural gas use (aside from what is consumed by power plants), and 88 million gallons of diesel fuel consumption<sup>1</sup>.

At the residential level, heating water for the dishwasher, washing machine, and shower consumes copious amounts of energy. In fact, according to the U.S. Department of Energy, water heating is the third largest energy consumer in American homes, ranging from 13-25% of total household energy usage. So just by minimizing water from the tap, homeowners can significantly impact energy consumption. By choosing water-heating appliances that are as energy-efficient as possible, homeowners can further reduce greenhouse gas emissions, help alleviate water shortages, and save money on their energy bills. Here are some recommended energy-and water-saving technologies for residential uses:

- **Efficient clothes washer:** Through superior design and system features, efficient clothes washers can clean clothes with 50% less energy and 50% less water than standard clothes washers. Most efficient washers also extract more water during the spin cycle, so less energy is required for drying. As a result, an efficient clothes washer can save homeowners over \$100 a year in water and energy bills.
- **Efficient dishwasher:** Recent advancements in design and system features have resulted in newer dishwashers that use 41% less energy and significantly less water than standard dishwashers. Installing an efficient dishwasher can save homeowners over \$30 a year in water and energy bills.
- **Low-flow fixtures:** Every day Coloradoans waste dozens of gallons of water in sinks, toilets, and showers that use an excessive quantity of water. Installing a low-flow toilet, showerhead, and faucet can reduce water consumption by about 50% for each fixture and save more than 25,000 gallons a year. Unlike older low-flow models, these new fixtures are equivalent in performance to standard higher-flow fixtures -- most homeowners won’t even notice the difference in water volume.
- **Dual-flush toilets:** Dual-flush toilets actually have two different buttons to let individuals determine whether they need a higher-volume (1.6 gallon) or a lower-

volume (0.8 gallon) flush (depending on what they're...er...flushing). By letting residents customize the amount of water needed, households can reduce water use by nearly 75% over standard low-flow toilets and reduce their water bills by \$50 to \$100 a year.

- **Xeriscape:** Xeriscape is a landscaping approach that can reduce outdoor irrigation water use by 50 – 75%. By using native plants that require less water, homeowners can create a beautiful outdoor environment that avoids the need for thousands of gallons of purified water and immense amounts of energy. Additionally, xeriscaping requires minimal maintenance and reduces the need for additional energy and chemical inputs such as lawn mowers (or weekend time to mow) and fertilizer.

In his famous article, “Man: Endangered Species,” Congressman Mo Udall concludes with a powerful message: “Each of us has a vital stake in what happens to this spaceship we’re riding on. We can save the environment of this Earth. There is a role for every one of us, but time is short and we’d better get busy.” By getting educated, you have taken the first step in contributing to the sustainability of this planet. The next step is action, and installing water-and energy-saving innovations is a great place to start.



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### A note about buying new stuff

When you’re shopping for appliances, envision two price tags. The first is the purchase price—think of it as a down payment. The second is the energy cost to operate the appliance during its lifetime. You’ll be paying on that price tag every month for the next 10 to 20 years. Although the initial cost may be slightly higher, high-efficiency appliances more than make up for their higher upfront cost with energy savings and are generally more durable and deliver better performance over their lifetime. Carefully review the energy guide label, which estimates the annual energy cost to operate the appliance and helps you compare it to other models. Choose a model that’s as efficient as possible and costs the least to operate. When in doubt, always look for the ENERGY STAR label, which ensures that the appliance has met government standards for energy efficiency.



## RESIDENTIAL ENERGY AUDIT PROGRAM

Every year, the average American family spends \$450 on wasted energy through holes and cracks in their home.

The first step to keeping energy in your home—and money in your wallet—is to identify where you are using and losing energy. The Center for ReSource Conservation’s Residential Energy Audit Program (REAP) can help.

A low cost REAP home energy analysis will help you understand your energy usage and give you personalized recommendations for lowering your energy bill.



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