



Conservation and Renewable Resources

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Energy Efficiency

by Margie Gardner

Oregonians can make dramatic reductions in their energy use with inexpensive technology.

Oregon's Norm Thompson company lives by its motto, "Escape from the Ordinary." It's what they strive for in their products and in their corporate culture. It's also what they looked for in 1994 when they were planning to build a new headquarters. The owners of Norm Thompson wanted to build a state-of-the-art, energy efficient headquarters while staying within their tight budget. Using what started as a standard tilt-up concrete box, they built a facility that not only makes extensive use of exterior light, but also uses a computer to sense the availability of natural light and adjust internal electric lighting controls. The computer regulates interior temperatures as well, by capturing the heat generated from people and computers

and redistributing it via heat recovery coils. "Our people are our furnace," says Norm Thompson co-owner Jane Emrick.

While these and other energy efficient improvements added \$4 per square foot to the cost—numbers that would make most companies cringe—Norm Thompson achieved a four-year payback on the investment and is now saving up to \$25,000 a year in energy costs. And these savings will continue year after year, their value changing only as the price of energy rises or falls.

The owners of Norm Thompson are no longer alone in their awareness that energy efficiency can pay off in the long run. Due to recent publicity about the "energy crisis," between 80 and 90 percent of

Northwest residents want to know what they can do to help. Short-term behavioral changes driven by recent publicity and the urging of utilities and public officials have already resulted in a drop in energy use of approximately 5 percent in the last year.

This is a big change from several years ago when concern about energy use wasn't really in the public consciousness. In spite of a steadily growing population, five years of higher-than-average rainfall fueled our hydroelectric system and hid the need for more generation. During this period, uncertainties wrought by energy deregulation delayed investments in new generating plants and efficiency. Now the region needs to build new generating plants as well as implement conservation measures. However, installing energy efficient appliances, more efficient industrial equipment, and energy saving building materials may be the most cost-effective way of finding new energy.

"Conservation" is most often defined as short-term changes in behavior, such as turning off lights, that result in less use of power. It typically means doing without. In the energy industry this is called curtailment.

"Energy efficiency" refers to the investment in technology or building changes that result in less use of energy over the long term, such as replacing an incandescent bulb with a compact fluorescent one. You still receive the same amount of light from your bulb, but you use less electricity. Over time, as an energy shortage wanes, it can become more difficult for people to maintain short-term behavioral changes. Once installed, however, energy efficiency measures can save energy for years, even decades.

Today the region uses 1,700 average megawatts (the equivalent of almost three Bonneville dams) less than it would have if the energy efficiency measures had not been implemented. In fact, the power saved from the increased use of energy efficient technology and materials in Oregon could defer the need to build some of the new generating plants currently being considered for construction throughout the state.

In the electric power industry this is called "deferred generation," and it has several key benefits. First, building fewer power plants means less pollution and waste. Second, the installation of energy efficient technology is, in the long run, cheaper than buying electricity from a power plant.

Studies indicate that, over time, the average cost of buying electricity from generating companies will be in the range of 3 to 4 cents per kilowatt-hour (KWh), while the average cost of energy-efficiency measures is about 2 cents per KWh. That means it is cheaper for utilities to "buy" KWh from consumers in the form of energy efficiency than it is to buy new electricity from a generating plant.

Energy efficiency also acts as a hedge against sudden spikes in the price of electricity. Every KWh saved is one that need not be bought on the open electricity market during a price spike.

Rebates, Coupons, Tax Credits, and the Energy Trust

One of the biggest roadblocks to energy efficiency among consumers is the initial capital investment required. Home owners often balk at the money needed to add more insulation inside their walls or attics. Small

business owners may not be able to afford changes to their lighting or their heating, ventilation, and cooling (HVAC) systems. And large industry executives are often leery of dedicating capital to improve the efficiency of manufacturing plants or industrial processes.

One way to help alleviate those costs is with rebates. Utilities can use rebates in the form of discounts, coupons, or payments to buy efficiency from consumers. These incentives pay the initial capital costs of such measures as installing new insulation, sealing ducts, purchasing energy efficient appliances such as water heaters and heat pumps, and replacing windows. Commercial rebates—offered to both small businesses and large industries—help companies tune up energy wasting HVAC systems, install energy efficient office equipment, and improve the energy use of industrial machinery.

Many utilities currently offer these rebates to customers as a way to meet yearly energy saving goals set by public utility governing boards (for public utilities) and by the regulatory authorities for investor owned utilities, or IOUs. IOUs represent over two-thirds of electricity sales in Oregon.

In March, however, this system is expected to change for the IOUs. As a result of deregulation, IOUs will dedicate 3 percent of their revenues to support conservation, energy efficiency, renewable energy, low-income energy assistance, and energy-efficiency upgrades in Oregon schools. The Energy Trust of Oregon will take the biggest share of this 3 percent contribution and spearhead the state's efforts in conservation, renewable energy, and energy efficiency. The Energy Trust's

budget may be as much as \$50 million a year—enough money to make a real difference in these important areas.

Tax credits are incentives offered by the state against Oregon income taxes; they also apply to a number of qualifying improvements to homes or investments in energy efficient systems and appliances. Buying an energy efficient dishwasher, clothes washer, or water heater can get you a credit of up to \$200 per appliance; changing to a geothermal heat-pump system to keep your house warm (three times more efficient than electric heat) can qualify you for a credit of up to \$1,500.

Northwest Energy Efficiency Alliance

Sometimes the market doesn't take to a particular technology or innovation despite demonstrated energy savings. That's where organizations like the Northwest Energy Efficiency Alliance can help. The Alliance works in conjunction with investor owned and public utilities as well as state and local governments. It operates on a number of fronts toward its mission to catalyze the Northwest marketplace to embrace energy efficient products and services and to educate consumers about how they can make their environments more energy efficient over the long term.

Funded by utilities in Oregon, Washington, Idaho, and Montana, the Alliance has focused specifically on what's called "market transformation," which brings affordable, energy-efficient technologies to the marketplace. The Alliance helps by providing funding and technical assistance for research and development, fostering the production of energy-efficient products, and

pushing for their acceptance into the market. The result: more and better energy efficient products and technologies are available to consumers throughout the four-state region, and they can be installed at lower costs.

One of the Alliance's earliest programs was designed to increase the market for energy efficient clothes washers, which now bear the federal "Energy Star" designation. When the program began in 1997, only about 2 percent of washers sold could be classified as "resource efficient" clothes washers (saving energy and water). Retailers had little or no information about the washers. Most domestic manufacturers, seeing little demand for the product, were not interested in bringing them to market.

In response, the Alliance designed a multi-layered approach to support demand for resource-efficient clothes washers in the Northwest. The goal was to convince major manufacturers that they were worth producing. This program included large rebates for con-

Net Metering

In 36 U.S. states, it is now possible to watch your meter run backward and have the local utility credit you at retail rates for energy generated by your solar panels or small wind turbine. The subject of tremendous wrangling between renewable energy advocates and utilities, net metering is making progress nationwide. A recent FERC decision overruled an Iowa utility's objections to net metering programs, and California recently raised its system eligibility requirement from 10 kilowatts to 1 megawatt.

Oregon passed a net metering law in 1999, HB 3219. This bill requires utilities to offer net metering for fuel cells and solar, wind and hydro resources of 25 kilowatts or less. The law requires utilities to offer net metering to all customer classes, but total customer-generation capacity is not to exceed 0.5 percent of a utility's historic single-hour peak load. Once the 0.5 percent level is exceeded, further eligibility is limited. In Oregon, excess electricity generation is netted against a current monthly bill or credited to the following month. At the end of the year, unused credits can be donated to a low-income assistance program or dedicated to another use, subject to approval by the Public Utility Commission. The green energy community advocates legislation that will expand the limits of net metering programs. For more information see www.rnp.org/htmls/netmeter.htm.

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consumers, point-of-purchase materials for retail outlets, retail merchandising support, training for retail salespeople, and some consumer advertising. After a year, sales of resource-efficient washers had grown to more than 12 percent of the market. Retailers indicated they believed they could sell the washers to a third of their customers. Consumers were pleased with the washers' performance and were better educated about how they worked. Most importantly, major manufacturers in the U.S. began to produce resource-efficient washers. Even after the consumer rebate was discontinued, sales continued at the same level.

The U.S. Department of Energy used results from the project when it determined energy efficiency standards for clothes washers. The first phase of these standards will produce washers that are more than 22 percent more efficient by 2004. By 2007, all clothes washers produced in the U.S. will be 35 percent more efficient than current models. Education transformed the market.

Learning from these successes, the Alliance and its partner utilities have redoubled their efforts to help consumers understand how they can save power over the long term. The region's

utilities have boosted funding and personnel for many different programs aiding homeowners, businesses, and industries. The Alliance will continue to push for market transformation in the future and will soon receive its funding from the newly established Oregon Energy Trust, rather than directly from the IOUs in the state.

The goal of organizations such as the Alliance is to make energy efficiency as easy for the public as recycling is now. It should not be something you do to go out of your way for the environment, but just another sound household or business decision—something that makes sense for both the environment and the pocketbook.

Just on the horizon are a number of exciting developments, such as light emitting diode (LED) technology for lighting and microscale heat exchangers that may improve the performance of heating and cooling systems by 30 to 40 percent.



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Refinements in solar technology allow windows and roofs to collect the sun's heat to generate power, and distributed generation systems allow buildings and homes to have their own power sources.

As efficient as these technologies are, however, none will save much energy if people don't use them. Right now, Oregonians are still lighting their homes and

businesses across the state with incandescent bulbs, when compact fluorescent bulbs produce the same light using 75 percent less energy. Over the next decade, Oregon could make dramatic reductions in its energy use by installing energy efficiency technology, especially given the unique opportunity provided by the Oregon Energy Trust.

Renewable Resources in the Northwest: An Awesome Opportunity

by J. Rachel Shimshak

We are lucky in Oregon. We have clean air, we can see the mountains, and our state has a history of supporting environmentally responsible policies and programs. The reason why we enjoy this high quality of life is that hydropower fuels over half of our economy. Hydro is a renewable resource, and harnessing falling water to make electricity does not pollute our air. *(Please see sidebar on Low Impact Hydro Institute which addresses the issue of hydro sustainability -ed.)* However, coal plants provide most of the remaining 40 percent of the electricity used by consumers. As we move into the next decade our need for more power could shift the balance between these fossil fuels and the relatively clean energy

of hydropower.

A report completed by the Northwest Power Planning Council in 2000 concluded that the region must acquire a minimum of 3,000 new megawatts (MW) of energy, about enough to serve four cities the size of Portland, to meet future demand. Utilities, owners of our transmission system, and generators of electric power will soon decide who will produce this power and how they will transmit it. The choices they make will impact the quality of our lives and the lives of the next generation of Northwesters. Certainly we need to build some new, efficient gas plants to meet our needs. However, if we are to proceed rationally, and in a way that protects our treasured quality of life, the Northwest needs to invest in