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Energy Efficiency & Environmental News: Water Heater Timers vs. Insulated Jackets[1]

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WATER HEATER TIMERS VS. INSULATED WATER JACKETS IN TERMS OF COST AND ENERGY SAVINGS

Tests and analyses conducted by the writer determined it is much more cost effective to install an insulated water heater jacket than to install a water heater timer.

Water heater timers can be purchased at building supply stores for about $35 and generally require an electrician to install with the average cost running about $65. This makes the total cost about $100. On the other hand, many local utilities provide insulated water heater jackets at no cost or at a cost of under $10. A water heater jacket is generally quite easy to install. It usually can be done by the homeowner as a do-it-yourself project.

The energy saving analysis on water heater timers was done based on a straight electrical resistance water heater which was considered the best system for energy savings. The maximum expected saving using a timer to turn off the water heater 18 hours per day would be about $22.09 per year for two people using about 40 gallons of water per day. This results in a simple payback of about 4.5 years. A simple payback less than 7 years is considered cost effective. So under these conditions the payback is good. However, for a family of four using about 80 gallons of water per day, the saving is much less, or about $12.27 per year. This results in a simple payback of about 8.1 years. This payback is not considered cost effective. The analysis was based on electric rate of 7.5 cents per kilowatt hour. If a time of day rate is offered which makes night electric rate lower than 4.5 cents then the payback could drop to 7 years or less if the water heater is turned on only at night.

The energy saving analysis on water heater jackets was also based on a straight electrical resistance water heater which was also considered the best system for energy savings. Installing a typical water heater jacket with an insulation value of R-6 will save an average of about $19.20 per year for two people and only slightly less for a family of four. This savings results in a very attractive payback of only 6 months. A water heater jacket can also be used with a gas water heater; timers, of course, cannot. Installing a water heater jacket on a gas water heater requires a little more care not to obstruct the combustion openings and space around the bottom of the water heater which allows combustion air to enter. Obstructing these areas can create a hazardous condition and a buildup of carbon monoxide, incomplete combustion and actual loss of efficiency. If reasonable care is taken, savings for gas water heaters can also be significant, with payback generally, occurring in about 1 1/2 to two years.

Water heater jackets installed are also recommended for solar hot water heater tanks and for electric water heaters with heat recover units. In these cases payback runs between one to three years depending on the efficiency of the water heating

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system. The higher the efficiency the longer the payback.

Another big advantage of using insulated jackets instead of timers is that no life style modification is necessary. With jackets, hot water is available all the time since the water heater is never turned off. With timers, the best savings can only be obtained if the hot water in the tank - is used up and only cold water replaces it. This means the timer must turn the water heater off while hot water is being used, not after you have finished using it. The heater also should be left off between 10 and 20 hours. This requires a very Spartan lifestyle and a lot of experimentation with little flexibility in order to achieve good savings.

For those readers desiring to know more about heat loss through water heater tanks and the calculations used in the analysis, contact the author.

DID YOU KNOW?

Since 1973, over half of the $38 billion federal budget for research and development has been spent on nuclear power (PBS Frontline).

When U.S. Department of Energy Secretary Jim Watkins completed his series of public workshops on energy throughout the country, he wrote in his report of results "The loudest single message was to increase energy efficiency in every sector of energy use".

MOISTURE IN CRAWL SPACES IS REDUCED BY POLYETHYLENE VAPOR BARRIERS

The results of a one-year field test in southern New Jersey show that unvented crawl spaces under a house may perform as well as or better than vented crawl spaces with regard to moisture control. Conducted by Lynn Stiles of Stockton State College for Atlantic Electric, the study examined the crawl spaces of 17 houses with reported moisture problems. To evaluate various retrofit techniques, Stiles divided the houses into three groups.

One group received a 6-mil polyethylene ground cover (vapor barrier) in the crawl spaces, but the foundation vents were left alone and the homeowners were instructed to use them normally. The second group received full-wall foundation insulation, plus a polyethylene ground cover. The foundation vents in this group were sealed and insulated and the rim joists were caulked to reduce air exchange between the crawl space and outdoors. The third group received no treatment.

The results of Stiles' study showed that relative humidity and wood joist moisture content both tended to be lower in the crawl spaces with a vapor barrier on the ground than in the control group with no vapor barrier. The driest crawl spaces were those with fully insulated and sealed walls with ground vapor barrier installed. (Energy Design Update, October 1992)

Gary Cook, Energy Extension Specialist for Building Construction, highly recommends ground vapor barriers to reduce moisture infiltration into the house from Florida's high ground moisture levels. In some cases, ground vapor barriers can also reduce radon gas entry. He does not recommend placement of vapor barriers in the walls or ceilings of Florida homes.

NEW GUIDELINES TO MAKE APPLIANCES MORE EFFICIENT

The U.S. Department of Energy has set new energy efficiency standards for three types of appliances: clothes washers and dryers and dishwashers. The new standards, which take effect in 1994, are 14 to 30 percent higher than the current standards.

Dishwashers, clothes washers and dryers use over 1.9 percent of the total energy consumed in the United States. The new standards will save an estimated 2.25 quadrillion BTUs of energy between 1994 and the year 2015. This is roughly equivalent to nine weeks of petroleum imports at current levels. In addition to saving energy, the standards will help the environment by reducing emissions associated with energy production and by decreasing the need for the development of additional energy supplies.

Under an act of Congress, the DOE established energy efficiency standards during the 1980s for 12 major household appliances. The initial standards for clothes washers and dryers and dishwashers became effective in 1988. The law establishing the standards also called for two review cycles for these appliances. These new standards are a result of the first review. According to the legislation, the standards must result in the maximum improvement in energy efficiency that is both technically feasible and economically justified.

Although the new standards may result in slightly higher purchase prices for the appliances, most price increases would be offset by reduced operating expenses. Generally, any additional cost should be recovered in less than four years.

Now, here are the new standards. For dishwashers, the new standard will result in a 30 percent reduction in energy use from levels set by the first standards. The net energy savings is expected to be 850 trillion BTUs by 2015. Operating costs should be reduced by $1.3 billion.

For clothes dryers, the new standard will result in a 14 percent reduction in energy use and a net energy savings of 810 trillion BTUs by 2015. Operating costs should be reduced by $1.3 billion.

For clothes washers, the new standard will result in a 29 percent reduction in energy use, with a net energy savings of 570 trillion BTUs by 2015. Operating costs will be reduced by $528 million during this period. (Texas Energy, Vol. 18, No. 6, Nov-Dec. 1992, p. 5)

HIGH OCTANE RIP OFF

According to a recent report by Public Citizen, a non-profit public advocacy organization in Washington, D.C., U.S. oil companies extract billions of dollars from motorists each year by misleading gasoline buyers into buying high octane gasoline, which most cars do not need, and by selling gasoline with lower octane ratings than the pump labels indicate. While current advertising wrongly suggests that consumers must buy high octane gas for engine cleaning benefits, a survey in the report showed that nearly all gasoline companies put the same engine cleaning benefits in all octane grades. More than $3 billion may be wasted annually on needless purchases of high octane gasoline, according to the report, with up to $600 million more spent for octane that consumers do not receive. (Wisconsin Energy News in Texas Energy, Vol. 18, No. 6, Nov-Dec. 1992, p. 7)

HOME AND FAMILY SAFETY

A Killer In Your Home... Have your home heating equipment safety checked! Bill Becker, IFAS Safety Extension Specialist, says since October three homes in Florida have had heating equipment emitting carbon monoxide which poisoned eight people.

Carbon monoxide is a silent killer. It is often colorless and odorless. Its presence is hard to detect until it's too late. Victims often go to sleep and never wake up. Over 230 Americans die each year as a result of carbon monoxide poisoning in their home. Over 80 percent of these deaths are associated with gas-fired furnaces. However, wood-burning stoves, fireplaces and kerosene heaters can also emit carbon monoxide. Too often, we think of home heating as a problem "up-north". It is, but it is also a Florida problem, particularly in gas-heated homes and homes with fireplaces.

Have your heating equipment safety checked by a qualified contractor. The firebox, the electrical and mechanical controls and automatic safety devices should all be checked. Lack of use can cause components to corrode and fail to function. Chimneys and flues should also be inspected annually and cleaned as necessary. They can become blocked and force carbon monoxide into the home. They can become caked with soot, oils and tars which can catch on fire and cause a house fire. (William Becker, Extension Safety Specialist)

BECAUSE YOU ASKED

Question: Should I Install turbine vents In my roof to save energy?

Answer: No, turbine vents do not cool the attic enough to save much energy; certainly not enough to pay for the cost of installation. In addition, investigations after Hurricane Andrew revealed turbine vents weaken the roof structure, increasing potential for wind damage during a hurricane.


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