

GREEN TECH THE SERIES COLUMN FOR AUGUST 12, 2015

HEADLINE: DRAIN WATER HEAT RECOVERY; ARE THEY WORTH IT?

It is no secret that heating and storing hot water, unless you have an on-demand hot water unit, is among the highest, if not the highest, single energy consumer in an average home. Heating hot water can account for up to 25% of the total energy cost for most households. Aside from drastically reducing consumption, attempts to reduce the cost are difficult at best, because, as soon as you turn the hot water on, it begins cooling down and/or it is going down the drain. Either way, it equals heat loss. This is where the invention of the drain water heat recovery (DWHR) installation has value. The question we will address in this column is whether or not the total money saved will cover the cost of the purchase and the installation?

First let's look at how these are made. There are two major manufacturers, Power Pipe and ECO-GFX/Thermodrain. The GFX is actually a short form for "gravity film xchange." This term was used in the early days of these units, but it was found to be too confusing to the consumer. The preferred term today, "drain water heat recovery" is a lot more self-explanatory. Both of these manufacturers start with a copper pipe of a similar size to your actual grey/black water drain pipe, commonly ABS pipe today. Copper pipe is then flattened and tightly wrapped around this large tubular section of copper pipe. A section of your main drain is removed and the DWHR is installed. This potable water copper tube has connections so that you can redirect your incoming municipal or well water at the base of the DWHR and have it connected at the top to your house supply, close to your hot water tank.

There are different philosophies on how this manufacturing process should be done. In that regard, the two major companies are at legal loggerheads over which of them designed the first product and who has "stolen" the other's ideas and designs with respect to the efficiency and quality of the product. In fact, they both work adequately from reports I have on file. Go to the Natural Resources Canada's web site: www.oee.nrcan.gc.ca/residential/personal/retrofit/13302. This page will supply a list of efficiency ratings for both of these companies and a smaller maker called Watercycle. More information on ECO-GFX can be found at: www.ecoinnovation.ca and for Power Pipe at: www.renewability.com.

There is one thing that can stop some installations. A vertical drop in your main drain is necessary for these to work properly. The theory is simple; heat is

transferred from the waste-water flowing down the drain to the cold water running through the outside lines. This cold water is heated as it moves up the outside of the DWHR while the warmer waste-water flows down, hence the need for a vertical installation. These units are expected to have a life span of close to 50 years and they are totally maintenance free. They can be bought on-line and at most big box stores. Shopping around is worth the effort, however. Prices range from just under \$400.00 to over \$800.00, for a large unit capable of servicing a home with 2 or 3 bathrooms. I have yet to see them on sale in the building supply stores, likely because they are a limited demand product. They are available from these stores on-line catalogues, however. Should you decide upon one, installation is probably best done by a plumber.

I know of three homes with these units, two of which have had them for a couple of years now. One of the older installs is in a home where the owner is very conscious of the value. He has monitored his costs closely and figures that he saves about \$80 a year. If you compare that to the cost of a 60" unit, plus the install, it will take well over 10 years to recover the dollars spent. One study, done in Quebec, showed that if ten, ten minute showers were taken daily, this savings rose to nearly \$330 annually. Saskatchewan Energy did a study and found that they can pay for themselves in up to five years of use. Obviously, achieving another 30-40 years of maintenance free savings after the initial cost recovery has to be considered in the cost analysis. It is also worth thinking about the fact that, as with most of the sustainability products, it's not just the immediate cost recovery that is important. The added environmental benefit of reducing the demand on your individual energy usage is of consequence when it comes to the carbon footprint aspect of the question. Union Gas estimates that the savings are equivalent to a reduction of 1 tonne of greenhouse gas emissions per year.

Another of the homeowners checked his system and found the incoming water from the DWHR was preheating the cold water by about 10.C. This home had the supply side of the DWHR plumbed to the entire cold water supply pipe system. He reported that, in order to get the desired shower temperature, they did not need to turn the shower to the same hot water temperature as previously. They also dropped the temperature of their hot water tank and still found the shower temperature reduced from the original setting. Every homeowner stated, without hesitation, that the level of hot water on demand was improved. One commented, "I am no longer worried about being the 3rd one to shower in the morning." All three owners said they would recommend these systems to anyone.

There have been some issues and most of them seem to be related to a drop in water pressure. This is due to the mass of copper coils the supply water must pass through before it gets to the house system. It is my experience that it's mostly in the larger units and, in some cases, a booster pump may have to be installed. While in a new home these installations can be designed into the waste drain system, in an older home I would recommend a plumber take a look at the proposed location first. While they are not difficult to retrofit, drain/vent configurations can be an issue as can space, which is why the makers offer sizes ranging from 30 inches long and up to 84 inches. Some municipal plumbing officials are hesitant to approve their installation, citing the flattened copper pipe as an issue. To my knowledge, there is no plumbing code that regulates against their use.

This has got to be one of the simplest energy efficiency additions to a home, especially a new home. With an installed cost of \$1,000 - \$1,400 and no maintenance, coupled with a 50 year life span, it is not hard to imagine how much energy savings they would generate if every new home had one.

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