



BUILDING TECHNOLOGIES PROGRAM

Drainwater Heat Recovery System COMPLETED PROJECTS

Challenge:

Hot water energy accounts for 14% of residential energy consumption --a number that could be significantly reduced by a Gravity Film Exchange (GFX) Drainwater Heat Recovery System (GFX).

Approach:

Install a Gravity Film Exchange (GFX) Drainwater Heat Recovery System in multi-family applications to quantify the energy savings and enhanced performance. Although the technology is suited for single family homes too, the greater throughput of drainwater from multifamily dwellings is expected to save more energy and improve the economics of introducing this technology into this sector.



Technology Description:

The Gravity Film Heat Exchanger (GFX) is a simple system designed to capture the heat in the warm, drainwater that falls down a vertical section of copper drainpipe. Excellent heat transfer, which occurs because the water tends to cling to the inside of the vertical pipe like a film, can be transferred to cold water circulating around the outside of the drainpipe. If the drainwater is produced at the same time as the incoming water (such as the constant flow that occurs from a shower), the GFX can capture more than half the drainwater energy. This saves energy otherwise used to generate hot water and effectively extends the recovery performance of the water heater itself, thereby, saving money and increasing shower capacity. For further information, visit the Web site of [Doucette Industries](#).

Scope:

A one year demonstration began in April 1999 in Duluth, Minnesota for which [preliminary findings](#) (PDF 52 KB) are now available. A larger scale demonstration in 72 apartments began in the Fall of 1999 in Madison, Wisconsin. Minnesota Power now offers a GFX-Rebate, and Oregon is expected to offer a tax credit for this technology.

Partners:

Minnesota Power; Madison Gas & Electric; Wisconsin Energy Center; Conservation Technologies; and Doucette industries. The United States Department of Energy's (DOE) Oak Ridge National Laboratory (ORNL) is administering the project for the Building Technologies Program (BTS).

Technology Improvements:

- Provides quicker hot water recovery;
- Installs in master residential drainwater system to recover wastewater heat from a variety of sources (showers, sinks, etc.);
- Preheated water may be supplied to entire house for greatest efficiency;
- Installs easily;

- No moving parts--virtually maintenance free;
- Avoids fouling in the waste flow pipe by using an unpressurized, partially filled, vertical falling film concept.

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