

2degrees Champions Awards 2015

The ultimate recognition for those driving innovation and pushing the boundaries of sustainable business - as voted for by your peers
15 JULY 2015, THE PORCHESTER HALL, LONDON



DrainMiser: Capturing and reusing the energy from waste water

Penelope Brudenell-Pryke • Greengineering Limited • Awards 2015 Entry • 11 Mar

Shortlisted in the 2degrees Champions Awards 2015

Greengineering has developed DrainMiser, an innovative waste water heat recovery system for improving the performance of heat pumps.

The background

Approximately 1.6 billion litres of hot water is showered away daily in the UK. The average shower lasts about 8 minutes. Hotel guests, power shower owners and teenagers usually take the longest showers, often up to 30 minutes.

Changing the behaviour of these groups is a challenge. Most air sourced heat pumps do not perform well in the UK winters and 2020 targets mean we need to move from gas to electric heating. The National House Building Association endorse this technology. "Of the technologies assessed to have the greatest relevance in achieving net zero CO2 emissions over the course of a year, the two that stand out as offering the greatest CO2 emission reductions... and Waste Water Heat Recovery (6.8% reduction)." NHBC Foundation Report July 2012

We developed DrainMiser innovative waste water heat recovery system; passive and active units, which reduce energy usage AND improve the performance of heat pumps.

What did we do

In 2014 we completed a Defra project to demonstrate that we could improve the performance of heat pumps. The DrainMiser-HP product we designed uniquely allowed standard air sourced heat pumps to access the energy in waste water, to create hybrids. DrainMiser is designed to use ALL available thermal energy to improve the performance of heat pumps.

Alongside this we also developed DrainMiser V and DrainMiser H passive units to capture and reuse the energy from the waste water, reducing the energy used to produce hot water.

Drainmiser units can be used independently or in any combination.

With DrainMiser we reduced the temperature of the waste water to less than the temperature of the incoming mains water.

Our adaptable heat design allows us to provide vertical units in any length from 1m-3m, with variable fitting options, making installation straightforward.

DrainMiser is suitable for domestic, commercial, new-build and retrofit.

The result

DrainMiser passive units achieve industry leading performances (40-80%) depending on model/size. DrainMiser-HP is not yet in production.

Using DrainMiser substantially reduces energy usage, associated costs and CO2 emissions. As most showers are taken peak demand times, reducing energy used for showering also has a positive impact on demand levelling.

Without changing behaviour DrainMiser can help:

- Demand levelling
- Environment: reducing CO2 emissions
- Businesses: reducing energy usage, costs, CO2 emissions
- Householders, especially those in fuel poverty: reducing energy usage, costs

If half the UK showers used DrainMiser, 26.4 million tonnes of CO2 could be saved annually; rolling out globally would be a step change.

We have huge goals for this innovative technology; to ensure 1 power plant can be closed due to demand reduction.

To achieve this we plan for DrainMiser to be No.1 heat pump add-on and waste water heat recovery to be standard in every new building, globally by 2020.

The personal pitch

We are passionate about creating simple innovative practical solutions to reduce energy use. DrainMiser is not alone in the field of waste water heat recovery, but our innovative designs offer the most complete solution and best return on investment. There are no other companies providing simple affordable, flexible waste water heat exchangers for the mass market. In addition the ability to adapt a domestic air sourced heat pump to an air/water hybrid is truly unique.

The publicity and prestige associated with winning would escalate global knowledge of our solutions. In addition it would allow us to bring forward development of our next project.

This new project is to develop a system to recover the waste thermal energy of vehicles (buses, lorries, trains, etc.) for use in buildings, further reducing energy usage and CO2 emissions globally.

A win for us would also be a win for the planet!

Suppliers, contractors and solutions providers used

Both our in house team and extended team of experts from industry and academia have obviously worked hard to support the technical development of these innovative products. In particular the Mid-Sim and BECCI teams at University of Wolverhampton (www.wlv.ac.uk).

We are very grateful for the considerable support and opportunities to further develop the technology and business that we received from Climate-KIC (www.climate-kic.org), Innovate_UK (connect.innovateuk.org) and of course the RBS Innovation Gateway (www.innovationgateway.rbs.com). This has included invaluable exposure to potential customers, distributors, manufacturers and other industry specialists such as BRE. In particular Katherine Fuller of Climate-KIC and Marcela Navarro of RBS.

In addition we feel fortunate to have been supported by our peers and mentors from School For Startups (www.schoolforstartups.co.uk), Worcestershire Business Central (www.business-central.co.uk), Federation of Small Businesses (www.fsb.org.uk), Growth Accelerator (www.ga.businessgrowthservice.greatbusiness.gov.uk), Manufacturing Advisory Service (www.mas.businessgrowthservice.greatbusiness.gov.uk), Virgin Media Pioneers (www.virginmediapioneers.com) and Entrepreneurial Spark (www.entrepreneurial-spark.com).

Links to relevant supporting materials

www.greengineering.co.uk

