



BORDERS COLLEGE WASTEWATER HEAT RECOVERY SYSTEM

Overview

Since 2020, Recirc Energy has owned and operated the wastewater heat recovery (WHR) system at Borders College in Galashiels—the first commercial WHR system in the United Kingdom. Commissioned in 2015, the system comprises a 500m heat network that supplies up to 800kW of heat to the site’s five boiler rooms.

The project was initiated to provide Borders College with a low carbon heat pump-based heating system using wastewater as a source. This enabled them to meet their sustainability targets. The project represents the first sewer to heat pump connection agreement in the UK and proved commercial scale wastewater heat recovery had no impact on existing wastewater infrastructure.

The implementation of WHR at the College overcame several technical challenges. The summer months and their related low flow periods affected system availability. These low flow periods, however, coincided with higher sewer temperatures and a valve control arrangement was created to facilitate multiple water passes to enable increased heat extraction from the warmer water.

Additionally, the density of solid content in the sewer was very high due to non-flushable items being regularly disposed of incorrectly. This required a series of system modifications to stabilise performance including the adoption of primary wastewater pre-screening and increasing the capacity of secondary fine screening devices.

E
800 kW
System

E
3 GWh
Delivered

E
6 Years
Operation

The Recirc Solution

The WHR system at Borders College comprises a retrofitted, low-temperature 4th generation heat network driven by heat pumps. The source heat is tapped directly from the town sewer line, making use of the increased temperatures prevalent in a wastewater supply and increasing overall system efficiency.

Established under a 20-year purchase agreement, CAPEX was recovered through a heat purchase agreement and energy savings. As a proof of concept, it is a low-risk financial solution that covered construction and operation. The design derisked the challenge of breaking into water infrastructure and provides the College with low carbon heat for individual or district heat supply. Recirc Energy's directors worked on behalf of Borders College to provide consultancy, project management and liaison with external stakeholders including the local council, utilities and water authorities.

The WHR system at the College is an exemplar of technology possibilities and won the 2017 Green Gown Award for Best Newcomer and 2018 Scottish Green Energy Award for Best Innovation.

In early 2021, the system passed a major milestone of a cumulative 3GWh heat delivery.

