Slough, UK

A small, experimental low-temperature district heating system has been in operation since 2010 in Slough, west of London. It consists of an energy centre that supplies heat to nearby dwellings (in total 10 dwellings with 25 residents) and an information centre. The system is intended to demonstrate different renewable technologies in combination with low-energy houses.

Table 1. Key data for the Slough case study. Measured data from 2011-2012..

Parameter	Value
Year of construction	2010
Total heated area	845 m²
Supply temperature (design/measured)	55 / 51.3 °C
Return temperature design/measured)	25 / 35.2 °C
DHW temperature	43 °C
SH design temperatures (supply/return)	55 / 35 °C
Supplied heat	49.6 MWh
Delivered heat	35.7 MWh
Distribution losses	0,28
Trench length	165

Supply-side technologies/System solution[edit]

- Small, single-temperature grid
- Biomass boiler
- Ground-source heat pump
- Air-source heat pump
- Solar thermal panels

Distribution technologies

- Twin pipes; steel twin pipes for main pipes and AluFlex for service pipes.

Demand-side technologies

- Direct connection of space heating systems.
- Radiators and forced-air heating.
- Instantaneous preparation of domestic hot water (designed for 10/43°C DHW temperatures and 55/20°C district heating temperatures).
- Each dwelling is connected directly to the district heating system (no internal systems in the terraced houses).

Lessons learned

Some lessons learned from this project are:

- Reported measured values from a period from March 2011 to April 2012 showed some deviations from design parameters, but overall the system was reported to function well.
- The supply temperature was slightly lower than 55 °C, but it was concluded that 50-55 °C was sufficient to satisfy the heat demands of the dwellings.
- The return temperature was higher than expected, with monthly average values up to 42 °C in the first months of the period, but it was lowered to a minimum monthly average of 28°C after a number of corrective measures were carried out: the DHW temperature setting was lowered, water flow through radiators was restricted and the heat exchanger area of heater batteries was increased. Malfunctions and suboptimal settings in substations were also later discovered. It was concluded that the return temperature was sensitive to these kinds of errors, especially in such a small system.