Low Temperature District Heating in Sneinton, Nottingham - REMOURBAN Project

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REMOURBAN project

CITYkeys (SCC2)

STANDARDS (SCC3)

REMOURBAN

GROWSMARTER

TRIANGULUM

New SCC1 WP 2015

SCC1

SCC1

SCC1
REMOURBAN Project

• Integration of:
  – Energy
  – Transport
  – ICT
• Three EU cities:
  - Valladolid (Spain)
  - Nottingham (UK)
  - Eskisehir (Turkey)
• Two follower cities:
  - Seraing (Belgium)
    – Miskolc (Hungary)
• 6M Eu for Nottingham over 5 years
The area around Sneinton Road, Sneinton, Nottingham is considered as the most appropriate for the development of the REMOURBAN (DEMO site).

The site is very close to the existing district heating. The pipe line is reaching the Bio City which is very close to Sneinton Road (100 – 200m).

A large number of the properties (65%) in the area are social housing, owned by Nottingham City Council (NCC) and managed on their behalf by Nottingham City Homes (NCH).
Nottingham’s existing extensive Energy-from-Waste (EfW) district heating network, currently supplying 4,900 homes close to the Demo site, means that there is an opportunity to supply the blocks with an efficient and low-carbon heating supply.

It is proposed that a branch emanating from the return pipe of the primary mains is created to use low temperature heating from the return the first time on this system and maybe in the UK.
Eastcroft incinerator

- The heat energy mainly comes from the annual incineration of around 170,000 tonnes of municipal waste at Eastcroft incinerator.
- The Nottingham District Energy Network is comprised of approximately 68km of insulated pipework carrying pressurised hot water around Nottingham City Centre to satisfy the heating and hot water requirements of circa 4,900 dwellings and over 100 commercial premises.
- It is a Combined Heat and Power (CHP) Plant, the steam is also run through a generating turbine to produce 60,000MWh of electricity annually.
Enviroenergy Nottingham LTDH network planning map
Maisonettes at Morley Court
The Sneinton Courts

Courts retrofit
– Procurement documents written
– Engagement with potential suppliers carried out
– Consultation with customers
– Wayne Hemingway appointed and design brief underway
The EE Monitor is smart and adaptable multi-functional device for use inside each home to show how much heat energy is being used and what it costs. The monitor is simple to install and easy to retrofit, with an Ethernet and a GSM solution available. The monitoring and credit control services have been developed with the needs of landlords in mind that debt exposure is minimised and where there is existing debt this can be recovered gradually through a debt recovery service.
The intelligent control system in each retrofitted property:

- optimise energy use and storage to suit predicted demand profiles
- allow provision of alerts and alarms for assisted living for vulnerable tenants
- energy consumption feedback for all tenants
Data capture and display

- EnOcean® Pressac Mini
- Temperature and Humidity sensor
- EnOcean® Pressac
- CO₂ Temperature and Humidity sensor
- Open Energy Monitor®
- raspberry pi3 based Emonpi
- Data acquisition test using laptop, Pressac® sensors, compact PC and portable wireless Router
Data capture and display

Architecture

Communication Server

**Software:** Java, TCP communication

**Data Format:** JSON, easy to implement and can support multiple technologies (e.g. integration of Enocean and OpenEnergy devices)

**Responsiveness and Tests:** availability and efficiency of the communication software has been tested with a multi-threaded client software which simulate the access to the server from all data acquisition system at the same time (the worst case scenario).
The database is only internally accessible and the administrator should grant permission for even internal users.

An IP based HDD is purchased and will be used as a backup for the main database.
The REMOURBAN project provides the opportunity to set up one of the first substantial Low Temperature District Heating scheme in the UK.

A ‘top-up’ shortcut from the primary flow mains of the existing DH connection will be included to act as a temperature boost for the supply water to mitigate the risk of flow water temperature being below the required level.

Monitoring and data collection will be embedded in all LTDH associated stages, from generation and distribution to substation and end-user metering.

The LTDH at Nottingham demo site will prioritise the end users’ demand, such as what thermal comfort they need, and aims to find the most economical way to satisfy these needs through energy sourced from waste heat.