HEAT NETWORK EFFICIENCY SCHEME

The University of Liverpool Main Campus

The Heat Network Efficiency Scheme provided funding to support the installation of heat meters in six buildings across the University of Liverpool Main Campus, improving the energy efficiency of the University's heat network for 30,000 students and 7,800 staff members. The network, managed by the University of Liverpool Energy Company (ULEC), serves 48 substations and provides up to 90% of campus electricity needs. The project began in November 2023 and was completed in July 2024. The overall project cost was £147,855 and HNES granted ULEC £72,430 in capital funding.

Summary	
Network name	University of Liverpool Main Campus
Network owner / operator	University of Liverpool Energy Company (ULEC)
Location	Liverpool, L69 7ZX
Number of residential / commercial customers	30,000 students, 7,800 staff
Total funding awarded	£72,430
Total project capex (total value of works)	£147,855
Heat source	Natural gas CHP
Performance/efficiency improvement measures deployed	New heat meters
Annual reduction in network fuel use (kWh/year)	126,153,860
Annual reduction in network carbon emissions (kg.CO2)	24,024,336

HEAT NETWORK EFFICIENCY SCHEME

Overview of heat network

The University of Liverpool was established in 1881. Now, it's home to 30,000 students, 8,000 international students, and employs 7,800 staff. The University spends approximately £16 million per year on energy costs.

The Main Campus district heating network is managed by University of Liverpool Energy Company (ULEC) and is served primarily through waste heat captured from the CHP exhaust and jacket water, with 3 gas boilers providing top-up and backup.

The heat is transferred through Plate Heat Exchangers in plant rooms, and is distributed through 5.5km of buried, insulated mains. A leak detection system is built into the pipework.

In addition, the CHPs provide electricity to all buildings on the heat network via a private wire network, with all CHP generated electricity consumed on site. The network serves 48 substations and provides 90% of all electricity needs on the main Campus.

The Combined Heat and Power Plant, through using gas to generate electricity, has secured savings of 7,000 tonnes of CO2 each year, a 13% reduction in Scope 1 emissions for the University. For the Main Campus to generate its own electricity and capture waste heat, this reduces overall energy costs by 20%.

Details of why the project was needed

Existing heat meter coverage was uneven across the campus, and existing meters are showing signs of operational wear and tear. This meant that it was difficult to identify inefficiencies such as high return temperatures, flow imbalances or heat losses across the network.

Furthermore, heat meters support long-term, evidence-based optimisation and investment planning and enhance carbon reporting accuracy for compliance with net zero targets.

Efficiency measures implemented

ULEC applied for HNES capital grant funding to part fund the installation of six heat meters installed in six buildings on the Main Campus. These will be linked to the on-site Building Management System (BMS), which monitors and provides control to the existing energy centre systems.

The new meters will allow the energy monitoring of all buildings between the Quad Node plantroom and Fingals Cave.

Outcomes of changes

As a result of the installations, the University will have improved control and accuracy over their energy consumption, better identify how to optimise the network, and improve their ability to identify and resolve issues and inefficiencies with their heating system.

Improving the network's metering coverage will support evidence-based optimization, help the network to work towards incoming heat network standards, and also make sharing data with academics and students at the University easier.

Since the new installations, the University has seen improved data and visibility across the network.

Next steps

ULEC seeks to increase heat meter coverage at the building level across the Main Campus. They have recently applied for revenue funding through HNES and are looking to subsequently apply for Capital funding through the scheme to help fund any recommendations put forward by the Optimisation Study.

ULEC also seeks to undertake Heat Network Technical Assurance Scheme (HNTAS) training.

Quote from heat network owner

> *"At the University of Liverpool Energy Company, we are committed to continuously improving the efficiency and long-term resilience of our heat network. The funding provided through the Heat Network Efficiency Scheme has been instrumental in enabling us to install new meters and significantly enhance visibility and control across the Main Campus.*
>
> *"This support has accelerated our ability to optimise system performance, reduce carbon emissions, and plan future improvements with greater confidence. We are deeply grateful for this investment, which strengthens our journey toward a more sustainable, low-carbon campus for the benefit of our students, staff, and wider community."*
>
> **Ben Parker**, Energy & Utilities Manager, University of Liverpool