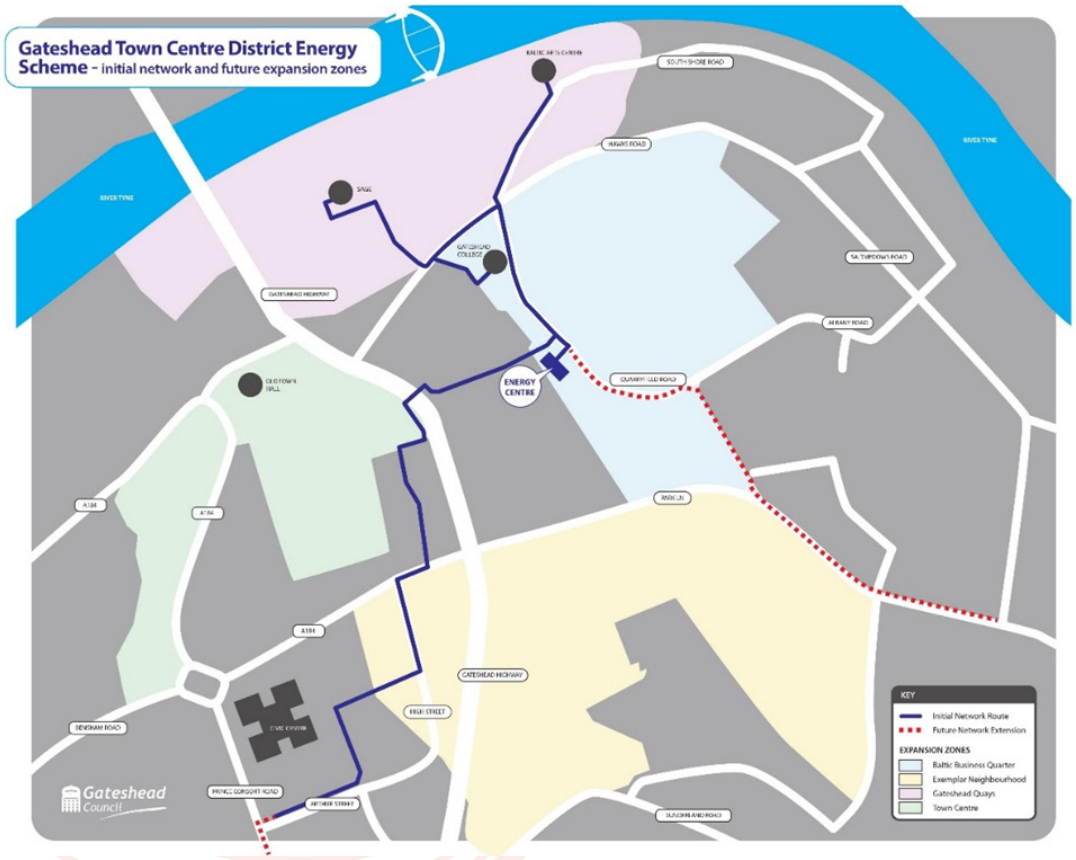
GATESHEAD DISTRICT ENERGY SCHEME

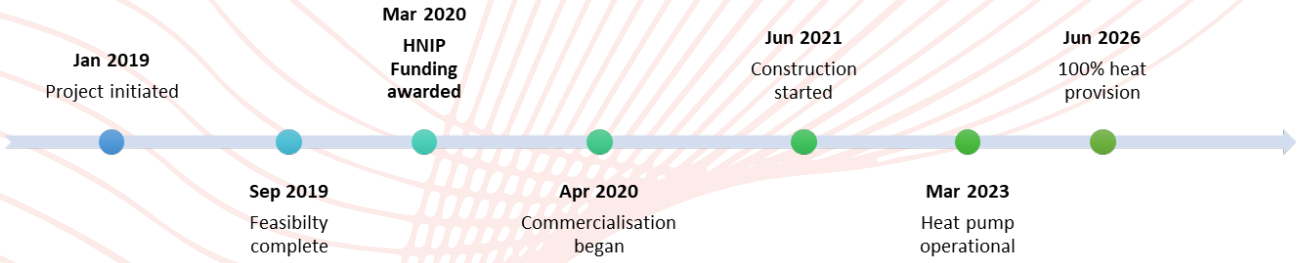


Project name	Gateshead District Energy Scheme
Location	Gateshead
Total project capex	£15,100,000
Funding awarded	£5,909,000 commercialisation and construction grant
Planned/estimated heat export at completion	Ca. 10 GWh per annum
Heat source & technology	Mine Water Heat Pump, backed up by gas CHP
Thermal storage capacity planned	250m^3 stores, and 750m^3 in network
Key anchor loads	Gateshead Quays Arena and Conference Centre
Length of primary network	5.5km
Anticipated number of buildings and/or connections	Gateshead Quays Arena and Conference Centre 270 private homes
Annual carbon savings (average over first 15 years)	1,252 tCO_2e per annum



The Gateshead District Energy Scheme is an expansion upon the development of the Gateshead Energy Centre. Opened by the council in 2017, the energy centre provides heat and power to a 5km energy network. £5.9 million of HNIP funding supported the commercialisation and construction of the network expansion which saw the installation of a 6MW mine water source heat pump. The technology will provide geothermal heat into the network, displacing both gas CHP and gas boiler generated heat. Upon completion, the network will supply lower carbon, lower cost heat to Gateshead Quays Arena and Conference Centre and 270 new private homes. The council is actively looking to roll out zero carbon heating to a much wider audience across the borough.

Project Milestones



The Story So Far

The project has passed many significant milestones since it was awarded HNIP funding in 2020. After starting construction in June 2021, the heat pump was delivered, and the mine water borehole completed by February 2022. In June 2022, the commissioning of the mine water heat pump commenced. By March 2023, the heat pump passed load and efficiency tests, achieving 6.23MW peak output, and a COP of 2.99. Permits from both the Environment Agency and Coal Authority were then received, allowing operation to commence. For the network extension, connection agreements for 270 homes were signed in March 2022, and the heat network extended to the site entrance by August 2022. Final designs for the heat substation and site heat network are ongoing, with an expectation that heat will be delivered to the first homes from Autumn 2023.

The project also relied on securing a Renewable Heat Incentive (RHI) subsidy, which was achieved only after the Government extended the non-domestic RHI to March 2023. This has been submitted and will go through appraisal. Thanks to the HNIP project, Gateshead Council, in contract with Balfour Beatty and GEA, has been able to secure a further £8.1m of Public Sector Decarbonisation Scheme (PSDS) grants. These enabled the connection of four more Council buildings to the network by Feb 2023 and helped to install almost 4MW of solar PV – largely through brownfield solar parks – which were switched on in Dec 2022. These panels further increase available renewable electricity on the network.

Lessons Learned

Installing a mine water heat pump wasn't without its complications; the project spent longer than planned to locate suitable borehole locations. To mitigate this risk, it is recommended that projects should start out with a range of borehole locations, to allow for areas that are not suitable. The Gateshead Energy Company also developed innovative hydrogeological tools, with support of the Coal Authority, to secure the large mine water flow rates and therefore raising the availability of heat from mine water heat pumps.



The HNIP investment placed the Gateshead Heat Network in a position to unlock funds from other government schemes, which were required to match the ambition and scope of the project which may have not been met otherwise.

Mid-way through the project, the team had to adapt to the need to remove less viable connections. This resulted in the connection of the Gateshead Quays development and new residential properties, which required new commercial terms for the developer to secure the connection to meet Building Regulations. Appropriate contingency planning would have limited the impact of these changing circumstances.

Councillor John McElroy, Gateshead Council Cabinet member with responsibility for energy said:

"This is a real statement of intent for our ambitions to tackle climate change in Gateshead and reach our zero carbon goal by 2030. We already have a significant track record of investment in heat networks, so this is proven technology - now our challenge is to expand on that success and roll out zero carbon heating – using heat from mine water - to a much wider audience across the borough."

To find out more, visit:
District Energy Scheme benefits - Gateshead Council

Useful Links: Timelapse of energy centre build

Infographic of minewater system

