Growth zones, large development sites and New Towns

Photo credit: James Feaver


Photo credit: Modunite Ltd

Overview

Energy Superloops are fifth-generation ambient heat networks designed to deliver low-carbon heat, ultra-fast fibre connectivity and integrated infrastructure for large-scale developments.

Unlike traditional district heating systems, which rely on high-temperature centralised plant rooms, Energy Superloops operate at low ambient temperatures. This significantly reduces heat distribution losses, improves system efficiency, and removes many of the operational and customer challenges associated with earlier heat network models.

By combining data centre waste heat, networked ground source heat pumps, and renewable power, Energy Superloops provide a scalable, future-ready energy solution for developments of 500 homes or more. They are designed to support the UK's transition to net zero at comparable costs to other heating systems whilst reducing the energy costs for the end user.

The Challenge

Developers of large residential schemes face a convergence of challenges:

- The need to comply with the Future Homes Standard (FHS), expected to become mandatory by 2028
- Increasing pressure to demonstrate low-carbon, high-performance buildings
- Grid constraints, particularly in areas with limited electricity capacity
- Rising construction costs and the need to minimise programme risk
- The requirement to deliver affordable, reliable heating systems for end users
- Planning pressures linked to sustainability, air quality and infrastructure integration

Traditional approaches, such as gas boilers, centralised energy centres with high-temperature heat networks or other forms of heating, may become increasingly unsuitable for meeting the pressures developers face.

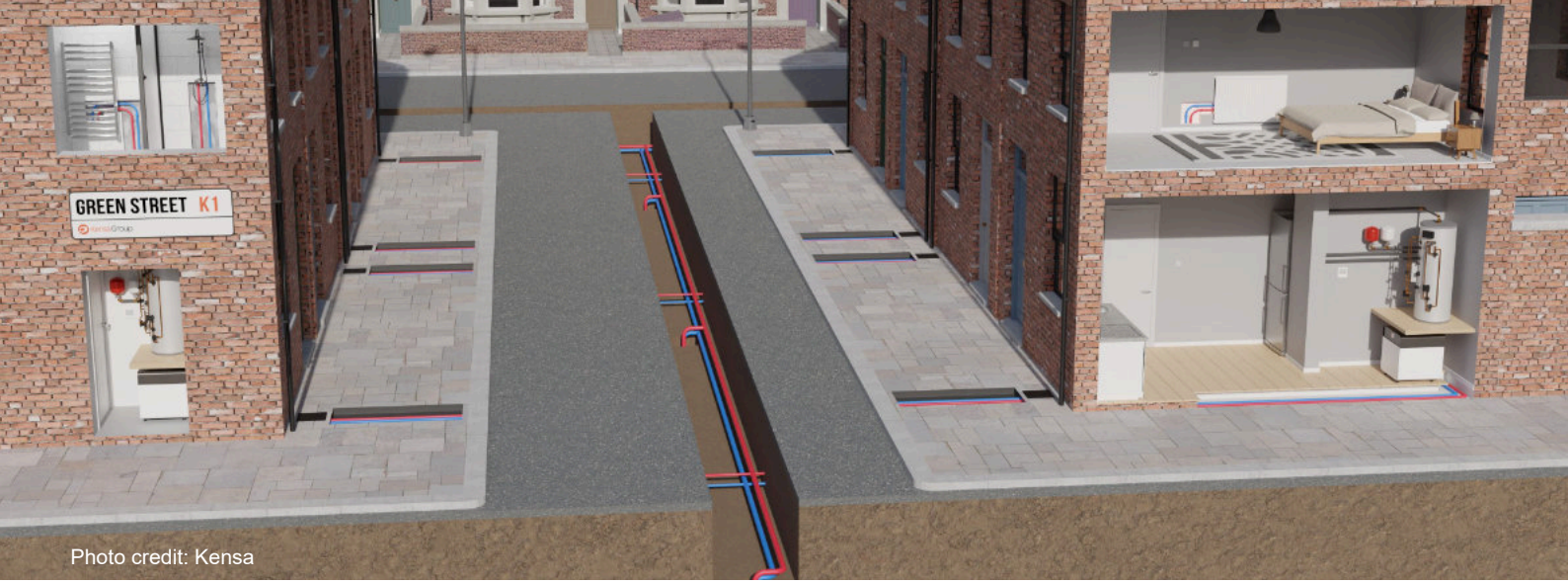

Photo credit: Kensa

The Solution

At the core of the Energy Super Loop solution is a low-temperature ambient heat network, which replaces traditional heating system and heat network concepts by connecting:

- A data centre, acting as a continuous source of recoverable waste heat
- A network of boreholes, providing both renewable heat exchange and thermal storage
- Individual ground source heat pumps (GSHPs) within each property utilising the waste heat.
- A new or existing renewable energy asset to power the system.

Rather than generating high-temperature heat centrally and distributing it (with associated losses), the system distributes low-temperature heat efficiently and upgrades it locally within each building.

This approach delivers:

- Higher overall system efficiency
- Reduced distribution losses
- Lower operating costs
- Improved system flexibility and scalability
- Comparable install costs to ASHP’s

It also allows the data centre to effectively act as the energy centre, while simultaneously delivering digital infrastructure such as ultra-fast (up to 10gb) fibre connectivity.

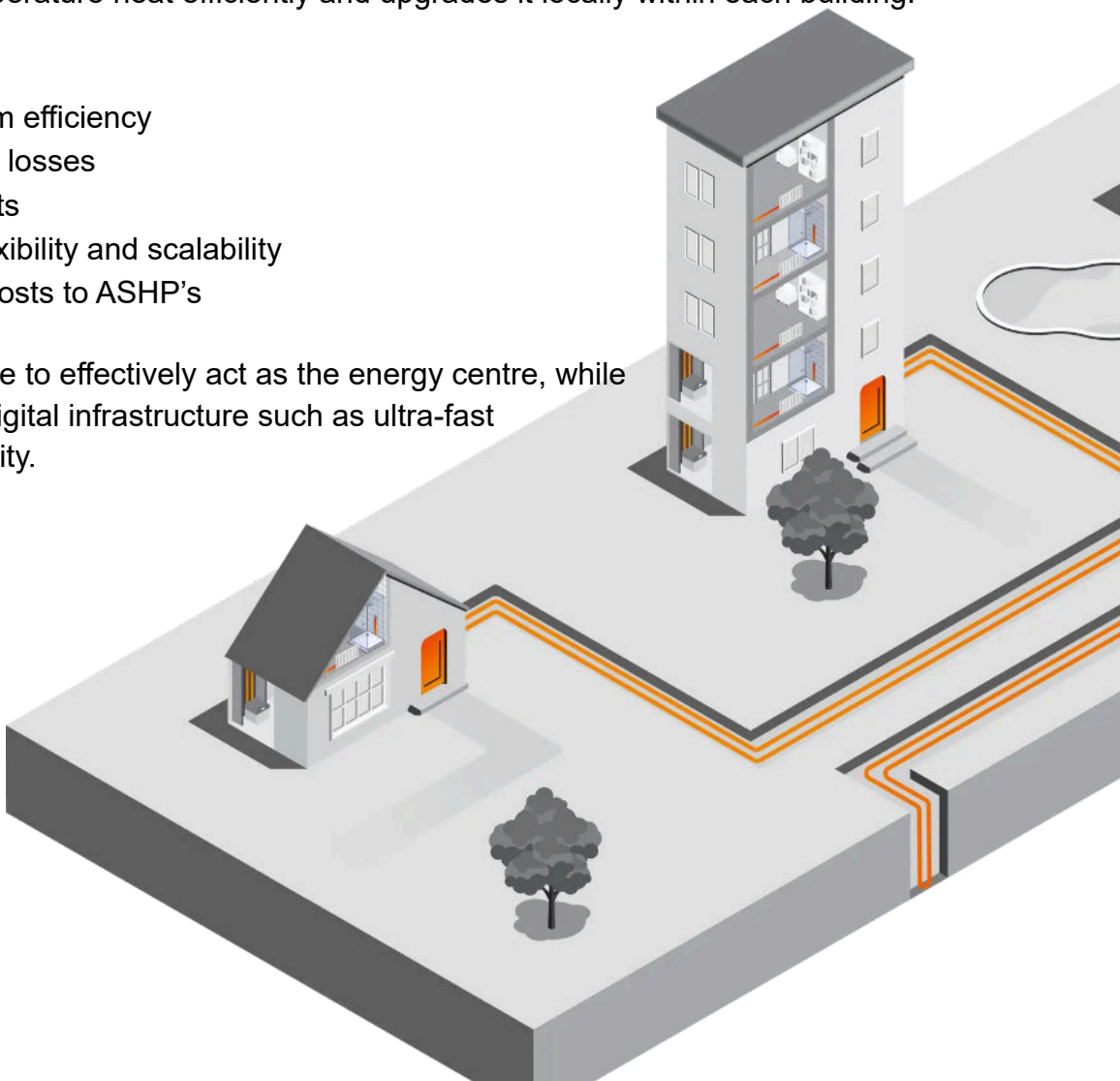

Photo credit:Claudio Schwarz

How It Works

The system operates as a closed regenerative loop:

Power generation

Local renewable energy and the national grid powers Superloop's data centre

1

Data centre

Computing operations generate recoverable waste heat 24/7

2

Heat recovery

Waste heat is used to warm water circulated through Superloop's pipes

3

Home heating

Pre-warmed water moves through your new ground source heat pump, boosting efficiency and cutting bills and emissions

4

Closed loop

Cooled water returns to our data centre to be reheated - cycle repeats endlessly

5

Energy Superloop

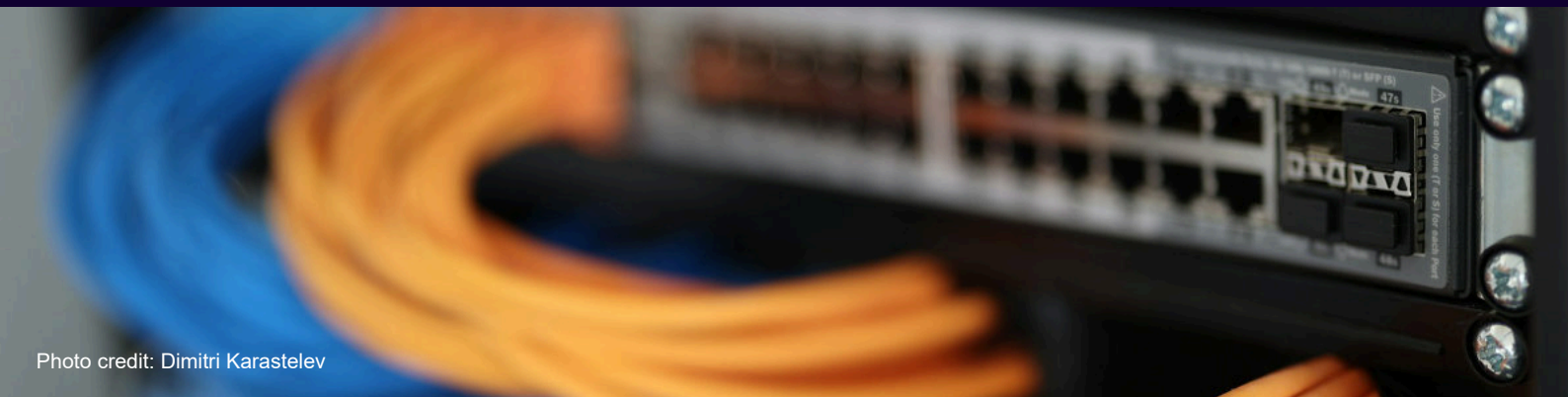

Photo credit: Dimitri Karastelev


Photo credit:Kensa

This continuous cycle ensures a stable, efficient supply of low-carbon heat. Our data centres can be sized for future construction phases, ensuring there is enough heat for an expanding heat network.

Infrastructure & Resilience

Energy Superloops are designed for long-term performance and resilience.

- The borehole array provides a buffered heat source, ensuring continuity of supply even if the data centre is temporarily offline
- The distributed nature of the system removes reliance on a single central plant, reducing risk of total system failure
- Underground infrastructure (boreholes and pipework) has a design life of up to 100 years
- Systems can be expanded in phases, allowing future development without major redesign

This makes the system particularly well suited to large, multi-phase developments and New Towns.

Commercial Model & Delivery

Energy Superloops are backed by major green investment funding from Octopus Energy Generation, enabling flexible commercial structures.

Key delivery options include:

- Turnkey delivery full design, funding, installation and operation
- Integrated delivery working alongside existing development partners

Importantly:

- The system does not add to the construction programme
- Infrastructure can be installed alongside standard utilities
- Developers can reduce or avoid capital expenditure and risk on traditional energy centres while still integrating a heat network with their development.

Planning & Policy Alignment

Energy Superloops are aligned with current and emerging UK policy:

- Support for the Future Homes Standard (2028)
- Alignment with upcoming EPC reform (Home Energy Model),Compliance with local planning policies:
    - EN1 (Carbon Reduction)
    - EN2 (Sustainable Construction)
    - EN4 (District Heating)


Photo credit:Kensa

Superloop networks also support Social Net Present Value (SNPV) considerations, incorporating:

- Carbon reduction
- Air quality improvements
- Public health benefits

Benefits for Developers

- Lower electricity demand compared to ASHP-led developments and comparable to gas boiler deployment
- Flexible funding and delivery models
- No need for centralised energy centres
- Faster planning outcomes due to sustainability benefits
- Scalable infrastructure aligned with phased development
- No uplift in cost per unit compared to other renewable heating systems such as ASHPs

Benefits for Residents

- 25–40% lower heating costs compared to gas (in retrofit scenarios)
- No external units, quiet and visually unobtrusive
- Lower maintenance requirements
- Ability to choose electricity supplier and tariff
- Improved indoor and outdoor air quality


Image credit: Kensa

Additional Capabilities

Energy Superloops can also:

- Provide heat to community assets such as schools and swimming pools
- Deliver ultra-fast fibre broadband (up to 10Gb) via integrated infrastructure
- Support integration with smart energy systems

Case Studies & Precedents

Kensa, a UK based Ground Source Heat Pump manufacturer, is a Superloop project partner. They are experts in large scale networked heat pump projects for new build developments.

Photo credit:Kensa

133 new energy-efficient homes comprising of 2, 3 and 4-bedroom houses and 1 and 2-bed apartments for Bristol City Council by Willmott Dixon. Read more about the project here.


Photo credit:Kensa

Kensa oversaw the installation of boreholes and ground source heat pumps into Longhurst Group's new affordable housing development, California Meadows in Huntingdon, Cambridgeshire.


Photo credit:Kensa

At Parc Eirin in South Wales, 114 new homes have been built to meet the UK's future housing and climate standards - without a gas boiler in sight. Instead, every home will be connected to a networked Kensa ground source heat pump system, delivering clean, efficient, affordable heating and hot water.

Why It Matters

Energy Superloops represent a step change in how heat is delivered at scale.
They:

- Enable large-scale decarbonisation at a comparable cost to other renewable heating systems
- Reduce energy costs and maintenance for end users
- Improve infrastructure efficiency
- Unlock the value of waste heat from data centres

They are designed not just for today’s requirements, but for the long-term evolution of energy systems and new house building in the UK.

Next Steps

Early engagement is key.

Working together at the earliest stages of a development allows:

- Optimal system design
- Integration with site infrastructure
- Access to funding
- Alignment with planning strategy

Contact us to discuss how an Energy Superloop could support your development:
info@dataglow.energy