



Growing Sustainable Networks

APSE Energy Event – Southampton Heat networks in practice

Southampton Geothermal Heat Company

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Head of Operational Excellence

September 2026

Agenda

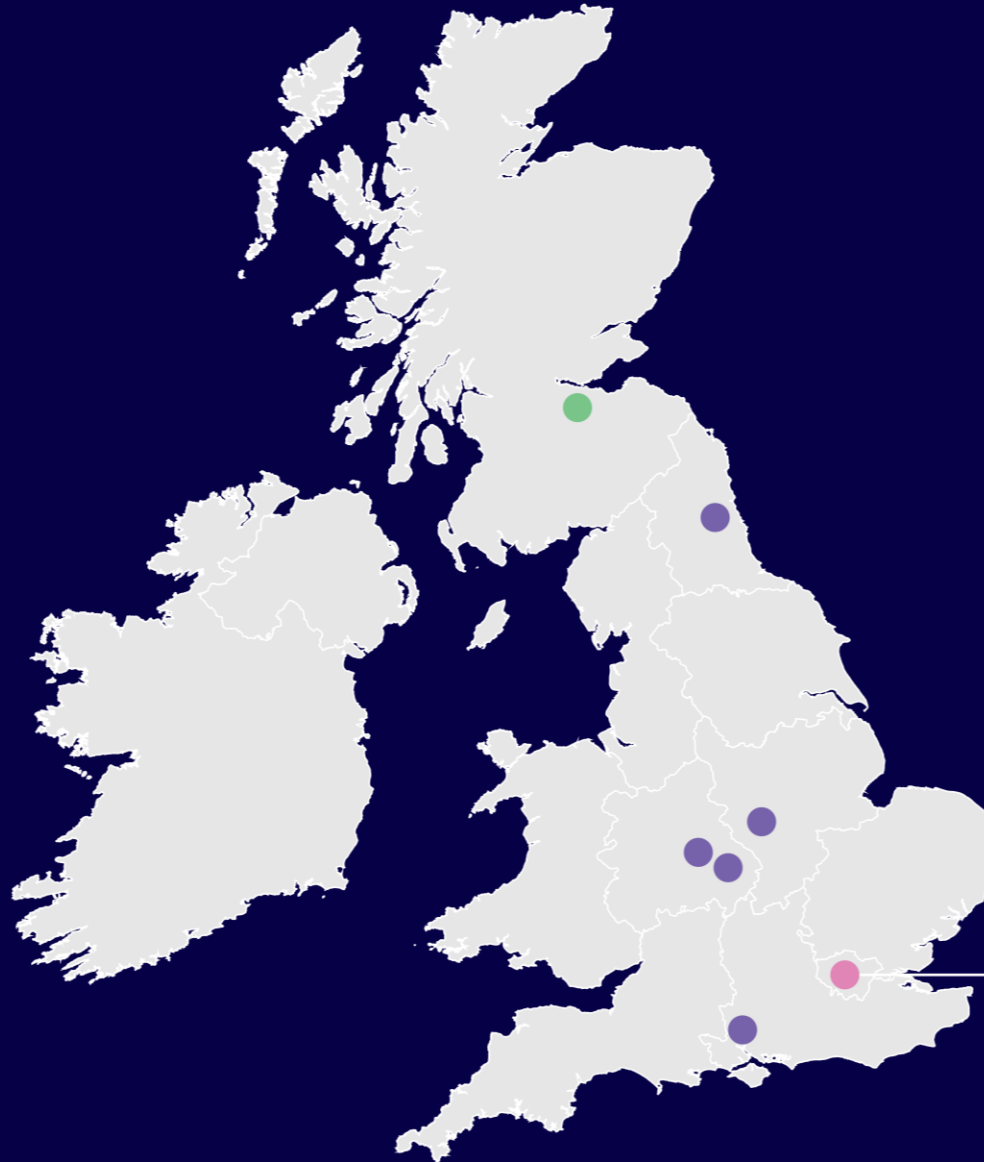
- Brief introduction to Bring Energy
- The Southampton Heat Network – 40 years of operation
- Practicalities of operating the scheme
- Continued development

Bring Energy

432 MW
Heating capacity

117 MW
Cooling capacity

67 MW
Electricity capacity



KEY

- District Energy Network
- EsCo: Energy Service Contracts

Greater London



London
Newcastle
Birmingham
Coventry
Leicester
Southampton
Edinburgh

One of the UK's longest running heat networks

Exploratory 500m well drilled by the Dept of Energy. Viable for DH
(1981)

SGHC Limited was incorporated as a partnership between Utilicom and City Council
Deeper well (1,800m) and Heat Network
(1986)

Continued growth and installation of CHPs in the Network
Electricity connection to the Port and Hospital
(early 2000s)

Decarbonisation begins amongst key Anchor load impacting electricity revenue from CHPs
Operational challenges related to Return Temps
(2023)

GHN application for expansion to the north of the city
(2026)

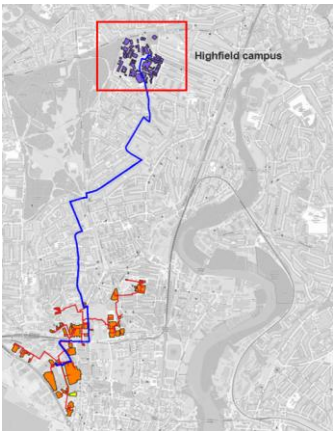
1980s – 1990s

2000s – 2010s

2020s – 2030s

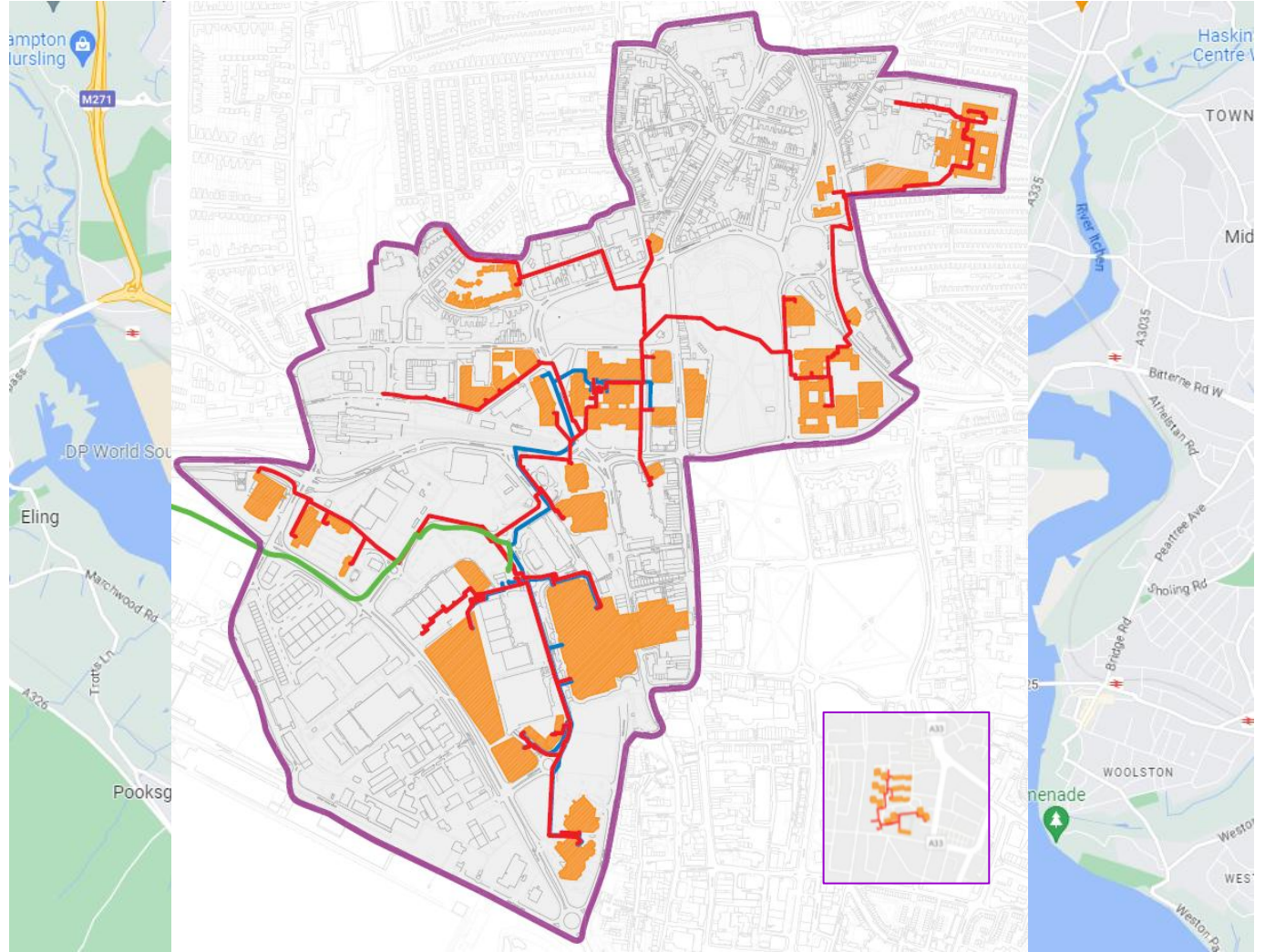


Expanded Geothermal Well
(2031)



System capacity

- 52 connections (4 residential bulk)
- 32 GWh of heat pa to the city
- 3.5 GWh pa of heat at the Holyrood estate
- 5-7 GWh of cooling pa
- Approximately 12MW of heat peak load in the main scheme plus peripherals
- 14.5 km heating network
- 5.1 km cooling network



Practicalities – people, processes and partnerships

- Generation assets maintenance and replacement
- Buried network maintenance and balance
- Customer substation operation, maintenance and access
- Metering and billing
- Regulatory compliance
- Customer engagement
- Around 100 M&E supply-chain partners support operation and maintenance
- Network redevelopment: partnership with our Geothermal specialist (Star Energy), the University and the City Council
- Operation efficiency such as Return Temperatures



Left: heat network pierced by marquee, right: Power cable failure



Left: well head, right: cyclone and buried pipework to Energy Centre

Practical challenge – Return Temperatures matter

Current challenge

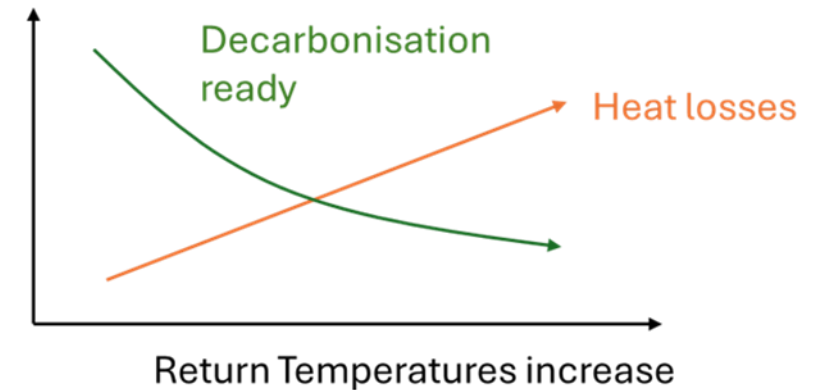
- The existing geothermal output is constrained by high customer return temperatures (EA permit).

Why it matters

- Reduces overall network efficiency
- Limits renewable heat utilisation
- Increases operational costs

Learning points

- Customer systems require ongoing optimisation
- Design standards need active enforcement
- Monitoring and engagement are essential
- Performance management is never finished



Looking forward – Decarbonisation and long-term heat cost model

Stage 1 (early 2030s): develop and drill one deep geothermal well system to be integrated into an expanded Heat Network – partnership with Star Energy.

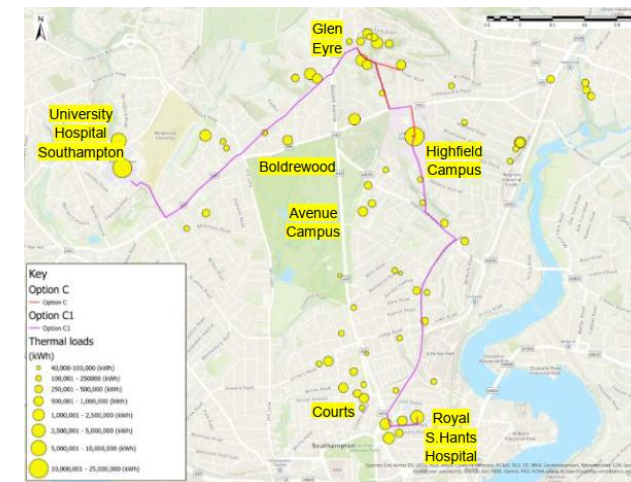
Stage 2 (late 2030s): drill a second set of geothermal wells integrated into a second expansion to the network to the University Hospital.

There are various stakeholders in the city who provide support to Heat Network development. In exchange, the industry secures jobs and decarbonise heat through renewable geothermal energy.

The Southampton City Council has been providing leadership support and facilitating information exchange. The city is proud of being the Geothermal Well city and wants to continue develop its renewable energy potential.

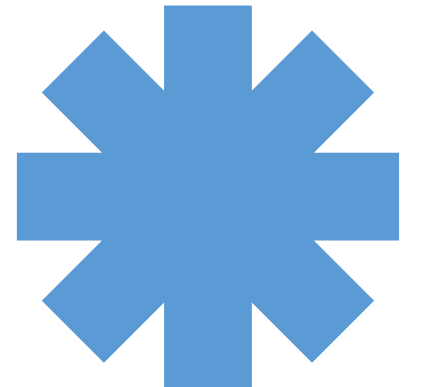
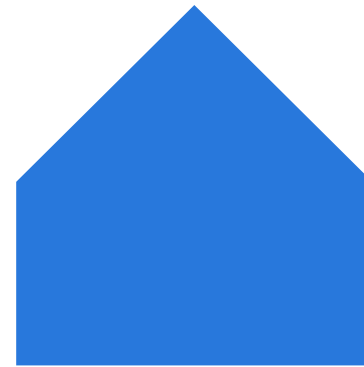
The Southampton MPs have been supportive the journey as they have facilitated forums of discussions with stakeholders, the **Southampton Energy Independence Summit** for a green city with electricity grid constrains.

Our ambition is to support the development of a National Geothermal Strategy, including targets and incentives for geothermal development and use for heat.



Thank you

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Appendices

Southampton Geothermal Heat Company

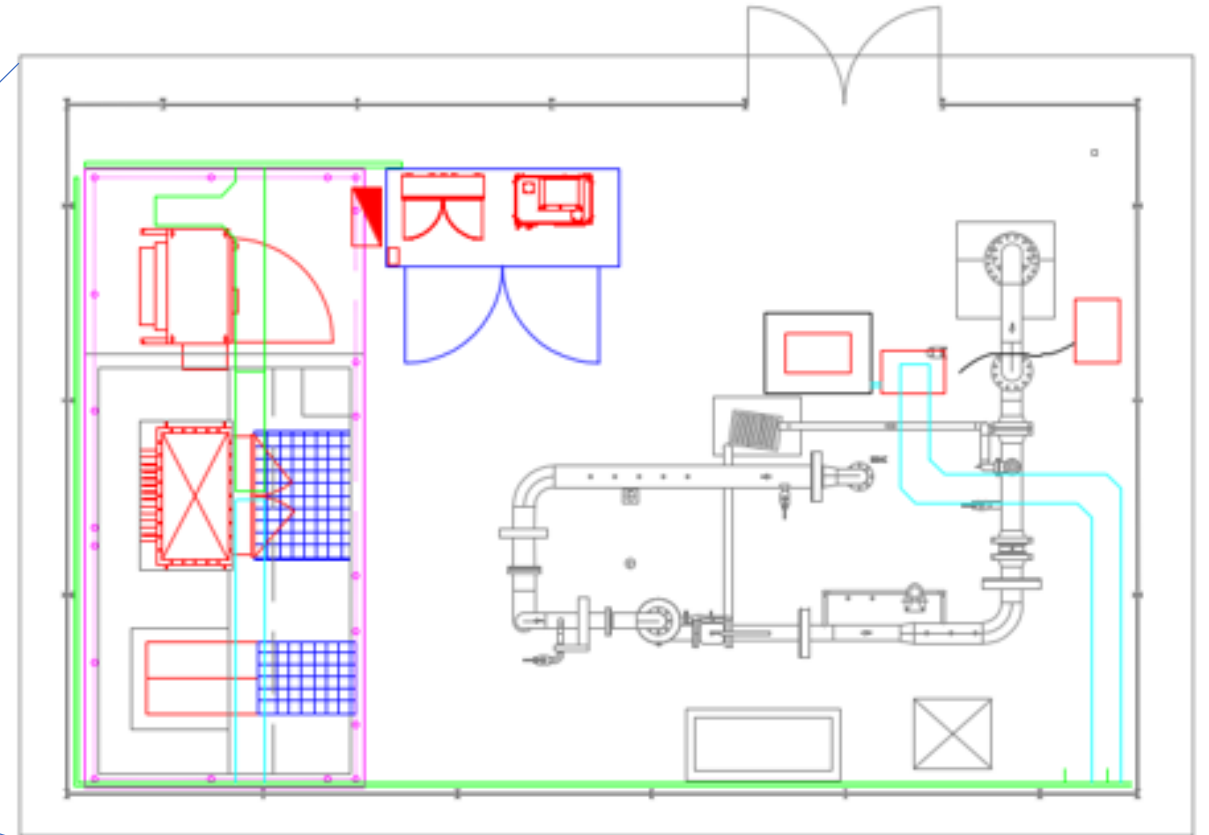
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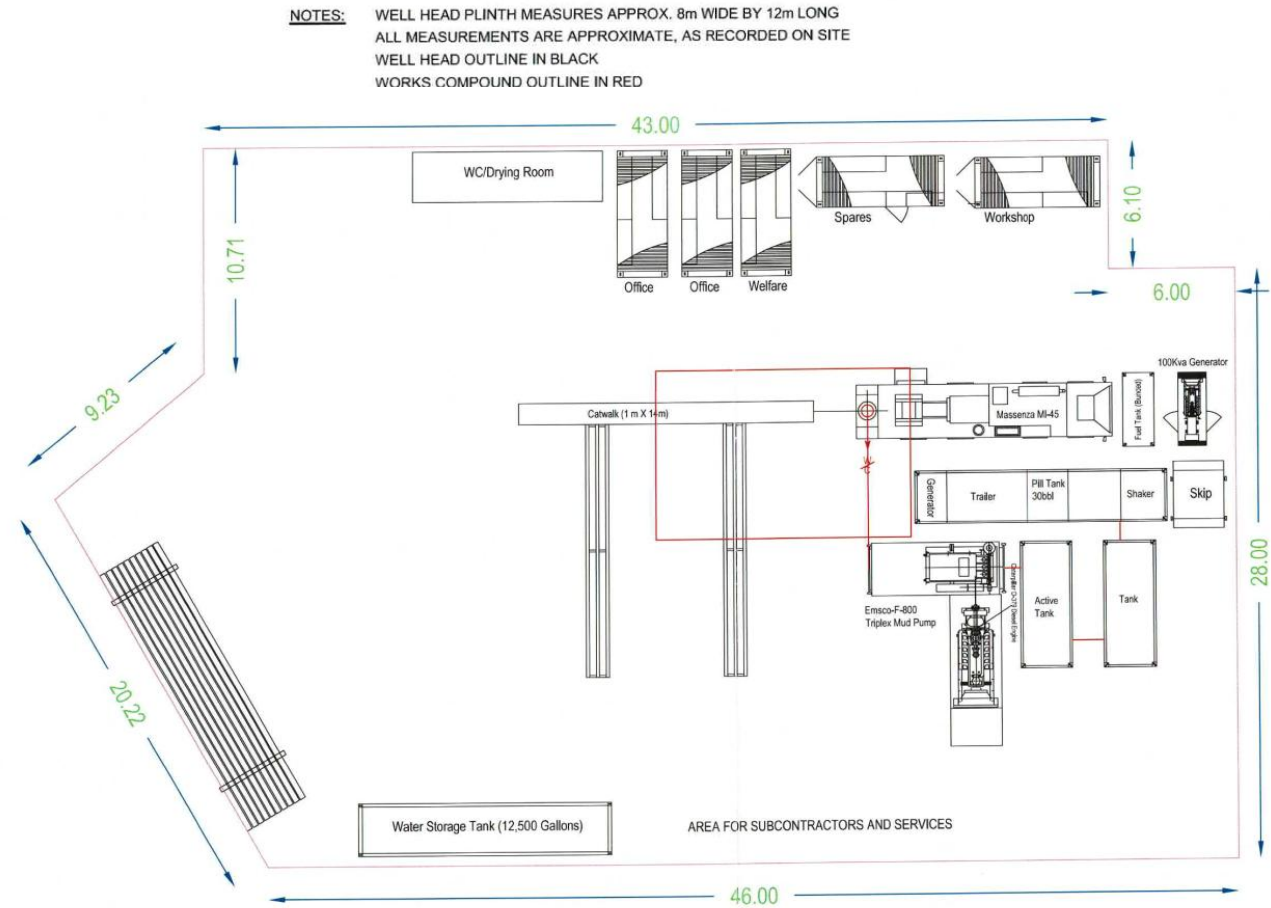
Existing geothermal well space requirements

- Well head with a submersible pump 1.2 to 2MW
- Electrical control panel (COP of 10)
- Cyclone filter to reduce heavy particles of brine
- Compound c. 85 m²
- Every 5-10 years: 1,500 m²



Existing geothermal well maintenance requirements

- Weekly cleaning of the cyclone filter
- If the wellhead runs 24/7 the pump requires to be removed and inspected every 5-10 years which requires a drilling rig to pull it out, as well as ancillaries.
- When the refurbishment was carried out by our drilling subcontractor, they worked 24/7 to complete the work and took a large area around the car park.



Existing geothermal well description of operation

The pump is driven by an inverter (VSD) located in an external enclosure at the rear of the heat station. A number of sensors are embedded in the downhole pump (including pressure, temperature, motor temperature, and vibration), which transmit to the VSD using the HV power cable.

The well will normally be operated at a flow rate pre-determined according the prevailing most economic operating strategy.

Operation: direct operation (current) or heat pump operation (decommissioned)

Start up:

Control valve left open during shut down. Continues open until purge setpoint active (Pressure and Temperature).

The cyclone filter operates release operates on differential pressure.

Existing geothermal well description of operation

