
Heat Networks
in Bristol
Investment to accelerate the roll out of local low carbon
energy infrastructure and drive city scale decarbonisation
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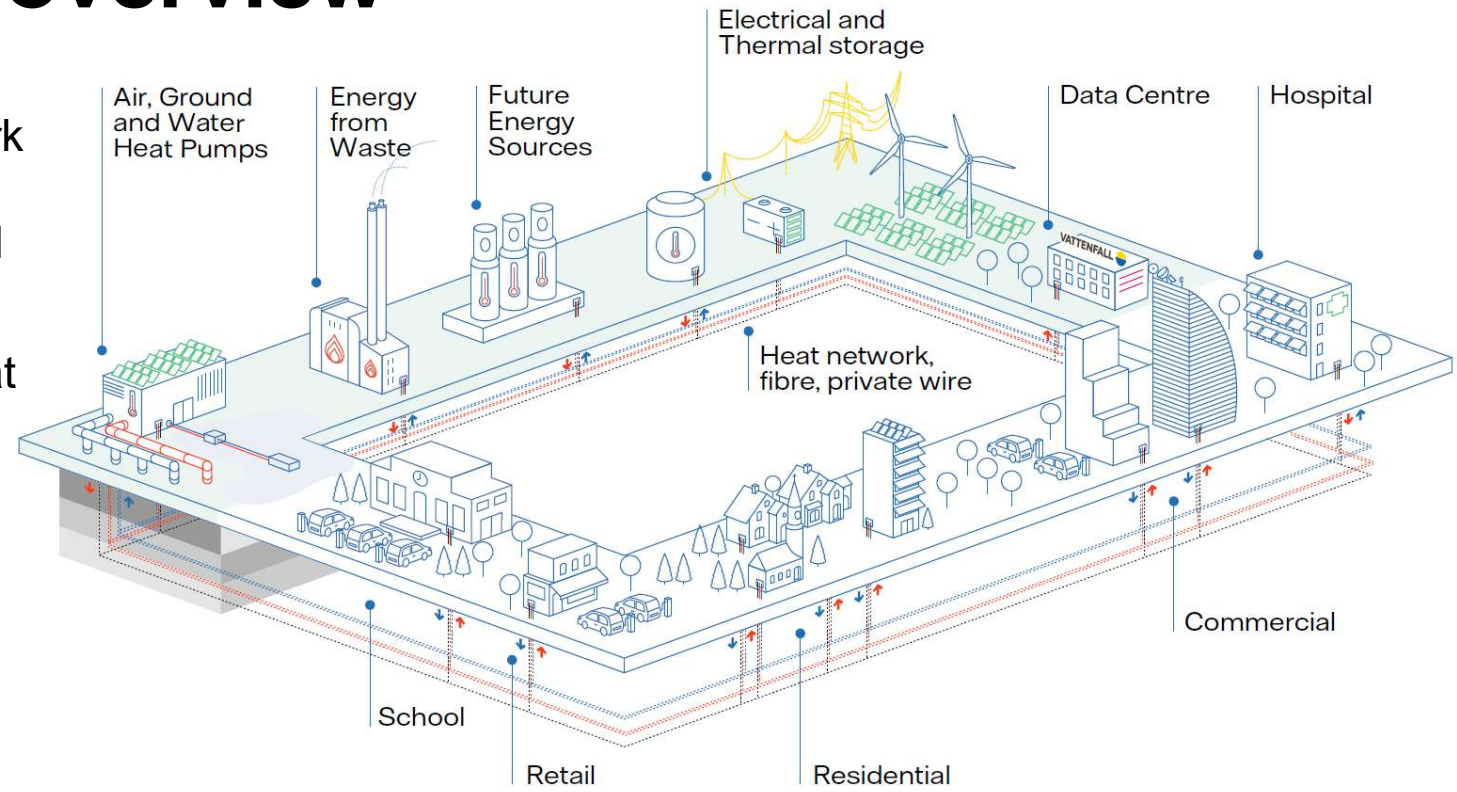
What are heat networks?

Heat networks overview

Distribute heat generated in a centralised location via a network of pipes for **domestic** and **commercial** space **heating** and **water heating**.

Efficiencies from generating heat centrally, rather than in each building.

Can collect heat from multiple sources, including **low or zero carbon** sources and **heat that would otherwise be wasted** reducing the carbon emissions



The only energy infrastructure able to make use of waste heat sources to deliver reliable, low carbon heat at scale

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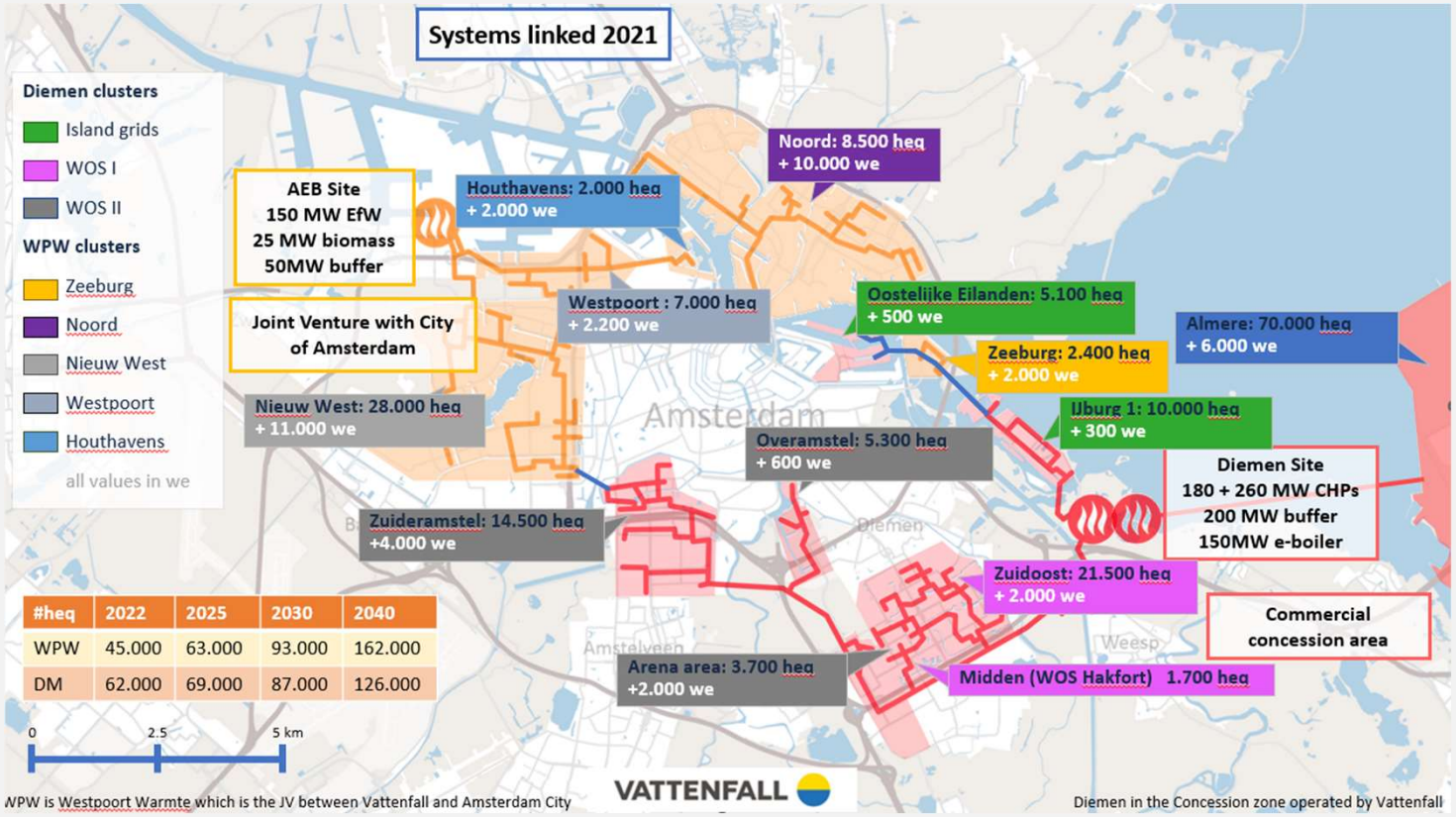
What are heat networks?

Heat substations, or connections

Heat substations are the interface between the heat network and buildings. They vary in size considerably from full plant room skid mounted units for large buildings to smaller ones which could replace a domestic gas combi boiler. **Existing gas boilers can be replaced like for like with a heat substation to facilitate a connection to the heat network.**

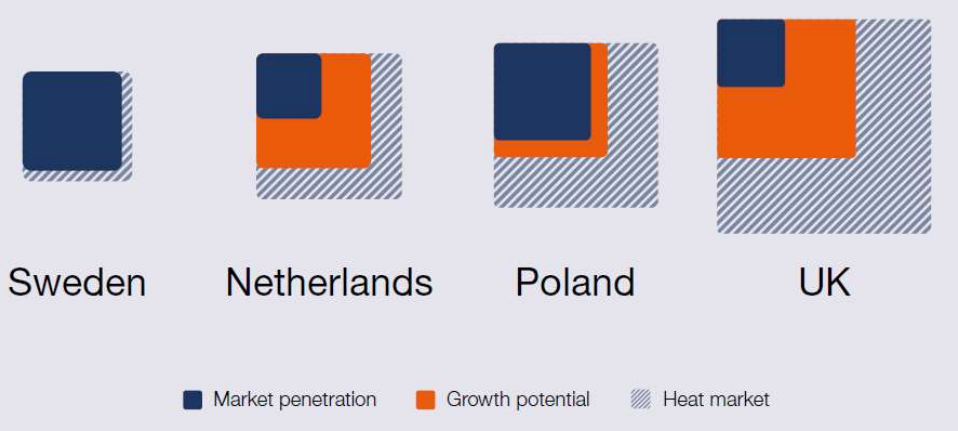
What is the potential?

- The Amsterdam heat network has reduced the city's emissions by 70% compared to gas boilers
- Heat network connection is a planning policy requirement
- Today growing at 8,000 new customers per year
- 320,000 customers by 2040
- New build/ retrofit split: initially 70:30, today 50:50, future 25:75



#heq	2022	2025	2030	2040
WPW	45.000	63.000	93.000	162.000
DM	62.000	69.000	87.000	126.000

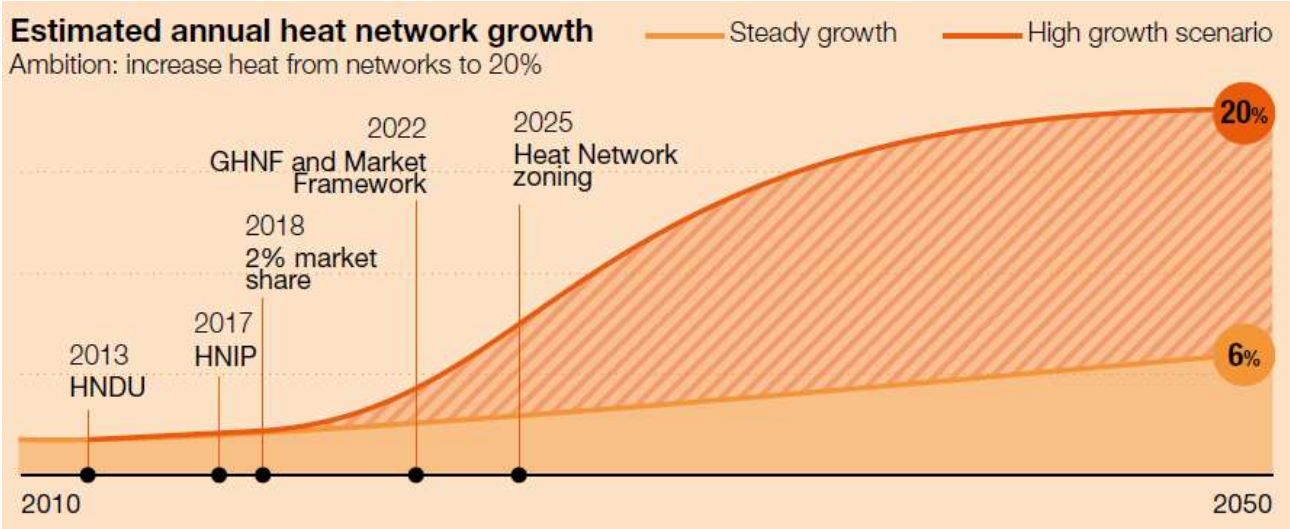
Huge growth is expected – and needed!



Behind the curve but with massive potential

The UK government estimates that c.20% of heat will be delivered via heat networks if we are to achieve net zero by 2050

The UK cannot decarbonise without heat networks



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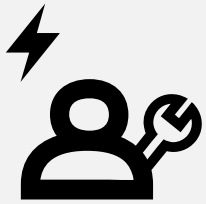
Heat networks rather than individual heat pumps?

Reliability

Fair and transparent pricing

Energy efficiency

Building and location compatibility



Maintenance

Environmental impact

Sector coupling

Electricity system benefits

Decarbonising Bristol's buildings

An introduction to the Bristol heat network

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Bristol planning policy

The Heat Priority Area is part of adopted local policy showing areas where heat networks are expected and will be supported. It is the basis for the City Leap concession.

New build developments

Major developments in this area must connect to the Bristol heat network if available.

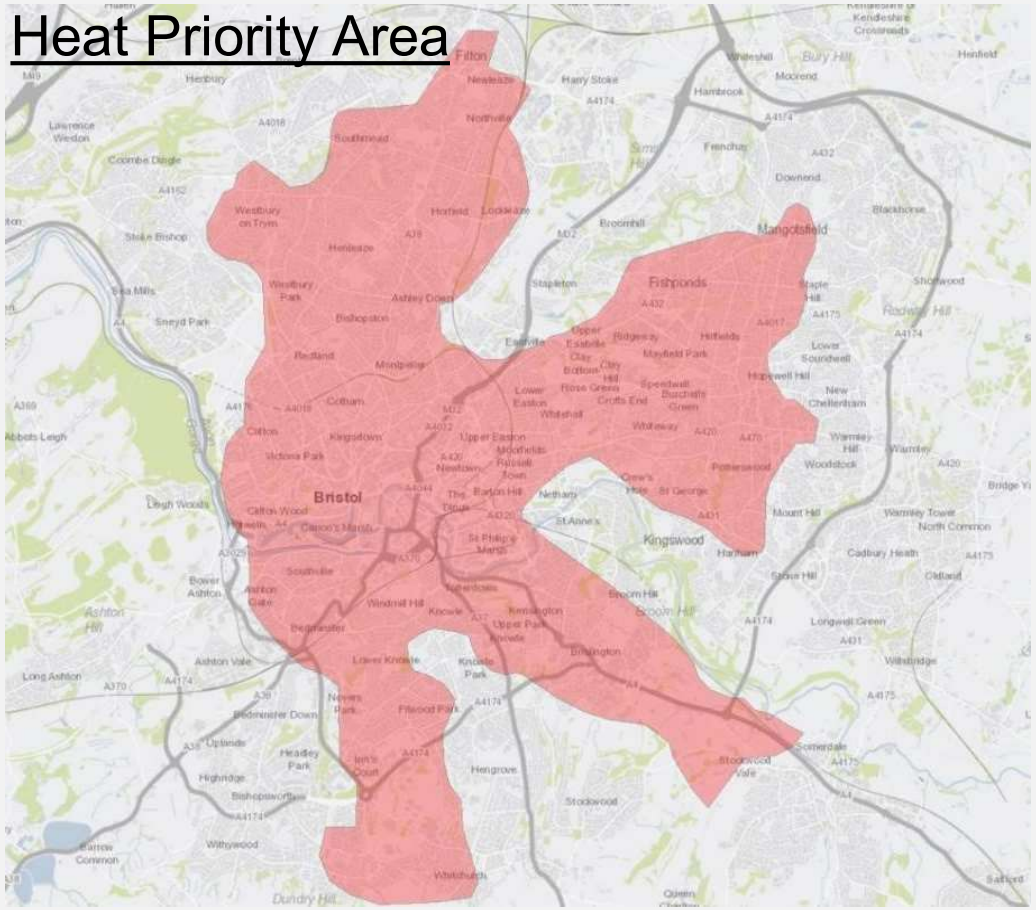
Other buildings in the Heat Priority Area will be required to be ‘heat network ready’ or futureproofed for later connection

Without this policy, heat network development in Bristol would not have happened

Residential retrofit

Bristol’s One City Climate Strategy states that 65k residential and 2k commercial buildings should be connected to heat networks to achieve lowest cost, lowest carbon decarbonisation.

No current delivery plan for these areas due to a lack of commercial grant support but it is deemed the best pathway for residents and from a UK PLC perspective



Vattenfall in Bristol

Vattenfall now **fully owns and operates** the heat network in Bristol. It is considered a key asset and will continue to be developed well **beyond the end of the 20-year Bristol City Leap concession.**

Over **the first five years**, Vattenfall will be investing £475 million to grow the Bristol heat network, providing enough heat to supply 12,000 homes.

***Bristol Heat Networks Ltd* will operate the Bristol heat network after the 20 year concession ends**

BRISTOL city leap

A ground-breaking twenty-year partnership has been created to deliver over £1 billion of investment into Bristol's energy system.

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AMERESCO

Vattenfall in Bristol

Heat network commitments

The Bristol heat network is a **strategic city asset** with contractual commitments to ensure it is operated fairly for customers, including:

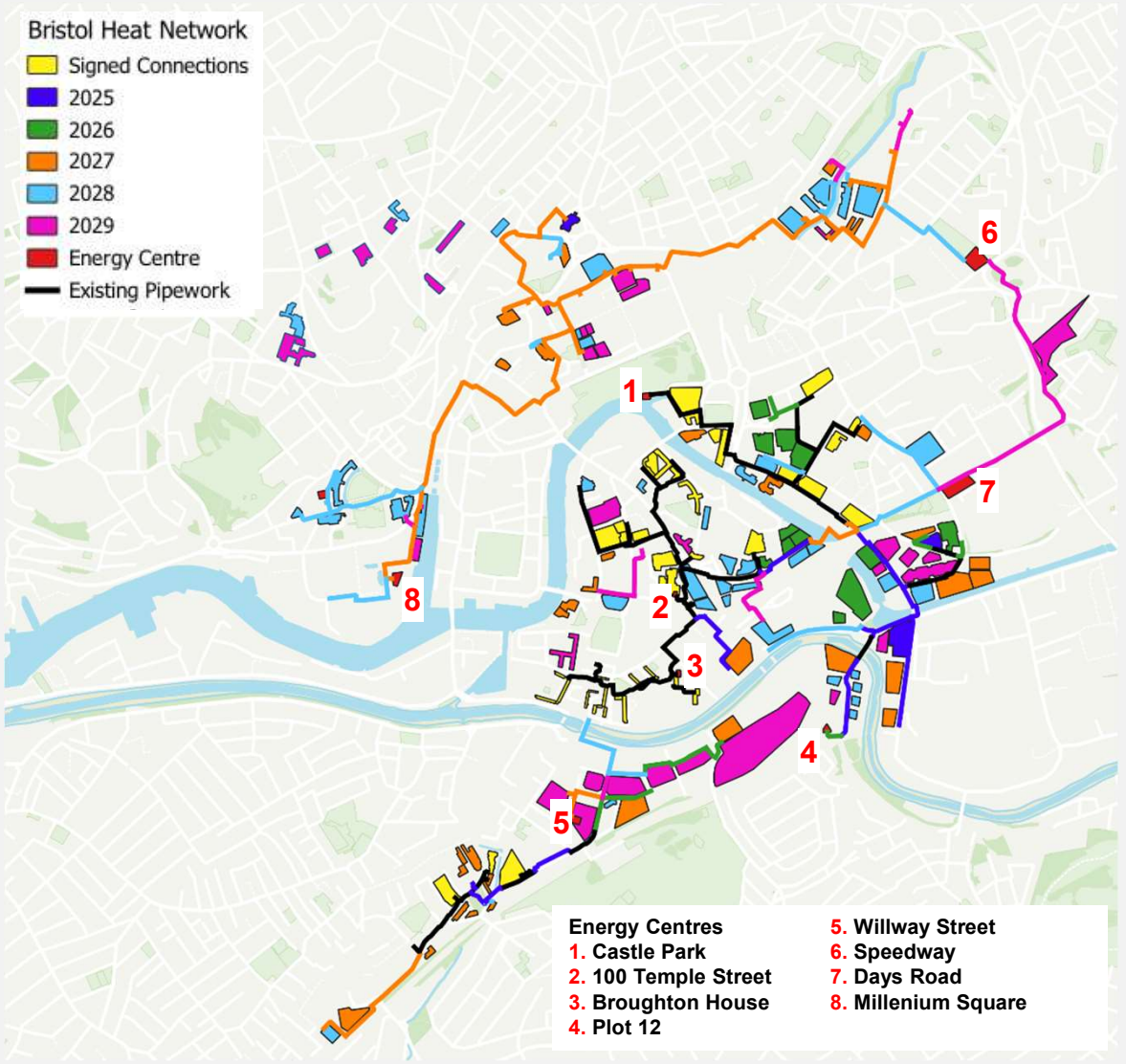
- **Guaranteed standards of customer service** and protection including Heat Trust accreditation for domestic customers
- **Guaranteed heat availability** standards
- **Fair and transparent pricing**, benchmarked against counterfactual
- **Heat network growth** of more than 10GWh demand added each year
- **Decarbonise the network** e.g. KPI on carbon content of heat; gas assets phased out by 2030; no new fossil assets

Bristol heat network

Existing & Planned

2025-2029

- Three live network areas
- Fourth network going live in 2025
- 37 buildings contracted for connection
- 13 retrofit connections
- Discussing connections with over 150 new and existing buildings
- Plans to connect network areas to improve resilience and diversity



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New build examples (heat network connection is mandatory for new large developments)

Assembly Building BT Group

Soapworks

Welcome Building

EQ

Halo

Castle Park View

Retrofit examples

Central Health Clinic

Temple Fire Station

100 Temple Street Offices

Temple Quay House Offices

Redcliffe Residential Blocks

Hannah Moore Primary School

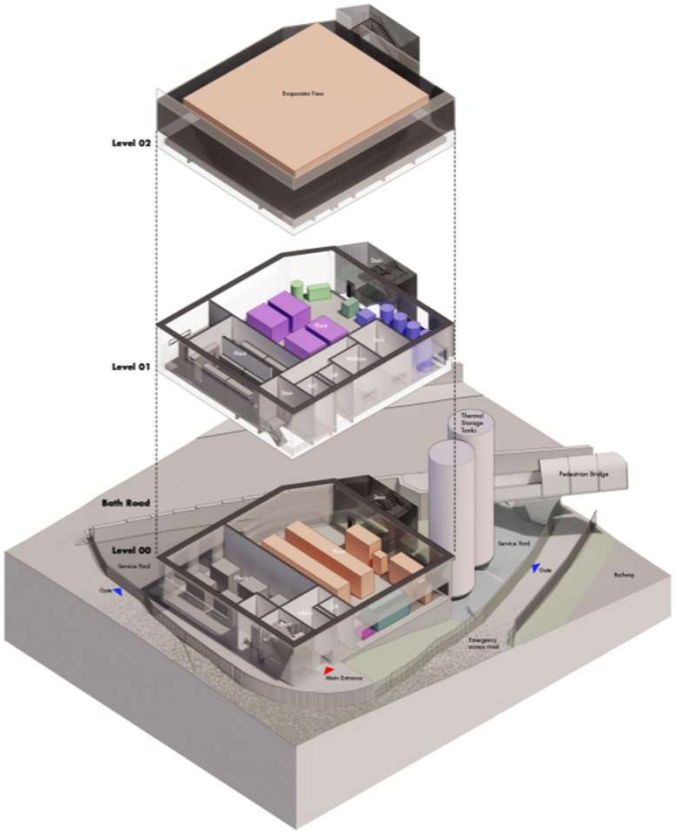
Low carbon heat

Castle Park – award winning 3MW energy centre

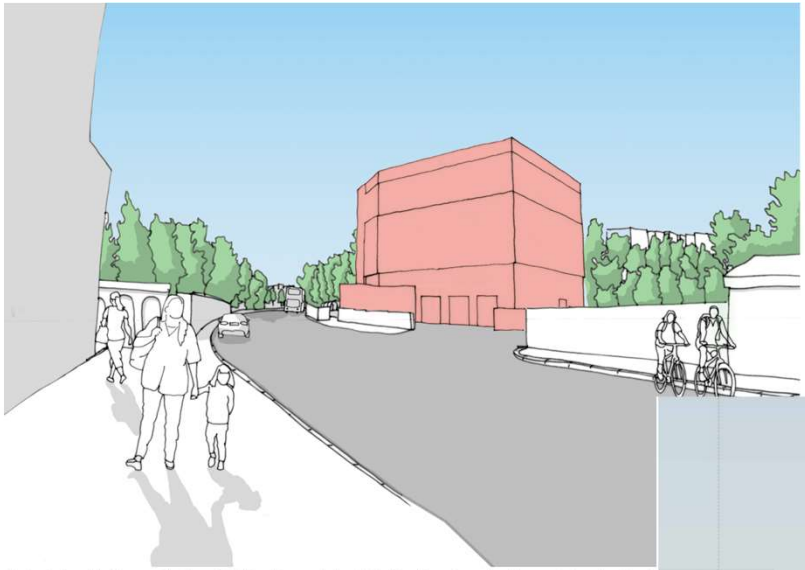
UK's largest harbour-based water source heat pump, providing heat from Bristol's floating harbour to up to 2,500 homes. The first of many similar facilities across the city.

Low carbon heat

Bath Road Energy Centre – 13MW air source HP



Exploded axonometric view of the energy centre



Context view - looking south along Bath Road towards the Wells Road junction, showing angled and set back
(Note: indicative massing only, not proposed facade detail)

Pre-app stage

Section view looking north-east towards future Temple Island development

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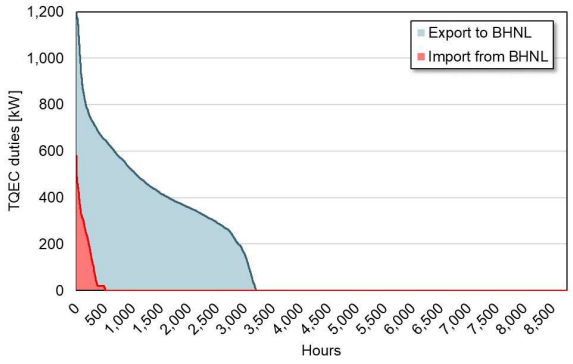
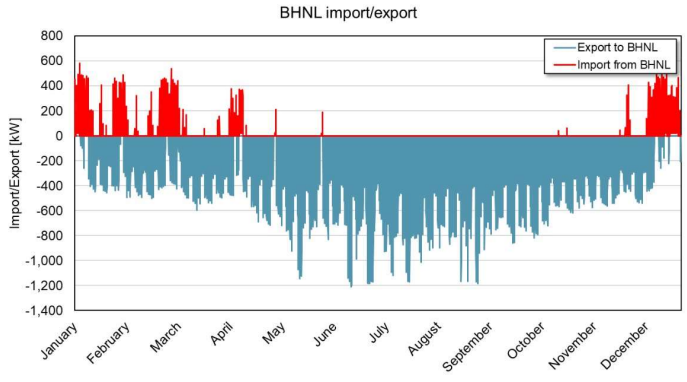
Low carbon heat

Temple Quarter enterprise campus

- One of the country's most innovative, low carbon heating systems will soon be active in Bristol when Vattenfall connects the University of Bristol's Temple Quarter Enterprise Campus to its low carbon heat network, providing heating, cooling and hot water

- This is one of the first times in the country, that a building connected to a citywide heat network will be able to sell excess heat produced from its own computer servers back into the heat network to help heat other buildings.





"The University of Bristol's new Temple Quarter Enterprise Campus (TQEC) will bring together world-class education and research, industry expertise and civic organisations to innovate at scale and shape future skills for the city-region.

the current Quantum Technologies Innovation Centre (QTIC) will expand, cementing Bristol's reputation in quantum research"

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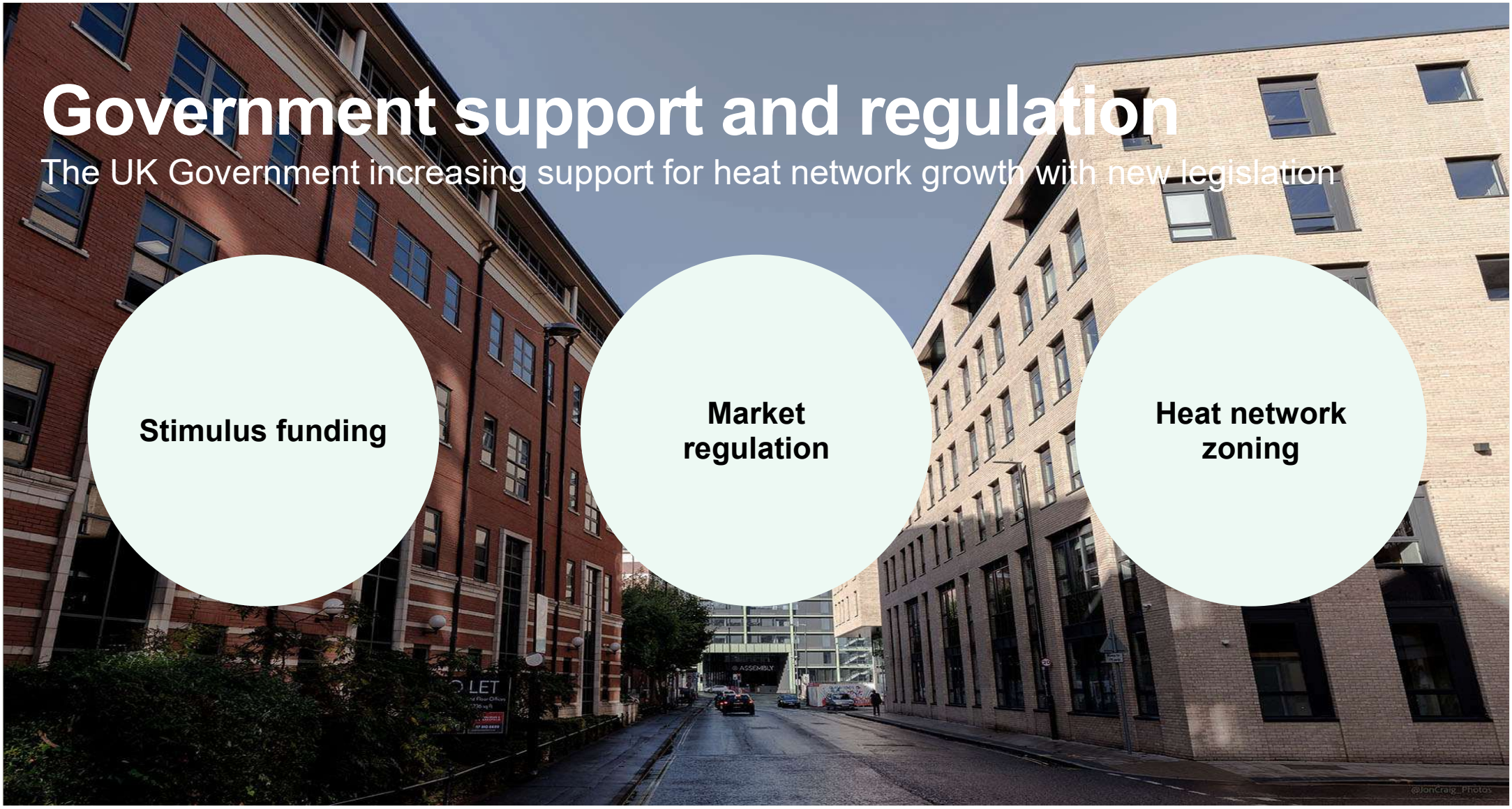
Government support and regulation

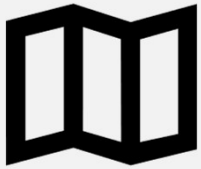
The UK Government increasing support for heat network growth with new legislation



Regulation

Stimulus funding

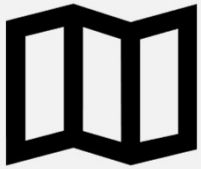
- Green Heat Networks Fund (GHNF) is a six-year **£288 million grant fund** supporting new heat networks.
- The scheme launched in March 2022 and has been extended and expanded. It will **run until 2028**.
- Capital grants are available for new projects, including for Vattenfall's in Bristol and other UK cities.
- In Scotland, a **further £300m is available** via Scotland's Heat Network Fund



Regulation

Introduction of market regulation

- Heat networks are **currently unregulated in UK**
- Energy Security Bill appoints **Ofgem as the regulator,** ensuring customers are protected with pricing and reliability of service standards.
- Heat Network operators will require a **license.**
- Holders of licenses **gain additional powers** e.g. permitting and land access to assist operations, reducing costs.
- Statutory undertaker powers

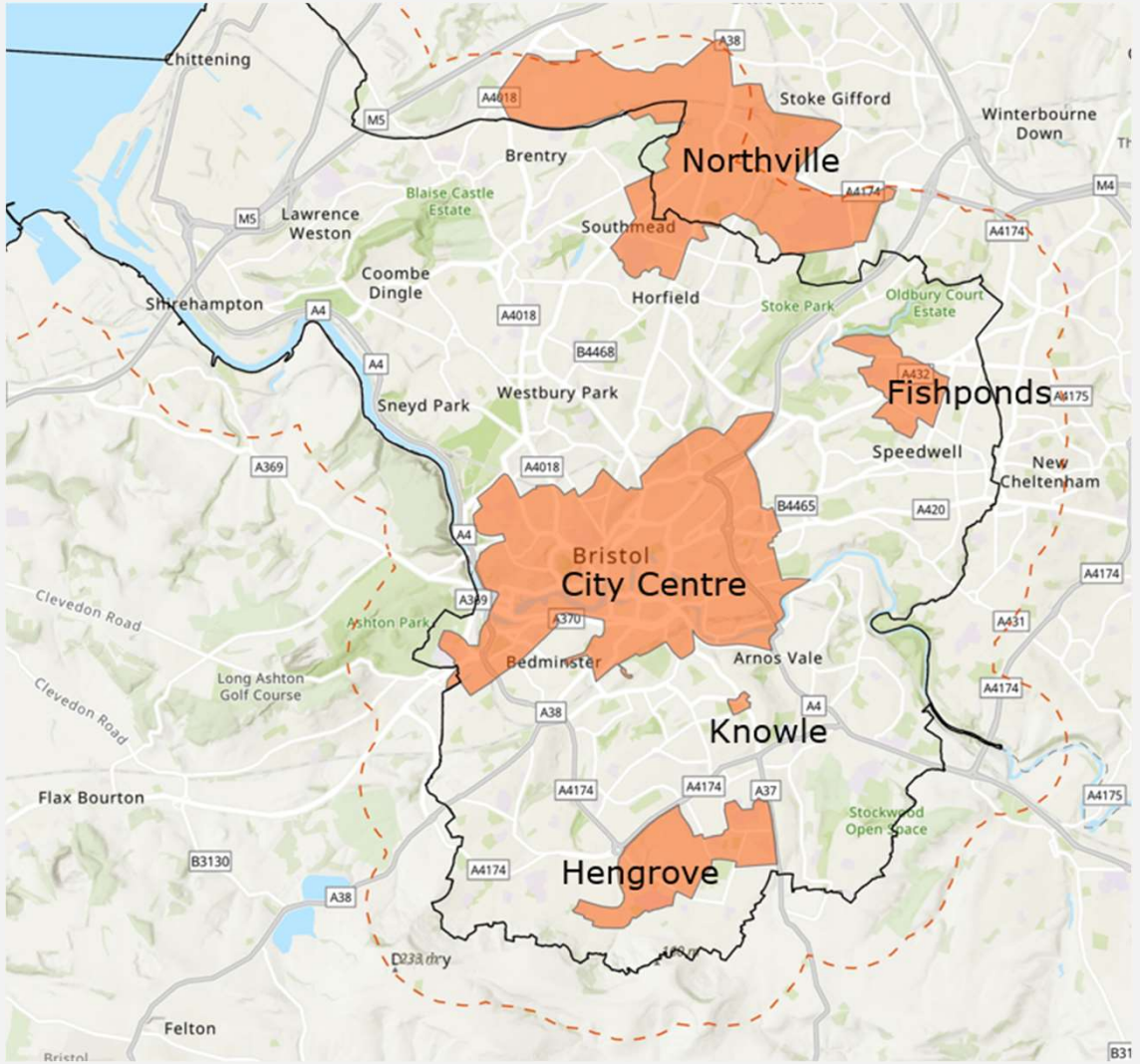


Incoming Regulation

Heat network zoning

Introduction of zoning

- **Zoning will support the growth of the market and accelerate deployment.**
- Within targeted city areas suited to heat networks **buildings would be required to connect** to a network.
- By identifying where networks are cost-effective for heat decarbonisation, zoning **provides stakeholders with clarity and confidence for connection.**
- Demand assurance gives investors security, supporting delivery of large-scale heat networks.
- **Ofgem will regulate heat networks from 2026**



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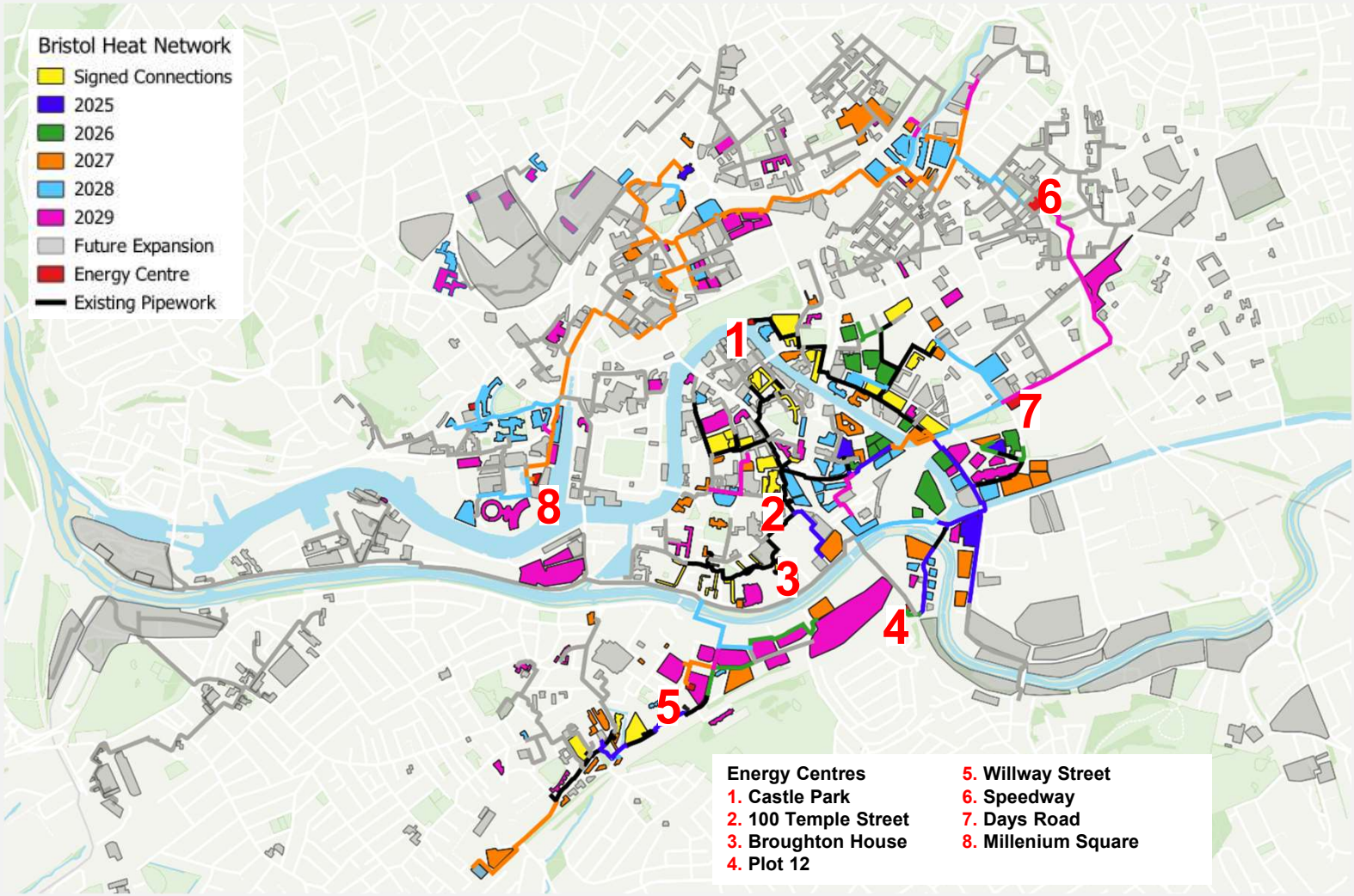
Future

Heat network connections, energy centres and pipework by year, including additional future expansion plans in grey.

Much of the future expansion shown has been through feasibility stage design.

The city ring main will connect all areas as a single network



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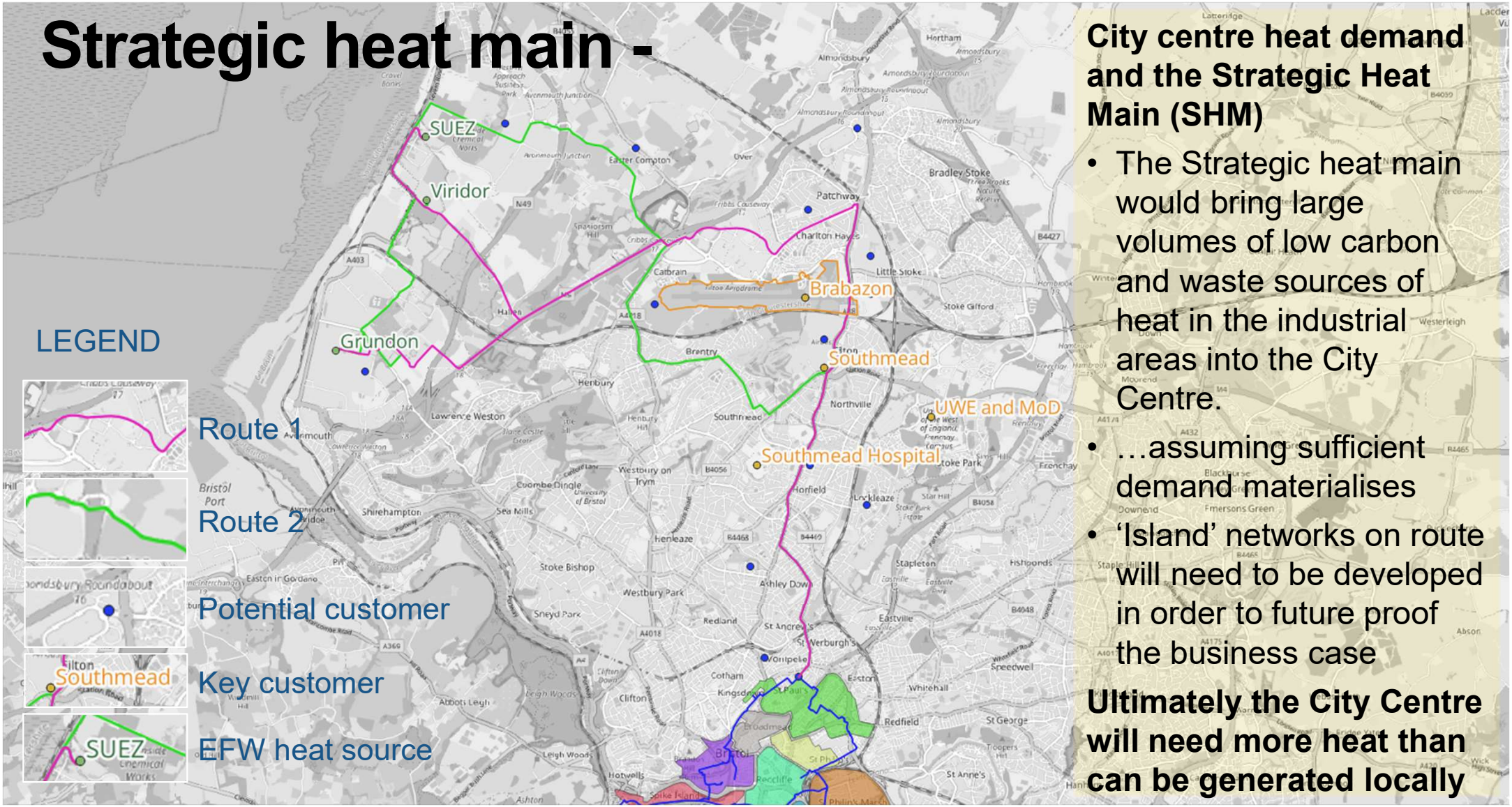
Strategic heat main -



City centre heat demand and the Strategic Heat Main (SHM)

- The Strategic heat main would bring large volumes of low carbon and waste sources of heat in the industrial areas into the City Centre.
- …assuming sufficient demand materialises
- 'Island' networks on route will need to be developed in order to future proof the business case

Ultimately the City Centre will need more heat than can be generated locally

A close relationship with the local authority is critical to success

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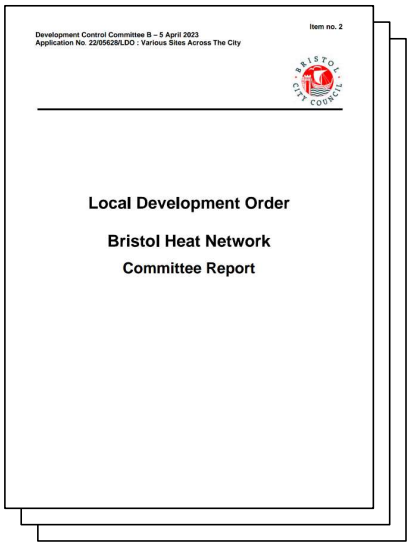


Development Control Committee B – 5 April 2023
Application No. 22/05628/LDO : Various Sites Across The City

Item no. 2

Local Development Order

Bristol Heat Network

Committee Report

Energy centres generate low carbon heat

Property team
- help identify locations on council owned land
- provide council owned plots for ECs at peppercorn rents

Regeneration team
- Guide on placemaking and public realm aspects of energy centres
- Collaboration with developers on sites

Parks, Highways, Sustainability
- Important stakeholders

Buried network distributes heat around the city

Highways team
- provide coordination and permitting to facilitate roads works
- Local Development Order

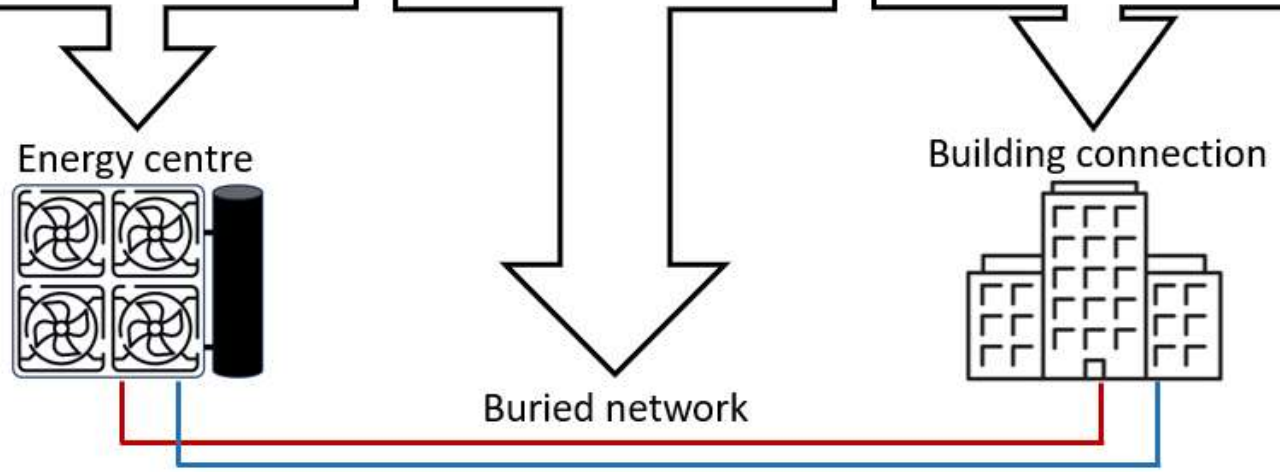
Regeneration/Transport
- Coordinate on public realm improvements, cycle routes/pedestrianisation
- Coordination of all infrastructure providers and developers in regeneration areas

Connection and supply is sold to building owners

Planning authority
- Maintain supportive planning policy, requiring new-builds to connect

Sustainabillity team
- Set strategic heat decarbonisation strategy for city, including heat networks

Regeneration team
- Coordination of new development in regeneration areas to generate demand certainty for heat network



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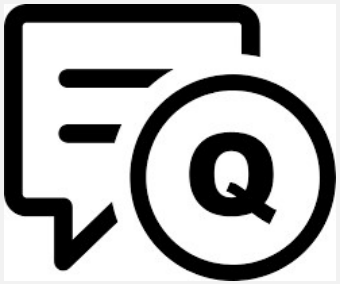

Questions