



Homes for
the Future

Decarbonising Heat in our Cities District Heat and PassivHaus

A Homes for the Future Special Interest Group Debate

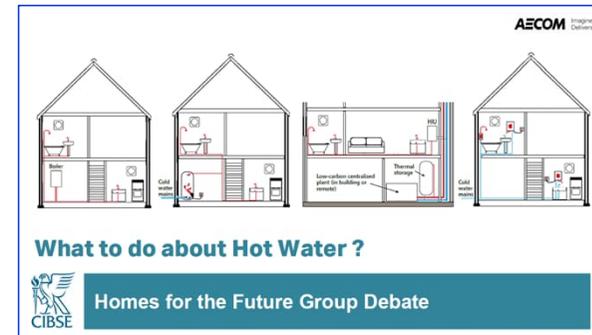
Agenda



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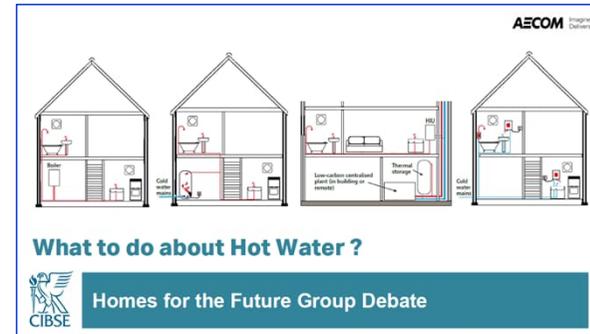
18:00	Welcome, Introduction to HFG & Introduction to tonight's speakers - Tom Lelyveld, Chair HFG
18:05	Agar Grove Case Study – Tom McNeil, Max Fordham
18:15	OPDC – Delivering Decarbonised heat at scale - Channa Karunaratne, AECOM
18:25	Agar Grove – A Contractor Perspective - Andrew Day, The Hill Group
18:35	Panel Q&A, Discussion and Debate
19:00	Drinks and Networking
20:00	Close

- The intention of the HFG is to inform and promote best practise in building services when constructing or retrofitting homes
- Created in 2010 the HFG has a membership of over 2,300 from the UK and around the world.
- Our Committee represents the broad range of skills and disciplines that contribute to delivering homes including:
 - Academics, Consultants, Contractors, Engineers, Extra Care Providers, Funding Bodies, House builders, Local and National Government, Policy Makers and Registered Social Landlords.



Terms of Reference:

- To act as a knowledge exchange for best practice and to increase members' knowledge, skills and awareness of techniques, tools and solutions for the residential market;
- To provide accurate information to meet service demands, planning requirements and Building Regulations and to produce information on fabric design, and analysis and engineering systems that are practical, modern and sustainable;
- To propose and contribute to the development of new publications, to provide design guidance;
- To work with other CIBSE groups to ensure knowledge is included on residential services design; and
- To identify and support the research required to fill the knowledge gaps.



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CIBSE Homes for the future group

Agar Grove Case Study

Tom McNeil

03/03/26

MAX FORDHAM

AGAR GROVE

Client London Borough of Camden
& the residents of the Agar Grove Estate
Architects Hawkins Brown (lead) with Mae
Landscape Architect Grant Associates
Planning Consultant CMA Planning
Structural Engineer Peter Brett Associates & Stantec
Services Engineer Max Fordham
Passivhaus Consultant Max Fordham
Passivhaus Assessor WARM
Project Manager Arcadis
Financial Viability Arcadis
Quantity Surveyor Arcadis
Contractor Hill

Site Area 2.57ha
Existing Density circa 100 u/ha
Proposed Density 193 u/ha
Procurement Route Design and Build

Competition Autumn 2012
Design Phase February -December 2013
Planning Consent August 2014
Start on site Phase 1a March 2016
Completed Phase 1a May 2018
Start On Site Phase 1b August 2018
Completion Phase 1b July 2020
Start On Site Phase 1c January 2021
Completion Phase 1c March 2024



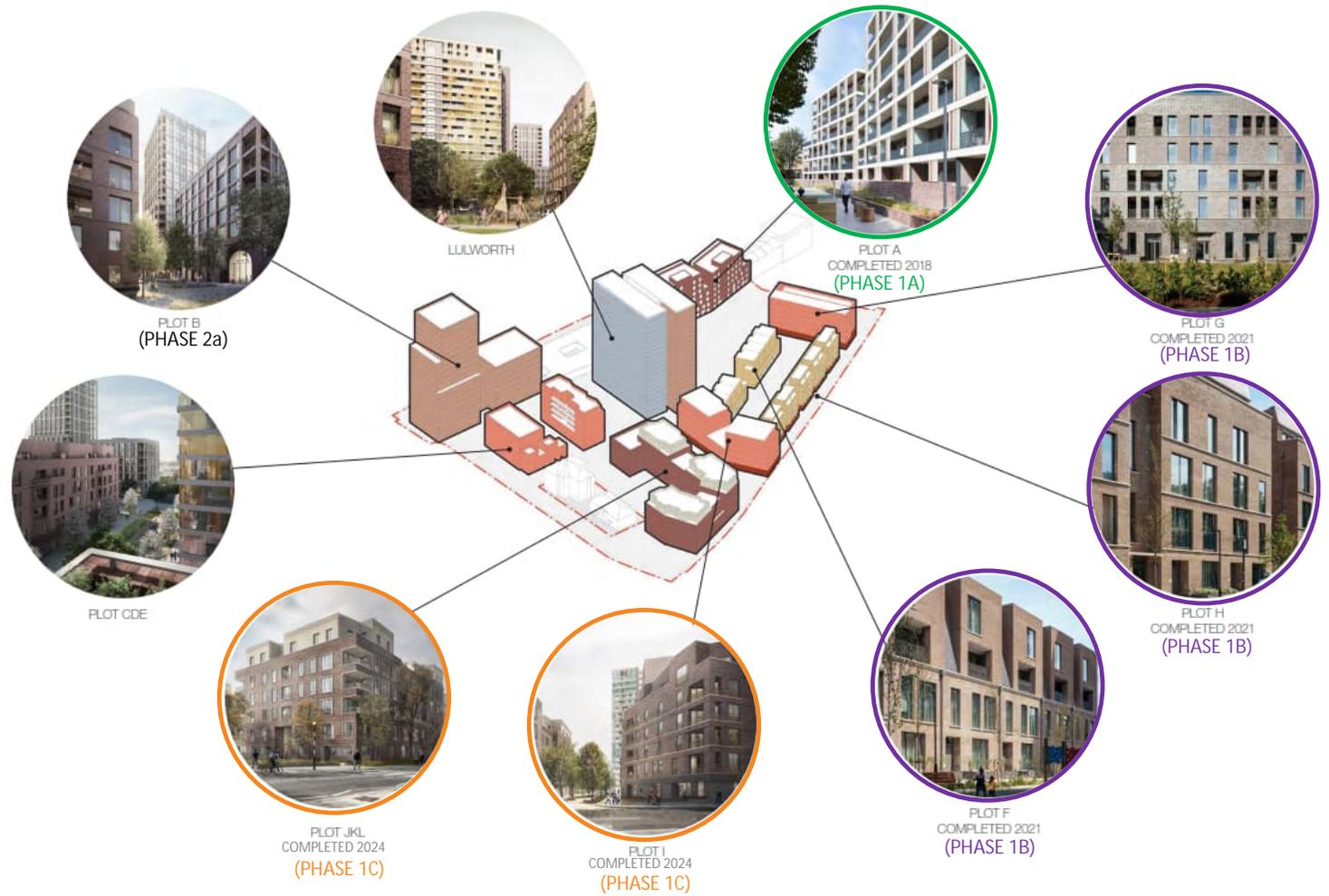
Image Hawkins Brown

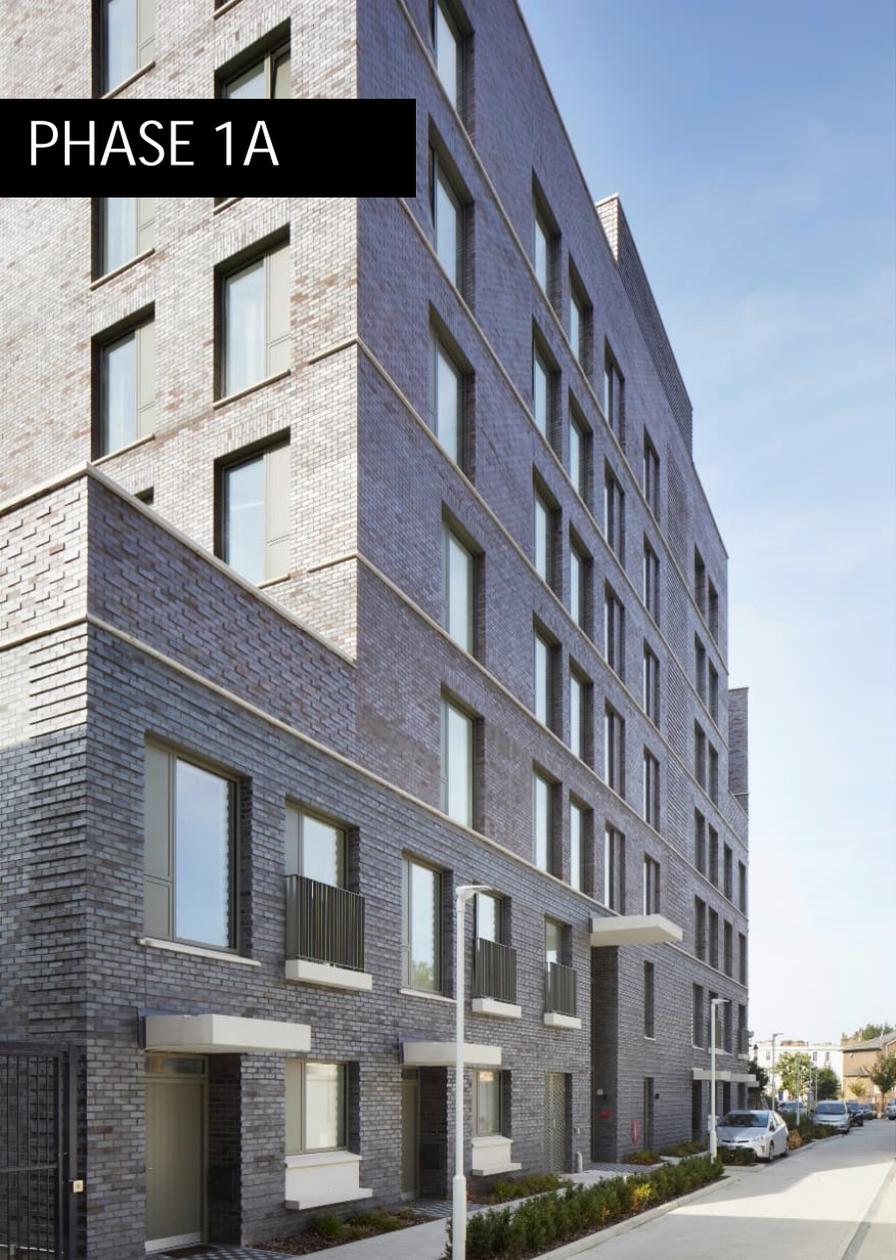
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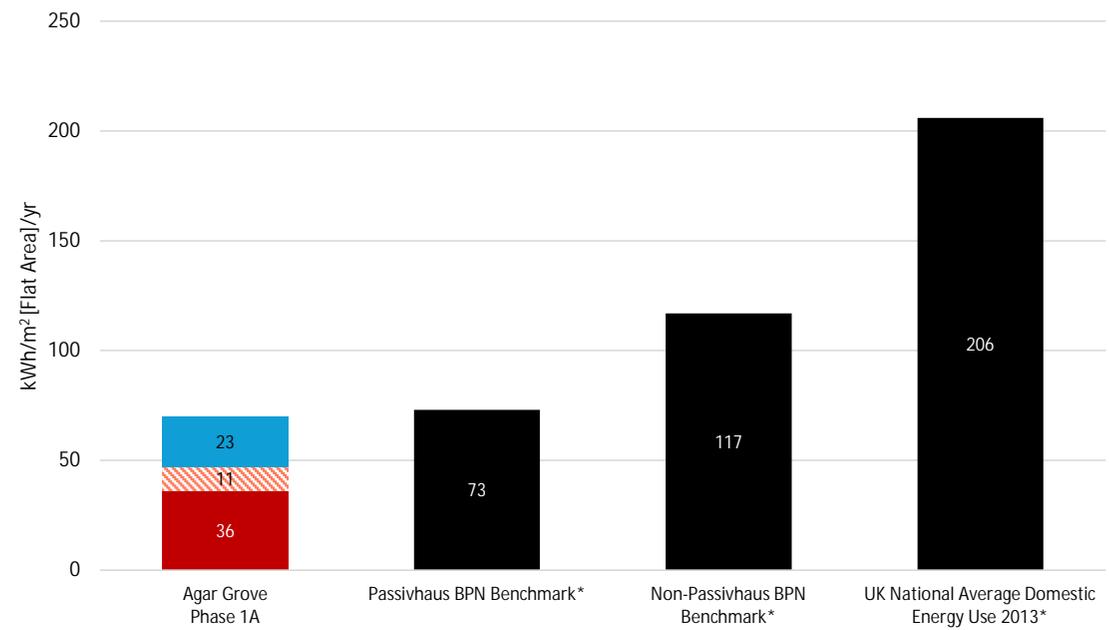




PHASE 1A

MAX FORDHAM

Operational Energy Performance



■ Gas (Communal Heat) ▨ Gas (Distribution Heat Losses) ■ Dwelling Electricity ■ Total

65°C flow
35°C Return 160 W/dwelling

*Building Performance Network (BPN) State of the Nation Report, 2020

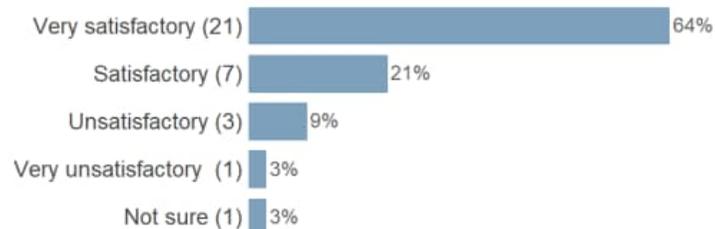
PHASE 1B



○ Communal heating temperature reduction
(57°C flow)

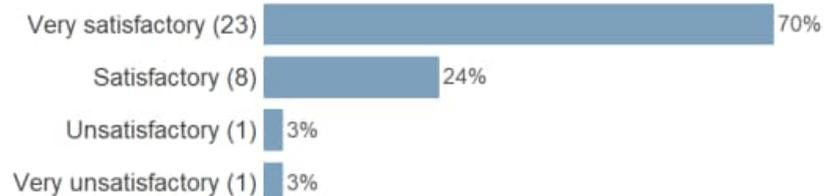
○ Summer comfort

Q32: How would you rate the conditions in your home in summer overall?



○ Winter comfort

Q16: How would you rate the conditions in your home in winter overall?



PHASE 1C



🔥 Heating & hot water

Q. Where does your heat come from?

This page provides an overview of how your new home receives efficient and **low carbon heat** from the communal heating system for use in your home. **No fossil fuels** are needed for your heat and hot water so it's much better for the environment. 🌱

(More detail on the controls can be found on the following pages)

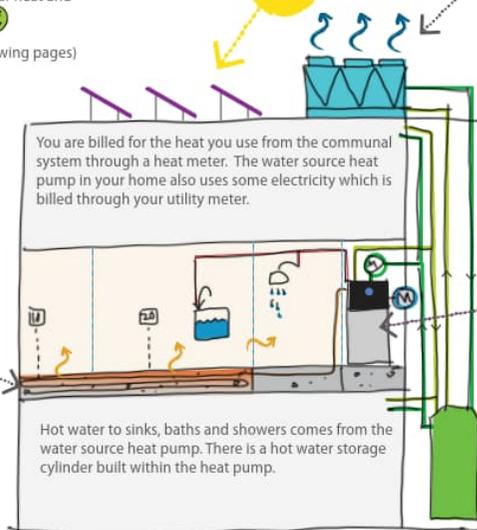
Electricity generated by the **solar panels** is used by the **air source heat pumps** making them super efficient and cheaper to run.

Air source heat pumps (ASHP) on the roof use the outside air and some electricity to warm up water which is circulated through a network of pipes around your block for all the homes to use

This is called a communal heating system because it's a shared system for you and others. It's also known as an 'ambient loop' because it circulates low temperature water around the system (20-25°C). Another name for it is an **Ultra Low Temperature Hot Water (ULTHW)** system. You might see this acronym labelled on the pipework inside your home. Although it has lots of names it's surprisingly simple and there's not much for you to worry about.

You have a **Water Source Heat Pump (WSHP)** in your home. This uses the warm water from the communal heating system to boost the temperature of the water for use in your underfloor heating and also your domestic hot water for washing etc.

It does this by using the warm water from the communal system and adding in extra electricity to boost the water temperature to what's needed. It does this very efficiently to ensure you use as little energy as possible.



You are billed for the heat you use from the communal system through a heat meter. The water source heat pump in your home also uses some electricity which is billed through your utility meter.

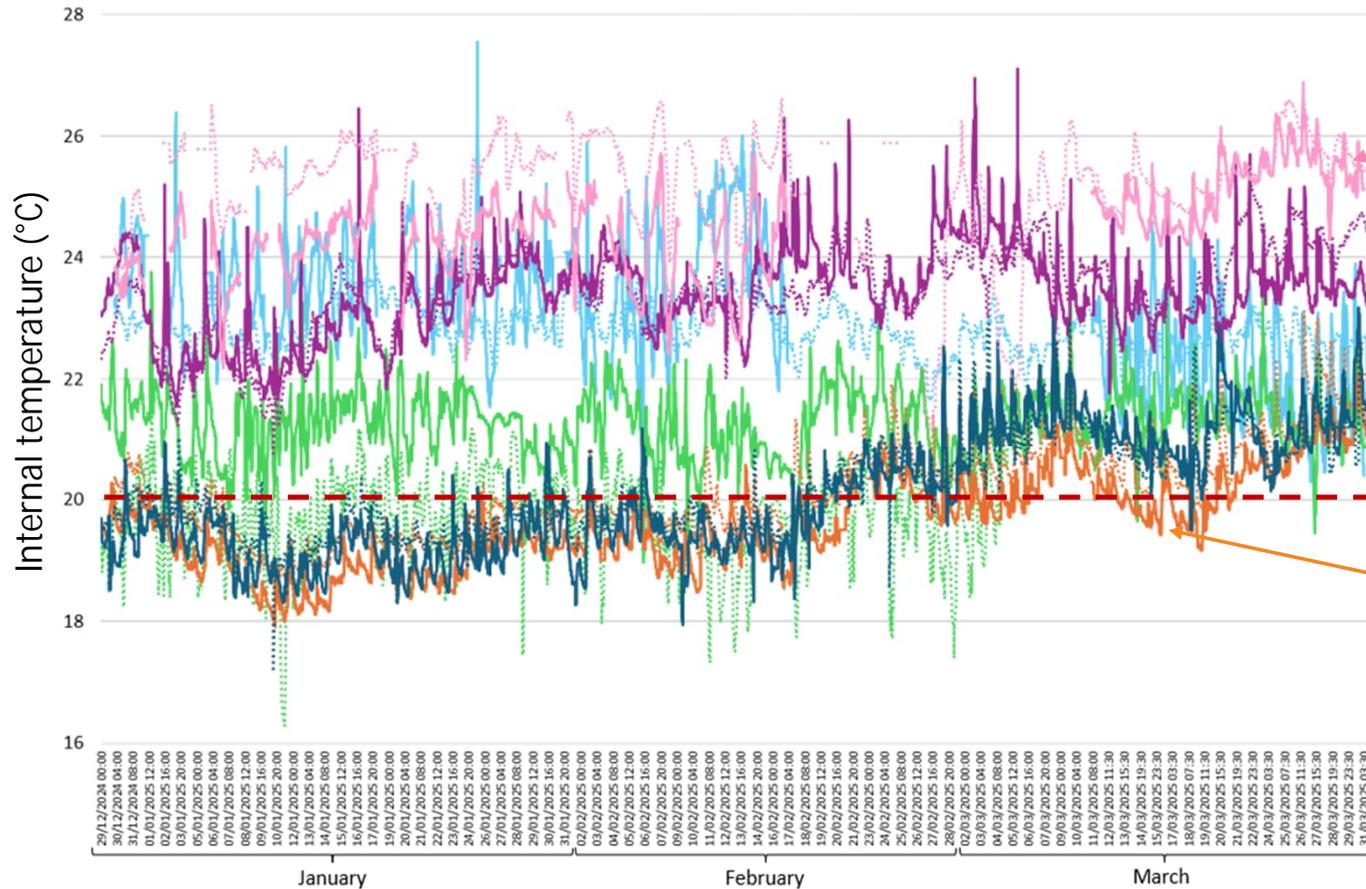
Heat is supplied to bedrooms and the kitchen/living room through underfloor heating pipes embedded within the concrete floor. This heat comes from the water source heat pump.

There is no underfloor heating in bathrooms, so it's generally recommended to leave doors open to help circulate the warmer air.

The building is **Passivhaus** which means very little heating should be required to keep you comfortable.

Hot water to sinks, baths and showers comes from the water source heat pump. There is a hot water storage cylinder built within the heat pump.

Phase 1C Internal Temperatures

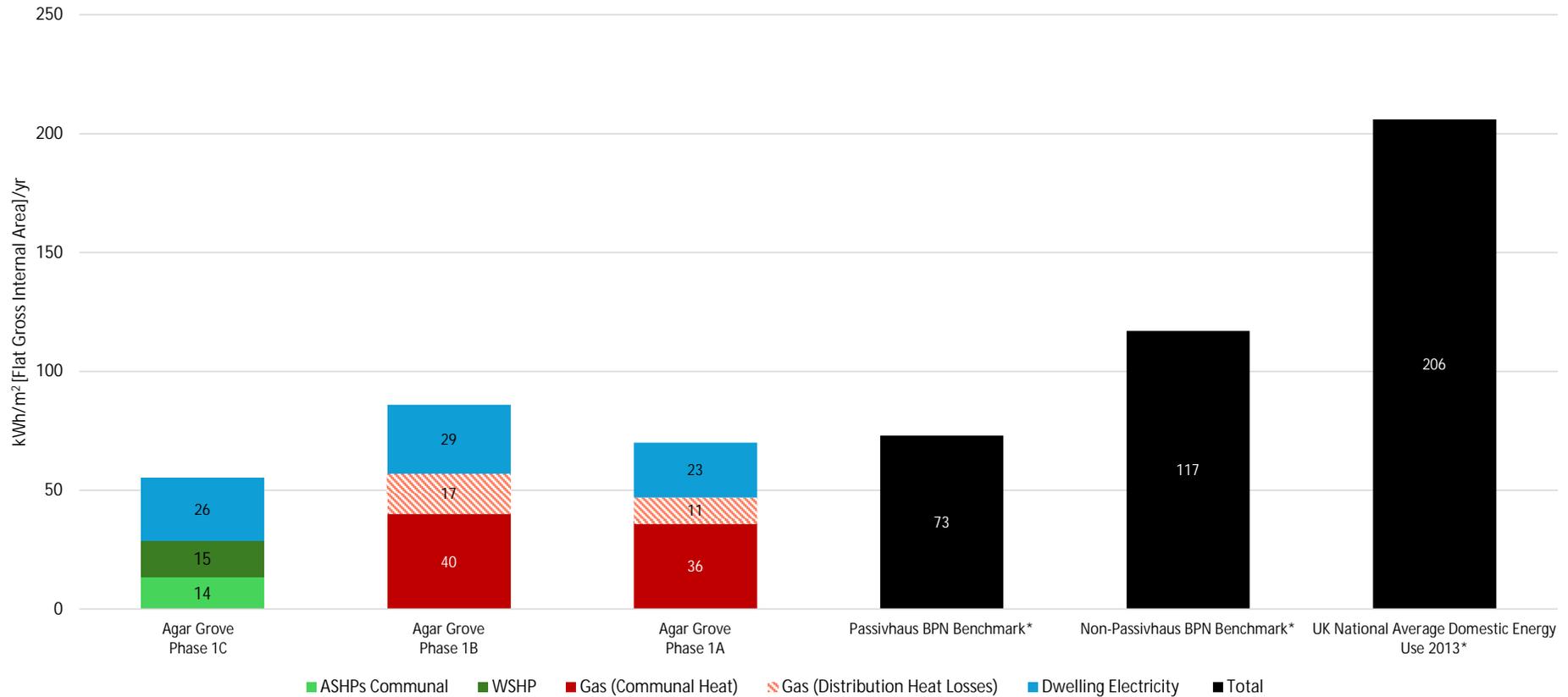


25°C average winter temperature & Highest heating demand

20.5°C average winter temperature & high heating demand

20°C average winter temperature & lowest heating demand

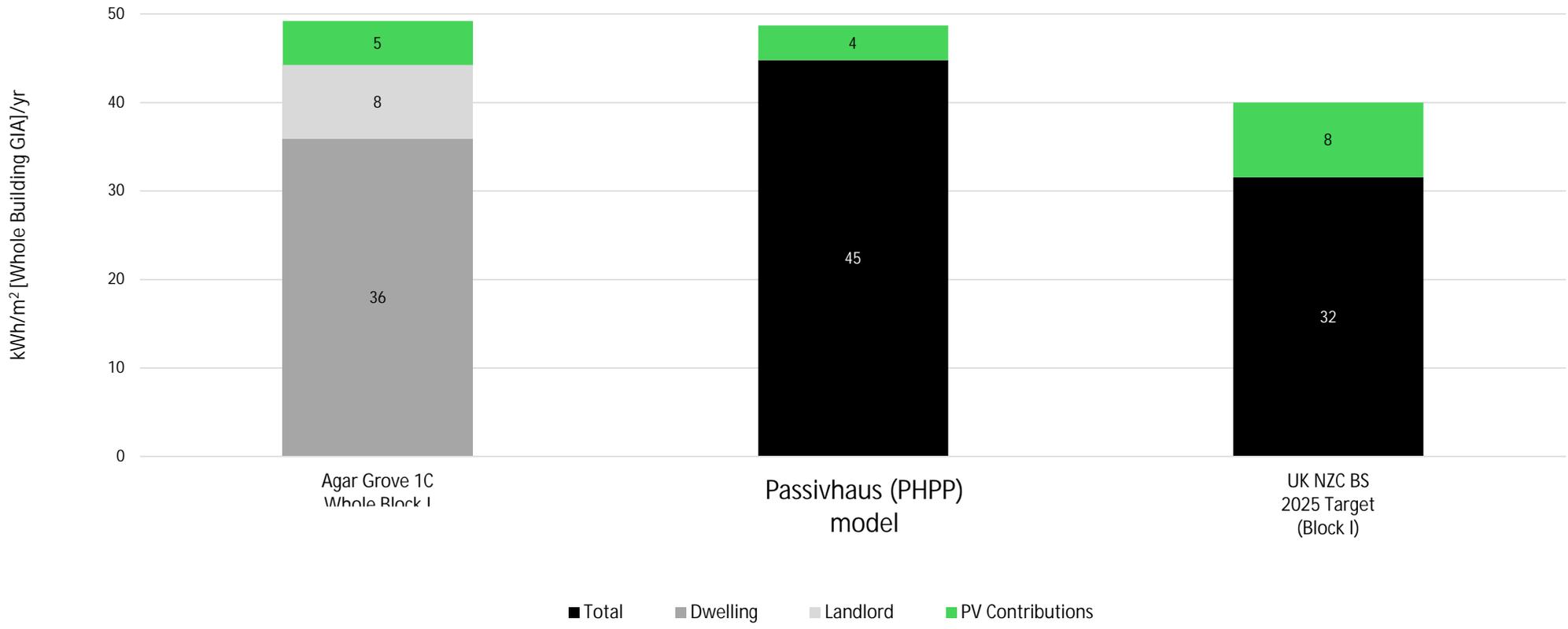
Energy Consumption Comparison



Reference

*Building Performance Network (BPN) State of the Nation Report, 2020

Phase 1C Energy Use Intensity (EUI)



PHASE 2A



- No heat network
- Integrated MVHR / ExASHP / Domestic Hot Water Cylinder – aka Compact Unit
- No heat metering - all power input from tenant electrical supply
- Summer tempering of supply air
- Ongoing monitoring proposed to review performance



District Energy

CIBSE - Decarbonising Heat in our Cities

Channa Karu - CEng, FIMechE
Market Sector Lead – Europe

What is a heat network?



1. Energy centre

Unlocks multiple low-carbon heat sources, which can supply a high proportion of heat demand.



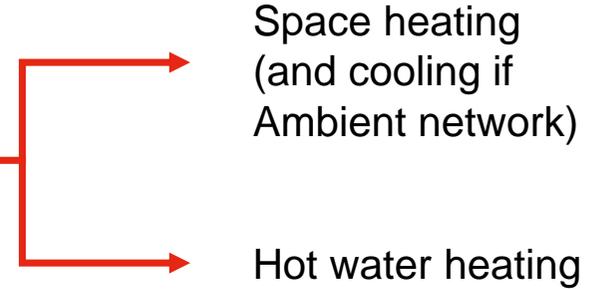
2. Heat network

Large pre-insulated pipes are buried in the ground and via an optimised route transport hot water to and from buildings.



3. Building connections

A heat exchanger provides an interface between the heat network and the heating services in connected buildings.



4. Building heating system

Existing space heating circuits and hot water systems inside the building can be used but may require some modifications.

Overview of heat network regulations

New Policy and Regulations:

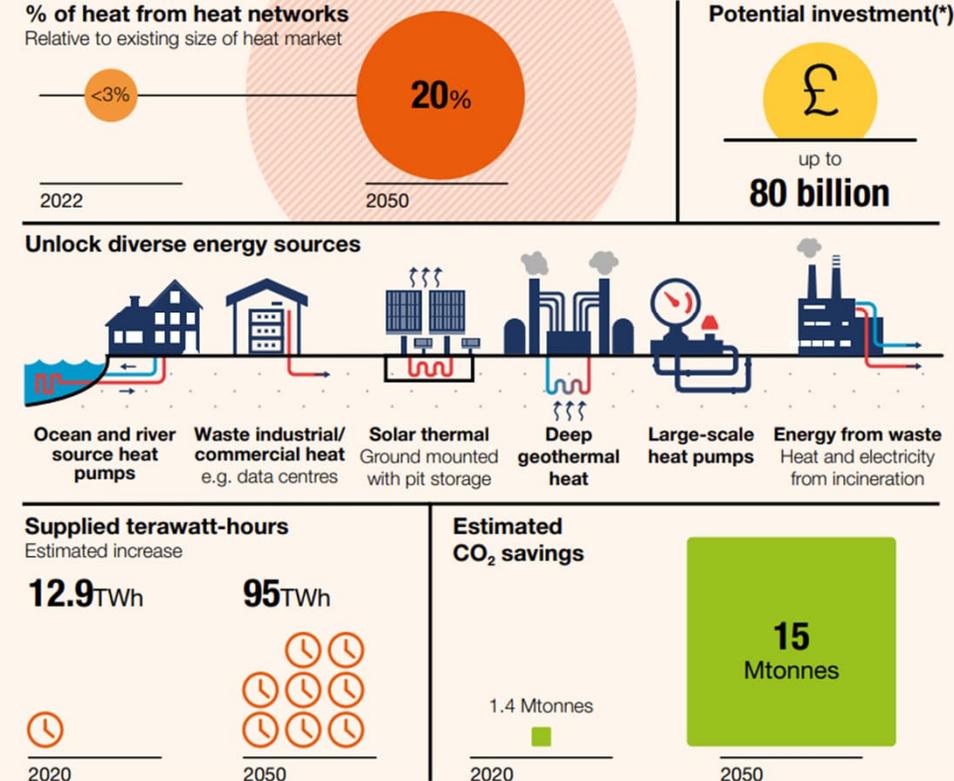
- Primary Legislation received Royal Assent in Late 2023
- **Zoning** – Policy in development to help identify and designate key areas suitable for heat networks across the UK. Aims to designate areas for heat networks within which local authorities and heat network developers would have greater powers
- **OFGEM** – appointed as regulator for heat, bringing heat in line with natural gas and electricity, bringing them in line with other utilities.

Heat as a service will become a regulated market

Statutory Instrument on secondary legislation planned for Spring 2026

The 2050 vision

We are committed to developing a self-sustaining heat market by 2050. Investment, innovation and infrastructure support our vision for the future of the market:



Warm Homes Plan: Heat Networks

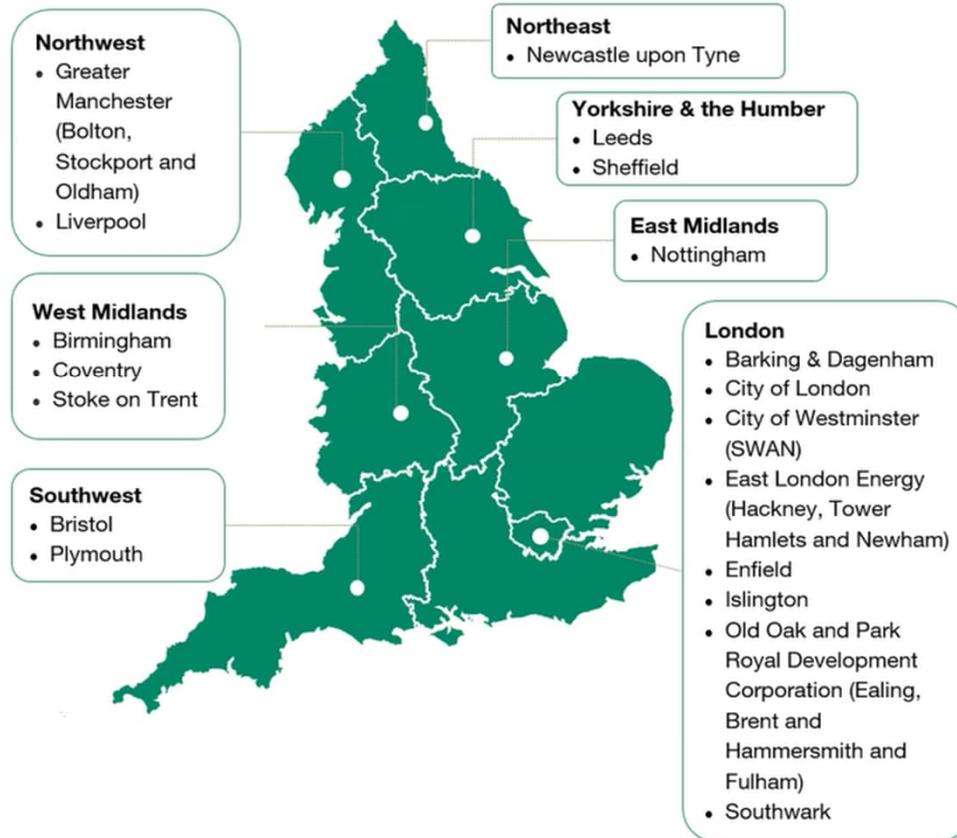
The plan allocates £1.5 billion to enhance and expand heat networks across the UK. This funding aims to integrate heat networks as a vital component of the broader energy efficiency strategy.

- Setting a target to more than double the amount of heat demand met via heat networks in England to 7% (27TWh) by 2035 and 20% by 2050.
- Introducing heat network zoning in 2026.
- Expanding the Green Heat Network Fund with £195 million/year to 2029/30 (Circa £700M) and mobilising the National Wealth Fund.
- Exploring options to enable low-carbon heat networks to compete fairly with their gas equivalent.
- Ensuring existing customers get the fairest deal, extending our Heat Network Efficiency Scheme (HNES) with £15million/year to 2029/30.
- Mobilising the National Wealth Fund.



Zoning

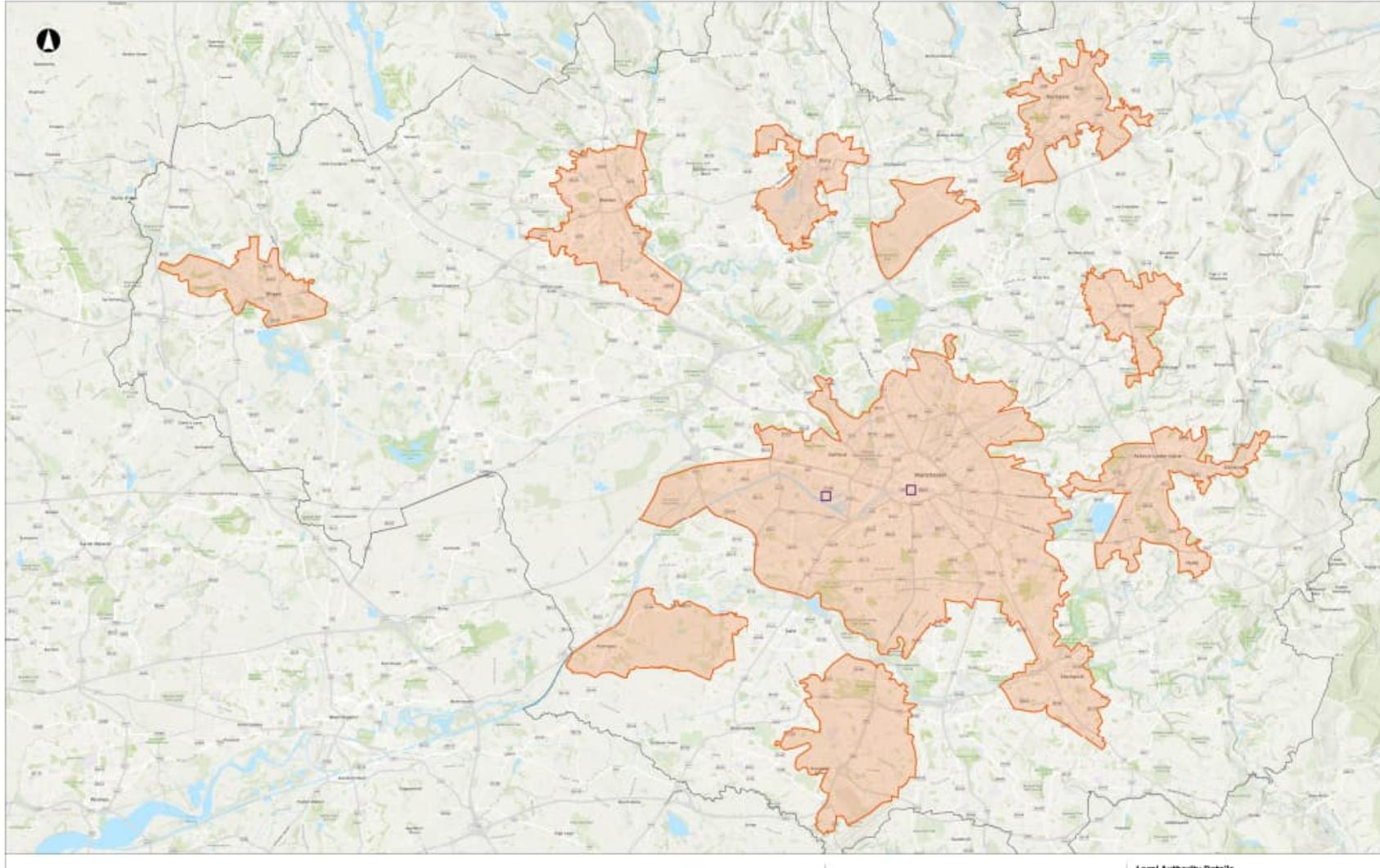
19 areas make up the Advanced Zoning Programme



Future roll out across rest of country in waves

Investment in these schemes is circa £10bn over the next 5 years.

Example of Heat Zones from the Pilot: Greater Manchester





North Acton

Park Royal industrial area

Harlesden

**Old Oak
Common Station**

Willesden Junction

Crossrail Depot

Old Oak North

Scrubs Lane

Example – Old Oak Common (OPEN) Heat Network

- Data Centre waste heat to 10,000 new homes, a hospital and several major existing buildings.
- Network of 11km of Pipework
- Reduces the electrical impact on the grid from redevelopment.
- Combination of 5th and 4th Gen networks

90 GWh Annual Heat Demand

10,000 New Homes



AECOM were commissioned by the OPDC Mayoral Development Corporation to establish a Heat Network across Ealing, Brent and Hammersmith & Fulham. The scheme looks to utilise waste heat from data centres and is supports OPDC in being an exemplar of net zero carbon sustainable development..

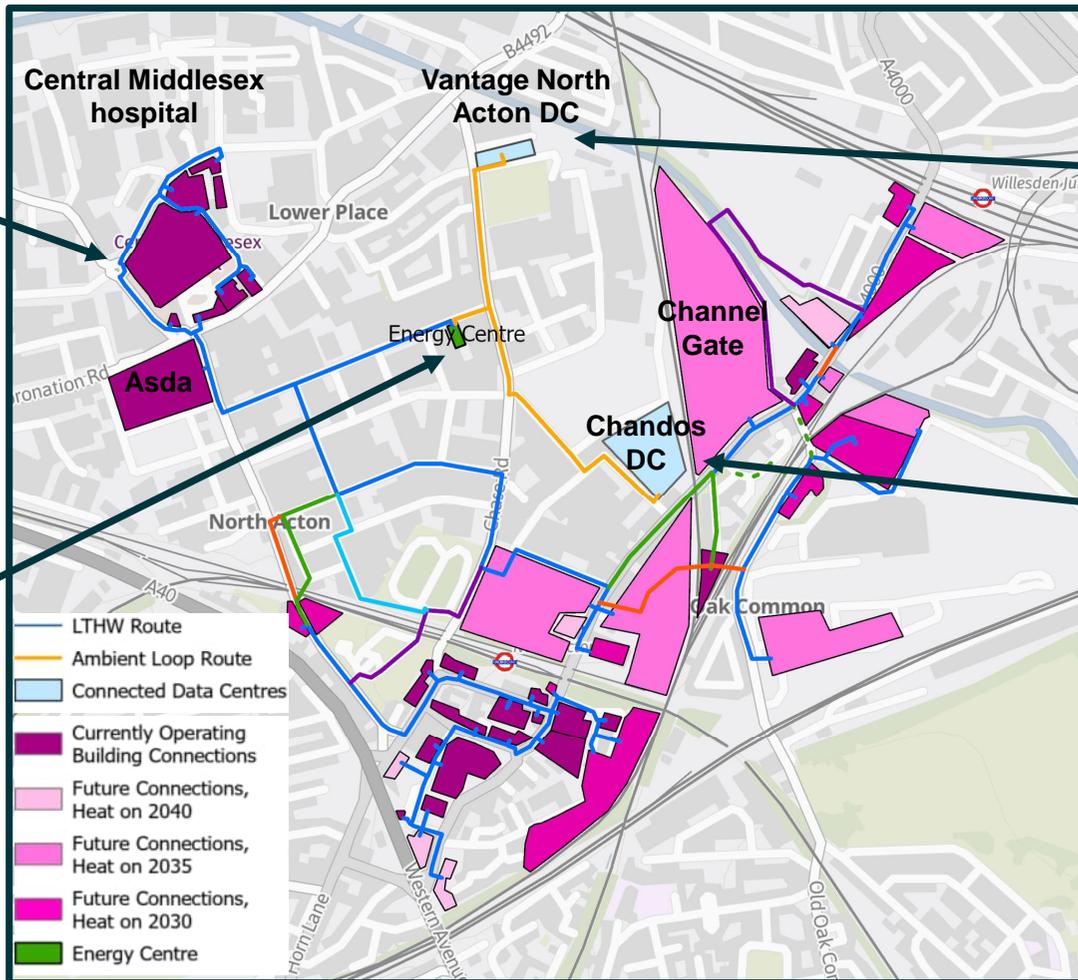
OPEN (Old Oak and Park Royal Energy Network)



Central Middlesex Hospital Plantroom



Minerva Road Energy Centre Site



Outline Map of Network at Ph 1 Full Buildout



North Acton Data Centre



Chandos Data Centre

Key Figures



Planned to Deliver up to 100GWh of heat at full build out, across 50 sites, including 10,000 homes, a hospital and several major existing buildings.



Recovers initially up to 17MW of low-grade heat from 2 data centres. Supplying of 23MW of LTHW



Distributes heat via a network of pipes.

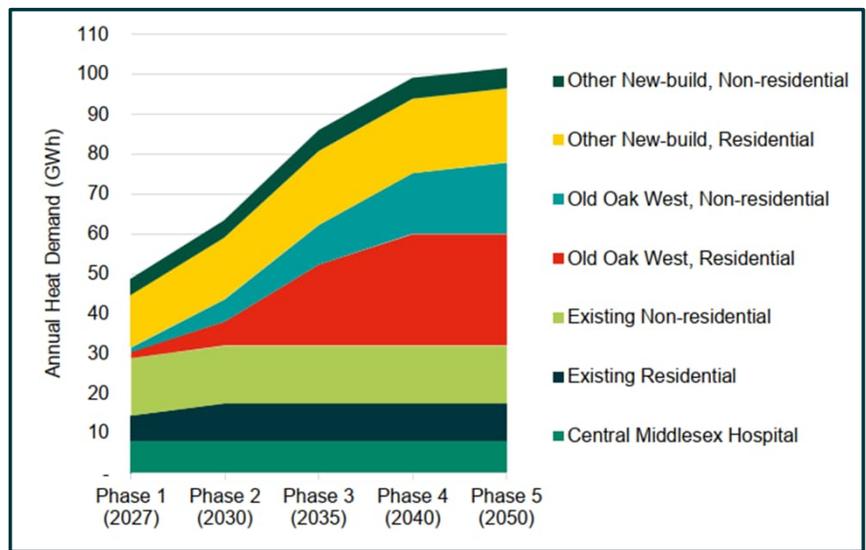
- 1 km of Ambient Pipe between – DC & EC
- 9km of LTHW pipe between – EC & Customers



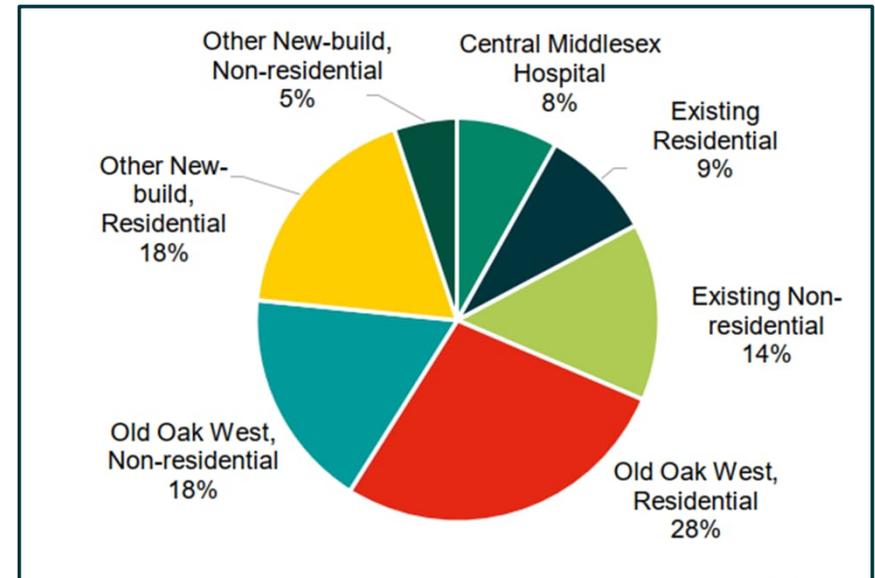
Forecasted carbon savings of 75 tonnes of CO₂ over 40 years.



Total CAPEX circa £100m, with £36m GHNF Construction grant funding secured in 2023.



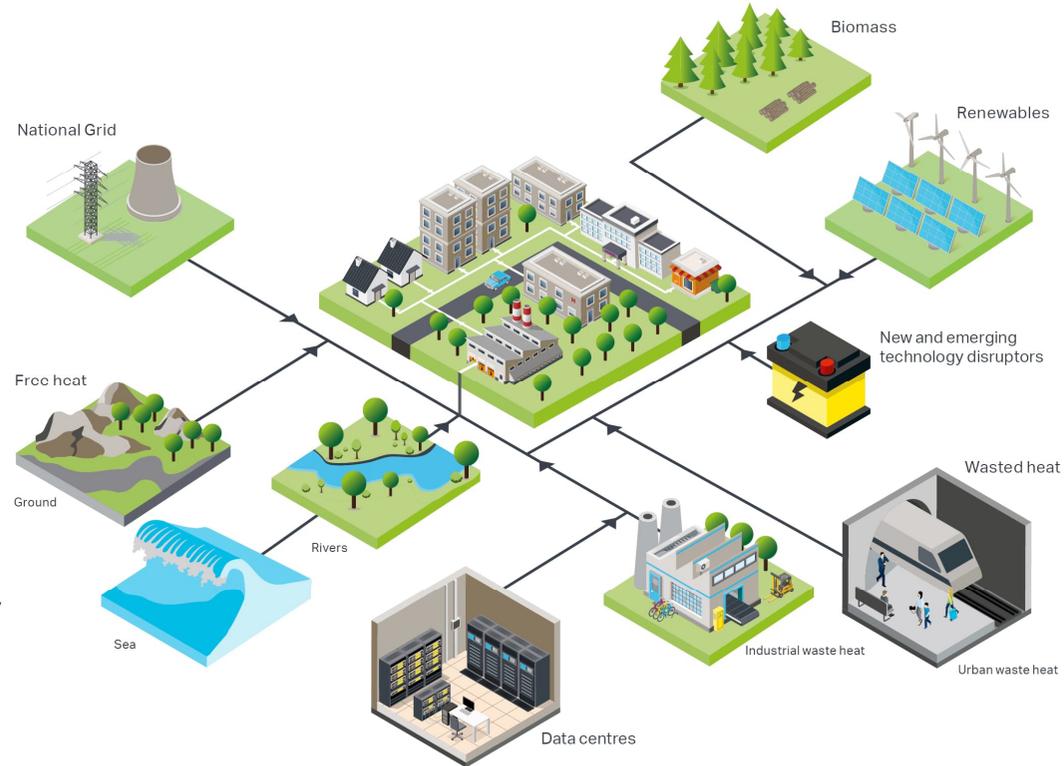
Projected Scheme Demand Over 5 Phases



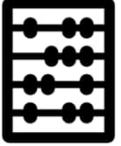
Make-up of demand at full build out

What are the benefits of a heat network?

- Enables energy security, resilience and independence
- Low Carbon and compliance with MEES
- Delivers otherwise wasted energy to buildings
- Can connect to any building
- Reduced electricity grid reinforcement costs
- Reduced impact on space take
- Improvement in noise considerations and air quality
- Remove plant replacement costs for buildings
- Can provide heating and cooling



Connecting to New Build



The benefits are clear - Provides electrified heat in an area with low power availability, helps meet planning, Part L, future MEES, a regulated energy market, can help with cooling needs and many more including lower costs than individual ASHPs



Site Specific - We like to standardise, but in reality, each site is different, in some places DH will make sense, in other Passivhaus etc



Negotiable – HN Developers can play tunes with the capital costs e.g. moving into standing, spreading over time, phasing connection charges etc. They want to work with house builders.



Key reflection – Heat Networks are new in their modern context – developers feel like they need to twin track two solutions – this creates a barrier

A modern multi-story residential building with balconies and a landscaped courtyard in the foreground. The building features a mix of brick and light-colored panels, with balconies enclosed by dark metal railings. The courtyard in the foreground has wooden planters, greenery, and a paved walkway. A large green semi-transparent banner is overlaid on the image, containing the title and speaker information.

A Contractor Perspective

Andrew Day, Sustainability Director, Hill Group

“To be the UK’s leading, most trusted housebuilder, creating exceptional homes and sustainable communities.”



- 9th largest UK Housebuilder
- Family owned and operated
- 5* Homebuilder status for 8th consecutive year
- 4.8 out of 5 Trustpilot rating
- 3rd place in NextGeneration benchmark
- Control of 8,800 homes with planning
- >30,000 homes in planning/under option
- >£112m spent on new land in last 12 months
- £15m homelessness charitable donation
- 3 times WhatHouse Housebuilder of the Year

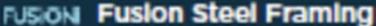


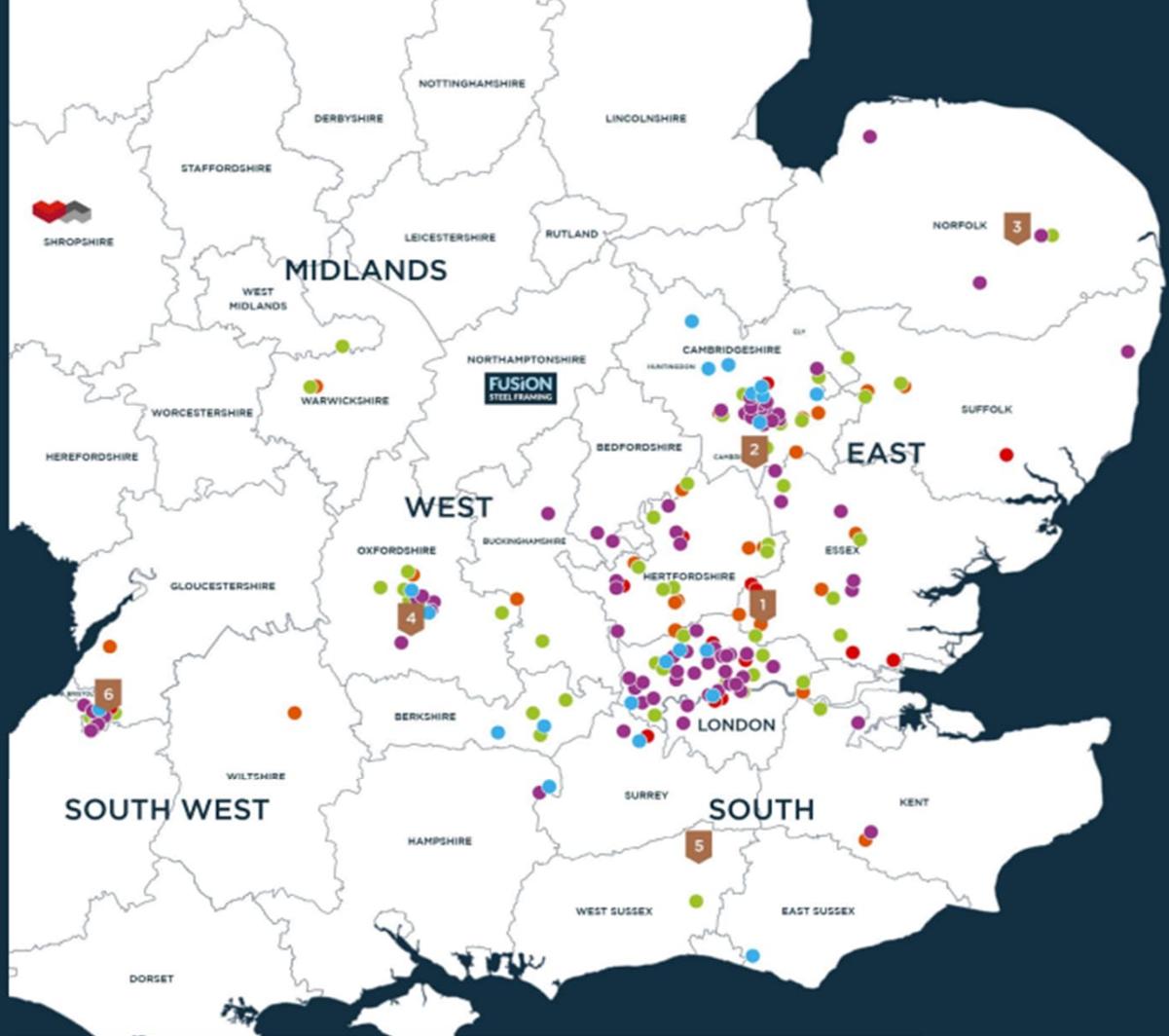
Where we work

HILL OFFICES

- 1 Head Office - Waltham Abbey, Essex (shared between all divisions)
- 2 Eastern and CIP - Ickleton, Cambridge
- 3 Eastern - Norwich, Norfolk
- 4 Western - Abingdon, Oxfordshire
- 5 Southern - Crawley, West Sussex
- 6 South West - Bristol



-  Live projects
-  Future projects
-  Strategic land
-  Volumetric Modular
- 



Urban Regeneration

Hill has breathed new life into more than 50 town and city centre neighbourhoods

Fish Island Village, Hackney Wick – 900 home JV

Knight's Park, Eddington, Cambridge – 1,400 home new town in partnership with the University of Cambridge

The Scene – mixed use, mixed tenure town centre redevelopment including a new 9 screen cinema

Agar Grove, Camden – the country's largest Passivhaus development

CB1, Cambridge city centre redevelopment including conversion of listed Spiller's Mill







Thank you

Questions & Debate