

Maiden Lane – Low Carbon Heat Source



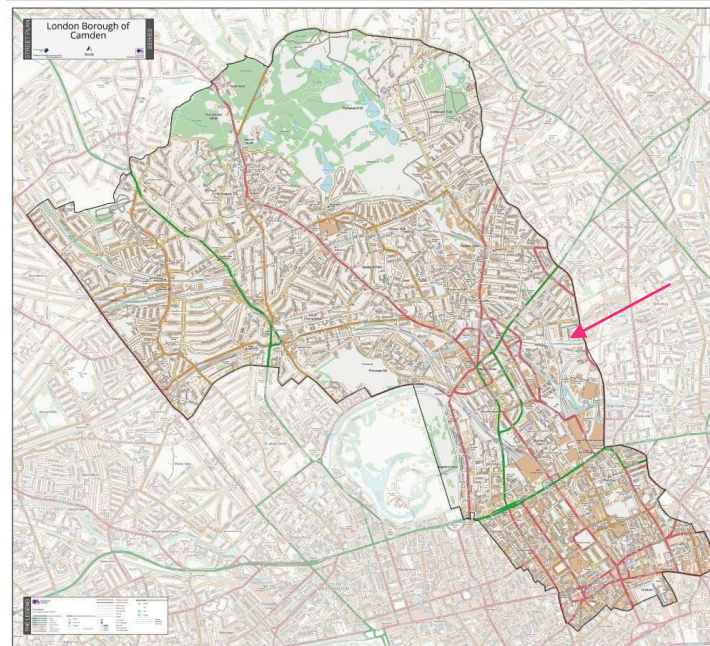
Options Appraisal and Funding Opportunities

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Introduction

- Existing/Proposed Heat Network Arrangements
- 2020 Heat Pump Options
- Funding Opportunities
- 2020 vs. 2022 Options Appraisal
- Further Work
- Delivering York Way
- Delivering Maiden Lane



Maiden Lane estate was built in two phases between 1976 and 1983. It comprises of 479 homes ranging from bedsits to four-bedroom maisonettes, along with shops and a community centre.

Existing Heat Network Arrangement



Original Maiden Lane boiler house.

York Way energy centre.

Proposed Heat Network Arrangement



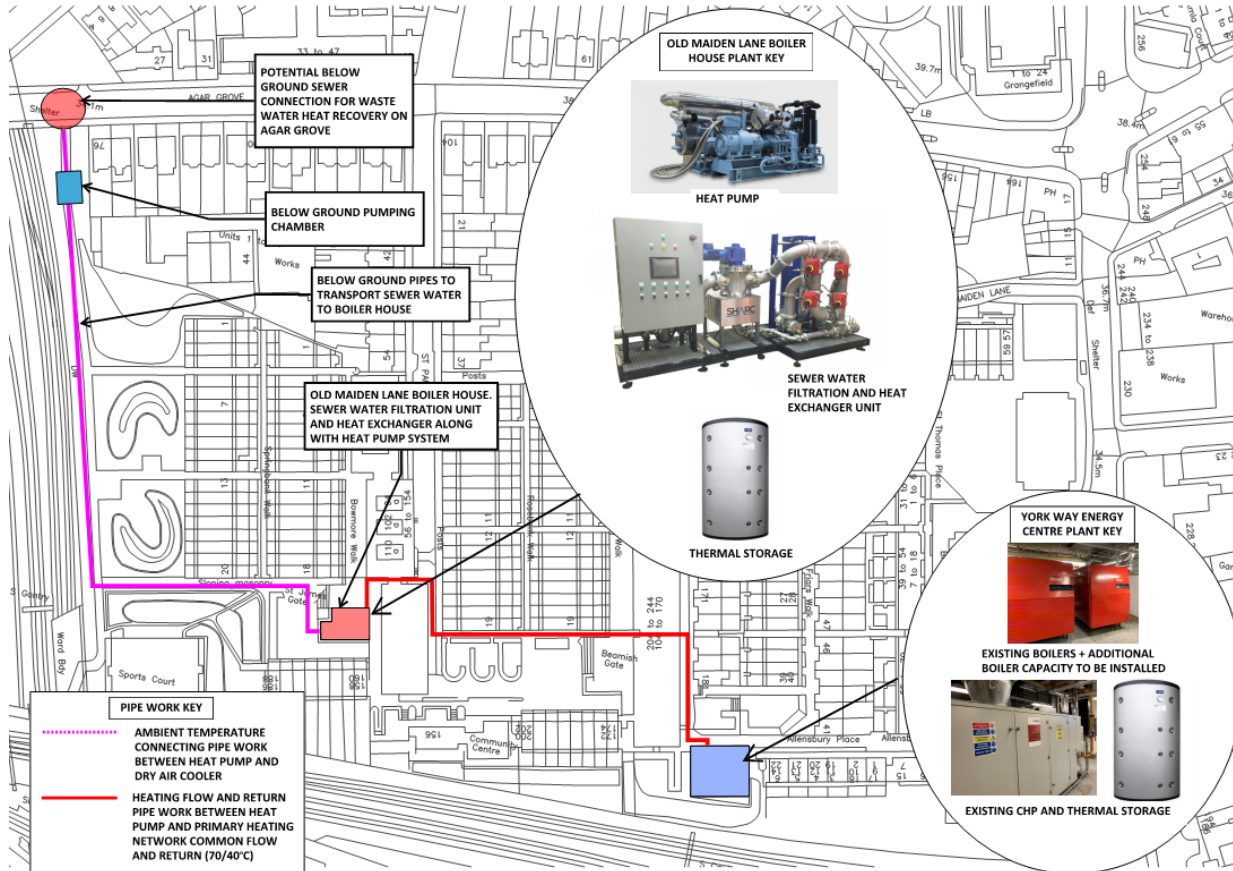
Original Maiden Lane boiler house.

York Way energy centre.

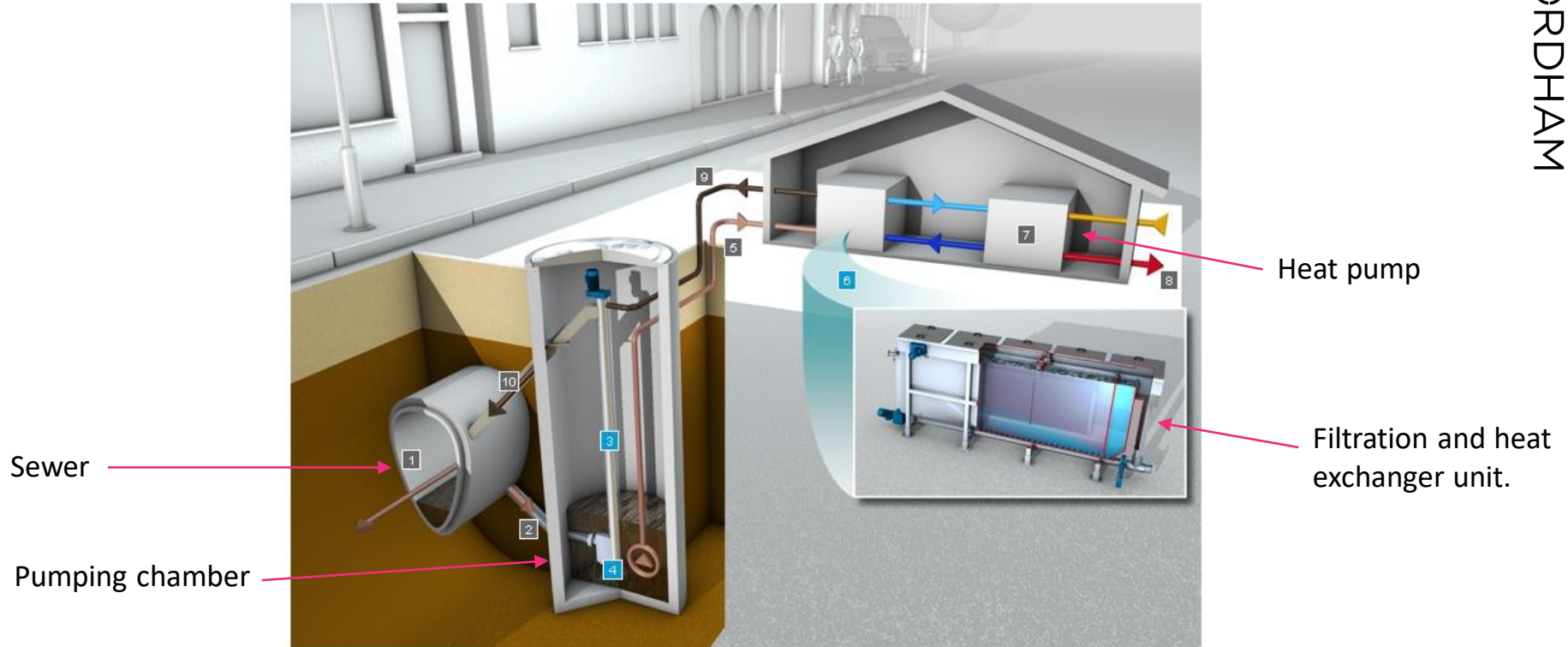
2020 Options Appraisal Recap

- Sewer Heat Recovery Water Source Heat Pump
- Air Source Heat Pump

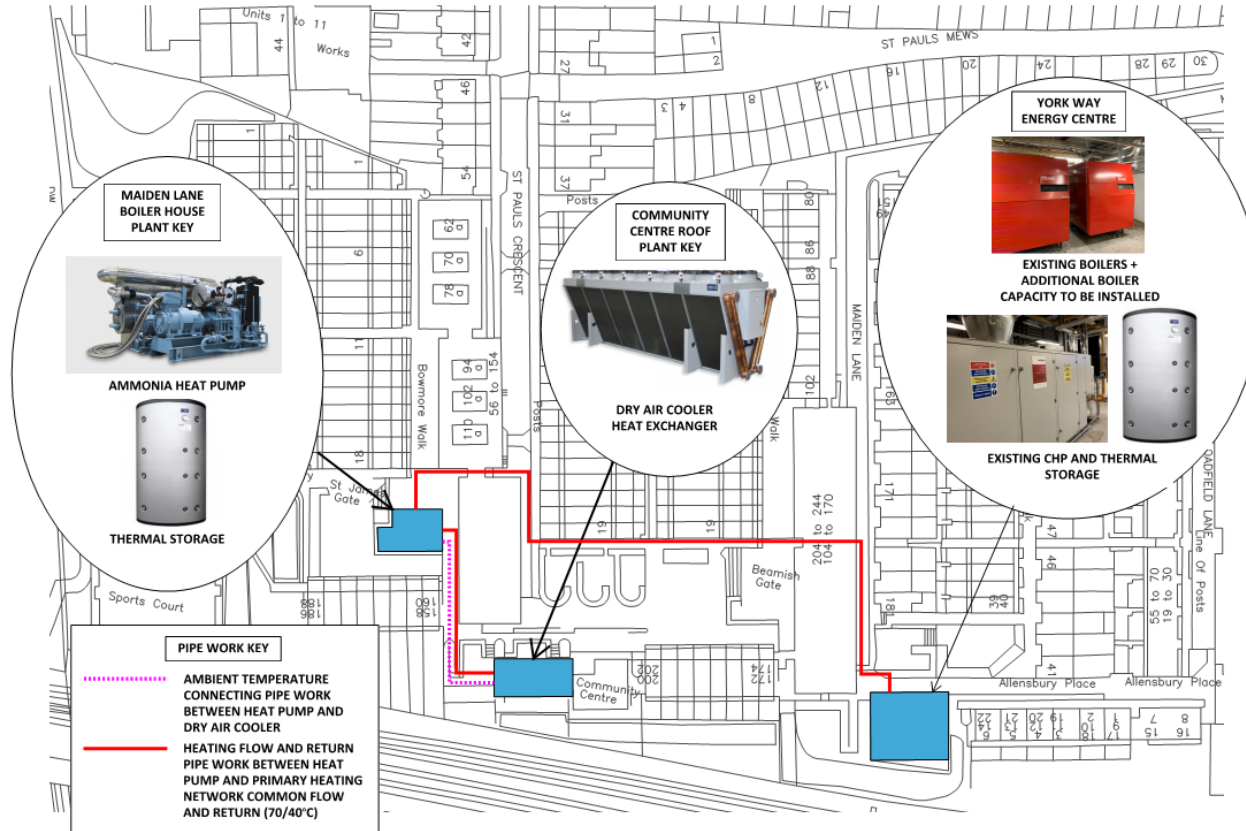
Sewer Heat Recovery WSHP 2020



Sewer Heat Recovery WSHP Schematic Arrangement



Air Source Heat Pump 2020



Air Source Heat Pump: External Plant Location

Air heat exchanger
mounted on
community centre roof



Air Source Heat Pump: Plant Enclosure



Review of Funding Opportunities

Fund	£ available	£ internal	Notes	Timeline	Risks
GHNH	Up to 50% of capex.	The rest.	Network to meet 100g CO ₂ /kWh thermal energy delivered to consumers.	Round 2 sub. 26/08 Award 8 weeks later.	Heat Trust membership required.
SHDF	Up to £16k per dwelling.	Must match at least half the grant.	Primarily to reduce heat loss – heating (heat pumps etc) only eligible if it reduces bills in isolation.	Launch 30/08 Deadline 15/10 Grant award 30/01/23	Based on raising EPC of individual houses and minimum internal spend required.

2020 vs. 2022 Options Appraisal

- Technology Changes?
- Areas to consider:
 - Distribution Technology
 - Available Refrigerant Technology
 - Commercially Available Systems
 - Source of Heat

Technology Changes

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 - **Distribution Technology**
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- Distribution

2020	2022
Relatively high HIU return temperatures.	Lower return temperatures now realistic.

Technology Changes

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 - Distribution Technology
 - **Available Refrigerant Technology**
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 - Source of Heat

- Distribution

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Relatively high HIU return temperatures.	Lower return temperatures now realistic.



- Refrigerant

2020	2022
Ammonia	Ammonia
	CO ₂

Technology Changes

- Areas to consider:
 - Distribution Technology
 - Available Refrigerant Technology
 - **Commercially Available Systems**
 - Source of Heat
- Centralised vs. **Local Heat Pumps**
 - Some aspects of installation are simplified.
 - Residents billed directly by electrical utility leading to some billing risk.



Technology Changes

○ Areas to consider:

- Distribution Technology
- Available Refrigerant Technology
- **Commercially Available Systems**
- Source of Heat

○ Centralised vs. **Local Heat Pumps**

- Some aspects of installation are simplified.
- Residents billed directly by electrical utility leading to some billing risk.

Installation Advantages	Installation Disadvantages
Lower capital cost.	New transformer and site electrical distribution
Easier to phase and install (if architectural issues are resolved).	Larger cylinder required per dwelling.
	Maintenance becomes more decentralised.

Technology Changes

- Areas to consider:
 - Distribution Technology
 - Available Refrigerant Technology
 - Commercially Available Systems
 - **Source of Heat**
- Air vs. sewer water; considerations remain the same.
- **Air**
 - Unchanged Risks
 - Noise from rooftop plant.
 - Structure, the weight of the plant.
 - Visual impact, planning.
 - Cold exhaust affecting surroundings.
 - Decreased Risks
 - Procurement; a number of other schemes have been delivered.

Technology Changes

- Areas to consider:
 - Distribution Technology
 - Available Refrigerant Technology
 - Commercially Available Systems
 - **Source of Heat**
- Air vs. sewer water; considerations remain the same.
- **Sewer Water**
 - Unchanged Risks
 - Commercial Agreement
 - Verifying sewer flow volumes and temps.
 - Decreased Risks
 - Early Adopter/Procurement; still relatively bespoke although other schemes are progressing.

Technology Changes

- Areas to consider:
 - Distribution Technology
 - Available Refrigerant Technology
 - Commercially Available Systems
 - **Source of Heat**
- Air vs. sewer water; considerations remain the same.

Manufacture		Heat Pump Technology	Capital Costs (£ million)	Maintenance Costs (£/yr)	SCoP	Carbon Savings (% reduction in CO ₂ e/yr)	Price of Heat (p/kWh)
A	GEA	Air Source - Type 1	1.89	25,000	3.01	43%	6.51
B	Solid Energy	Air Source - Type 1	1.77	9,360	3.38	46%	5.75
C	Daikin	Air Source - Type 2	1.41	10,960	2.25	33%	7.81
D	Mitsubishi	Air Source - Type 2	1.28	-	2.25	36%	7.46
E	Gcore	Ground Source - Open	1.63	10,220	2.45	36%	7.3
E	Gcore	Ground Source - Closed	2.96	10,220	2.45	36%	7.3
F	Sharc	Sewer heat recovery	1.63	18,875	3.31	45%	5.99

Technology Change Summary

- Distribution Technology
 - Improved HIUs allow lower return temperatures.
- Available Refrigerant Technology
 - CO₂ Heat Pumps may now be viable.
- Commercially Available Systems
 - Potential to explore decentralised systems with Heat Pumps local to residences.
- Source of Heat
 - Considerations remain the same.

Other Considerations

- Relocation of ASHP to another area?



Further Work

- Additional Work Outside MXF Current Agreement
- Funding Opportunities
 - Do Camden want to apply?
 - Camden view of Heat Trust requirements?
- Review of Options Appraisal
 - Work that would reduce risk.
 - What heat source should be progressed?
 - Study ASHP, WSHP or both ASHP & WSHP?
 - MXF proposals, scope and fee.
 - Recirc Energy proposals, scope and fee.

Delivering the York Way Project

- York Way Remedials
 - Scope and funding to be agreed.
 - MXF complete Stage 4 technical design from September 2022.
 - Tender in January 2023.
 - Site works carried out Summer '23 or '24?

Delivering the Maiden Lane Project

- De-risk of Heat Pump
 - Technical risk?
 - MXF scope and fee to be agreed.
 - Recirc Energy scope and fee.
 - Planning risk?
 - Architect appointment?
 - Pre application material & discussion.
 - Resident consultations.

Tasks	Date
Further Feasibility work - agreement with Thames Water	May-22
Extended Sewer Monitoring	Apr-22
Develop Stage 3 Design Sewer Source Heat Pump Scheme	Jun-22
York Way Remedial works	Jun-22
Soft Market Test Heat Pump Scheme and Financial Appraisal	Jul-22
Finalised Tender Pack for Heat Network Upgrade	Sep-22
Tender Heat Network Upgrade	Oct-22
Tender Evaluation	Dec-22
DA Approval	Jan-23
LH Consultation	Jan-23
Contract Award	Apr-23
Mobilise	Jun-23

Delivering the Maiden Lane Project

- Procurement
 - Traditional full design or D&B?
 - How many contracts?
 - Key Performance Indicators.
 - Contractor selections.

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