



Worthing Heat Network

Dan Goodchild, Carbon Reduction Manager - Adur & Worthing Councils



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Sustainable 
Protecting our environment 

Outline

- Introduction to Worthing
- Evolution of the Worthing Heat Network
- Heat from sewer proposals
- Procurement
- Next steps



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Worthing BC

- Joint working arrangement with Adur DC
- Climate Emergency/net zero 2030 target in 2019
- Carbon Reduction team established 2020
- First Climate Assembly in Sussex
- Public Sector Decarbonisation Scheme Success

2020/21

Fleet
41.1%

Electricity
20.6%

Gas
38.4%



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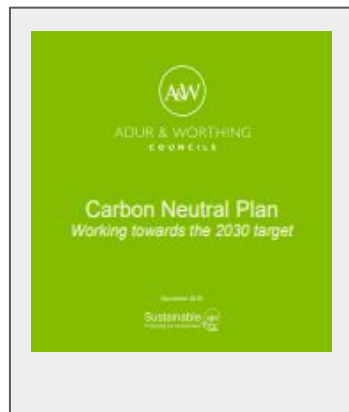
2020/21 TOTAL: 2,806tCO₂e



Worthing Civic Quarter HN: The Journey



Department for
Business, Energy
& Industrial Strategy



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	Building level ASHP installations	Solution 1; Ground source heat pump	Solution 2; Sewer source heat pump	Extended network; Sewer and ground source heat pump
Network Scope	Civic Quarter Only	Civic Quarter Only	Civic Quarter & Union Place	Worthing-wide
Capital cost ¹	£1.3m	£1.9m	£4.3m	Up to £16.3m
Levelised cost of heat	15.2 p/kWh	8.7 p/kWh	11.3 p/kWh	9.2 p/kWh
CO ₂ reduction versus present day systems	14,100 tonnes 87% total reduction	12,200 tonnes (min.) ² 75% total reduction	22,500 tonnes 90% total reduction	170,300 tonnes 85% total reduction

Worthing Heat Network: Net Zero targets



Own estate: 2030
Wider area: 2045

**ASHPs are the
only
counterfactual**



NHS as a whole: 2040
University Hospitals Sussex FT: 57% by 2025



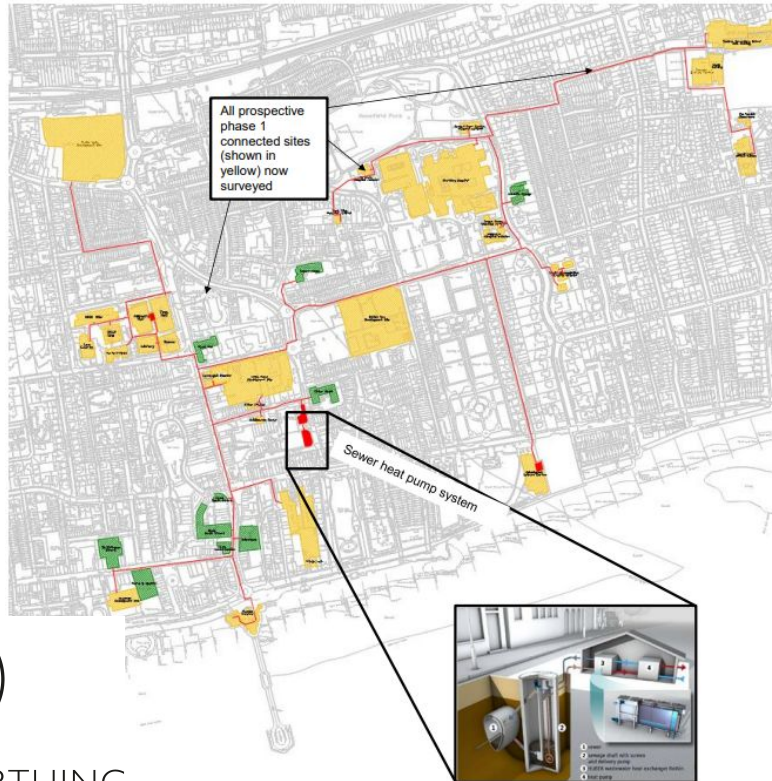
Own estate: 2030



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Primary driver of heat network is decarbonisation

Worthing Heat Network: retrofit connections



- 27 connections
 - 18 Existing buildings (only 5 public sector owners)



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Ministry of
JUSTICE



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Worthing Heat Network: new developments

- 9 new development sites (many with WBC ownership)
- Strong Local Plan policy
 - to be adopted Spring 2022...?

Major development within areas identified as heat network opportunity clusters, will be required to connect to district heating networks where they exist, or will be expected to maximise opportunities for the development of a future district heating network. Where this is not possible, a viability assessment should be submitted to justify departure from the heating hierarchy.



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Worthing's Sewer Proposal

- Main combined sewer runs straight past council owned land and through heat network area
- 12mth flow and temperature monitoring
- Draft Use of Sewer Agreement Heads of Terms agreed with Southern Water

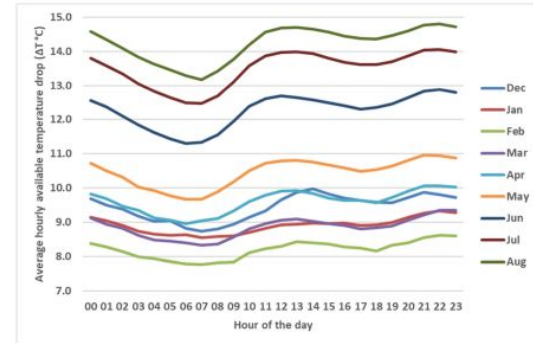


Figure 10: Average hourly available temperature drop (ΔT) by hour of the day and month

Worthing's Sewer Proposal

- Modelling of HP and connection sizes
- Remaining heat to be met by gas-fired peaking plant (for now)
- 39gCO₂e/kWh reference scenario

Parameter	65/35°C	85/55°C
Total heat delivered (GWh)	16.30	16.42
Total heat delivered (% of total demand)	89.1%	89.8%
SCOP (kW _{th} /kW _e)	3.95	3.16
SPF (kW _{th} /kW _e)	3.57	2.91

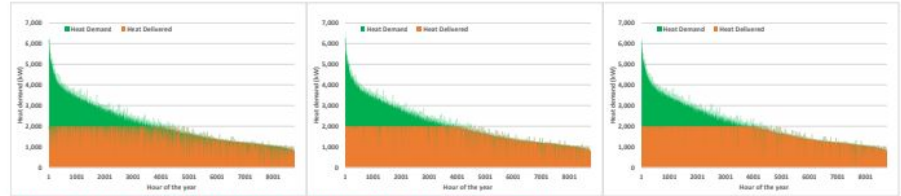


Figure 13: 2MW heat pumps with (left to right) 300, 600, 900mm sewer connections sizes

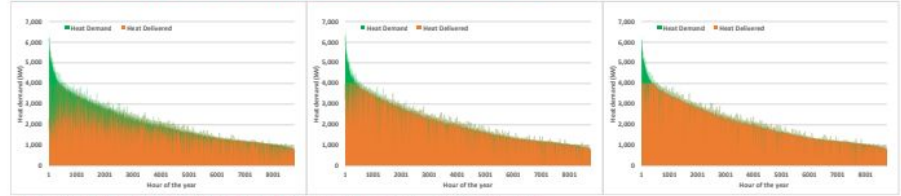


Figure 14: 4MW heat pumps with (left to right) 300, 600, 900mm sewer connections sizes

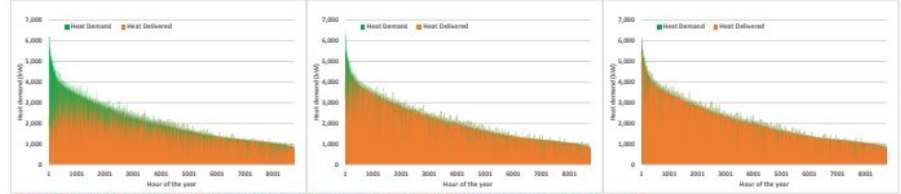
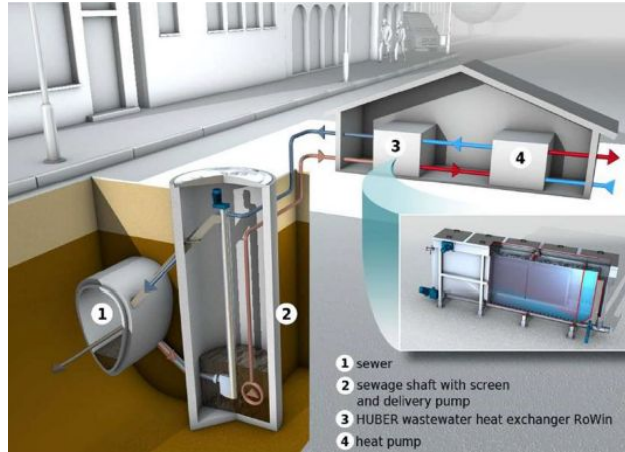


Figure 15: Heat delivered by 6MW heat pumps with (left to right) 300, 600, 900mm sewer connection sizes

Energy Centre

- 3MW heat pump proposed
- No water leaves the sewer
- Can be recirculated for additional heat extraction



Procurement

Output specification, so if the market can meet cost/carbon equivalency from alternative means, this is deemed acceptable

- Selection Questionnaire Launched in April
- Seeking a concessionaire partner to design, build, own, operate & maintain
- 'Evergreen' to incentivise expansion/ongoing investment
- WBC will on-grant/loan HNIP funding, but no additional economic stake
- WBC 'Golden Share' permits attendance at board meetings, but voting rights only over retained matters:
 - Carbon and expansion
 - Business Continuity/Ownership etc.



HNIP & Public Sector Decarbonisation Scheme

HNIP

- £0.9m Commercialisation
- £3.208m Construction Grant
- £1.275m Construction Loan

PSDS

- £0.585m already secured
- Potential for up to £15m



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Next Steps

- SQ evaluation Spring 2022
- Competitive Dialogue throughout summer/autumn
- Contract Award by March 2023
- Construction and heat on dependent on concessionaire approach



Thanks for listening

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