



Worcestershire  
Local Enterprise Partnership

# Worcester City Heat Network WLEP Project Development Fund ask

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*WLEP Board*

3 February 2023

# What is the proposition...

- To take heat from the River Severn and distribute it to homes and businesses in key locations.



## How will we achieve it...

- We will use 'Water Source Heat Pumps' (WSHP) to extract heat from the river water. The heat is then circulated through a heat network to homes and businesses in the vicinity.

# Overview...



- The Worcester City Heat Network is a circa £20million project to connect large heat users within the city (including the Shrub Hill development) to a source of secure low carbon energy (i.e. the River Severn via Heat Pumps).
- A fully funded initial feasibility study from the BEIS Heat Networks Development Unit ((HNDU), and led by the University of Worcester) was recently completed showing that there was a business case for investment in a heat network for the city of Worcester.
- Since the feasibility study was completed, we have secured commitments for local match funding from key stakeholders in the city, the unit cost of gas has increased dramatically and new potential customers have been identified – all meaning that the business case is now even more compelling.

# Key Information...



- The value of the heat produced is estimated to be £1.15million annually at current prices.
- The network will also be able to take waste heat from sources such as the Severn Trent facility at Diglis, and can be delivered in phases.
- By connecting to the heat network, a business or organisation benefits from a cost effective method of building decarbonisation (compared to individual heat pumps).
- There is also the potential to offer competitive tariffs for customers committing to long term contracts. Other commercial opportunities may be available such as supporting the electrical grid network through demand management and frequency response.

# Key Information...



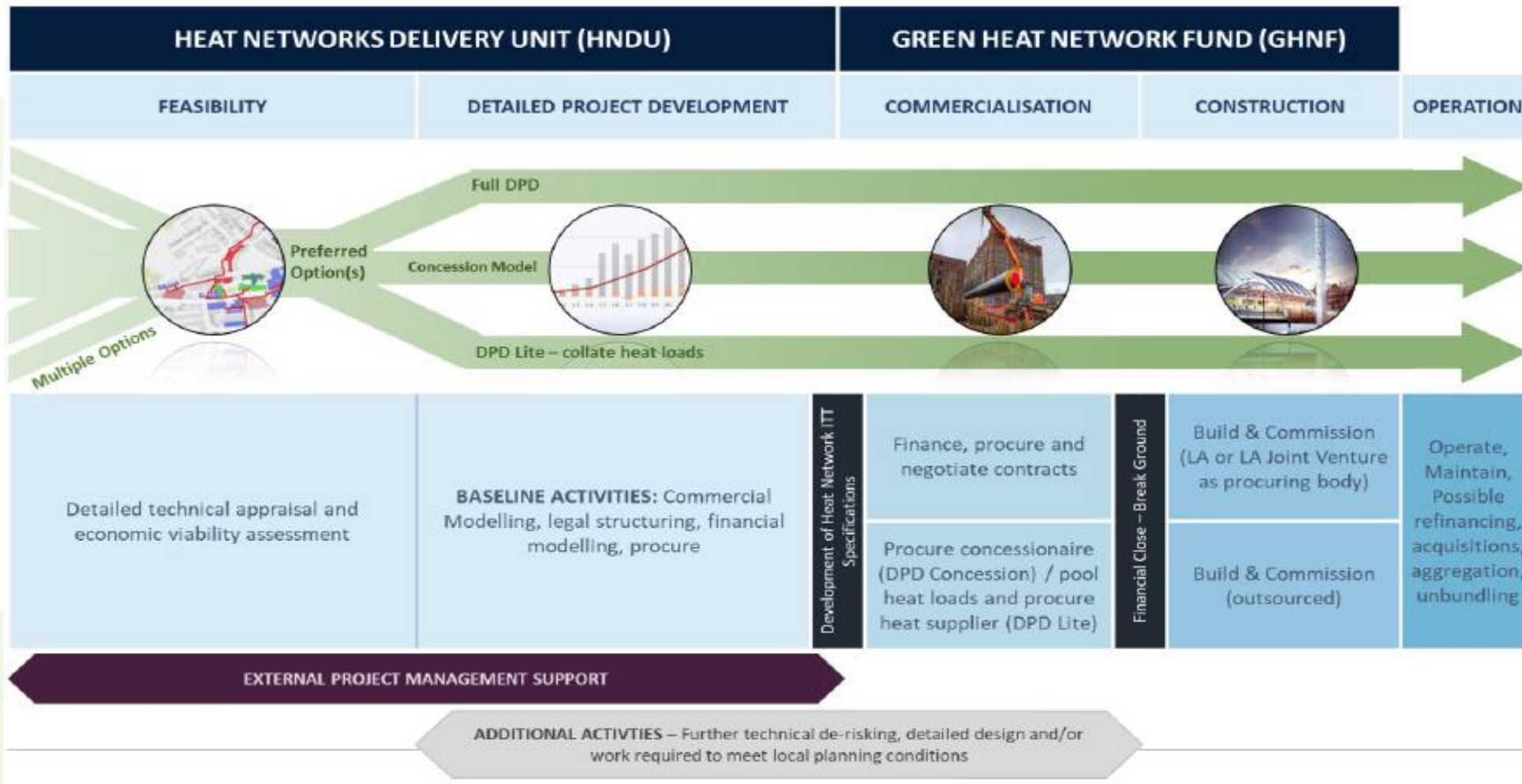
- The project has been adopted as a 'pathfinder' by the River Severn Partnership, and both HM treasury and BEIS have received presentations on the potential heat network.
- Based on the feasibility report a bid for further funding has been submitted in order to advance to the detailed project design stage. The detailed project design will provide a pathway for the legal, financial and physical build aspects of the project.
- We will then have a 'Decision Point' between forming a joint venture, special purpose vehicle or seeking a commercial partner to own and run the Heat network.

# Key Stakeholders...



- Diocese of Worcester Cathedral
- Heart of Worcestershire College
- Platform Housing / Rooftop Housing / Sanctuary Housing
- University of Worcester
- Worcester City Council
- Worcestershire County Council
- Worcestershire Local Enterprise Partnership / Midlands Net Zero Hub

# The HNDU Journey...



# Salix Case Study Example...

The Bedford College Group harness the power of the Ouse River to decarbonise heating with £2.8 million grant



- Water Source Heat Pump (WSHP)
- Genius Control - heating management system
- Carbon management strategy with learners.
- Future implementation of air source heat pumps (ASHP)
- Annual savings: £88,000
- Total grant value: £2.8M
- Annual carbon savings: 350tCO<sub>2</sub>e\*



# Next Steps...

- Appoint a lead body for the 'Detailed Project Design' stage funding application - COMPLETE
- Secure local match funding contributions – IN PROGRESS
- Apply for DPD funding – IN PROGRESS
- Begin early commercialisation investigations – SUBJECT TO APPROVAL

# Ask of WLEP Board...



- Seeking £40k WLEP investment to secure a £200k grant
- In order to leverage £200k of grant funding from HNDU for the Worcester City heat network detailed project design study (including fully funded Project Manager) a match fund of £60k is required.
- Currently the project has £20k of match funding contributions secured from other stakeholders.



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## Worcestershire 2040 Vision:

**“A connected, creative, dynamic economy for all.”**

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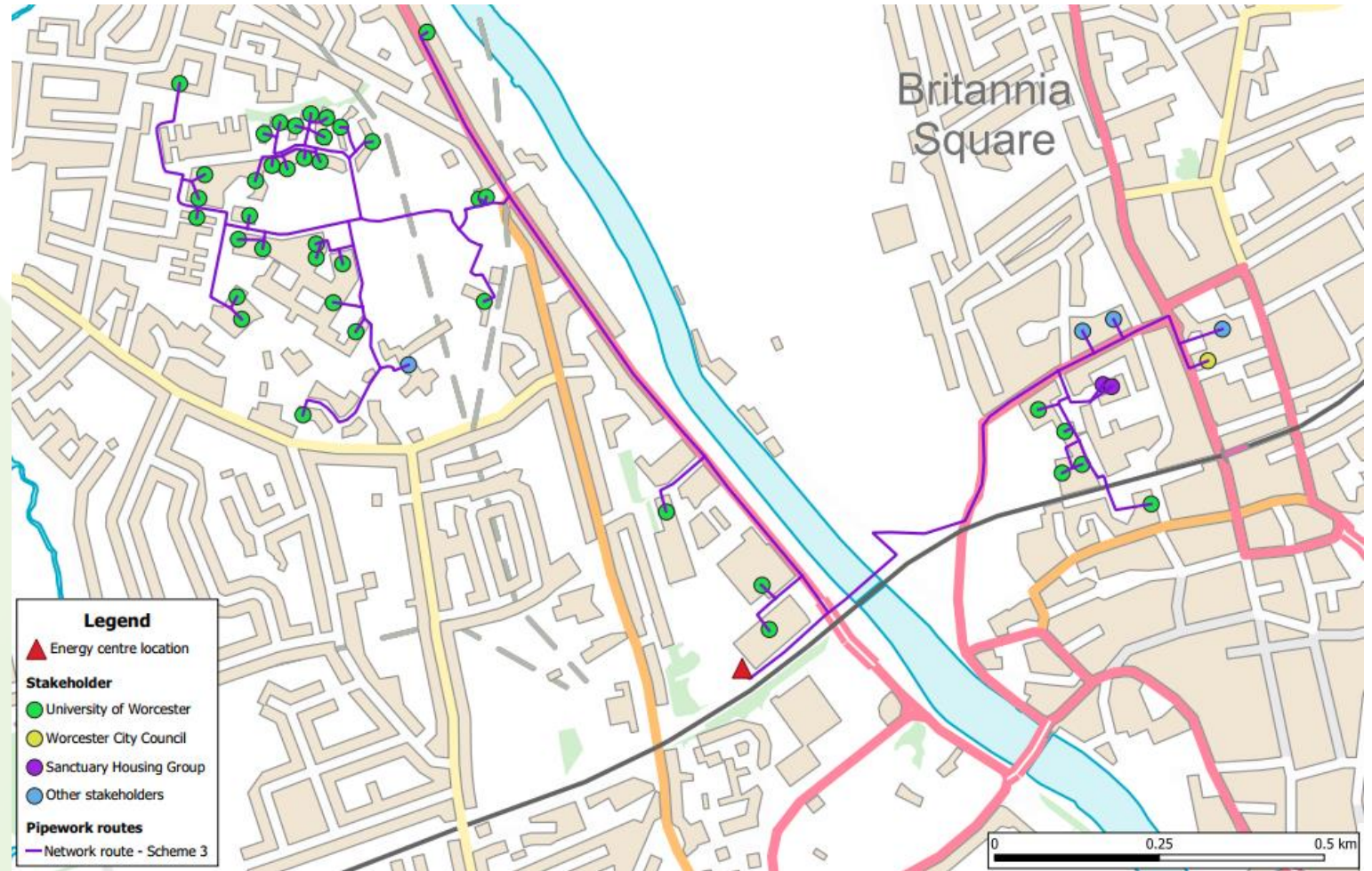
An aerial photograph of a city, likely Loughborough, showing a river (the Great Ouse) flowing through the center. A bridge crosses the river in the middle ground. To the right, a prominent church spire is visible. The city is surrounded by green spaces and trees. The sky is blue with scattered white clouds.

## **ADDITIONAL INFORMATION:**

**The following slides are from the Element Energy Feasibility Report funded by BEIS (HNDU)**

## After discussions with the University, scheme 3 was chosen for the technical design and cash flow modelling

- The map on the right shows a possible network path
- This includes all University buildings as well as selected stakeholder buildings
- The Energy centre location was suggested at the back of the arena as an indicative location to be reviewed. This location has several benefits:
  - Large area available
  - Minimal visual and noise impact
  - Relatively low flood risk



## Assumptions for modelling



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- The table below summarises the core assumptions used in the cash flow modelling

Inputs/assumptions	Baseline (Scheme 3)
<b>Technical</b>	
Heat demand	11.5 GWh/y
Water-source heat pump efficiency – seasonal COP	314%
District heating standing losses (% of heat supply)	10%
Scheme lifetime	40 years
<b>Financial</b>	
Heat sales price – gas counterfactual	4.8 p/kWh
Heat sales price – Air-source heat pump counterfactual	12.4 p/kWh
2025 Gas cost from Uni bills	2.85 p/kWh
2025 Electricity cost from Uni bills	15 p/kWh
Discount rate	3.5%
Loan interest rate	5.2%
Grant funding	50% capex (max available)
Loss of income from parking	£60,000/y
Business rates (DH excluded in BEIS published strategy)	£0/y

## Comparison with ASHP – Using an ASHP lifetime of 15 years, DH becomes cheaper than ASHP, with an NPV of £3m

- A few sensitivities are assessed when comparing DH with ASHP as in this case there is a level of uncertainty with regards to which technology provides a better business case for decarbonisation
- On the right is an example of sensitivity where the ASHP lifetime has been reduced to 15 years, which is an average typical value for heat pump lifetime.
- In this case, the cost of heat through heat pumps is now increased enough that the DH scheme generates more revenue annually than it incurs costs.
- The NPV of the scheme reaches £3m by the 40<sup>th</sup> year of the scheme operation in this sensitivity.

