



**Maidstone Heat  
Network  
Soft Market Test**

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## 1 Introduction


Kent County Council (KCC) with support from the Department of Business Energy and Industrial Strategy are developing a heat network in the centre of Maidstone. Technical support is being provided by AECOM.

The project team is now keen to engage with the market to understand private sector appetite for the further development of the project. Feedback from this engagement exercise will help develop the procurement and delivery strategy. All comments will be reported back to the project team and potentially used to inform the outline business case, which will set the future direction for the development of the proposed project.

The objective of the soft market test is to gather private sector views on;

- 1) potential structures for the delivery and operation of the project network
- 2) potential availability of third party, private funding and financial/commercial challenges
- 3) the technical and non-technical challenges facing the implementation of the proposed network
- 4) appetite to participate as a delivery partner

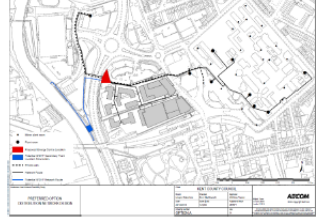
This market test exercise seeks to gather information and KCC encourages respondents to provide feedback. KCC invites all respondents to attend a supplier day following submission of the questionnaire.


Information valid as of: Sept 19

### Maidstone Energy Networks Feasibility Study

**Project Sponsor:**  
Kent County Council

**Network Map:**



**Summary forecast financial information:**

Item	CAPEX (£'M)
Energy Centre	1
Primary Plant	2
Ancillary Plant	0.9
Heat Distribution Pipework	2.3
Electrical Distribution Cable	0.5
On-costs	2.9
<b>Total</b>	<b>9.6</b>

Project IRR*	3.2 %
Carbon savings (year 1)	1,300 Tonnes
Considering third party finance?	Yes

\* Real pre-tax pre-finance, 40-year assessment period

FID	Construct ion Start	Heat On (initial)	Heat On (full)
HNIP funding to be sought	2021 (estimate)	-	2022 (single phase)

**Project Stage**  
Feasibility Stage – HNDU Scope v10.4

**Project Contact Details:**

LA Name:	Kent County Council
Contact Name:	Steven Baggs & Thad Dell
Email:	<a href="mailto:steven.baggs@kent.gov.uk">steven.baggs@kent.gov.uk</a> , <a href="mailto:thad.dell@kent.gov.uk">thad.dell@kent.gov.uk</a>

**Technical Information:**  
**Primary energy source:**  
Gas CHP and Water Source Heat Pump

**Project description:**  
Central Maidstone has been identified as having good potential for district heating. A concentrated number of buildings – owned by relatively few individual entities – have been shown to have a high demand for heat and consume significant amounts of electrical power as well. At present, large quantities of natural gas are combusted in their respective on-site boiler heating systems, leading to relatively poor environmental performance. Building types include offices, residential accommodation, community facilities and a large prison/foreign national detention centre (HMP Maidstone). A large, mixed-use development is planned for this area, offering potential development synergies with the creation of new energy networks.

**Energy centre description:**  
Due to relatively small size of the network, a single-phase development programme is proposed, until further details regarding the new development are available. Concept designs suggest plant as follows:

- River-Medway-sourced, water source heat pumps (WSHPs) c. 500 kW<sub>e</sub> capacity
- 2No. 600 kW<sub>e</sub> gas-fired CHP engines
- 7 MW<sub>th</sub> gas boilers
- 2No. 25 m<sup>3</sup> thermal storage vessels
- Electrical and mechanical ancillary equipment
- Meters, management and control system
- Flues appropriately sized for combustion plant
- Private Wire electrical network serving all facilities *except* HMP Maidstone
- Photo-voltaic panels for Energy Centre parasitic electrical load

**Heat/cooling demand phasing description:**  
Phase 1 – to power heat on Q1 2022

- All plant in the energy centre and within river bank (water management system)
- All distribution infrastructure

Works to be undertaken in parallel with the first phase of the Maidstone East development – the location of the energy centre. Later phases of Maidstone East development and other proposed building projects would connect when applicable

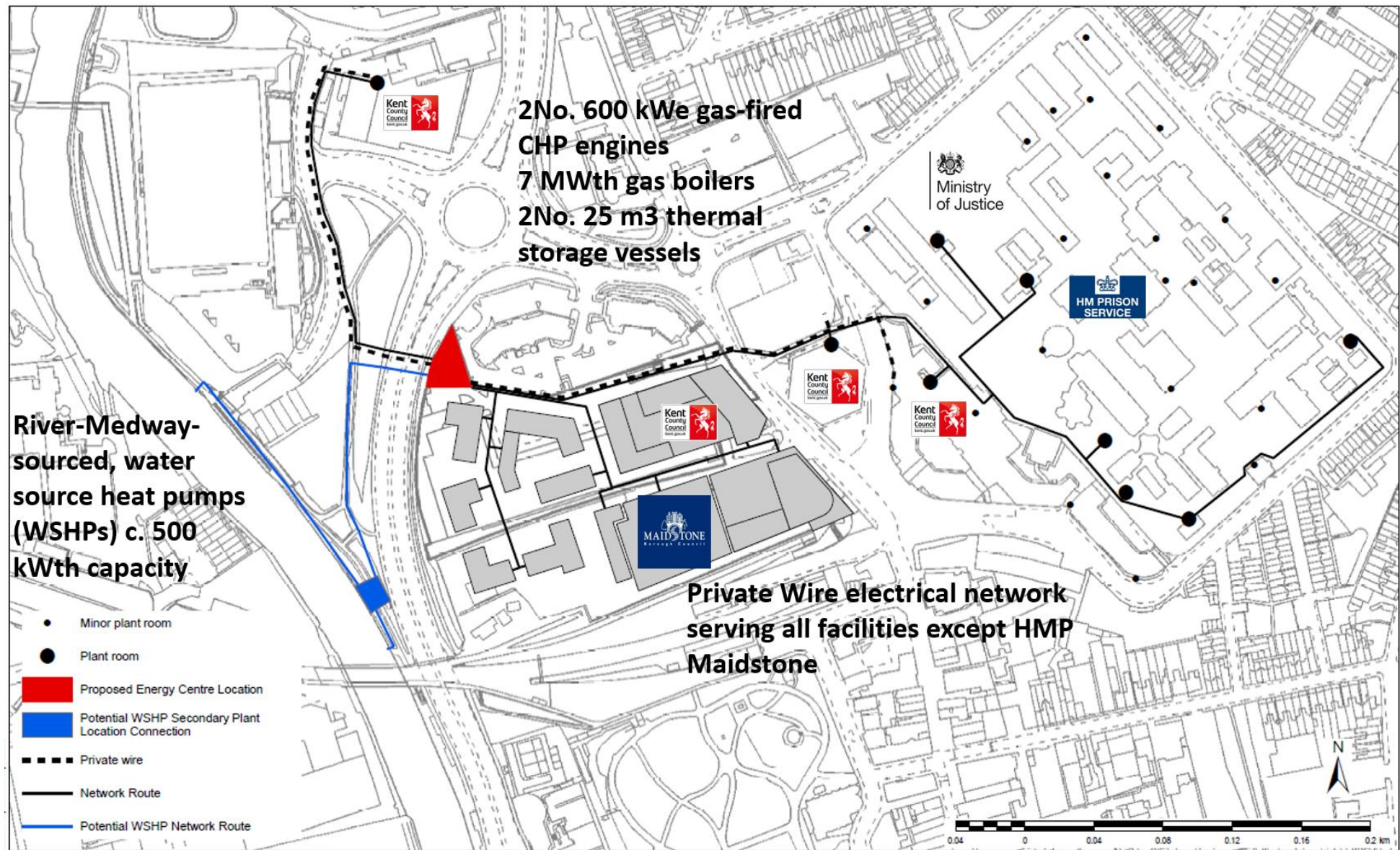
## 2 Opportunity

The Council has ambitious plans for carbon reduction and tackling climate change with the Kent and Medway Energy and Low Emissions Strategy to support the delivery of the Kent Environment Strategy. Its purpose is to identify an evidence-based approach to deliver clean growth. This includes strategies and actions to reduce carbon emissions, eliminate poor air quality, reduce fuel poverty and deliver an affordable, clean and secure energy supply.

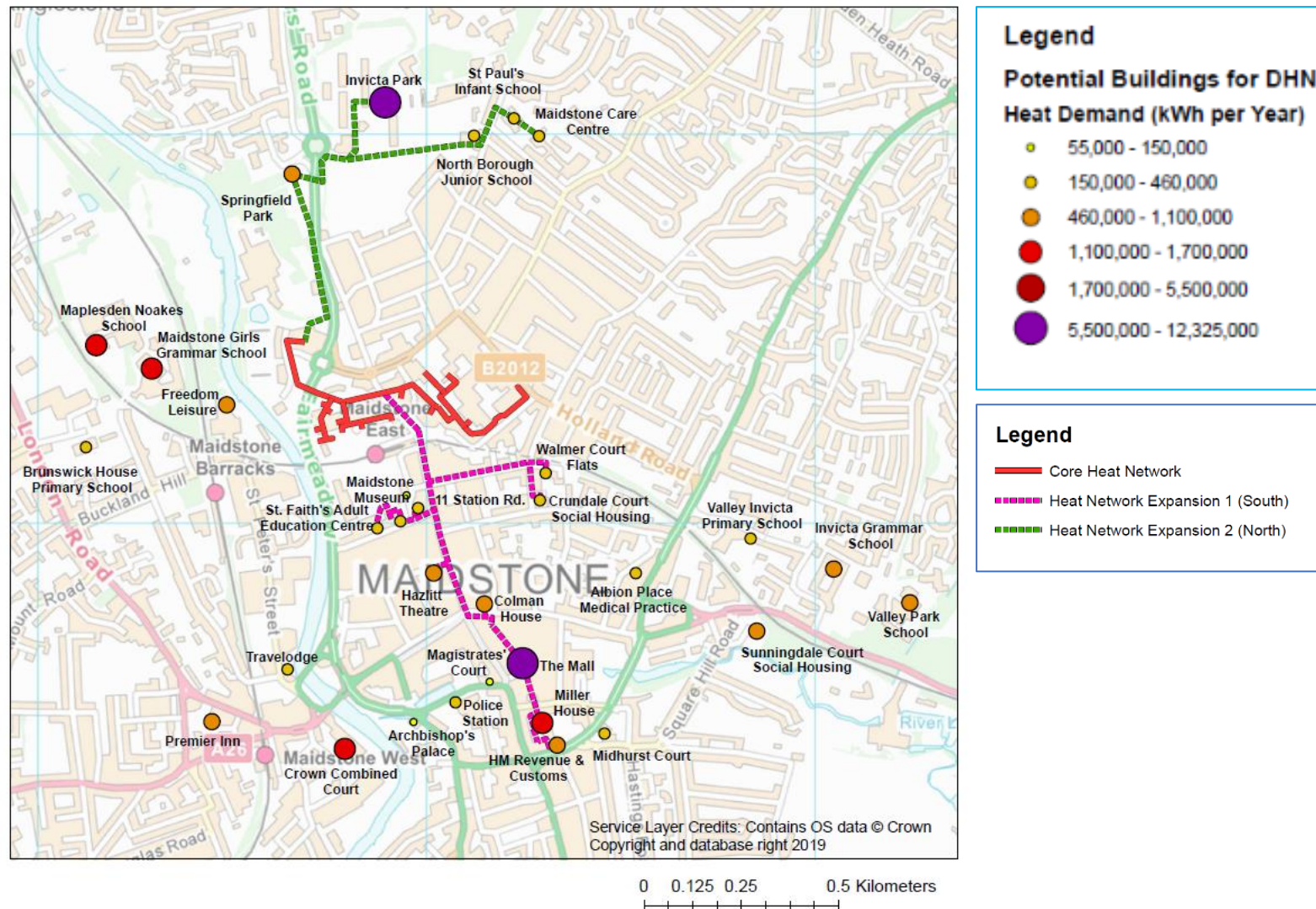
As part of the action plan based on the above policy, KCC seeks to decarbonise its heating for the main County Hall campus in Maidstone. The KCC buildings included in the study are County Hall's Sessions and Invicta House in addition to the Kent History and Library Centre (including a block of residential flats). Adjacent to County Hall, KCC with Maidstone Borough Council is jointly developing a predominantly residential development called Maidstone East in a land deal with Network Rail. The other major building that forms the heat network is HM Prison Maidstone. The Prison is the key building in terms of their large heat load and the Energy Team have been working closely with the Ministry of Justice and the HNDU to develop the project.

Together these buildings create an attractive opportunity for deployment of initially a concentrated energy network, including a low temperature heat network, providing hot water to buildings to serve their space heating and domestic hot water demands; and a private wire electrical network, providing electricity to much of the study area. The constituent parts of phase 1 are shown in the map on page 4.

The entire scheme would be delivered in one phase, with further extensions south into Maidstone town centre possible (and explored within the 2016 feasibility study), in addition to extensions to new developments planned along the river Medway to the north with 1300 dwellings planned from c.2026 at Invicta Park Barracks Ministry of Defence site.



The below map sets out the realistic ambitions for the scheme beyond phase 1 to be a wider town centre scheme to attract new connections with a total load of 11.33 MWh/p.a/m (South route) & 5.2MWh/p.a/m (North route) . Further detail see Appendix V.



### 3 Key project risks

As with any district heating opportunity there are risks that will need to be fully considered and mitigated as the project progresses. The risks identified within the report include but are not limited to;

1. Location of the energy centre;

Further work has been undertaken subsequent to the Feasibility Report to determine further options within and outside of the Maidstone East development boundary. These options are included in the appendix. To avoid programme delay risk, the project team concluded that the development of the energy centre outside of the new build red line boundary may be more desirable. However there are good reasons why the energy centre could be situated within the Maidstone East redevelopment.

2. Technology to achieve low carbon and economic balance;

The Council within the context of Net Zero ambitions is keen to make the scheme as low carbon as economically possible. Further design and stakeholder engagement will need to be undertaken to ensure this ambition can be met. This includes looking at the risks associated with either the Sewer Source Heat Pump (for which the main sewer combines within the boundary of the Maidstone East development) or the Water Source Heat Pump, drawing heat from the River Medway. The Council is also keen to hear from the market as to any other technology to seriously consider for this scheme in the short to medium term such as Hydrogen boiler peaking plant/ fuel cells, to support the heat pumps.

## 4 Structure

Whilst the Council understands it would be ideal to be clear about its level of involvement and its preferred structure; it is keen to open up a dialogue to discuss a variety of different potential structures for the delivery of the project. The Council would be the counterparty in most delivery structure relationships and has a corporate governance structure in place to enable this. The Council is clear in its ambition for reduced emissions within the context of the Kent & Medway Low Emissions Strategy and meeting its corporate commitments.

The Council will be considering whether to make a capital investment in the scheme and this will be dependent on a number of factors. How much involvement the Council wishes to have is yet to be determined. It is the aim of the Council to access a Heat Network Investment Programme grant following successful application in 2020. Following completion of the outline business case, the Council will determine whether to progress the project through to the commercialisation stage. The Council will also decide how it will procure and deliver the project with or without a third party or partner.

## 5 Key Project Assumptions

Below are some of the key technical and financial indicators which should help to inform your response. In addition, please refer to the Appendix IV extracts from the Technical & Economic Model carried out by AECOM.

Assumptions to use	
Emissions Requirement	Maximum 20-year average CO <sub>2</sub> content is 0.156gCO <sub>2</sub> /kWh.
Metering Requirements	No deviation from Heat Trust requirement.
Capping connection charges	Connection charge for the Maidstone East development would be no more than the developer's avoided cost of implementing an alternative heating supply.
Contract Term	Assume 20 years (negotiable).
Inflation	Real (no inflation), rather than index linked.
Operational temperatures	Dual temperature network '3 <sup>rd</sup> generation' (85/55°C) & 4 <sup>th</sup> generation (65/35°C).
Voids	Maidstone East and Kent History & Library Centre have c.520 flats.

Costs	
<b>CAPEX</b>	<b>£9,646,380</b>
Heat Generation CAPEX	£5,785,576
Distribution CAPEX	£3,860,804
Annual OPEX	£176,858
Year 1 fuel costs	£770,721
Annual Repex / Sinking Fund	£282,589

Revenues (first fully operational year)	
Total Connection Fees	£1,722,224
Annual Heat Sales	£678,804
Annual Power Sales	£872,249
Annual Profit (without RHI)	£320,885
Levelized Cost of Heat, p/kWh	9.13

DHN Technical Factors	
Total Peak Load	5,808 kW
Network 1 peak load	3,668 kW
Network 2 peak load	2,441 kW
Network Annual Heat Consumption	10,377 MWh/yr
Network 1 load - % of total consumption	69.97%
Network 2 load - % of total consumption	30.03%
Total Thermal Losses	9.67%
Total district heating pipework Length	1,506 m
Total district heating pipework Length - Network 1	987 m
Total district heating pipework Length - Network 2	519 m
Network 1 percentage of total load	69.97%
Network 2 percentage of total load	30.03%
Linear Heat Density	6,892 kWh/m

Total carbon savings (tonnes CO2)	8,528
Annual average saving (t / year)	569
Average carbon factor (kgCO2/kWh)	0.154
Nat carbon % Saving	26.2%

Carbon Savings (Over 15-year period)

## Soft Market Test

**Tariffs**

- The presumption is that the heat and power price offered will not be more than the alternative market offer obtainable by connected customers. This will be reflected in the tender requirements.
- The project would be required to become Heat Trust accredited and costs associated included.
- We also expect the project to demonstrate compliance with CIBSE Heat Networks code of practice through the forthcoming accreditation scheme.

**Commercial connections**

The core scheme is comprised of the following connections:

Connection ID	Owner / Operator	Heated Area	Points of Connection	Year of Connection
Sessions House	KCC	23,000 m <sup>2</sup>	1no. DH & PW	2022
Invicta House	KCC	11,000 m <sup>2</sup>	1no. DH & PW	2022
Kent Museum & Library (& adjoined flats)	KCC	5,000 m <sup>2</sup> (community) 6,300 m <sup>2</sup> (residential)	1no. DH & PW	2022
HMP Maidstone	Ministry of Justice	29,000 m <sup>2</sup>	TBC (DH only)	2022
Maidstone East Development Site	TBC; Currently Maidstone Borough Council / KCC	31,000 m <sup>2</sup>	TBC	2022

## 6 Next steps

To help inform thinking and understand interest in this heat network opportunity, we invite your responses to the following questions as well as any other comments or observations you would like to make. Responses received will not be shared outside the project team and will remain confidential.

**Further to the response received, we will invite recipients to a supplier day on Thursday 14<sup>th</sup> November.**

## 7 Market engagement questions

### Instructions to Respondents

#### Completion

Please complete this questionnaire in the separate MS WORD Document format by using the response boxes.

#### Queries

Queries in relation to completing this questionnaire should be directed to Mr Thad Dell through the messaging service facility available on the Kent Business Portal.

#### Supplier Day

KCC will have a supplier day on **THURSDAY 14<sup>th</sup> NOVEMBER** 10am to 2pm to which all respondents are invited. There will be an opportunity to hear about the scheme developments and one to one dialogue with the project team.

Please confirm your intention to attend as part of your submission.

## **Return**

Please return all completed questionnaires via the portal by **17:00 hours on Thursday 31<sup>st</sup> October 2019**.

## **General**

The respondents should note that the responses will not be considered as expressions of interest in any way, and whichever approach is chosen by KCC, there will be no impact of this exercise on the bidders' evaluation in any subsequent procurement process. KCC reserves the right not to progress the project or any procurement process.

The purpose of this exercise is to help inform KCC of an appropriate structure for any future delivery model and to ascertain interest from potential 3rd party partners/tenderers. KCC would like to understand the market's appetite for the proposed Energy Network risks and the likely return that would be required by private investors or participants to invest or participate in the project.

Please note that comments received will be treated in the strictest confidence by KCC, but may be subject to disclosure under the Freedom of Information (FOI) Act. Accordingly, respondents should indicate clearly in their responses any information contained therein that should be considered as commercially sensitive and respondents must specify the reasons for its confidentiality or commercial sensitivity. KCC will, where possible, consult with respondents about confidential or commercially sensitive information so identified before making a decision on a FOI request received.

## **Respondent's introduction**

Full name of respondent (company/individual)

Brief introduction of respondent

Relevant contact person name

Position and Organisation Chart

Contact Number

Other contact information

**I would like to attend the supplier day on Thursday 14<sup>th</sup> November 2019 10am – 2pm.**

Yes / No

## **Commercial Structure**

1. Please provide a summary of your current role in the District Heating market and your experience of developing heat networks?  
(Max 500 words)

[Click here to enter your response](#)

2. What is your company's capability and appetite to be involved in the Maidstone Heat Network Project? Please explain why you are interested in the project? (Max 500 words)

[Click here to enter your response](#)

3. From your perspective, what is your preferred delivery structure for this scheme? Please highlight your answer below.

Agree / Disagree

A.	Design, Build, Operate & Maintain (non sub-contracting for any below structure)	1	2
B.	Joint Venture ESCo with Kent County Council	1	2
C.	As a 3 <sup>rd</sup> Party ESCo	1	2
D.	Concession Model	1	2
E.	Project Sponsor ESCo	1	2
F.	In-house Delivery	1	2

4. Please explain your preferred delivery structure from your company's perspective? (Max 500 words)

[Click here to enter your response](#)

## Finance

5. Can you provide funding for this project? And if so what type and level would you consider for a project of this type/size?? (Max 150 words)

[Click here to enter your response](#)

6. What is the minimum and maximum investment you would consider for a scheme of this nature? (Max 150 words)

[Click here to enter your response](#)

7. Please indicate the expected timescale of any funding and how this will be allocated over time? (Max 150 words)

[Click here to enter your response](#)

8. Your desired hurdle rate, IRR (real terms not inflation) for this project or similar type? (Max 150 words)

[Click here to enter your response](#)

9. The type of due diligence you would expect to perform in respect of the project? (Max 500 words)

[Click here to enter your response](#)

## Technology

10. What suggestions would you make with regard the technology choices made so far within the report? What changes or recommendations would you make?? (Max 250 words)

[Click here to enter your response](#)

11. How would you completely decarbonise this project? What technologies would you use? . (Max 250 words)

[Click here to enter your response](#)

## Soft Market Test

12. What do you think are the key risks and issues associated with the scheme and suggested approach to mitigation. (Max 250 words)

[Click here to enter your response](#)

## Your offer

13. Please provide any further information you would like to add in relation to your potential involvement in the Maidstone Heat Network project? The following maybe useful to consider?. (Max 2000 Words)

[Click here to enter your response](#)

You may wish to include:

- Experience and track record of heat networks delivery, including cities / local authorities in the UK and Europe
- Opportunity to elaborate on preferred partnering approaches / commercial structures
- Experience of developing and growing heat networks over time
- How the heat network could be designed for expansion with consideration of technology
- Whether low carbon heat can be increased / accelerated for the Maidstone heat network & how this would affect the project commercially
- Consumer pricing principles, for example how capital costs vs ongoing operational costs are reflected in tariffs

## 8 APPENDICES

- I. MAIDSTONE ENERGY NETWORKS – FEASIBILITY REPORT
- II. MAIDSTONE ENERGY NETWORKS – MAP PACK
- III. MAIDSTONE ENERGY NETWORKS – EC DRAWINGS PACK
- IV. MAIDSTONE ENERGY NETWORKS – EXTRACTS FROM  
TECHNICAL & ECONOMIC MODEL
- V. MAIDSTONE ENERGY NETWORKS – NETWORK EXPANSION  
OPTIONEERING
- VI. MAIDSTONE ENERGY NETWORKS – ENERGY CENTRE  
LOCATION APPRAISAL

