Department for
Business, Energy
& Industrial Strategy

Green Heat Network Fund consultation and call for evidence:

Government response

September 2021

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Contents

Foreword

The Prime Minister has made clear with his Ten Point Plan for a Green Industrial Revolution that he is committed to clean growth and that the UK is, and must continue to be, at the forefront of global efforts to combat climate change. Over the past decade, we have reduced carbon emissions by more than any similar developed country, which stands us in good stead to take forward the Presidency of COP26.

Decarbonising heat is a key part of the Government's heat and buildings strategy and underpins the Ten Point Plan. It requires us to move to cleaner and more efficient ways of heating our homes, buildings, and industrial plants. It is a challenging undertaking that has no single solution and will require a combination of leading-edge technologies and increased customer options to make it happen. However, if we deliver this change in the right way, we can seize substantial environmental and economic benefits while creating a system that delivers for the consumer. It is a certainty that heat networks will play a vital role in making net zero a reality because they are a proven, cost-effective way of providing reliable, low carbon heat at a fair price to consumers, while supporting local regeneration.

The Government has demonstrated the value it places on building a sustainable heat networks sector by providing focused project support since 2013 and has committed to investment of nearly half a billion pounds. This has helped the market access private investment, supported the growth of the supply chain and unlocked large scale renewable and waste heat resources. This year, we have also introduced proposals to help build a future market framework which will enhance consumer protections whilst supporting market growth.

We now look to establish a new Green Heat Network Fund. This fund is intended to assist both new and existing heat networks to decarbonise by moving to low carbon technologies, while also ensuring that consumers are treated fairly by the networks that will benefit from its support. Getting the design of the scheme right will be vital to ensuring that it achieves these ambitions.

I am grateful to those who responded to the recent Green Heat Network Fund consultation and others who have engaged with BEIS in discussions about the scheme since it was announced in the March 2020 Budget. The design of the scheme has been greatly enhanced by the feedback we have received from you, and I would like to thank you for the time and effort you have committed to supporting its development.

Lord Callanan

Minister for Business, Energy and Corporate Responsibility.

Introduction

Purpose of this document

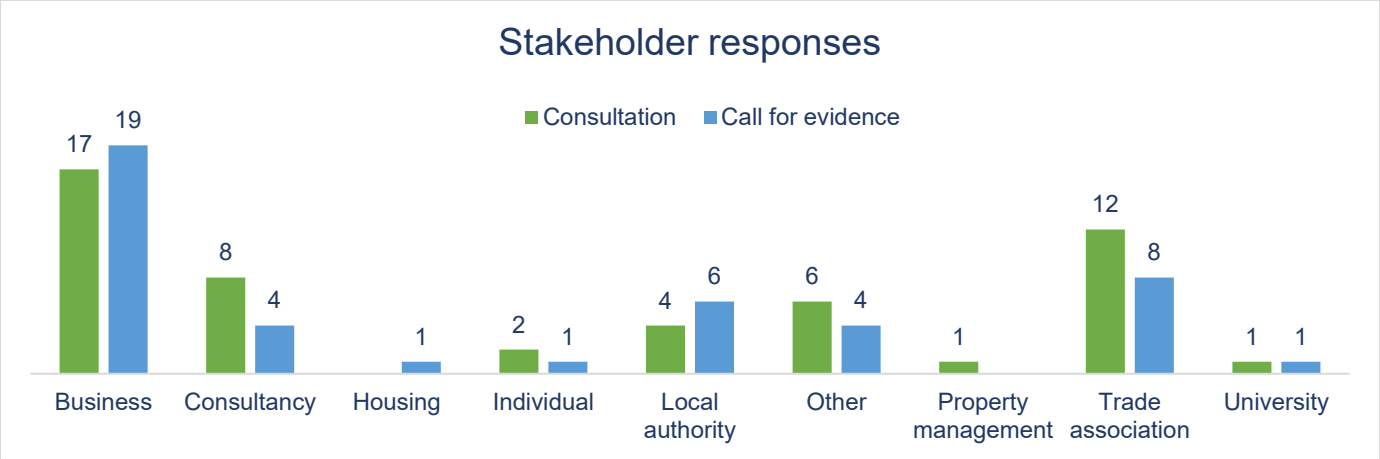
This document sets out the Government's response following the Green Heat Network Fund call for evidence and consultation, where we have set out our current position, decisions and accompanying rationale on the design of the fund.

In September 2020, we published our call for evidence on the Green Heat Network Fund (GHNF)[1]. This document sought evidence from stakeholders on areas such as the heat network supply chain, drivers and barriers to heat network decarbonisation, to inform the development of the GHNF. Alongside the call for evidence, we published a pipeline questionnaire[2], to expand our understanding of the pipeline of heat network projects that could potentially transition to low-carbon heat generation.

In November 2020, we published our consultation[3] on the Green Heat Network Scheme design, which detailed the proposed design of the GHNF.

Following a general Introduction, this document provides a brief overview of where proposals have been amended as a result of the consultation, and outlines the amended requirements and what they mean for potential applicants to the fund.

This document summarises and details our responses to the 51 responses received in relation to the consultation and the 44 responses received in relation to the call for evidence. A diverse range of stakeholders provided their views, as set out below.



Please bear in mind that the precise details of the scheme design will evolve in advance of the GHNF launch in 2022, for example as a result of lessons learned from the Transition Scheme. For those requiring further information, there will be full guidance published on Gov.uk in due course.

[1] BEIS, 2020. Designing the Green Heat Network Fund: call for evidence
[2] BEIS, 2020. GHNF pipeline questionnaire
[3] BEIS, 2020. Green Heat Network Fund: proposals for the scheme design

Policy context

Heat networks are a crucial aspect of the path towards decarbonising heat and reducing our greenhouse gas emissions to net zero by 2050. In the right circumstances, they can reduce bills, support local regeneration and can be a cost-effective way of reducing carbon emissions from heating.

There are currently over 14,000 heat networks in the UK, providing heating and hot water to approximately 480,000 consumers. Heat networks deliver heating, hot water, and/or cooling from a central source or sources to domestic dwellings, public sector buildings, shops, offices, sport facilities, hospitals and universities. They are uniquely able to unlock otherwise inaccessible larger scale renewable and recovered heat sources such as waste heat and heat from rivers and mines. In 2015 the Committee on Climate Change (CCC) estimated that around 18% of UK heat will need to come from heat networks by 2050 if the UK is to meet its carbon targets cost-effectively (up from approximately 3% currently).

There is significant potential for the number and scale of heat networks to increase dramatically. The CCC estimate in their Carbon Budget 6 publication[4] that up to £17.5 billion of capital investment could be needed in the next 10 years for heat networks to deliver their full contribution to net zero. There is a growing heat network market in the UK on which to build. Market growth is already supported by strong Government commitments of up to £320m through our Heat Networks Investment Project (HNIP) and the work of the Heat Networks Delivery Unit (HNDU) supporting local authorities and project developers in the early phases of project development.

In the March 2020 Budget, the Chancellor announced £270m in funding for the Green Heat Network Fund (GHNF), which aims to stimulate the growth of low-carbon heat networks by supporting low-carbon thermal generation.

Summary of Government response to the consultation

Since the closure of the GHNF consultation in January 2021, alterations have been made to the GHNF proposals to reflect feedback from stakeholders.

The following section outlines the main comments provided by stakeholders to each of the 65 questions within the consultation and aims to provide a high-level summary of the main modifications to the proposals following the consultation.

The overarching themes discussed in the GHNF consultation are discussed in brief below. Stakeholder comments, and a more detailed Government response to each section, can be viewed in the second half of this document.

Full draft guidance and a draft application model are being produced in parallel with this response to be published over the summer to be socialised and tested with industry well in advance of scheme launch.

[4] CCC, 2020. Sixth Carbon Budget.

Territorial extent: The Green Heat Network Scheme will apply in England only.

Following further discussion with the Devolved Administrations, Wales is building on existing programmes in Wales to integrate support for decarbonising heat and will not be included within the scope of the GHNF.

Scope

Overall, respondents supported the scope of the GHNF making specific recommendations for refinement to the scope outlined in the consultation.

Commercialisation: The majority of respondents supported the inclusion of commercialisation costs within the GHNF scope, with general themes ranging from suggestions focusing on increasing flexibility and time to complete works. We reviewed our proposed commercialisation approach and accepted that commercialisation requires support in the 2021/22 period and that it may be necessary to support wider commercialisation costs in some circumstances. While we acknowledge the argument regarding longer timescales and have adjusted our approach, we are relatively constrained in our flexibility to do so. *Please see our responses to questions 1-5.*

Accessing thermal energy and generation costs: The majority of respondents supported the inclusion of costs associated with accessing thermal energy. Respondents were broadly content with the breadth of generation costs discussed but further clarifications were suggested. In response, we have decided that the GHNF will use a principles based approach that allows the applicant to assess which costs are necessary for a project to access/generate thermal energy and distribute it to customers. The GHNF will specify in detail only which costs are ineligible. *Please see our responses to questions 6-7.*

Technology/sources of thermal energy and types of networks in scope: Robust discussion followed the consultation regarding our proposed approach to the technologies and sources of thermal energy with broad themes emerging around areas of contention including carbon intensity appraisal for EfW and hydrogen, biomass use, biogas and syngas exclusion, and the role of shared ground loops. Following detailed investigation regarding the points made, we have amended our approach to new EfW carbon intensity appraisal, biomass sustainability appraisal and the inclusion of biogas and syngas in certain specific circumstances, and have made adjustments regarding on and off gas networks and communal network aggregation that will impact shared ground loops. *Please see our responses to questions 8-14 and 25-28.*

Distribution costs: The majority of respondents supported the inclusion of primary, secondary and tertiary distribution costs with some concern expressed regarding the limited amount of funds available and therefore the cost and additionality of supporting secondary and tertiary distribution. We thank respondents for clarifications regarding the extent and importance of support for distribution costs. We can confirm that primary distribution costs and secondary distribution costs (subject to additional eligibility requirements) will be eligible for the GHNF. We concluded that there was insufficient supporting evidence to overcome the concerns regarding costs to include tertiary distribution costs as eligible costs at this time. *Please see our responses to questions 15-22.*

New and existing networks: Stakeholders demonstrated substantial differences in opinion regarding the benefits of directing support to new or existing networks, and the consequences of not doing so. The case was made by many respondents that without intervention, funding would likely go preferentially to existing networks, and the case was made both for and against this. Having reviewed the arguments made by respondents, and taking account of the alignment of segmented support against the strategic objectives that the funding is aimed at addressing, we have concluded that a mechanism to ensure that new networks can access funding, should a large number of existing network applications come forward, may be required. *Please see our responses to questions 23-24.*

Benefits

A wide range of potential benefits metrics were discussed by respondents and they raised general concerns regarding the burden that could fall on applicants. We would like to reassure respondents that the benefits are designed to measure the overall performance of the GHNF at a strategic level, not individual projects. Where responses were focused on project outcomes rather than GHNF strategic outcomes we have noted the more detailed aspects of those responses and have considered the wider comments as part of monitoring, evaluation or scheme design. A broad theme discussing different aspects of energy and resource efficiency emerged and we will continue to develop and prioritise the most important benefit indicators for monitoring this segment. A wide variety of responses were made regarding supply chain capacity and capability and we will consider these as we continue to develop suitable indicators. We note that all schemes will be required to adhere to ADE-CIBSE Code of Practice (CP1) best practice guidance, and that metering and billing requirements are covered under existing legislation, so we will not include these among the strategic benefits for GHNF. *Please see our responses to questions 29-30.*

Consumer protection

The majority of respondents supported the protection of domestic and microbusinesses through the Heat Trust or an equivalent scheme and this will be taken forward as a requirement. While the majority of respondents were also supportive in principle of segmenting different counterfactual costs for different customer types, substantial concerns were raised regarding the differential costs of gas and electricity on project economics, fuel poverty and the future homes standard. While we will be proceeding with the use of different counterfactual pricing for different consumers, adjustments have been made to address the concerns raised. *Please see our responses to questions 29-37.*

Scheme delivery mechanism

We received a wide range of responses regarding the application process and monitoring and reporting topics, including a large number of methodological suggestions. We note the concerns around transparency and proportionality and the burden of monitoring and reporting requirements. We have taken on board the suggested metrics and will be developing final application forms, guidance and monitoring and reporting requirements over the following months for socialisation with stakeholders well in advance of scheme launch. *Please see our responses to questions 38-41.*

Application assessment Gates

There was strong support for the use of pass/fail gates. Many respondents emphasised the need for guidance and concerns were raised about the chosen gated metrics and their assessment methodologies. Following a full review of those methodologies we will be proceeding with the initial gates, but will be making changes to the methodology and assessment that underpin them. *Please see our responses to questions 42-56.*

Assessing the Grant award

The majority of respondents agreed with the approach to grant calculation. However a consistent theme in responses which disagreed with the approach was the need for flexibility and a simplification of the approach itself, with the need for accompanying guidance. We took note of the case for simplification and have endeavoured to further simplify the approach. We will be issuing detailed supporting guidance. *Please see our responses to questions 57-61.*

Financing projects

All respondents were strongly in favour of projects which have not secured finance being allowed to apply for GHNF funding. In recognition of this, we have introduced applications for provisional awards of funding; such applications will only be permitted in the first two application rounds of each financial year (April or July) and funding must be secured no later than the end of February of that financial year. *Please see our response to question 62.*

Economic assessment

Views were mixed on whether the assumptions in the economic appraisal in the Impact Assessment were appropriate; since receiving feedback from stakeholders, we have refined our underlying assumptions. *Please see our response to question 64.*

Scheme evaluation

Respondents suggested a number of areas which should fall within scope of the scheme evaluation, including the experience of applicants in the application and assessment process and consumer outcomes, heat prices and overall consumer experience. We will consider these suggestions when determining the scope of the evaluation. Evaluation findings will be published on GOV.UK. *Please see our response to question 65.*

What will the GHNF fund?

Commercialisation:

Consultation Question 1: Should costs associated with commercialisation activities be included within the GHNF scope? If not, which costs should be excluded?

Summary: there were 34 responses to this question

All but one respondent (33) to this question agreed that commercialisation costs should be included within the GHNF scope. Respondents suggested that costs to safeguard existing HNs, land costs, and specific project design work to maximise end-user benefit should be included in the scope of GHNF. One respondent suggested that research and early-stage development costs should be excluded from the fund.

Comments included:

- commercialisation funding should be capped to mitigate the risk of speculative investment (or, a preventative mechanism should be introduced).
- commercialisation support is particularly important for innovative and retrofit schemes which require more up-front costs than more conventional schemes.
- Yes. This is critical to delivery since this is an area of market failure.

Consultation Question 1	Response	Percentage
Yes	34	67%
No	1	2%
Comment only	0	0%
Blank	16	31%

Table 1

Government response

The case for including commercialisation costs has been accepted. Therefore costs associated with commercialisation will be included in scope of the GHNF and detailed guidance on what can be included will be issued in due course, please see our response to consultation question 2 for further details. For the purpose of clarity, research and development costs will not be considered eligible commercialisation costs.

Consultation Question 2: Should commercialisation costs include wider costs such as counterparty costs to better enable connection, e.g. legal costs of an energy off-taker? Please provide your reasoning.

Summary: there were 29 responses to this question

The majority of respondents (27) agreed that it would be useful for commercialisation funding to include wider costs.

Several respondents (6) agreed that the inclusion of legal costs would incentivise various counterparts (waste heat providers, large heat users, off-takers) who would otherwise have to pay up-front to engage in HNs, in some cases these costs could, potentially, be prohibitive. There was some disagreement across responses to questions 1 and 2 however, with one respondent arguing that counterparty legal costs should be funded only if they generate value for money for HN consumers; this contrasted with other respondents (2) who specified that without financial support, local authorities would not be able to source appropriate specialist legal advice.

Suggested wider costs for inclusion:

- Abstraction licenses and permits and the cost of modelling and monitoring to obtain them.
- Costs of independent advisers to enable potential heat suppliers to negotiate with Local Authorities.
- Asset reconfiguration and value early write off costs to an off-taker.
- Grant funding for the entire value chain to drive demand rather than supply.
- Costs associated with better informing final user so that they have confidence to accept risks associated with HN and pricing.
- For retrofit schemes, costs associated with understanding the necessary modifications in buildings and potential for connection (building surveys, heritage studies, permits for listed buildings, counterfactual models). Legal costs could be brought down by introducing standard boiler template contract arrangements. Capping commercialisation costs and letting the applicants determine the best use of the funding.
- Closely defining the parameters for eligible costs.

Consultation Question 2	Response	Percentage
Yes	28	55%
No	2	4%
Blank	21	41%

Table 2

Government response

We have carefully considered the detail of the responses received and have concluded that wider costs such as those given as an example in Question 2 may be included within the scope of commercialisation costs applied for; we will be publishing detailed guidance, identifying unacceptable costs and setting out the framework for eligibility that the applicant will need to interpret and the GHNF assessment confirm. The guidance will outline the types of costs we consider ineligible for inclusion in applications to the GHNF. The guidance will also direct retrofit projects to the outcomes of the Heat Network Optimisation Opportunities

project (HNOO) and the Heat Network Efficiency Scheme (HNES) which may be able to support projects in identifying building opportunities.

Consultation Question 3: Should commercialisation stage awards be awarded:
as part of a single application for commercialisation and construction funding; or
in a single application for commercialisation funding only?

Summary:

The level of support for each option was almost the same. Option A (a single application for commercialisation and construction funding) was preferred by nine respondents and Option B (a separate application for each stage) was preferred by eight respondents. In addition, nine respondents argued for more flexibility suggesting that both options are kept and applicants be allowed to decide.

Overall, Option A was favoured as it provides a comprehensive approach that helps to give more certainty in relation to both commercialisation and construction funding.

The benefits of Option B were perceived to be the introduction of specific mechanisms which will ensure that projects selected generate large benefits, mitigating the risk of speculative projects.

Comments included:

- One respondent suggested funding commercialisation from HNIP and construction from GHNF to bridge the two projects.
- Single application with clauses that could pause projects which do not pass commercialisation.
- Follow up assessment to check that projects have sufficiently progressed.
- More flexibility between construction and commercialisation timelines to conciliate the different workstreams necessary to build a heat network.

Consultation Question 3	Response	Percentage
Yes	26 Option A: 9 Option B: 8 More flexibility: 9	51%
No	0	0%
Comment only	2	4%
Blank	23	45%

Table 3

Government response
Following review of the concerns and benefits of the different options discussed by respondents, administrative concerns and the risk of speculative projects we have concluded that Applicants to the GHNF will be able to apply for commercialisation and construction funding or alternatively *construction* funding only. We recognise concerns about the need to maintain the investment momentum in heat networks between HNIP closure and GHNF opening. To manage the transition between the funding schemes, we will be funding a Transition Scheme in 2021/22 with additional funding of £10m being made available. Applicants can opt to apply for *commercialisation funding only* from the Transition Scheme, in two rounds with final submission dates in August and October 2021 (subject to there being funds remaining). Further details of the Transition Scheme are being/have been announced separately.

Consultation Question 4: What period of time should be allowed for the commercialisation stage for a LZC heat network project? Please provide examples and/or your reasoning as appropriate.

Summary: there were 26 responses to this question

The majority of respondents (10) suggested that the time period for the commercialisation stage should range between six months and two years with one respondent suggesting a minimum of 2 years and an ideal period of 3 to 5 years.

The respondents gave the following reasons for their suggestions:

- Multiple dependencies.
- Requirements of the Environment Agency and planning authorities.
- Lengthy process to secure off-take from a developer.
- Project complexity and large numbers of participants.
- Any element of public sector procurement makes projects more lengthy.

Several respondents suggested the approach to setting the timeframe for commercialisation should be flexible citing the following reasons:

- Decided by the applicant within the scheme's overall timescales (suggested by 3 responses); Based on previous industry experience demonstrated by data in HNIP and HNDU funding;
- Time periods allocated depending on the size of the heat network project in terms of scale, complexity, innovation and location;
- Ambient loops and networks with heat pumps require flexibility due to their technical requirements (e.g., heat pumps have longer gestation period).

Consultation Question 4	Response	Percentage
Yes	25	49%
No	1	2%
Comment only	1	2%
Blank	24	47%

Table 4

Government response

In light of the substantial range of commercialisation timelines provided as responses but mindful that the GHNF will be a three-year scheme we intend to take three key measures:

1. We are intending to launch the GHNF Transition Scheme in the summer of 2021 for commercialisation funding only. The Transition Scheme is intended to ensure that there is a pipeline of GHNF projects capable of receiving construction funding early in the overall scheme, and maintain the momentum achieved through HNIP.
2. We will allow applicants to the full GHNF scheme to apply for funding across financial years. For example an applicant could apply for commercialisation and construction funding in 2022/23 with the construction funding to be drawn down in the next financial year.
3. To manage the risk of projects supported by GHNF failing to reach a Final Investment Decision, we are exploring a potential option that would allow the full GHNF scheme to over-allocate funds in the first two years. The final year budget would be used to manage the extent to which the over-allocation was or was not realised.

Consultation Question 5: What, if any, additional work would be required to support a project that was moving from HNIP to GHNF? What are the anticipated costs of doing so?

Summary: There were 18 responses to this question

Respondents made the following suggestions for additional work that would be required to support projects moving from HNIP to GHNF.

- Building and network design, ground surveys, land procurement, and detailed geological assessment where heat pumps are the prime mover.
- Distribution network operator (DNO) reinforcement could be an issue and needs to be considered as an allowable uplift under RIIO2.
- Additional work to respond to different scheme criteria, metrics and application process (re-working techno-economic and carbon savings assessments, re-submissions etc)

In terms of anticipated additional costs that could be incurred by a project moving from HNIP to GHNF, respondents made the following comments:

- Ongoing operational costs to help projects move from fossil powered systems to a ZLC heat source (increased by the low price of gas in the UK).
- Estimated an additional cost of £20k for a typical project based on the (limited) information provided.
- Councils who will be completing their DPD phase after HNIP closes and before GHNF is open need confidence about the requirements of the scheme so that they can make best use of the DPD phase, and not have to re-do work.
- If there are significant changes to the application process and requirements, finance should be made available for project management support, technical, financial, commercial, and legal consultancy support.
- A gap between HNDU, HNIP and GHNF could jeopardise HNIP projects.

Some respondents made suggestions about the type of support that could be provided to aid the transition from HNIP to GHNF, including:

- Clear and timely communication, clear guidance and policy documents on the transition and updated processes (incl. how contracts agreed under HNIP will be affected and how any costs associated with this would be recovered).
- constructive stakeholder engagement and promotion; (ii) GHNF DP must have a sufficient understanding of decisions behind the design of the scheme; (iii) HNIP projects should be given as much time as possible

Consultation Question 5	Response	Percentage
Yes	10	20%
No	6	12%
Comment only	3	6%
Blank	32	63%

Table 5

Government response

We have taken these responses into account when considering project timings (eg, the issuing of draft guidance well in advance of scheme launch) and implications for wider eligibility criteria (discussed later in this document). This has supported the case for the introduction of a GHNF transition scheme in the later half of 2021/22.

Accessing thermal energy:

Consultation Question 6: Should the cost of accessing heat sources be included within the GHNF scope?

Question 7: If so, do you agree or disagree with the scope of support for accessing heat sources proposed? If not, what would you propose and why?

Summary: All of the respondents to Question 6 (37) agreed that the cost of accessing heat sources should be in scope.

The majority of respondents to Question 7 (19) stated that the scope of support should be changed, although some respondents acknowledged it would be impractical to present an exhaustive scope.

Suggestions for changing the scope included:

- Drilling of wells to access thermal waters.
- The equipment/ infrastructure to enable the heat/energy recovery from a source (for example EfW).
- Clear definition/guidance is needed to explain when thermal energy is considered a direct source or a biproduct of another process. A principle based approach would be more suitable than producing a comprehensive list.
- Compensation for loss of electricity income associated with heat off-take.
- The scope is too technology focused (e.g., large-scale heat pumps); a 'system-level' approach would be more useful. The stakeholder gave an example of a low temperature network connected to local heat sources circulating heat to buildings using heat pumps. Using this example, heat losses and installation costs would be reduced, along with other benefits.

Consultation Question 6 and Question 7	Response	Percentage
Yes-cost of accessing heat sources should be included within the scope of the GHNF	37	36%
Blank	30	29%
No-scope of support should be changed	19	19%
Yes-agree with the proposed scope of support	16	16%

Table 6

Government response

We have carefully considered these responses and confirm that an application for project costs may include the cost of **accessing** thermal sources, provided these are additional costs that are **not** incurred due to legal requirements.

Costs associated with constructing heat/cooling processes whose primary function is not the generation of heat/cooling will be ineligible. Clarifications around what may not be included within these costs will be set out in the scheme guidance.

Recognising that it would be difficult to provide a wholly prescriptive list of costs in scope, instead we propose to introduce a principles based framework for assessing eligibility. If the applicant assesses that costs are necessary to enable the supply of heat/cooling to customers, then these could be eligible if the costs have not been otherwise excluded from the scheme. The GHNF scheme guidance will set out those costs and activities which will be ineligible. The GHNF will rely on the core assessment gates that have been amplified in light of the consultation – see Question 42 which will be validated by GHNF assessors through review of supporting evidence provided by applicants.

Generation:

Consultation Question 8: Do you agree with the proposed scope of generation costs? Should there be any other costs included or excluded?

Summary: there were 31 responses to this question.

The majority of respondents (22) agreed with the scope of the generation costs with some respondents (15) either suggesting additional areas that should be included or suggesting areas where the scope should be widened, examples are given below:

- Exploration surveys and well design costs for deep geothermal.
- Plant enclosure costs for CHP.
- Tertiary costs associated with network connections (which should be additional as compared to the counterfactual).
- Whole life cycle costs should be included, including maintenance, asset renewal.
- Licensing costs, extraction costs, MCPD permits and annual costs associated with flue sampling, top up water.
- Costs of both primary and backup plant, including REPEX, feed stocks.
- Components affecting reliability of supply for customers, ie. geothermal stores or back-up generators as contingency.
- Cost of energy centre buildings where applicable.
- More explicit reference to secondary/recoverable/waste heat.

Consultation Question 8	Response	Percentage
Yes	22	43%
No	6	12%
Comment only	7	14%

Consultation Question 8	Response	Percentage
Blank	16	31%

Table 8

Government response

We thank respondents for the clarifications and additions to expected generation costs shared with us**.**

The overriding principle is that eligible generation costs for GHNF are those costs which are directly attributable to enabling the heat/cooling network to be capable of operating in the manner intended by the concept design of the network submitted as part of the application.

Under the principles based approach to eligibility, the GHNF Guidance will set out the types of generation costs that should NOT be included in a GHNF application. The specific exclusions set out in the consultation have been reviewed and amended in response to the comments we have received and will be discussed in greater detail in our response to questions 9-14.

Consultation Question 9: Are there any other LZC sources of thermal energy that have not been covered in our framework approach to technology section (combustion, heat recovery, etc.)?

Summary: there were 30 responses to this question.

There was an exact split for this question with the number of respondents (10) who believed we have included all the suitable LZC sources of thermal energy in our framework matching the number who disagreed (10).

Although, there was a mixed response in respect of the comments received, with respondents suggesting technologies they believed should be included in the GHNF, including industrial waste heat recovery, energy from waste, biomass CHP, nuclear, hydrogen and solar thermal. Two respondents suggested that flexibility should be built into the application process to enable novel and innovative technologies to apply for the fund.

Consultation Question 9	Response	Percentage
Yes	10	20%
No	10	20%
Comment only	10	20%
Blank	21	40%

Table 9

Government response

Our responses to consultation questions 11-12, 14 and 17 cover our decisions on the eligibility of gas CHP, biogas and syngas and biomass.

Outside of these technologies, the principles based approach to eligibility outlined in the consultation is non-prescriptive. However, the GHNF is not intended to fund technology that has not already been demonstrated to operate in the conditions proposed by the project and at a capacity similar to that required by the project.

The GHNF guidance will set out the technologies that would not require evidence of technological maturity and how maturity may be demonstrated. These will align with the technologies that were set out in the consultation.

Consultation Question 10 Do you agree or disagree with the proposed methods for calculating emissions against the specific technologies listed (see also section Appraising CO2e)? If you disagree, please provide an alternative method for calculating emissions to support your response.

Summary: there were 31 responses to this question.

The majority of respondents (22) agreed with most of the methodologies suggested but disagreed with one or more of the methods for calculating emissions, particularly in the case of energy from waste. Many respondents (24) submitted detailed technical information on their recommended ways of calculating emissions, examples are given below:

- We request that the decarbonisation of the gas network is considered in CO2 calculations, to allow for the gradual introduction of biogas/hydrogen into the gas network.
- The CO2 appraisal proposed is lacking in rigour in several places in our opinion. Caution is advised as BEIS need to get this right and this is best determined by analytical experts rather than % agreement via consultation.
- We do not understand the reason to have one mechanism for new and another for existing EfW plant and they should both be assessed using the proposed mechanism for existing plants.
- The suggested methodology appears to be sound but where heat pumps have been selected to deliver simultaneous heating and cooling the CO2e benefit assessment needs to fully reflect this.

Consultation Question 10	Response	Percentage
Yes	6	12%
No	21	41%
Comment only	4	8%

Consultation Question 10	Response	Percentage
Blank	20	38%

Table 10

Government response

Having taken account of The Green Book guidance *(appraisal and evaluation in central government HM Treasury guidance on how to appraise and evaluate policies, projects and programmes)*- the BEIS guidance on valuing energy usage and greenhouse gas emissions[5] is the methodology applicants should use to appraise CO2 for oil, gas and electricity.

We note the error in the consultation document that respondents brought to our attention and can confirm that it is consumption-based, long run marginal emissions factors (rather than generation ones) that should be used.

For biofuels, BEIS[6] and Defra[7] guidance should be used. We will also communicate to stakeholders any updates to guidance as they are published.

However, we recognise for specific technologies, changes to methodology may be required. Following feedback received and internal review of new EfW we will be using the standard methodology to evaluate emissions as proposed for existing EfW[8].

We thank respondents for their feedback on the proposed methodologies for assessing Hydrogen fuels. We have fed back these insights to the BEIS Hydrogen teams that are preparing to consult on this and will be aligning with wider BEIS policy on hydrogen carbon intensity appraisal following that consultation. Therefore, we will be publishing updated guidance on appraising CO2 for specific hydrogen fuels and technologies once this information becomes available to us.

Consultation Question 11: Should biogas and/or syngas be out of scope of the GHNF as the primary heat source for a heat network? Please provide your reasoning.

Summary of responses: There were 29 responses to this question.

There was a wide variation of opinion on this question with an almost 50:50 split of respondents who agree that biogas and syngas should be out of scope for the GHNF (14) and those who disagreed (13). Some respondents believe that biogas and syngas should be included if they come from a sustainable source and other respondents believe those fuels will be adequately supported by the Green Gas Levy.

[5] BEIS, 2012 (updated 2020). Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal.
[6] BEIS, 2020. Greenhouse gas reporting: conversion factors 2020.
[7] Defra, 2013 (updated 2019). Environmental reporting guidelines: including Streamlined Energy and Carbon Reporting requirements
[8] BRE: Technical Note – Modelling Energy from Waste Facilities

Comments included:

- Biogas recovered from processes associated with agriculture or waste should be included.
- It (biogas and syngas) could be included if from a sustainable source.
- Biogas should be out of scope for the GHNF as it has its own separate funding from the proposed Green Gas Levy.

Consultation Question 11	Response	Percentage
Yes	14	27%
No	13	25%
Comment only	2	4%
Blank	22	44%

Table 11

Government response

Following a review of the evidence supplied to us and the strengths of arguments made as well as BEIS's stated policy positions regarding the use of these fuels we have substantially amended our approach.

There will no longer be a blanket exclusion (except for peaking plant) of the use of biogas or syngas as a fuel in the GHNF. Biogas or syngas may be considered as a fuel for GHNF supported projects in the following specific and limited circumstances:

- Where the heat network is off gas grid, biogas or syngas may be used for primary, secondary or peaking plant, provided the gas is manufactured on site.

- Where the heat network in on gas grid and the gas is manufactured on site, biogas and syngas may be used for secondary or peaking plant only, and will not be eligible for primary plant.

Consultation Question 12: Should biomass be in the scope of the GHNF, with the stipulations set out above? Please provide your reasoning.

Summary of responses: there were 29 responses to this question.

There was strong support for the inclusion of biomass in the GHNF (19), although some respondents reiterated the importance of the biomass being sustainable and local.

Some respondents (3) were opposed to the inclusion of biomass, citing the Committee on Climate Change report of June 2020 which advised that biomass should not be used as a fuel source for heat networks and 2 respondents commented on issues with air quality.

Comments included:

- Out of scope because all the processing and transporting related carbon mean the biomass is not carbon neutral.
- Whilst problematic, biomass still forms a key part of the renewable heat supply chain.
- Yes, locally sourced biomass can help bring woodland back into management, generating significant biodiversity benefits and this provides additional rural employment.

Consultation Question 12	Response	Percentage
Yes	19	37%
No	9	18%
Comment only	1	2%
Blank	22	43%

Table 12

Government response

Given the strength of the argument made to us regarding the utility of biomass in rural settings, biomass will continue to be in scope of the GHNF subject to the following conditions:

- The biomass is sourced from a sustainably managed source as evidenced through an approved list (i.e. Biomass Sustainability List (BSL), Sustainable Fuels Register (SFR), or equivalent).
- The use of biomass adheres to all existing regulations (including air quality standards).

Consultation Question 13: Should authorisation of a biomass fuel on the Biomass Sustainability List (BSL) or Sustainable Fuel Register (SFR) play a role in the GHNF assessment of a biomass fuel's sustainability?

Summary: there were 26 responses to this question.

The majority of respondents (18) agreed that biomass fuels should either be on the BSL or SFR to be able to play a role in the GHNF. All the respondents who disagreed (7) stated that biomass should not be included in the scope of the GHNF at all.

Consultation Question 13	Response	Percentage
Yes	18	36%
No	7	14%
Comment only	1	2%
Blank	24	48%

Table 13

Government response

Taking into account the feedback received from consultation respondents and the potential importance of biomass in rural settings, we have decided that sustainability will be demonstrated if an applicant commits to not using construction grade timber and commits to sourcing biomass fuels authorised on either the BSL or SFR (or equivalent).

Consultation Question 14: Should the maturity of technology types be a consideration for the GHNF in terms of eligibility? For example, permitting only technologies where at least one other operating example exists at a similar scale.

Summary: there were 31 responses to this question.

Respondents were conflicted on the point of the maturity of technology types and if they should be eligible for GHNF support. There were two directions of comment, one suggesting that more mature technologies would be a more effective use of funds and that R&D should be supported by other funds and the second argument suggested that innovation could be stifled by not offering funding and it could prove to be a market barrier.

Comments included:

- It doesn't encourage innovation.
- Agreed - GHNF should not be for R&D purposes, it needs to be delivering tried and tested technologies.
- No. If funding can be found to finance a scheme using innovative technology it should be supported.
- Yes, proof of concept makes projects easier to progress and reduces risk.
- No. Focus on carbon. Immature tech should be supported with innovation funding.

Consultation Question 14	Response	Percentage
Yes	12	24%
No	16	33%
Comment only	3	6%

Consultation Question 14	Response	Percentage
Blank	18	37%

Table 14

Government response

We have carefully considered the arguments made to us and how the maturity of technologies aligns with the strategic objectives of the GHNF. As the purpose of the fund is to deploy cost effective low carbon Heat Networks, we have concluded that supporting immature technologies does not sufficiently align with the purpose for which funding is to be granted under the GHNF. Therefore, the decision has been taken that the GHNF will not be able to fund technologies that have not been demonstrated to operate in the conditions proposed by the project and at a capacity similar to that required by the project. A project using technologies that are not listed as mature as set out in the consultation will need to evidence an appropriate technology readiness level as outlined in our guidance.

Primary distribution:

Consultation Question 15: Do you anticipate projects that come forward will seek to separate generation from distribution as distinct legal entities? If so, to what extent do you expect this to happen?

Summary: there were 22 responses to this question.

The majority of respondents (20) anticipated that projects seeking to separate generation from distribution as distinct legal entities would be a common model. Some respondents suggested that technologies including waste heat sources, deep geothermal and lower temperature models were more likely than others to separate generation from distribution.

Comments included:

- With regard to deep geothermal we expect the geothermal plant to always be operated and owned by a separate legal entity.
- Not generally for smaller schemes but this is common for EfW projects.
- We anticipate that projects where generation and distribution are provided by different legal entities will be a common model.

Consultation Question 15	Response	Percentage
Yes	20	41%
No	2	2%
Comment only	2	2%
Blank	27	55%

Table 15

Government response
We thank respondents for sharing their insights on likely project structuring with us. This has helped inform our understanding of who may seek to make applications to the GHNF.

Consultation Question 16: Do you agree or disagree with the scope of costs that are attributable to primary distribution? Should further costs be included or excluded?

Summary: there were 25 responses to this question.

The general view of respondents is that the list of attributable costs for primary distribution is fairly comprehensive. Some of the additional costs mentioned include, BMS, route proving and planning, easement, pipe bridges and project management and contingency costs.

Consultation Question 16	Response	Percentage
Yes	20	41%
No	3	6%
Comment only	2	4%
Blank	24	49%

Table 16

Government response
We thank respondents for sharing their insights into costs for primary distribution plant. The consultation list provided was indicative and was not intended to be exhaustive. We will update our internal guidance and modelling to take into consideration as appropriate the additional costs flagged to us.

Consultation Question 17: Do you agree or disagree that projects that are CHP based, but which come forward with sufficiently low-carbon intensity, should be supported by GHNF in their investment in grid connection costs, but not private wire and associated costs?

Summary: there were 34 responses to this question.

There was a mixed response to this question, with 18 respondents agreeing that CHP based heat networks with sufficiently low-carbon intensity should be supported by GHNF investment, and conversely 14 respondents did not think CHP should be supported, with several respondents (4) stating that CHP should not be supported by the GHNF as it is not a LZC technology.

Comments included:

- Yes, these projects will stimulate infrastructure investment for future low carbon generation options.
- Yes, only if the application clearly demonstrates a sufficiently low carbon intensity.

Consultation Question 17	Response	Percentage
Yes	18	37%
No	14	29%
Comment only	2	4%
Blank	15	30%

Table 17

Government response

Given the strength and nature of the argument made to us regarding private wire costs we have amended our approach such that where the inclusion of private wire improves the IRR of the project, costs and income from the inclusion of private wire may be included. Detailed guidance on this will be provided in the GHNF Guidance.

Secondary distribution:

Consultation Question 18: In your view should secondary distribution costs be included within the scope of the GHNF? What works would be involved and would they have an impact on the network's ability to operate as intended? Please provide any details to support this.

Summary:

Only two respondents disagreed with the inclusion of secondary distribution costs. In both cases this was due to concerns around the amount of money available to the Fund.

The general consensus view of respondents was that secondary distribution costs should be included, while a significant minority of respondents suggested that there should be an additionality test (ie if planning requires a new build development be heat network ready, the costs should not be included).

Consultation Question 18	Response	Percentage
Yes	19	37%
No	2	12%

Consultation Question 18	Response	Percentage
Comment only	6	4%
Blank	24	53%

Table 18

Government response

After carefully considering the arguments made to us regarding the importance of inclusion of secondary distribution costs, the interim outcomes of the Heat Network Optimisation Opportunities (HNOO) project, the cost benefit case of supporting these costs and the likely additionality of these costs, we have concluded that subject to certain conditions the GHNF will permit secondary distribution costs to be included as eligible project costs.

Detailed guidance will be provided highlighting where secondary distribution costs may be included, but in principle these costs will need to pass an additionality test (ie secondary distribution costs will not be funded in new build developments).

Consultation Question 19: Do you agree or disagree with the scope of costs that are attributable to secondary distribution? Should other costs be added or subtracted? What would the costs of those works be and who would ordinarily bear those costs?

Summary:

General agreement by respondents that the example scope of costs described in the consultation described potential secondary distribution costs. The list was not definitive and respondents reiterated that it should not be and that the scope of costs for 5th generation networks would look quite different and assessors need to be aware of this distinction.

Consultation Question 19	Response	Percentage
Yes	24	47%
No	0	0%
Comment only	0	0%
Blank	27	53%

Table 19

Government response

We thank respondents for sharing their insights into the scope of costs for secondary distribution plant. We concur that the list provided was and should be indicative and not exhaustive. We will update our internal guidance and modelling to take into consideration as appropriate the additional costs flagged to us.

Tertiary distribution:

Consultation Question 20: In your view should tertiary distribution costs be included within the scope of the GHNF? If so, should there be a distinction made between new and existing behind the meter systems when considering eligible tertiary distribution network costs?

Summary:

Strong views were held by respondents that upgrading tertiary distribution may be required for optimal systems and the cost of doing so could be a barrier with 16 respondents supporting the inclusion of tertiary costs.

Respondents had consistent concerns around additionality of such works for new builds, that they should not require this and should not be eligible, existing buildings where there is other funding available should not be eligible, and existing buildings where the counterfactual would be to replace tertiary systems should not be eligible (ie where the counterfactual is to replace electric storage with wet systems). There were also concerns about costs of including this and the reduction of funding available to projects as a consequence.

Consultation Question 20	Response	Percentage
Yes	16	31%
No	3	18%
Comment only	9	6%
Blank	23	55%

Table 20

Government response

We have carefully considered the arguments made to us regarding the importance of inclusion of tertiary distribution costs, the interim outcomes of the Heat Network Optimisation Opportunities (HNOO) project, the cost benefit case of supporting these costs, the scope of the GHNF and the likely lack of additionality of these costs in new buildings. We have concluded that in light of the risks around additionality, the need for a demonstrable value for money case, alongside the evidence base we currently hold, we are unable to support the inclusion of tertiary costs.

We will continue to keep this position under consideration, and should we receive further evidence supporting the inclusion of tertiary distribution costs in the GHNF we may seek to review this decision.

Consultation Question 21: Do you agree or disagree with the scope of costs that are attributable to tertiary distribution? Should further costs be included/excluded? What would the costs of those works be and who would ordinarily bear those costs?

Summary:

There was broad agreement by respondents that the exemplar scope of costs described was appropriate but not definitive. Respondents emphasised that the scope should not be prescriptive. Some respondents made comments regarding installation of user controls and wider fabric improvements such as insulation.

Consultation Question 21	Response	Percentage
Yes	18	35%
No	4	8%
Comment only	3	6%
Blank	26	49%

Table 21

Government response

We thank respondents for sharing their insights into the scope of costs for tertiary distribution plant. At this time these costs will not be supported by the GHNF, we will update our guidance to make it clear that these costs are out of scope.

As per the consultation, for the purposes of GHNF, customer HIUs are **not** classed as tertiary distribution costs.

Consultation Question 22: Are there customer level interventions that could be encouraged and supported but which have not been included?

Summary:

Respondents broadly agreed that customer level interventions should be supported.

Some examples suggested include:

- Customer information campaign costs
- smart customer controls
- customer temperature and system optimisation costs

Consultation Question 22	Response	Percentage
Yes	1	2%
No	0	0%
Comment only	14	27%
Blank	36	29%

Table 22

Government response

We thank respondents for sharing their insights regarding potential customer level intervention and concur that interventions of this nature align with CP1 recommendations and can be included in the scope of eligible costs applied for through the GHNF. The applicant guidance for ADE-CIBSE Code of Practice (CP1) compliance will clarify this further.

Approach to new and existing networks

Consultation Question 23: Please provide your thoughts on the proposed approaches. What issues and challenges do you see with each and what approach do you prefer? Please provide details.

Summary:

Respondents had a wide range of views broadly identifying three categories of heat network - existing networks that are not expanding or unable to expand, existing networks that are expanding, and new networks. Respondents had varying views on how and whether support should go to all three categories. Several respondents suggested having a different expansion gate for existing networks i.e. more than 2GWh.

Another theme that emerged was that 2GWh would be too high in some scenarios and it might exclude some projects that closely align with the strategic objectives of the GHNF. There was specific comment around rural and community based projects, and an indication that for newbuild developments the 2GWh minimum threshold would be substantially more than 150 dwellings. It was also highlighted that some HNs would not be able to meet the expansion requirement due to lack of opportunity.

There were suggestions that percentage growth of heat delivered for existing networks might be more appropriate than a flat figure to compensate for the different sizes of network involved.

It was also highlighted to us that there has been relatively little decarbonisation of existing networks to date so this can still be considered nascent and therefore requires focused support.

Consultation Question 23	Response	Percentage
Yes	3	6%
No	9	18%
Comment only	16	31%
Blank	24	45%

Table 23

Government response

The GHNF will support new and existing heat networks that deliver low carbon heat at a volume of heat that is consistent with our strategic objectives for heat networks in England.

To inform our decision, we reviewed evidence provided to us through the consultation response, carried out additional analysis of the HNDU and Heat Network (Metering and Billing) Regulations 2014 (as amended), notification data sets and finally, and assessed the administrative resource required to ringfence funding for both types of heat networks.

The GHNF intends for a maximum of 40% of its annual budget to be allocated to existing network decarbonisation with 60% supporting the development of new low carbon networks. Following the first operational year of the scheme we will use the data to inform whether there is or is not a need to more formally segment the funding for new and existing networks.

Consultation Question 24: Are there other approaches that have not been considered that could reduce the risk of existing networks taking too great a share of the GHNF budget? Please explain your answer.

Summary:

A significant theme emerged through these responses that the funding available through the GHNF is relatively limited and there is a concern by respondents that more money is needed to address the need for both new and existing network decarbonisation.

Suggestions such as the below were made to help manage expected high demand:

- Exclude simple technologies such as ASHP and focus on complex projects
- Consider how connecting together existing networks should work

Consultation Question 24	Response	Percentage
Yes	0	0%
No	0	0%
Comment only	20	39%
Blank	33	61%

Table 24

Government response

We recognise stakeholders' concerns on the size of the GHNF budget. However, we believe excluding technologies on the basis of simplicity would be problematic in terms of defining 'simple projects' and that such a change to the eligibility requirements for the GHNF may inadvertently exclude projects which meet the strategic objectives of the GHNF.

Our approach as set out in our response to question 23 aims to be equitable, fair and transparent and allows for ongoing flexibility in how we treat new and existing networks.

The types of heat networks in scope

Consultation Question 25: Do you agree or disagree that the differences between SGL and Ambient Heat Networks is one of scale? If not, how should they be distinguished?

Summary: there were 18 responses to this question.

There was an exact 50:50 split on this question with 5 respondents agreeing that the differences between SGL and Ambient heat networks for the purpose of the GHNF eligibility assessment is one of scale and 5 disagreeing. The remainder of the respondents commented on the distinguishing features of SGL and Ambient heat networks, their comments included:

- I feel this is a complex and sophisticated area that needs addressing.
- Our view is that this will simply be a consequence of the 2GWh threshold.
- A Shared Ground Loop is a kind of Ambient Heat Network, do they need to be distinguished?

Consultation Question 25	Response	Percentage
Yes	5	10%
No	5	10%

Consultation Question 25	Response	Percentage
Comment only	8	16%
Blank	33	65%

Table 25

Government response

Please see our answer to consultation question 28 which summarises our decisions on the eligibility of ambient, SGL and communal heat networks.

Consultation Question 26: Do you agree or disagree that Ambient Heat Networks should be within scope of the GHNF and SGLs should be out of scope? Can you provide any evidence demonstrating the value of including/excluding SGL or Ambient Heat Networks from the GHNF?

Summary: there were 25 responses to this question.

The majority of respondents (12) disagreed with the suggestion that Ambient Heat Networks should be within scope of the GHNF and SGLs should be out of scope. Several of those who disagreed (6) believed that both should be in scope and conversely one respondent thought both should be excluded.

Consultation Question 26	Response	Percentage
Yes	8	16%
No	12	24%
Comment only	5	10%
Blank	26	51%

Table 26

Government response

Please see our answer to consultation question 28 which summarises our decisions on the eligibility of ambient, SGL and communal heat networks.

Consultation Question 27: Should Communal Heat Networks be within scope of the GHNF? Can you provide any evidence demonstrating the value of including/ excluding Communal Heat Networks from the GHNF?

Summary: there were 27 responses to this question.

The majority of respondents (21) believed that communal heat networks should be included in the GHNF. Several respondents (5) believed communal heat networks would be constrained by the thermal energy criteria of the 2GWh limit, while one respondent suggested there should be incentives for communal heat networks to combine.

Comments included:

- The cost of applying for grant funding in relation to the size of opportunity is likely to preclude smaller schemes.
- They (communal heat networks) can provide a valuable load to a balanced network.
- Communal heat networks are often the oldest and most in need of investment. They therefore stand to benefit most from financial support.

Consultation Question 27	Response	Percentage
Yes	21	41%
No	1	2%
Comment only	5	10%
Blank	24	47%

Table 27

Government response

Please see our answer to consultation question 28 which summarises our decisions on the eligibility of ambient, SGL and communal heat networks.

Consultation Question 28: Do you agree or disagree with our minimum thermal energy criteria of 2GWh/year? Is the GWh approach the right approach to set the floor on smaller projects? If you disagree, what alternative approach would you suggest?

Summary: there were 34 responses to this question.

The majority of respondents (22) did not agree with the minimum 2GWh thermal energy criteria, several respondents (7) thought it should be lowered to allow smaller schemes to apply and that it would exclude many community and rural schemes.

Conversely, 2 organisations thought the threshold should be higher to promote strategic decarbonisation at scale and 2 other respondents thought the number of homes would be a better metric.

Consultation Question 28	Response	Percentage
Yes	5	10%
No	22	44%

Consultation Question 28	Response	Percentage
Comment only	7	14%
Blank	16	32%

Table 28

Government response

Following detailed analysis of the evidence provided to us and assessment of average decentralised energy networks reported to the Heat Network (Metering and Billing) notification database the 2GWh/year minimum size threshold will be retained with some adjustment. Ambient loops will be further distinguished from SGLs in that they will be defined as being centrally managed where a SGL is not.

Sufficiently low carbon communal heat network projects can apply to the GHNF, provided they can aggregate their networks in a given geographic area to meet or exceed the 2GWh/year threshold. Communal heat network applicants would submit a single application to this effect and SGLs would be a permitted technology for each building if assessed to be the preferred LZC technology. The communal systems would need to be identified or located within an area highlighted as having heat network potential within a relevant local energy plan. Communal systems supported would need to be made heat network ready (HN ready) as a provision of GHNF support.

For rural heat network applications, we acknowledge that a consumption based threshold may not be appropriate. In light of evidence provided by respondents, we will permit rural network applications to have a minimum of 100 dwellings connected to the network – be that an ambient network or SGL or conventional low carbon heat network.

With the exception of aggregated communal networks and rural heat network applications as outlined above, SGLs will be required to meet the 2GWh/year minimum threshold of the GHNF.

Benefits

Consultation Question 29: Are the outlined benefits the most important and most appropriate to measure? If applicable, please indicate your views on benefits that should be monitored instead/as well.

Summary:

As many respondents submitted combined responses to Questions 29 and 30, the summary and government response also addresses both questions here.

There were 31 responses to Question 29, of which 21 suggested additional or alternative benefits. Six respondents stated that they disagreed with the outlined benefits.

There were 20 responses to Question 30, of which 16 suggested additional or alternative benefit indicators.

Suggestions for additional benefits and indicators mainly focussed on the following themes:

- Energy and resource efficiency, grid impacts and demand side response.
- Growth in the heat network sector, and supply chain capacity and capability, with a wide variety of suggestions of how this could be measured.
- Consumer benefits, including reduction of fuel poverty and improved consumer wellbeing.
- Standards and metering, including ensuring that schemes use the CP1 best practice guidance.

In addition, some responses mentioned that reporting for the purposes of benefits monitoring should not be too burdensome for projects.

Consultation Question 29	Response	Percentage
Yes	15	29%
No	6	12%
Comment only	10	20%
Blank	20	39%

Table 29

Government response

The benefits are designed to measure the overall performance of the GHNF at a strategic level, not individual projects.

When prioritising benefits, consideration has been given to ensuring that indicators are sufficiently strategic, measurable and attributable. Consideration has also been given to the reporting requirements this will place on projects. We have noted the more detailed aspects of responses and many of these have been considered elsewhere as part of monitoring, evaluation or scheme design.

We note the number and variety of comments on different aspects of energy and resource efficiency. This will form a key aspect of the assessment of applications. We continue to develop and prioritise the most important benefit indicators for monitoring energy efficiency.

In particular, we agree that the measurement of benefits pertaining to demand side response and grid impacts should be more sophisticated and we are considering responses as we further develop suitable indicators.

We note the suggestions on supply chain capacity and capability and are considering these as we continue to develop suitable indicators.

Consumer experience is a vital aspect of the scheme and projects will be carefully monitored to ensure there is no consumer detriment. Projects will be required to demonstrate positive outcomes for consumers before being allocated funding.

All schemes will be required to adhere to CP1 best practice guidance and comply with metering and billing requirements which are covered under existing legislation. It is not necessary to include these among the strategic benefits for GHNF.

Consultation Question 30: Are the general indicators the most appropriate for each benefit? If not, please suggest measures you believe to be more suitable. Suggestions on supply chain capacity and capability indicators are welcomed.

Summary:

Please see summary of Question 29.

Consultation Question 30	Response	Percentage
Yes	11	22%
No	2	4%
Comment only	9	18%
Blank	29	57%

Table 30

Government response

Please see response to Question 29.

Consumer protection and pricing

Consultation Question 31: Do you agree or disagree with our proposal that heat networks supported by the GHNF should be a member of the Heat Trust or commit to offering equivalent standards to domestic and micro-business consumers by the time any GHNF funding is drawn down? If you disagree, what consumer protection standard would be more appropriate?

Summary: there were 31 responses to this question.

All respondents (31) stated that heat networks should be a member of Heat Trust, there was very strong support for Heat Trust, of these respondents 7 supported joining either the Heat Trust or an equivalent scheme. Two respondents said there is only room for one

scheme and two respondents thought that registration should be delayed until after “heat on”, due to the volume of work in setting up a project.

Comments included:

- Schemes should joint Heat Trust or not be eligible for GHNF.
- Membership of Heat Trust should be mandatory.
- This will set a common baseline and we are supportive of this.
- Market success depends on customer having confidence in the system and assurance of service standards and protections.

Consultation Question 31	Response	Percentage
Yes	31	100%
No	0	0%
Comment only	0	0%
Blank	0	0%

Table 31

Government response

We will be proceeding with the above proposal; with respect to an applicant committing to equivalent standards, the applicant will need to evidence this through an independent audit report. We will be providing further details on this requirement in the published guidance.

Consultation Question 32: Is the counterfactual heat price structure clear? Do you agree or disagree with the general principle of using different counterfactual pricing for different consumers and different types of building?

Summary: there were 28 responses to this question.

The majority of respondents (18) agreed with the general principle of using different counterfactual pricing for different consumers and different types of building, others (6) commented on the disparity between gas and electricity pricing, with gas being cheaper because it has less tax than electricity. One respondent highlighted the importance of building fabric and ensuring residents do not fall into fuel poverty.

Consultation Question 32	Response	Percentage
Yes	18	35%
No	4	8%

Consultation Question 32	Response	Percentage
Comment only	6	12%
Blank	23	45%

Table 32

Government response

We will be proceeding with the proposals to use different counterfactual pricing for different consumers, with the following adjustments identified to address the concerns regarding gas and electricity cost differences and fuel poverty concerns:

In the case of domestic or microbusiness (as defined by Ofgem[9] and used by the Heat Trust), where there is an assessment for consumer detriment, there will be a distinction between the cost of heat to the landlord and tenant/leaseholder. The GHNF will assess customer detriment against the tenant's share of the proposed heat network tariff. For existing buildings, customer detriment will be against a gas or oil counterfactual depending on whether the customer is in an urban or rural setting. For new build, customer detriment will be against a notional air source heat pump counterfactual.

For commercial, Local Authority and all other customer types, the tariff will be assessed by GHNF on the basis of whether customers are or are not likely to connect on the basis of the tariff proposed, it will not be assessed on the basis of whether the customer is or is not paying more than they would for an alternative heat supply. The rationale for this is that such customers are assessed by GHNF to be sufficiently resourced to evaluate and negotiate an appropriate price for the supply of heat.

Consultation Question 33: Would it be appropriate to use a self-declared counterfactual where an applicant is not connected to the gas network? If not, what counterfactual would be appropriate?

Summary: there were 27 responses to this question.

The vast majority of respondents (19) agreed that a self-declared counterfactual could be used for properties not connected to the gas network. Some respondents (4) suggested the counterfactual could be supported by evidence or data, and one respondent suggested that alternative counterfactuals could become standardised over time, thus saving time in the application process.

Consultation Question 33	Response	Percentage
Yes	19	39%

[9] https://www.ofgem.gov.uk/key-term-explained/micro-business-consumer

Consultation Question 33	Response	Percentage
No	3	6%
Comment only	3	6%
Blank	25	49%

Table 33

Government response

Please see our response to question 32.

Consultation Question 34: Do you agree or disagree that public bodies, commercial and industrial sectors are sufficiently resourced to negotiate their own mutually agreeable off-take terms i.e. if it is not good value, they will not connect?

Summary: there were 29 responses to this question.

The majority of respondents (22) agreed that public bodies, commercial and industrial sectors are sufficiently resourced to negotiate their own mutually agreeable off-take terms and are likely not to connect if it is not good value. Some respondents thought the public sector was well resourced and conversely, others believed commercial and industrial sectors were better able to negotiate.

Comments included:

- In general, public bodies do not have the resources and skills to carry out the necessary negotiations around connection.
- Yes and no. Some public bodies, commercial and industrial sectors are very well resourced and very knowledgeable when negotiating off-take terms. This is especially true of the public sector. However, those operating in the commercial and industrial sectors may not have sufficient resource, knowledge or experience.

Consultation Question 34	Response	Percentage
Yes	22	43%
No	0	0%
Comment only	7	14%
Blank	22	43%

Table 34

Government response

The broad theme of responses supported our view that public bodies, commercial and industrial sectors are sufficiently resourced to negotiate their own mutually agreeable off-take terms. Therefore, we will continue with the approach that only domestic and micro business customers require the additional protections of a consumer detriment test.

Consultation Question 35: Do you agree or disagree with our current view that a distinction should be made between new build residential and retrofit, with a gas counterfactual for retrofit and the Future Home Standard for new build?

Summary: there were 30 responses to this question.

There was a mixed response to this question with many respondents supportive (16) and others against (6), with a further 6 respondents either seeking clarification or suggesting alternative counterfactuals.

Comments included:

- Gas counterfactual is not relevant in off grid areas.
- We agree. However, this is subject to confirmation of what the Future Homes Standard counterfactual will be.
- For any retrofit project at scale the counterfactual should be individual ASHP.

Consultation Question 35	Response	Percentage
Yes	16	31%
No	8	16%
Comment only	6	12%
Blank	21	41%

Table 35

Government response

Please see response to question 32.

Consultation Question 36: Do you agree or disagree with our proposed view that micro-business should be treated in the same way as domestic consumers, making a distinction between new build and retrofit?

Summary: there were 30 responses to this question.

The vast majority of respondents (25) agreed that micro-businesses should be treated in the same way as domestic consumers, with three respondents stating that we should define what we mean by “micro-business”.

Consultation Question 36	Response	Percentage
Yes	25	49%
No	2	4%
Comment only	3	6%
Blank	21	41%

Table 36

Government response

We take note of the strong positive response with regards to including micro businesses within the protections of the consumer detriment test and will continue to do so. This aligns with Heat Trust requirements and the definitions we use will also align with the terms defined by Ofgem[10]. and used by the Heat Trust[11].

Consultation Question 37: Are there any types of consumer or necessary considerations that have not been adequately reflected in Figure 4, when considering a counterfactual cost of heat for the assessment of consumer detriment?

Summary: there were 23 responses to this question.

The majority of respondents (13) thought that we have adequately reflected the necessary considerations for the counterfactual cost of heat and assessment of consumer detriment. The artificial legislative framework (low cost of gas compared to the high cost of electricity) was raised and one respondent broached the issue of leaseholders not signing up to the heat network and installing a gas boiler.

Consultation Question 37	Response	Percentage
Yes	13	27%
No	0	0%
Comment only	10	20%
Blank	26	53%

Table 37

[10] https://www.ofgem.gov.uk/key-term-explained/micro-business-consumer
[11] https://heattrust.org [12] BRE: Technical Note – Modelling Energy from Waste Facilities

Government response

Please see our response to question 32. We note concerns around the low cost of gas, however this is outside the remit of the GHNF to address. Additionally, we believe that by making a landlord/tenant distinction for customer detriment that the operational cost of heat from a LZC heat network (approximately the tenant's share) is generally price competitive to the whole life cost of gas.

Scheme delivery mechanism

Consultation Question 38: What information do you think that the GHNF monitoring and reporting system should capture?

Summary: There were 21 responses to this question.

Eight respondents were concerned about the administrative burden of monitoring and reporting requirements and suggested that these be kept to a minimum to avoid discouraging potential applicants and raising end-consumer prices. In addition, there were some suggestions that GHNF should co-ordinate with other organisations such as CIBSE and Heat Trust to avoid duplication of reporting requirements.

Several different monitoring and reporting areas were suggested by respondents, including:

- Consumer outcomes, including sales price and consumer complaints.
- Ongoing compliance with scheme rules, and performance against application commitments.
- Performance and efficiency of heat networks, amount of heat generated, and carbon savings compared to the counterfactual.
- Financial performance of heat networks, income generation and commercial or contractual issues.
-

Consultation Question 38	Response	Percentage
Yes	NA	NA
No	NA	NA
Comment only	21	41%
Blank	30	59%

Table 38

Government response

We have taken on board the suggested metrics and will be developing final monitoring and reporting requirements over the following months. These will be reflected in guidance before implementation of the scheme.

We note the concerns around proportionality and burden of monitoring and reporting requirements. While monitoring and reporting is a vital mechanism to ensure GHNF and individual projects deliver on their proposed benefits, ensure value for the taxpayer and inform future policy, we recognise that data requested should link to objectives and have a clear rationale for collection.

Consultation Question 39: Are there aspects of HNIP delivery that you would like to see changed for the GHNF and if so, which ones?

Summary: there were 24 responses to this question.

The main point made by respondents was that applying for HNIP is seen as complex and burdensome and this can deter applicants from applying. Also, that the GHNF should aim to be simpler and more user-friendly, the amount of time and resource needed to complete applications and the complexity of the financial model was viewed as a barrier.

One applicant felt that the use of the Green Book five case model put private sector applicants at a disadvantage and suggested that summary guidance on using this model should be provided.

Other comments suggested that GHNF should offer more flexibility around deployment of funding and compliance with conditions in the funding agreements than HNIP does. There were also comments that there should be transparency around scoring and the financial model.

Consultation Question 39	Response	Percentage
Yes	0	0%
No	0	0%
Comment only	23	45%
Blank	28	55%

Table 39

Government response

The case made by respondents regarding the need for simplification, transparency and reduction of administrative burden for applicants has been taken on board and we have streamlined the application process within the limits permitted by Government rules and guidelines.

A key change from HNIP is that the application form itself will undertake all of the calculations necessary to appraise the gated metrics (see Q42). In this way

applicants will have full sight of how well they score on the scheme's primary metric: average annual kWh of low carbon heat delivered per £ of grant awarded. On the basis that an application is assessed to be deliverable, score adjustments by assessors are limited to a maximum of a 30% downward change.

We believe that this core change in approach, combined with the simplification of the application form itself, will give greater confidence to prospective applicants of the extent to which their scheme does or does not align to GHNF objectives and the likelihood of success of their application.

Full draft guidance and a draft application model are being produced in parallel with this response to be published over the summer to be socialised and tested with industry well in advance of scheme launch.

Consultation Question 40: Should applicants be held to their supply chain commitments as part of a monitoring cycle? At what project stage would you see supply chain commitments adding the most value?

Summary: There were 19 written responses to this question, all of which were positive. A number of respondents (9) also stressed the importance of ensuring that the supply chain commitments are proportionate and flexible around the needs of projects and their existing procurement strategies. Some responses also highlighted important stages of project development where monitoring of supply chain commitments could add benefit, though there was no consensus.

Consultation Question 40	Response	Percentage
Yes	19	37%
No	0	0%
Comment only	6	12%
Blank	26	51%

Table 40

Government response

Applicants will be required to sign a supply chain commitment statement as part of their application. This will seek to better ensure that private and public sector heat network developers stretch the existing supply chain as well as encourage new entrants to help increase supply chain capacity.

We plan to collect data on supply chain commitments through the GHNF monitoring cycle, to help assess the benefits to the supply chain realised by these commitments. This data, and final reports, will be collected and published in

aggregate. Our plan for monitoring projects has not yet been decided and is being informed by responses to this consultation (see question 41).

During scheme development we will also ensure that these commitments remain proportionate and do not negatively impact projects.

Consultation Question 41: What steps could be taken to monitor the performance of the networks? Should there be consequences for poor performance? If so what?

Summary: There were 25 responses to this question.

The consensus from respondents on what steps could be taken to monitor the performance of heat networks is that quarterly monitoring and reporting would be appropriate but that it should not be a burden on the operators.

The majority of respondents agreed that there should be some consequence for poor performance, suggestions included clawback or retention of GHNF funds. However, it was also mentioned that any financial penalty could just be passed on to consumers. Respondents thought that any proposed financial consequences for poor performance should be thought through carefully and there should be clear definitions of what is meant by poor performance.

Remediation plans were suggested as an initial step when poor performance was identified. Staging the payments of GHNF funds was proposed, so that later payments could be withheld if performance does not improve. One respondent suggested that a lever might be the publication of performance data for networks supported by GHNF in order to shame under-performers.

Consultation Question 41	Response	Percentage
Yes	16	31%
No	1	2%
Comment only	8	16%
Blank	26	51%

Table 41

Government response

We agree that monitoring and reporting while important should not be burdensome, and will discuss further with stakeholders the frequency and nature of reporting obligations. At present, we believe reporting on a regular basis ensures the timely receipt of information from applicants while reducing the burden on them.

Projects will be required to be CP1 compliant and we will explore Quality Assurance requirements that may be required to accompany the key stages of project development.

Application assessment

Gated metrics:

Consultation Question 42: To what extent will an applicant be able to self-assess against the initial gates outlined above? Do you agree or disagree that having initial gates that are pass/fail are a helpful mechanism?

Summary: There was universal support for the utility of pass/fail gates. Many respondents emphasised the need for guidance with clearly defined metrics and outcomes (e.g. what results would constitute a pass or a fail, with worked examples).

Concerns were raised about the gates and metrics themselves (rather than the principle of having gates), with some reference to scheme design in HNIP. These are briefly summarised below:

- The consumer detriment gate will need a Future Homes Standard counterfactual.
- Additionally tariffs which can be shown to be fixed or limited in their ability to flex over time, should be seen in a more favourable light to those where cost pass through are possible.
- Clarity on how heat loads are considered under the scheme design. For example is a project extension from 50GWh to 51GWh considered as 51GWh or 1GWh?
- Applicants should be required to submit multiple scenarios, to enable the assessor to better understand the context of each applicant, with clear guidance set by BEIS on the degree of connection risk included in each scenario.
- With the deliverability metric, BEIS should clarify through guidance the level of progress expected for a connection to be considered feasible.

Consultation Question 42	Response	Percentage
Blank	27	53%
Yes-gates are a helpful mechanism	24	47%

Table 42

Government response

We will be proceeding with the initial gates, making some changes to the methodology and assessment that underpin them; these changes are detailed throughout the consultation response. Guidance (including worked examples) will be published on these gates and on other elements of scheme design.

In summary these are:

- Carbon gate – heat delivered to end customers must be 100gCO2e/kWh or less. This includes the emissions associated with pumping and wider system parasitcs.
- Customer detriment assessment.
- Social IRR of 3.5% or greater where carbon abatement is assessed against a fossil based counterfactual (gas for urban and oil for rual).
- Minimum thermal demand: 2GWh/year or 100 dwellings connected for rural only schemes.
- Maximum capex & commercialisation support of up to but not including 50% of total capex.
- Capped award – The total 15-year kWh of heat/cooling forecast to be delivered will not exceed 3.33 pence of grant per kWh delivered (subject to review by GHNF)

Applicants will be able to test their projects against the Stage 1 gates in advance of making applications to the GHNF as the application model will be publicly available and submission of a completed version of it will be required as part of the application's supporting documentation.

Full application guidance with a continuously improved Frequently Asked Questions section will be developed and published to offer further clarification.

Consultation Question 43: What are your views on the appropriate minimum SCOP a project should be benchmarked against?

Summary: A variety of views were expressed on the use of SCOP as a gate and the 2.5 value proposed.

For those that thought the SCOP as proposed was too high, reasons included:

- The 2.5 value and the counterfactual of an ASHP would make it difficult for applicants to show significant carbon savings by their proposed generation technology.
- The SCOP should be 2.4 (no rationale given).
- A Lower SCOP would encourage take-up, and the SCOP can be raised over time as the market matures, and importantly, basing the increase on performance data.
- SCOP of 2.0 is more appropriate based on studies into the long-term seasonal performance of ASHPs.

Of those that viewed the proposed SCOP as too low, reasons included:

- Recommendation against using ASHP as counterfactual and thus minimum SCOP should be 3.0 or greater.
- SCOP should be comparable to the Seasonal Performance Factor used in the Non-Domestic and Domestic Renewable Heat Incentive schemes. A higher SCOP would improve energy performance and drive innovation.

Several respondents disagreed with the use of an ASHP as the counterfactual and the use of SCOP as a floor. Reasons included:

- Using a standalone ASHP as a benchmark for existing buildings is too simplistic due to various factors such as electrical infrastructure constraints and noise. Thus, the approach as outlined in the consultation could restrict the introduction of a low carbon technology for a suitable site currently using gas CHP. The existing counterfactual should be used for existing buildings rather than an ASHP.
- The SCOP and ASHP approach is too prescriptive and potentially costly in mandating that schemes deliver a minimum CO_2 saving. Instead, £/tonne CO_2 saved should be used.
- A coefficient of system performance for kWh of energy in/out should be used instead.

Finally, a respondent did not offer a view on the SCOP the GHNF should use, commenting that this depends on the proposed low carbon technology.

Consultation Question 43	Response	Percentage
Blank	29	57%
Agree with 2.5	7	14%
Too high	6	12%
Too low	4	8%
Disagree with SCOP approach	4	8%
Other	1	2%

Table 43

Government response

Following careful analysis of the evidence presented to us and assessment of HNDU data sets, we will be adjusting the methodology for appraising project carbon intensity using a minimum SCOP of 2.5 to develop a static carbon intensity ceiling, recognising some stakeholders' concerns on the SCOP of 2.5 being challenging, particularly for older buildings which typically have less insulation. For the purposes of clarification, the carbon intensity of the project will factor in pumping, system parasitics and distribution losses.

The carbon intensity ceiling will be based on a SCOP of 2.5 and the electricity grid intensity in 2023, which results in a project carbon intensity ceiling of 100gCO2e/kWh of heat delivered to customers. We are investigating whether a

window from heat-on to connect to primary low/zero carbon technology should be permitted – during this time the overall carbon intensity of the network could exceed 100gCO2e/kWh but the gated metric would still fail should the carbon intensity exceed this ceiling in any subsequent year.

The Application Form will automatically calculate this and the calculations can be reviewed by the applicant.

Consultation Question 44: Do you envisage any challenges with the CO_2 appraisal method proposed for the GHNF? Is there a risk it will exclude technologies or solutions that would still be of social benefit, and if so, which ones and why?

Summary: The majority of respondents (16) disagreed with the methodology, with some referring to the views they provided in response to Question 10. Reasons included:

- Approach to assessing the carbon impact of new EfW which is required to be 'heat ready' but not required to actually export heat needs further consideration. Other stakeholders also raised concerns for the utility of the appraisal methodology as applied to existing EfW sites.
- Methodology should be aligned to that of other government schemes such as the RHI.
- Marginal emissions factors for imported electricity as listed in the methodology could be highly detrimental to projects. Instead, an average should be used for imported electricity, marginal used for benchmark, and marginal used for exported electricity.

Several respondents cited the importance of using the best available datasets such as those used by Defra to mitigate against the risk of excluding technologies and the issue of changes in projected CO_2 emissions.

Consultation Question 44	Response	Percentage
Blank	29	57%
Yes-challenges and issues with the methodology	16	31%
No	6	12%

Table 44

Government response

We recognise that for specific technologies, changes to methodology may be required. Therefore, we will be publishing guidance on appraising CO_2 for specific technologies.

We have considered the case made regarding new EfW and accept that the methodology should be consistent with existing EfW[12].

While we recognise the arguments made regarding the methodologies we proposed for hydrogen appraisal, we are awaiting the outcomes of the wider consultation being undertaken by BEIS before making a determination on Hydrogen fuel appraisal for the purposes of the GHNF.

We will be proceeding with BEIS' guidance on valuing energy usage and greenhouse gas emissions[13] as the guidance applicants should use to appraise CO_2. For biofuels, BEIS[14] and Defra[15] guidance should be used. We will also communicate to stakeholders any updates to guidance as they are published.

We note the error in the consultation document that respondents brought to our attention and can confirm that it is consumption based long run marginal emissions factors (rather than generation ones) that should be used.

Consultation Question 45: Do you agree or disagree with the Social IRR gateway?

Summary: The majority (11) of respondents agreed with the Social IRR gateway as proposed in the consultation.

A number asked for clarifications and offered suggestions on the gateway approach as set out in the consultation, including:

- Whether the Green Book specifies a positive social net present value with a discount rate of 3.5%
- What the boundary of assessment should be when assessing the social net present value.
- Gateway approach should recognise that negative cash flows are generally not going to be feasible for the network operator and BEIS should consider revenue support in light of the social IRR benefit.
- Many stakeholders focused on the need for clear guidance setting out the calculations and assumptions to calculating the Social IRR.

Several respondents were neutral on the gateway, highlighting the need for greater detail and guidance before giving a view on its utility.

Finally one respondent disagreed with the Gateway, highlighting it as complex and one that applicants will struggle to understand. Like many other stakeholders, the need for guidance and clarity was emphasised, if BEIS was to use this Gateway.

[12] BRE: Technical Note – Modelling Energy from Waste Facilities
[13] BEIS, 2012 (updated 2020). Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal.
[14] BEIS, 2020. Greenhouse gas reporting: conversion factors 2020.
[15] Defra, 2013 (updated 2019). Environmental reporting guidelines: including Streamlined Energy and Carbon Reporting requirements

Consultation Question 45	Response	Percentage
Blank	34	67%
Yes	11	22%
Neutral	5	10%
No	1	2%

Table 45

Government response

We will be proceeding with the Social IRR gateway. However, in recognition of the complexities in calculating Social IRR, the Application form will automatically calculate Social IRR. Importantly the approach adopted will evaluate the impact of displacing fossil-based heating irrespective of geography or local planning requirements. We do not intend for our decarbonisation assessment methodology to be in competition with local planning policy decarbonisation requirements.

Both central and local government policies designed to tackle the decarbonisation of heat look to displace fossil-based heating which in urban areas is predominantly natural gas-based heating and in rural areas is a combination of different fuels. For simplicity purposes in rural areas heating oil will be presumed to be the fuel that is being displaced for project level Social IRR calculation purposes.

Given the GHNF will only fund projects that do not show customer detriment to customers at risk, the heat network option will have been assessed to offer a price that is competitive to a LZC counterfactual (only existing residential/micro-business use a fossil-based counterfactual). As such, the heat network will have been shown to offer customer value for money to meet the heat decarbonisation challenge. Collectively we intend for our assessment to align with local government policies to move buildings to decarbonise heat and therefore the GHNF will value the displacement of fossil-based heating with LZC heat from the applicant's heat network when assessing project level Social IRR.

Deliverability and supply chain commitment gate:

Consultation Question 46: Is the deliverability of the project an important consideration? If so, are the broad categories outlined appropriate to determine this?

Summary: Most respondents (21) agreed on the importance of deliverability and of the categories proposed to assess this. Of these responses, one respondent argued for scheme funding arrangements to allow allocated budget to be released back into scheme funding if a successful applicant is unable to deliver on their project.

The remainder of respondents agreed on the importance of deliverability but gave views on how deliverability should be assessed. These include:

- Scheme guidance should set out how progressed a project needs to be and the outstanding issues that are acceptable to address during commercialisation. As a wider point, BEIS should ensure early engagement with prospective applicants and provide assurance of funding as soon as possible to build confidence and credibility for stakeholders involved in the project.

- On the stakeholder category, BEIS should look to assess: Whether all stakeholders have been identified, whether they have already been engaged by the applicant and are committed to relevant deliverability timescales.

- The inclusion of a condition on the credit worthiness of customers will preclude heat networks that don't rely on large anchor customers, which will be detrimental to shared ground-loop systems. Leeway should be given for projects that are trying to decarbonise large numbers of private households. This could be achieved through a report on customer uptake or a risk score that compares the number of private properties versus the number of properties held by an anchor customer.

- Deliverability assessment should be brought forward to the Stage 1 Gateway Metrics and could replace the Social IRR Gateway Metric. This could emphasise to prospective applicants the importance of deliverability and reduce the risk of applicants gaming the scheme.

Consultation Question 46	Response	Percentage
Blank	24	47%
Yes-Agree with categories	21	41%
Yes-Disagree with categories	6	12%

Table 46

Government response

We will be proceeding with a deliverability gate and the categories outlined in the consultation. The deliverability assessment while containing an element of subjectivity will include a significant proportion of published criteria against which projects will be assessed. However, we recognise concerns on subjectivity and the need for clear, transparent guidance; we will be publishing detailed guidance setting out how this gate will be assessed, including examples of evidence required where appropriate.

Consultation Question 47: What are the key areas that should be included in the supply chain commitment? Please provide your reasoning.

Summary: In total there were 18 written responses to this question. A majority of responses (13) were positive and suggested a range of areas to be considered by the supply chain commitments. The most popular suggestion (7) centred around jobs and

skills, including apprenticeships and the importance of improving diversity in the sector. The second most popular suggestion (5) focused on the importance of growing local and UK supply chains and expertise. Two responses also mentioned low carbon/sustainability.

Some responses struck a cautious note and suggested that, as much of the benefits being sought may be out of the applicant's control, the supply chain commitments should be kept as light touch as possible.

Consultation Question 47	Response	Percentage
Yes	17	33%
No	1	2%
Comment only	6	12%
Blank	26	51%

Table 47

Government response

We recognise that in order to meet our Net Zero objectives and bring about the maximum benefits for the Green Heat Network Fund, the heat network supply chain serving the UK market must be upskilled and scaled up, to support a focus of the supply chain commitments on jobs and skills. We are also developing a skills programme to support the heat network market to meet the challenge of growing to meet our net zero ambitions.

We are also committed to grow our current net zero industries and encourage new ones to emerge, through the 'Build Back Better: our plan for growth' commitment to infrastructure, innovation, and skills, and to support the supply chain commitments contributing to quality UK heat network offer.

We anticipate requiring applicants to sign a supply chain commitment statement as well as ongoing reporting requirements.

Consultation Question 48: Should a distinction be made between larger and smaller projects with regards to supply chain commitment? If so, what would you propose?

Summary: There were 18 response to this question, the majority of which (13) were positive. There was broad support for recognising that smaller projects may create smaller outcomes and therefore have less scope to influence the supply chain. There was support for proportionality on the quantity of what is being delivered through the supply chain commitments, by project size. However there was support for, qualitatively, the same commitments to be made across all projects.

One respondent suggested we include a statement of intent for smaller projects and contractual requirements for larger ones, while another called for keeping flexibility on the delivery of the commitments.

Of the negative responses (5), one was against the idea of supply chain commitments completely, while the remainder suggested that distinctions between project sizes weren't necessary as smaller projects will deliver less against the same commitments.

Consultation Question 48	Response	Percentage
Yes	13	25%
No	5	10%
Comment only	8	16%
Blank	25	50%

Table 48

Government response

We will ensure that the expectation of the supply chain commitments is proportionate to the size of the project and to the benefit being sought, while not placing a disproportionate burden on larger projects.

We recognise the supply chain constraints currently faced by the market, and plan to work with applicants to help deliver on the supply chain commitments.

Consultation Question 49: What is the appropriate level of reporting to ensure supply chain commitments are being delivered? Please provide appropriate examples.

Summary: There were a total of 15 responses to this question, the majority of which (13) were positive. There was no agreement on the exact level of reporting necessary, with responses ranging from light touch reporting, to annual or quarterly. Among positive responses there was a broad consensus (7) that reporting should be proportionate to project size, in line with responses to question 48.

Consultation Question 49	Response	Percentage
Yes	13	25%
No	2	4%
Comment only	7	14%
Blank	29	57%

Table 49

Government response

In line with question 48, we will strive to ensure that the level of reporting on supply chain commitments is proportionate to the scale of the project and to the scale of benefit being sought through the supply chain commitments.

Our guidance due to be published in the summer of 2021 (if not earlier) will set out the expectations for monitoring and reporting requirements which will be designed with the consultation responses in mind coupled with the need to ensure that benefits realisation of the scheme can be assessed.

Consultation Question 50: Are there any gaps in standardising contracts to support projects that are not covered by the existing heat network contract templates "Sales, Operations and Maintenance Set (SOMS)" ?

Summary:

Of the respondents that commented (9) the overarching theme was that the existing SOMS were welcomed and useful. A request for clarification regarding whether these will be a requirement for applicants or a useful "assistance tool" for projects was made. A few shortfalls in the current SOMS were identified including:

- EfW heat off-take agreement;
- the energy services needs to cater for all types of models, including a plant adoption, utility, master developer;
- adapt to smaller projects, e.g. those being developed with local authorities
- splitting out agreements for Design & Build and individual Design and Build (DBOM and O&M alone are not flexible enough);
- agreements should include incentives to run heat networks more efficiently and support performance by building on CP1;
- the agreements should cater for non centralised (hub and spoke) network typologies, i.e. 5th generation and SGL

Consultation Question 50	Response	Percentage
Comment only	9	18%
Blank	42	82%

Table 50

Government response

We can confirm that the existing SOMS are expected to be a "useful assistance tool" for projects and that projects are free to use them or not as they so choose.

We thank respondents for their feedback regarding potential gaps in the current SOMS and are actively taking these proposals forward for further review and

investigation and will publish any resulting annexes, clarifications or documents that result from those investigations.

Consultation Question 51: Should additional activities be carried out over the next year, in advance of the GHNF to support up-skilling across the sector? If yes, what activities should these be?

Summary:

Respondents generally welcomed Government focus on improving skills training around renewable heat recognising that upskilling is needed across the sector. Specific recommendations regarding support for upskilling the sector in relation to:

- exploring partnerships with universities and training institutions;
- clear guidance and rules required with supported webinars. The sooner rules can be embedded into procurement the better as some projects may procure service suppliers ahead of GHNF application;
- heat pump engineering, installation, integration, commissioning and maintenance;
- provide readiness training for new entrants (to reduce risks for projects);
- key pinch points in skills in all parts of the development cycle;
- increase of borehole and drilling skills;
- share learnings from HNIP, e.g. actual capital costs of all project elements, plant performance, proportion of heat supplied, what went wrong, publication of monitoring data for others to analyse and learn from;
- Development of CP1 checklists for designers;
- training courses on application documents and processes with access to detail and feedback (incl. counterfactuals, metrics);
- build capacity to supply highly insulated pipework, run SBRI on insulation materials;
- Suggestion for a review of HNDU, HNIP and RHI to provide learnings of where skills gaps are.

Consultation Question 51	Response	Percentage
Yes	14	27%
No	2	4%
Comment only	3	4%
Blank	32	37%

Table 51

Government response

We thank respondents for the breadth of responses and suggestions made in response to this question.

Those responses that are beyond the remit of the GHNF such as engagement with wider educational establishments have been passed to the Heat Network policy and Market Development teams for them to investigate and take forward where appropriate.

A full communications plan for the GHNF is being developed to socialise GHNF requirements and guidance with the industry and potential applicants including information events as soon as possible within the development cycle.

Adjustment metrics:

Consultation Question 52: Do you agree or disagree with the core metric an adjusted kWh/£ GHNF budget spent for evaluating projects against one another?

Summary: Over half of respondents (11) agreed with the core metric, with some caveats such as:

- The core metric should not impede new, innovative projects from receiving a grant, which may be more expensive at the outset.

- Application assessment should evaluate cost competitiveness between similar projects as some generation technologies are more mature than others.

Disagreement with the core metric centred on several themes:

- Overall assessment process is too complex, lacks transparency and is subjective.
- Citing the GHNF budget, a preferable alternative would be a pass/fail approach with funding on a first come-first served basis.

Consultation Question 52	Response	Percentage
Blank	31	61%
Agree	11	22%
Disagree	9	18%

Table 52

Government response

We consider that evaluating cost competitiveness between similar projects as suggested by one respondent could ensure that projects are assessed more fairly according to technology maturity. However, using this approach could add complexity to the assessment process.

We also consider that awarding funding on a first come-first served basis as suggested by another respondent could reduce competitive tension between applications and provide limited value for money against the objectives of the GHNF.

We will be proceeding with the approach as outlined in the consultation. However, we will revise the impact of the assessor adjustments such that the maximum downward adjustment of the pre-adjustment kWh/£ grant that could be applied is no greater than 30%. As such applicants who have a good level of LZC thermal energy supplied relative to the grant requested will apply in the knowledge that, if the project is assessed to be deliverable, they will score well.

Consultation Question 53: Are there any metrics you feel should be included or removed, which ones and why?

And **Consultation Question 54**: What, in your view, should the relative weighting of the metrics proposed be?

Summary: A broad range of views were expressed on metrics:

- Metrics should encourage reward scenarios where consumers are taken out of fuel poverty.
- Metrics should capture energy efficiency improvements, such as tariff structures that incentivise lower return temperatures.
- Metrics should capture how effective the generation technologies are in their use of the primary energy resources.
- Metrics should factor in project size, grant funding required, lifetime carbon savings etc.
- One stakeholder argued that Deliverability and Carbon should be the only metrics, to ensure assessors can carry out a quantitative appraisal of applications.

Concerning the weightings proposed in the consultation, there was substantial support for reducing the weighting of the Innovation and energy efficiency metric, on the grounds, to reduce the possibility of gaming.

There was also support for carbon and deliverability being weighted highly (as proposed in the consultation), and conversely these metrics being weighted lower.

Consultation Question 53 and Question 54	Response	Percentage
Blank	80	78%
Metrics- should be added or amended	10	10%
Weighting	9	9%
Metrics-None need to be added, removed, or amended	3	3%

Table 53 and 54

Government response

The metrics as suggested in the consultation will be retained.
While we recognise concerns by some stakeholders on the risk of gaming arising from having subjective criteria, we consider that this risk can be mitigated through the publishing of detailed guidance setting out how applications will be assessed for all metrics, and the types of evidence we expect applicants to provide.

While reducing the number of metrics (to, for example carbon and deliverability only) would reduce the complexity of the scheme for both applicants and assessors, we believe the additional metrics add fairness to the process and help meet the GHNF' objectives. For example, an applicant may score reasonably well on deliverability, but score comparatively better against the thermal energy metric, uplifting their score.

With respect to the weightings, these were included in the consultation for stakeholders to engage with our thinking on how applications could be scored. Analysis from HNIP data, the GHNF call for evidence and responses to this consultation have been used to amend the methodology: the maximum downward adjustment of the pre-adjustment kWh/£ grant that could be applied will be no greater than 30%. As such applicants who have a good level of LZC thermal energy supplied relative to the grant requested will apply in the knowledge that, if the project is assessed to be deliverable, they will score well.

Consultation Question 55: Do you agree or disagree with the Innovation and Energy efficiency sub-categories proposed? Are there any additional areas that should be included?

Summary: Of the respondents who provided a response, approximately half of respondents (11) agreed with the sub-categories as proposed in the consultation.

Several respondents suggested additional subcategories that should be included, such as:

- Factoring in the type of heat network in the metric, with favourable weighting towards shared-ground loop, ambient and 5th generation heat networks.
- Considering consumer interaction with their heat supplier, focusing on rewarding smart usage of the heat supply.
- Metric should also be a benefit indicator and should reward applicants that commit to fabric improvements.

Several respondents also argued that the metric should be removed:

- Innovation and energy efficiency should be a criterion but considered in the round rather than trying to put hard metrics on it.
- Metric will add complexity and could be open to gaming.

Consultation Question 55	Response	Percentage
Blank	30	59%
Agree	11	22%
Disagree-additional subcategories suggested	7	14%
Disagree-metric should be removed	3	6%

Table 55

Government response

Recognising that there are many ways to score innovation and energy efficiency, we plan to attribute the lowest proportion of the maximum downward adjustment (total of 30% of which innovation and energy efficiency will make up a maximum of 4.5%) to this area.

Applicants will be invited to include an optional short paper (1-3 pages) setting out how they believe their project demonstrates innovation or enhanced energy efficiency measures (either system related or through their heat/cooling off-taker).

Consultation Question 56: Should a minimum score be set for any project to be funded or are the use of the gated metrics sufficient?

Summary: Just over half of respondents were in favour of a minimum score. The following points were raised:

- Projects should simply be ranked on their scores to drive selection for funding.
- Minimum hurdle/score would give applicants certainty on what score needs to be achieved for the application to be considered in a competitive funding round and their chances of getting funding. Applicants can also receive feedback on how the application can be improved.

The remaining respondents viewed the gated metrics as sufficient, with one stakeholder caveating that flexibility should be allowed for innovative projects.

Consultation Question 56	Response	Percentage
Blank	32	63%
Yes-minimum score should be set	10	20%
No-gated metric sufficient	9	18%

Table 56

Government response

In light of the responses and to ensure that a relative value for value metric is in place the GHNF will rely on two key gated metrics:

1. Social IRR; and
2. Maximum of 50 pence of grant per kWh of average annual heat delivered.

The first gated metric ensures that projects supported show that a social rate of return consistent with HMT Green Book social time preference is achieved. The second gated metric seeks to ensure that projects supported are sufficiently aligned to our published Impact Assessment[16].

Assessing the grant awarded

Assessing the grant awarded:

Consultation Question 57: Will the general approach to grant calculation be sufficient to meet the financial needs of applicants seeking support? Please explain your response?

Summary: The majority of respondents (11) agreed with the approach to grant calculation. Some stakeholders agreed with caveats including:

- Deducting counterfactual technology cost will reduce the profitability of the investment.
- Applications requesting a higher grant value are likely to receive a lower score; support for an application should reflect the greater lifetime carbon savings associated with larger schemes. On this basis, the approach as stated in the consultation should be re-examined.

A consistent theme of responses disagreeing with the approach was on the need for flexibility and a simplification of the approach itself, with accompanying guidance:

- Grants should be allowed to exceed 50% of capex in some cases for newer technologies. The grant approach should also allow up to 80% of capex in some cases, with no cap on the amount of grant funding.
- The 50% threshold has been shown to be insufficient for several projects. Flexibility on the required hurdle rate is important so that applicants can reflect the specific risk profile of their project.
- HNIP was weighted towards smaller schemes; the GHNF should re-examine the approach to ensure that larger schemes which can decarbonise buildings and by extension cities at a greater scale are not disadvantaged.

Several respondents also cited limited revenue from heat pumps, reflecting gas and electricity prices in the UK, where a carbon tax is not levied on fossil fuel heating fuels but where RHI payments mitigated the price differential.

[16] 2020 BEIS: Green Heat Network Fund: Impact Assessment

Consultation Question 57	Response	Percentage
Blank	34	67%
Yes	11	22%
No	6	12%

Table 57

Government response

Financial clearance we have received means that applicants may apply for up to but not including 50% of the maximum eligible capital costs. This change is on the basis that the cost of transitioning from a counterfactual, higher carbon technology to a low/zero carbon technology will be high.

We **don't** propose a cap on maximum grant awarded as an additional method of assessing the grant awarded, however there will be a cap of 50p grant per kWh of average annual heat delivered as a measure to ensure value for money.

Consultation Question 58: Are the cashflows proposed to be evaluated sufficient? For example, should nominal post-tax cash flows be considered? Should the proposed finance structure be included and blended investor returns (shareholder loans + equity) be appraised?

Summary: The majority of respondents (9) viewed the cashflows proposed as sufficient. However, there was a strong recommendation against including the above suggestions, to minimise complexity.

Additionally, mirroring responses to Question 57, some respondents focused on the need for clarity and flexibility:

- Various legal accounting practices should be permitted relative to the scale of applicant, etc.
- The pre-tax overestimates actual revenues, but then excluding inflation reduces this again. Applicants' viability for schemes is always based on the post-tax cashflows, with inflation, so there is a potential disconnect if the IRR is altered between the two.

Consultation Question 58	Response	Percentage
Blank	41	80%
Yes	9	18%
No	1	2%

Table 58

Government response

We will be proceeding with the assumptions proposed in the consultation on assessing the grant awarded. We recognise that the suggestions in the questions (nominal post-tax cashflows, proposed finance structure and blended investor returns) could add a layer of complexity for applicants. On this basis, we will not require applicants to include an assessment of wider financial impacts relating to accounting, taxes, financing structures, working capital, Companies Act, etc.

However, applicants seeking provisional awards, subject to private finance being secured, will be expected to have analysed nominal post-tax post-finance cashflows. We anticipate publishing a template full financial model, subject to approvals, in late 2021 to assist projects and help standardise full financial modelling within the sector.

Consultation Question 59: Should there be a ceiling/cap on permissible returns and if so, what should it be?

Summary: The majority of respondents (10) were against a ceiling/cap on permissible returns. Those respondents that gave a reason gave the following:

- Higher level of returns should be allowable for higher level of risk.
- The competitive aspect of the grant allocation process will organically reduce margins.

Various reasons for why a ceiling/cap should be introduced were given, including:

- There should be a cap and this cap should reflect project risk, where the riskier the project, a higher ceiling IRR should be applied. Clarity and guidance is also needed on how investments from local authorities from different sources should be included.
- The GHNF should mirror HNIP's approach in this respect, where a cap was a feature of the scheme design. One stakeholder implied there should be transparency on what this cap is as well as an underlying rationale.

Consultation Question 59	Response	Percentage
Blank	34	67%
No	10	20%
Yes	7	14%

Table 59

Government response

We will not be proceeding with a cap on permissible returns. Not having a ceiling will allow applicants to reflect the risk profile of their projects, and the competitive tension inherent in the assessment process will naturally regulate excessive returns.

Ultimately, the gated metrics, the competitive component of the assessment and the limitation of budget available will act as the barrier to unreasonable returns being sought and supported by the GHNF.

Consultation Question 60: Does evaluating generator only cash flows but accounting for the cost of distribution through a notional (or actual if appropriate) 40 year use of system charge present any challenges for an applicant? If yes, please explain under what circumstances these challenges would arise.

Summary: there were 12 responses to this question.

The majority of respondents (9) to this question stated that it would present challenges for applicants, particularly a 40-year timeframe, given the level of unknowns and sensitivities that are being modelled.

Comments included:

- The main issue is that the generator is unlikely to be the driver behind the project.
- The majority of ambient networks and 5th Generation networks do not generate, this consideration unfairly frames the scheme towards less carbon favourable projects.
- It is a tortuous construction that complicates what is already a complicated process (we'd estimate it adds 50% to the workload of making an application).

Consultation Question 60	Response	Percentage
Yes	9	18%
No	3	6%
Comment only	2	4
Blank	36	72

Table 60

Government response

To address the complexity highlighted to us by respondents we will be publishing a full application model for projects to complete with detailed supporting guidance that will be used by us to evaluate project cashflows.

Consultation Question 61: If a project intends to have a formal distinction between investment in generation and distribution (e.g. GenCo/DisCo), does a GHNF award to the generator, sufficient for both generation and distribution returns, present any issues?

Summary: there were 13 responses to this question.

The overarching distinction for this question is whether the generator and distributer are the same or separate. Only two respondents agreed with this split, and six responds believed the award would not be sufficient for both generation and distribution returns. Some respondents (4) believed that if the generator and distributor were separate the award would need to be clearly stated with agreements and reporting/monitoring requirements.

Comments included:

- If the GenCo/DisCo are owned by the same parties we do not envisage any issues.
- In our view yes. It forces heat networks companies to work in partnership with the generator.
- Any award would need to clearly state the proportion awarded to each entity and how these entities are to be obligated to deliver the project as a whole.

Consultation Question 61	Response	Percentage
Yes	2	4
No	6	12
Comment only	5	10
Blank	38	74

Table 61

Government response

We recognise the concerns raised by respondents and will not be proceeding with requiring the application be made by the generator.

Financing projects:

Consultation Question 62: Should GHNF allow projects to apply that have not secured finance? Please provide your reasoning.

Summary: there were 23 responses to this question.

All 23 respondents were strongly in favour of projects that have not secured finance being allowed to apply for GHNF funding. Respondents suggested that a provisional offer could be made and the period between grant award and grant agreement could be used to

secure other finance, others commented that funding cannot be secured until the level of grant is known.

Consultation Question 62	Response	Percentage
Yes	23	45
No	0	0
Comment only	0	0
Blank	28	55

Table 62

Government response

We acknowledged that for some projects it may not be possible to have all sources of funding in place. Further, we accept the view that requiring projects to have all funding in place may actually limit the pool of potential investors; some investors may be unwilling to engage with a project that cannot demonstrate investible returns and would not want to commit the time and materials necessary to make an application to GHNF that may or may not be successful.

To address these concerns, we have introduced provisional awards for the GHNF. However due to the practicalities of Government funding rules, such applications will only be permitted in the first two application rounds of each financial year (April or July) and funding must be secured no later than the end of February of that financial year. Detail on provisional awards and associated timings will be included in application guidance.

Consultation Question 63: If provisional awards were offered what would the minimum expiry duration have to be for it to be of value to the applicant/investor community?

Summary: There were 16 responses to this question.

There was a mixed response to this question with the majority divided between six months (4) and one year (7) minimum expiry duration for provisional grant awards.

Other periods were suggested with one respondent suggesting a period as short as three months, other respondents (3) recommended a three year minimum period with one suggesting up to 5 years for complex projects. Some respondents advocating longer periods argued that having the relative certainty of GHNF funding for that length of time would help with efforts to secure other investment.

Consultation Question 63	Response	Percentage
Yes	0	0
No	0	0
Comment only	16	31
Blank	35	69

Table 63

Government response

Please see our response to question 62.

Economic assessment

Economic assessment:

Consultation Question 64: Do you think the assumptions listed in Annex A of the accompanying Impact Assessment are reasonable for the purpose of an economic appraisal? If not, please provide suggestions on how they can be improved.

Summary: there were 14 responses to this question.

Of the 14 responses received, views were mixed on whether the assumptions used in the economic appraisal presented in the Impact Assessment were appropriate, with an equal number of respondents agreeing and disagreeing on those used. Of those disagreeing, responses were typically focussed on the specific technology cost and performance assumptions rather than assumptions on the technology mix, counterfactual, and general methodological assumptions.

A few respondents raised concerns that specific technologies were not included in the analysis which they felt should have been in scope such as biomass, deep geothermal, shared ground loops and 5th generation heat networks. Furthermore, some respondents who highlighted these concerns also raised issues around the clarity of the technology groupings used.

A small number of respondents raised concerns around the assumed capital installation costs of various technologies. Specifically, it was raised that the assumed level for energy from waste was too high whereas for gas-CHP and gas boilers the assumed level looked too low. Additionally, it was raised that a capital expenditure assumption of £545/kW was used across a range of technologies inappropriately. Regarding operating cost assumptions, there were reservations suggesting that the assumed level was too low, particularly when applied across a range of low carbon technologies.

In terms of performance, it was noted that the assumed average running hours at peak load across all low-carbon technologies was too low even when modelling a high performing plant. Regarding the thermal efficiency, it was argued that some of the assumed levels were too optimistic.

Consultation Question 64	Response	Percentage
Yes	6	12%
No	6	12%
Comment only	2	4%
Blank	37	73%

Table 64

Government response

Since receiving responses to the consultation, we have refined our underlying assumptions. These revised assumptions address most concerns raised above by stakeholders.

We would like to reiterate that the technologies included in the economic appraisal are not an exhaustive list of the technologies that will be funded by GHNF, but are the more common technologies which we would expect to come forward and are well suited to use in heat networks. Importantly, evidenced assumptions are needed to quantify with confidence the modelled impacts of a technology, so where technologies have not been included this may also be the result of an associated evidence gap.

Scheme evaluation

Scheme Evaluation:

Consultation Question 65: Are there any particular areas which you think an independent evaluation of the scheme should explore?

Summary:

There were 15 responses to this question.

Key areas mentioned by respondents included:

- Consumer outcomes, including heat prices and overall consumer experience.
- The applicant experience, including guidance and application process.
- Overall performance against the objectives of the scheme, including value for money.

Consultation Question 65	Response	Percentage
Comment only	16	31%
Blank	35	69%

Table 65

Government response

Several respondents' comments focused on evaluation of individual projects at the application stage; these comments have been considered alongside stakeholder feedback to consultation questions 42-56, which focus on application assessment.

We note the areas that stakeholders have recommended we focus on, and we will consider these when determining the scope of the evaluation. Evaluation findings will be published on GOV.UK.

Summary of Government response to the GHNF call for evidence

The following section summarises stakeholders' feedback to questions 1-45 in the call for evidence and the Government responses to each of these questions.

Responses to questions 46-50 gave us valuable techno-economic data on current and planned heat networks; this data has also fed into the design of the scheme. However, the nature of the data received means we have not summarised and responded to these questions in this publication.

For brevity, we have briefly summarised below the main themes that emerged from responses to the call for evidence.

Supply chain: Many stakeholders viewed the GHNF as having the potential to benefit the heat networks supply chain. Several suggestions were raised on how BEIS could boost the supply chain, including focusing on training and the retention of skills and improving procurement and bidding in the sector. *Please see our responses to questions 47-51 in the consultation, which focus on the supply chain.*

Costs and revenues: Stakeholders were agreed on the high costs of building and operating heat networks, with many highlighting infrastructure costs as being particularly high. Power Purchase Agreements (PPAs), seasonal and day/night tariffs and demand-side storage (and participation in demand-side flexibility initiatives) were cited as possibly helping to reduce input electricity costs. *Stakeholder feedback on costs and revenues have been considered in all aspects of scheme design.*

Technologies: many stakeholders agreed with scope of technologies suggested in the call for evidence, which we subsequently revised in the consultation. Other stakeholders provided suggestions of technologies that were not listed in either document. *Please see our responses to questions 9-14 in the consultation, which focus on the technologies in scope of the GHNF.*

Consumer pricing: Stakeholders differed on the pricing structures they used and how they factored in consumer detriment when developing these structures. However, a recurring theme of responses was the difficulty of competing on price against a gas counterfactual and the need for a gas levy to address this. *Please see our responses to questions 31-37 in the consultation, which focus on our approach to consumer pricing and detriment.*

Lessons learnt from other schemes and initiatives: Stakeholders were keen that we learn lessons from what has and has not worked well with respect to various schemes such as the RHI, HNIP and ECO, with stakeholders focusing on the need for clear guidance and transparency in the GHNF assessment and application process. *We have held, and will continue to hold, discussions with colleagues and stakeholders to ensure the GHNF is fit for purpose.*

Supply chain opportunities

Call for evidence Question 1: What impact do you think that GHNF investment in projects could have on the supply chain in terms of e.g. risks and costs?

Summary of responses: There were 24 responses to this question.

Half of respondents (12) felt that the GHNF could have a positive impact on the supply chain. Respondents viewed the GHNF as having the potential to de-risk project investment and boost the pipeline of projects which could strengthen the supply chain. Respondents also flagged the potential to reduce development costs if the GHNF builds on existing SOMS work to provide further standardised documentation. A respondent flagged a risk that overseas supply chain firms may benefit from an improved supply chain.

Respondents raised various concerns about the scheme, including that investment could be delayed to 2022, and that bid costs should be reduced to ensure a competitive and more open supply chain. Additionally, one respondent argued that the GHNF should require MCS qualified installers and approval on equipment to ensure only certified installers can benefit from project spend.

Respondents also viewed the GHNF as needing to provide financial certainty earlier in the ordering process, and also that funding/policy support for low carbon heat networks should be a long-term proposition.

Call for evidence question 1	Response	Percentage
Blank	20	45%
Positive impact	12	27%
Other	7	16%
Financial support	3	7%
Financial certainty	2	5%

Table 66

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best

practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

While the GHNF itself is envisioned to be a three year programme of grant funding, we will commit to discussing with stakeholders other ways of growing the heat networks sector.

Call for evidence Question 2-Do you think that GHNF investment in projects could give supply chain companies the confidence to stimulate investment in expanding their UK offering?

Summary of responses: There were 26 responses to this question.

Most respondents (22) viewed the GHNF as having the potential to stimulate investment from supply chain companies, with the caveat that financial certainty and long-term funding/policy support for low carbon heat networks was needed.

Other respondents were unequivocal in their responses; one respondent viewed HNIP as too focused on finance and that the GHNF should look to encourage supply chain companies to bid, removing barriers to bidding and ensuring bids met clients' budgets from multiple organisations across the sector. Another respondent flagged that increased investment would only happen if there was free or highly subsidised training to upskill UK companies.

Call for evidence question 2	Response	Percentage
Yes	22	50%
Blank	18	41%
No	4	9%

Table 67

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 3: Which components of the supply chain would most benefit from GHNF investment in projects?

Summary of responses: There were 22 responses to this question.

Most respondents (10) viewed the whole supply chain as potentially benefitting from GHNF investment.

Other stakeholders flagged various components/stakeholders such as the skills base, HIU manufacturers, metering and billing providers and private and public ESCOs.

Manufacturers and distributors of large scale heat pumps were also singled out as potential beneficiaries.

Call for evidence question 3	Response	Percentage
Blank	22	50%
Whole supply chain	10	23%
Other	8	18%
Large scale heat pumps	4	9%

Table 68

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 4: How can the GHNF help to encourage coordinated procurement (e.g. by stimulating standardisation, cost saving through volume, reducing costs for tendering in the supply chain and building stronger pipeline certainty)?

Summary of responses: There were 19 responses to this question.

Over half of respondents (12) flagged the need for a procurement platform and other measures. Respondents identified that better coordination of procurement could remove procurement bottlenecks, mitigate barriers to bidding, provide suppliers with economies of scale and speed up delivery of projects.

Other respondents suggested areas which could better support the supply chain, such as addressing tender costs, incentivising network connections, and guaranteeing funding through scheme parameters as opposed to using competition.

Respondents also flagged that standardisation of products and documents could aid procurement.

Pipeline development was also cited as an area of focus, with one respondent viewing the industry as already involved in cost reduction and standardisation, with government intervention in this area having the potential to negatively impact the market. The respondent suggested a clearly defined criteria for funding with a focus on fairness of access for both technologies types and applicants (with a weighted criterion to favour lower carbon networks), which in turn could stimulate the pipeline.

Call for evidence question 4	Response	Percentage
Blank	25	57%
Procurement framework	6	14%
Other	6	14%
Standardisation	5	11%
Pipeline development	2	5%

Table 69

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 5: How can GHNF encourage continuous improvement of project design, construction and operation and ensure learnings are shared?

Summary of responses: There were 23 responses to this question.

Most respondents (12) flagged communication as an area of focus for the GHNF. One respondent flagged CHPQA (Combined Heat and Power Quality Assurance Programme) seminars and webinars as a useful model of engagement for the GHNF to emulate, citing their value to industry.

Specifically, while recognising commercial sensitivities, various respondents argued that the GHNF should share learnings via case studies/knowledge sharing, including:

- As a condition of funding, successful applicants should be required to make specific information publicly available such as the technology used, data on decarbonisation achieved etc.
- Giving case studies to applicants for initial feasibility studies.
- Establishing good practice case studies from each round of projects, that are published to support subsequent applicants.
- Workshops/seminars on new technologies either infrastructure based or generation technologies.
- BEIS engaging with and sharing research and learnings from organisations such as the Energy Systems Catapult and the International Energy Agency District Heating and Cooling hub.

Other respondents offered a variety of suggestions such as the GHNF examining lessons learnt from the impact of the Renewable Obligation and Non-Domestic RHI, funding party verification of CP1 checklists and designing heat networks/retrofitting buildings to adopt low temperature heat to maximise the benefits of heat pumps.

Other respondents focused on standardisation and performance monitoring as important areas of focus for the GHNF. Respondents suggested the GHNF should standardise heat network contracts, encourage 'smart as standard' e.g. high frequency metering, and mandate performance monitoring as a condition of funding through publishing network flow and return temperature and flow rates at 15 minute intervals.

Call for evidence question 5	Response	Percentage
Blank	21	48%
Communication	12	27%
Other	6	14%
Standardisation	3	7%
Performance monitoring	2	5%

Table 70

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best

practice can be shared ensuring a competitive bidding process, will feature in these workshops.

In reference to respondents' suggestions that we learn lessons from schemes such as the RO and RHI, we have engaged with both stakeholders and fellow BEIS colleagues across a number of schemes (RO, RHI, HNIP, HNDU, ECO) to understand the impact of these programmes and to reflect suggestions into our scheme design where possible. We plan to further discuss feedback on these schemes and examples of international schemes given in the call for evidence with stakeholders.

Call for evidence Question 6: How can GHNF target increased capability and capacity, offering to deliver lasting value to the UK?

Summary of responses: There were 19 responses to this question.

Most respondents (15) offered a range of suggestions on how the GHNF can target increased capability and capacity:

- Targeting R&D/Innovation
- Addressing interconnections to force the use of existing heat.
- Commissioning engineers who are experts in this subject to identify suitable projects for the pipeline
- Training/knowledge sharing with industry
- Funding 3rd party verification of CP1 checklist
- Developing a heat Sector Deal and supporting the creation of a National Centre for the Decarbonisation of Heat proposed by various organisations such as the University of Birmingham and the Energy Systems Catapult.

Respondents also suggested that the GHNF should support a central pool of graduates/apprentices to second onto successful projects or support local skills programmes.

Finally, respondents also suggested the GHNF could reduce project costs through standardisation of documents.

Call for evidence question 6	Response	Percentage
Blank	25	57%
Other	15	34%
Training/skills	2	5%
Standardisation	2	5%

Table 71

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 7: How can we ensure there are lasting market benefits from the GHNF, looking at supply chain capability and capacity as well as socio-economic benefits?

Summary of responses: There were 20 responses to this question.

Most respondents (14) offered a range of suggestions on how the GHNF can ensure there are lasting market benefits:

- Commissioning engineers who are experts in this subject to identify suitable projects for the pipeline.
- The GHNF should allow innovation and not be too prescriptive about what a 'good scheme' should look like prior to launch.
- Place conditions on supply chain with targets for areas such as gender and ethnic diversity and apprenticeships.
- Support solar thermal/ground source heat pumps with the carbon reductions/economic benefits that these technologies offer.

Other respondents flagged the importance of training and skills to support the industry and the need for long-term financial/policy support for low carbon heat networks.

Call for evidence question 7	Response	Percentage
Blank	24	55%
Other	14	32%
Training/skills	4	9%
Long term funding	2	5%

Table 72

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 8: How can the GHNF add value and bring about lasting supply chain benefits and a sustainable market?

Summary of responses: There were 13 responses to this question.

There were a wide range of responses without any major themes emerging, although, three respondents thought the GHNF could add value and bring about lasting supply chain benefits by ensuring high quality projects and two respondents thought this could be achieved through long term government funding.

Further suggestions included:

- Better communications with potential users and suppliers;
- Increasing access to jobs and skills development;
- Having a weighted cost benefit analysis which favours low carbon projects
- Being technology agnostic and allowing the most suitable technology for each project to be funded;
- Providing certainty and continuity over the medium to long term;
- Ensuring the HNIP pipeline is maintained.

Call for evidence Question 8	Response	Percentage
Blank	31	70%
Ensuring high quality projects	3	7%
Providing, long term government funding	2	5%
Other	8	18%

Table 73

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Call for evidence Question 9: What complementary activities alongside GHNF do you think would help to develop a sustainable heat network market in the UK?

Summary of responses: There were 27 responses to this question.

There were a wide range of responses without any major themes emerging, although, three respondents supported training, promotion and events, and four respondents thought changes to the planning system would support a sustainable heat network market in the UK. Comments from stakeholders included:

- Training and promotion, events for developers and a series of BEIS workshops;
- Extending statutory undertakers powers to heat networks and permitted development rights;
- Treating heat networks as critical infrastructure;
- Clear strategic vision through the Heat and Buildings Strategy and a comprehensive policy and regulatory framework.

Call for evidence Question 9	Response	Percentage
Blank	17	39%
Training and promotion	3	7%
Changes to planning system	4	9%
Other	20	45%

Table 74

Government response

Our response to consultation questions 47-51 details our views on the supply chain commitment proposed for the GHNF. Our response to consultation question 50 details our proposal to produce revised SOMS guidance.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from

stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Financial drivers

Call for evidence Question 10: Can you provide evidence for or against the observations made with regards to anchor load buildings', be they public or private sector, and willingness to pay more for low or zero-carbon heat relative to a fossil fuel alternative?

Summary of responses: There were 21 responses to this question.

There was a difference of opinion, with six respondents saying there is no evidence that customers are willing to pay more for their heat and four respondents saying that customers are willing to pay more for their heat. Other contributions included the following points:

- Anchor load buildings key to developing a business case for HNs, as they de-risk investment;
- Decarbonising industrial, or large businesses, which can act as anchor load buildings are an essential part of the Net Zero transition for heat;
- Building Regulation changes through the Future Homes Standards will help to drive deployment of LZC heat.

Call for evidence Question 10	Response	Percentage
Blank	23	52%
Customers not willing to pay more for LZC heat	6	14%
Customers willing to pay more for LZC heat	4	9%
Other	11	25%

Table 75

Government response

These responses have improved our understanding of the demand for low carbon heat. We consider that among the private and public sectors, there is considerable demand for low carbon heat. We are keen to discuss further with stakeholders how awareness and demand for low carbon heat among domestic consumers can be increased. This topic will form one of many planned for future discussions with stakeholders.

Call for evidence Question 11: Can you provide high-level information on the size and scale of your heat network (i.e. generation capacity, buildings connected, and distribution network length) and define what proportion of capex goes on i) generation ii) distribution and in a fossil fuel and LZC example (or scenario if you don't have LZC assets)?

Summary of responses: There were 14 responses to this question.

Respondents provided examples of a wide variety of projects from small communal systems to larger £30 million projects, that included heat pumps with interseasonal storage, low temperature networks using heat from data centres and networks utilising heat from minewater and rivers.

Call for evidence Question 11a - Can you provide the same on iii) operating revenues and expenditure, including fuel pricing and foregone revenues, in a fossil fuel and LZC example?

Summary of responses: There were 4 responses to this question.

The main point raised by respondents was that the main operational issue is competing with the price of natural gas.

Call for evidence Question 11	Response	Percentage
Blank	14	32%
Comment only	30	68%
Call for evidence Question 11a	**Response**	**Percentage**
Blank	40	91%
Comment only	4	9%

Table 76

Government response

Responses will feed into our knowledge of heat networks, their sources of thermal energy and consumer profiles. These responses will complement project and pipeline data from HNDU, HNIP and the GHNF pipeline questionnaire.

Call for evidence Question 12: To what degree do new networks which have secured funding (e.g. from subsidy) for generation still need other investment in infrastructure and distribution?

Summary of responses: There were 14 responses to this question.

The majority of respondents (6) thought that infrastructure requires the greatest amount of investment, while others thought distribution within buildings, new emitters, controls, thermal stores and potentially building fabric also require other investment.

Call for evidence Question 12	Response	Percentage
Blank	30	68%
Infrastructure requires greatest amount of funding	6	14%
Other	8	18%

Table 77

Government response

Evidently, there are a range of costs that new and retrofitted heat networks will incur; please see our responses to consultation questions 6 and 7 on the scope of support for heat networks accessing sources of thermal energy.

Call for evidence Question 13: If an existing network replaces CHP with a low or zero-carbon alternative, what additional cost does that create in terms of the distribution network?

Summary of responses: There were 21 responses to this question.

The majority of respondents (10) thought that the impact of cost will depend on operating temperatures and three respondents thought that the cost impacts would be insignificant. Other contributions included the following points:

- The more the storage the more flexible the network;
- Depends on the size and location of the energy centre and the need for additional flues.
-

Call for evidence Question 13	Response	Percentage
Blank	23	52%
Dependant on temperature	10	23%
Nothing significant	3	7%
Other	8	18%

Table 78

Government response

Evidently, there are a range of costs that new and retrofitted heat networks will incur; please see our responses to consultation questions 6 and 7 on the scope of support for heat networks accessing sources of thermal energy.

Call for evidence Question 14: What do you consider to be the key factors driving heat network capital costs and to what extent could the GHNF in part help to bring these down?

Summary of responses: There were 22 responses to this question.

The majority of respondents (9) thought the key factors driving heat network capital costs include the expense of installing new pipes in built up areas. Other contributions included the following points:

- Need to encourage innovation and help to develop economies of scale within the supply chain;
- A key consideration is location, particularly proximity of heat suppliers to customers;
- Accessing renewable sources such as geothermal, open source water or wastewater.

Call for evidence Question 14	Response	Percentage
Blank	22	48
Capital costs of installing new Pipes	9	19
Other	15	33

Table 79

Government response

Evidently, there are a range of costs that new and retrofitted heat networks will incur; please see our responses to consultation questions 6 and 7 on the scope of support for heat networks accessing sources of thermal energy.

We will be using stakeholder workshops to discuss and refine various aspects of scheme design as well as discussing feedback received from stakeholders on how the supply chain can be stimulated. The useful suggestions we have received from stakeholders, such as supply chain specific events where knowledge and best practice can be shared and ensuring a competitive bidding process, will feature in these workshops.

Call for evidence question 15: Can you provide evidence on input electricity costs (for electrically driven heat networks) and the extent to which these can be reduced? i.e. the cost (p/kWh) itself and ‘smart’ optimisation: bulk purchasing (aggregation across a

portfolio), PPAs (including virtual and sleeving), thermal & battery storage, time of day tariffs, demand side response, load shifting etc.

Summary of responses: The majority of respondents (11) highlighted various technologies and financial products/ structures that could reduce costs, such as:

- demand-side storage (e.g., battery and thermal storage)
- PPAs (Power Purchase Agreements)
- seasonal and day/night tariffs.

Some respondents highlighted the forthcoming TCR (Targeted Charging Review) costs as potentially changing the level of cost savings from demand-side initiatives. Between these respondents.

Additionally, there were differing views on the utility of different technologies in reducing costs compared to others: For example, one respondent saw tariffs as more useful and financially viable than battery storage, unless the operator is using a CHP and a PPA to provide power.

Finally, respondents highlighted the use of CHP to reduce input costs.

Call for evidence question 15	Response	Percentage
Blank	31	70%
Various measures	11	25%
CHP	2	5%

Table 80

Government response

The diversity of responses to this question has fed into our thinking on the behaviours and project features the Innovation and energy efficiency metric should look to assess (see consultation question 55). In our response to question 55, we set out that we aim to publish guidance on the types of *evidence* we would look to assess, rather than the project features we would consider to represent innovation and energy efficiency.

Call for evidence Question 16: Can you provide evidence, e.g. in the form of examples, that, if a more competitive and tailored electricity purchasing framework were available to heat networks, projects would be able to access this without compromising existing commercial arrangements?

Summary of responses: Respondents generally focused on the benefits of having such a framework and the barriers to achieving this. However, the following examples were provided:

- CfD or similar

- London South Bank university
- IDNO framework

Call for evidence question 16	Response	Percentage
Blank	34	77%
Various	10	23%

Table 81

Government response

Responses to this question have supported our evidence base on the role of electricity supply in relevant heat networks commercial operations, and the appetite for such a framework.

Call for evidence Question 17: Can you provide any evidence that previous capital funding - e.g. in the form of capital grants from other funding streams - was sufficient to enable heat networks to decarbonise? What challenges, if any, were found?

Summary of responses: Most respondents (6) offered a nuanced view, viewing capital funding as sufficient but citing funding rules and the upfront resource required to prepare an application for capital funding as challenging.

In terms of specific examples, respondents cited green investment banks and ADEME (French Environment and Energy Management Agency) as sources of capital funding.

The remaining respondents viewed capital grants alone as insufficient to enable decarbonisation, with a strong emphasis placed on the RHI alone as being more suitable or capital funding needing to be combined with the RHI.

Call for evidence question 17	Response	Percentage
Blank	34	77%
Yes	6	14%
Capital grants not sufficient	4	9%

Table 82

Government response

We will be publishing a range of scheme guidance to ensure the application process is as seamless and transparent as possible, with a view to reducing the

time applicants need to spend to understand and prepare for applying to the GHNF.

We also plan to further discuss with stakeholders examples of international schemes.

Call for evidence Question 18-What additional financial incentives do you believe can be accessed by networks using low or zero-carbon generating technologies e.g. demand side response, access to regional funds, levy avoidance, etc.

Summary of responses: Respondents (10) gave examples of a range of financial incentives, spanning ones that can currently be accessed as well as ideas on incentives that could benefit low/zero-carbon networks:

- Access to demand-side response and flexibility markets in general.
- Access to regional funds.
- A levy on gas.
- Decreased VAT for the final consumers if the network reaches a target of renewable shares.
- Zero-rated emissions in the Capacity Market for EfW and CHP participants.

Finally, the remaining responses focused on additional Government support (financial and non-financial) for low or zero-carbon heat networks and what this should look like.

Call for evidence question 18	Response	Percentage
Blank	29	66%
Various	10	23%
Other	5	11%

Table 83

Government response

The diversity of responses to this question has fed into our thinking on the behaviours and project features the Innovation and energy efficiency metric should look to assess (see consultation question 55). In our response to question 55, we set out that we aim to publish guidance on the types of *evidence* we would look to assess, rather than the project features we would consider to represent innovation and energy efficiency.

Several suggestions outside of the remit of the GHNF (such as access to regional funds) have improved our understanding of the various initiatives that could benefit the heat network industry.

Technology options

Call for evidence Question 19- Of the low-carbon technology options covered, are there any which you think will play a particularly significant role in heat network decarbonisation i.e. be used more predominantly than others?

Summary of responses: A range of technologies were suggested, with respondents focusing both on technologies which *could* play a significant role and technologies which *should* play a significant role but perhaps won't dominate the technology mix of heat networks.

The majority of respondents (20) viewed heat pumps (particularly ground-source and water-source) and heat recovery as playing a significant role in heat network decarbonisation.

5 respondents did not focus on specific technologies, with several highlighting the technology neutrality of heat networks and that location and context should determine the technology used in heat networks.

Call for evidence question 19	Response	Percentage
Blank	16	36%
Heat pumps	10	23%
Heat recovery (including EfW)	10	23%
Other	5	11%
Biomass	2	5%
Deep geothermal	1	2%

Table 84

Government response

We agree that the means of generating thermal energy used in heat networks should vary according to the location and context of the heat network. However, the diversity of technologies suggested demonstrates that our principles-based approach to the technologies in scope of the GHNF (see pages 24-28 of the consultation) is the right approach to take.

Our responses to consultation questions 11-12, 14 and 17 cover our decisions on the eligibility of gas CHP, bio and syngas and biomass.

Call for evidence Question 20: Are there any other low-carbon sources of heat or technology options that could be used by heat networks which we have not covered?

Summary of responses: There were 21 responses to this question.

The majority of respondents (10) suggested that we should include the technologies that were identified in the call for evidence, as being suitable for GHNF within our non-exhaustive list, such as mine water, marine data centres, heat pumps.

Several respondents also highlighted the efficiency benefits of thermal storage including long term thermal storage (heat stored in soil and pit storage).

Some respondents suggested innovative use of existing technologies such as micro heat networks for terraced houses, air source heat pumps mounted on roof tops, water flow restriction/regulation technologies and converting current fossil fuelled systems to hydrogen and biogas.

While other respondents thought that our approach to technologies should not be prescriptive, to avoid excluding new/innovative technologies. One respondent commented that the list seems comprehensive and practical.

Call for evidence Question 20	Response	Percentage
Blank	23	48
Support for technologies already identified as suitable	10	21
Thermal storage	7	15
Innovative use of existing technologies	4	10

Table 85

Government response

We agree that the means of generating thermal energy used in heat networks should vary according to the location and context of the heat network in question.

Our principles-based approach to the technologies in scope of the GHNF (see pages 24-28 of the consultation) is broadly non-prescriptive, with the exception of gas CHP, bio and syngas and biomass (please see our responses to questions 11-12, 14 and 17).

Call for evidence Question 21- Are there any advantages or disadvantages associated with these technologies, e.g. cost, availability or ease of deployment?

Summary of responses: The bulk of responses (11) covered a variety of technologies:

- Building on earlier responses, several respondents highlighted that the right technology is required for the right network, reflective of commercial and other factors.

- All technologies will share challenges with having skillsets for installation, maintenance and other aspects of heat network development and operation.

- One respondent listed several technologies and the advantages and disadvantages of each, for example bioenergy as one of the lowest cost decarbonisation options available (on a per kw basis), with another respondent citing stringent standards as a barrier to uptake.

The remaining responses focused on specific technologies:

- Heat pumps: High initial costs for ground and water-source heat pumps, but zero carbon intensity and very low energy costs.

- Long-term heat storage via pit storage and boreholes: Allow heat to be stored in summer and consumed in winter with high efficiency rates. Additional benefits can be gained when combined with short-term heat storage.

- Hydrogen: One respondent viewed hydrogen as having significant drawbacks but did not detail their answer further.

- Ambient/shared-ground loops: Improved efficiency when used for both heating and cooling. Higher costs with distributed network assets can occur but the benefits outweigh the drawbacks.

Call for evidence question 21	Response	Percentage
Blank	22	50%
General	13	30%
Heat pumps	5	11%
Long term heat storage	2	5%
Hydrogen	1	2%
Ambient/Shared ground loop	1	2%

Table 86

Government response

We agree that the means of generating thermal energy used in heat networks should vary according to the location and context of the heat network in question. However, the diversity of technologies suggested demonstrates that our principles based approach to the technologies in scope of the GHNF (see pages 24-28 of the consultation) is the right approach to take.

Our responses to consultation questions 11-12, 14 and 17 cover our decisions on the eligibility of gas CHP, bio and syngas and biomass.

Call for evidence Question 22-What are the key drivers that will lead heat networks to transition to low-carbon heating technologies? Can you provide any evidence to support this?

Summary of responses: There were 25 responses to this question.

Over half of respondents (18) offered a range of views on the key drivers that will lead heat networks to transition to low-carbon heating technologies:

- Carbon taxation/gas levy
- Government subsidy
- Climate change.
- Performance monitoring leading to an improvement in standards.
- Consumer requirements for new connections or the ambition to demonstrate low carbon operations, delivered through building regulations and operational carbon reporting. This point came with the caveat that most existing networks are under 15 years old and existing generation technology is still operational. These networks are unlikely to be able to support the level of investment required to switch to low-carbon technologies.
- Correct design, knowing the usage requirements of off-takers and acceptance of mixed technologies. The respondent suggested an approach which they believed could be cost effective across a range of heat networks, including: improving fabric efficiency, operating efficiency (e.g. temperature), introducing solar thermal and adding heat pumps to a gas boiler which could have cost effective applicability across a greater range of heat networks as below:

While emphasising the issue of cost of gas and other fossil fuels, other respondents also highlighted the importance of zoning with the obligation to connect that zoning mandates as a key driver.

An equal number of respondents also highted a national renewable heat target and changes to building regulations for new build properties, incentives for retrofit and clear local and national planning policy as drivers.

Call for evidence question 22	Response	Percentage
Blank	19	43%
Government incentives and legislation	9	20%
Other	9	20%

Call for evidence question 22	Response	Percentage
Zoning	3	7%
National renewable heat target	2	5%
Building and planning regulations	2	5%

Table 87

Government response

Several suggestions outside of the remit of the GHNF (such as access to regional funds) have improved our understanding of the various initiatives that could benefit the heat network industry, and have helped to inform our work on future regulation and zoning policy.

Call for evidence Question 23- Can you provide evidence as to the wider environmental impacts of these technologies e.g. in terms of trees felled, release of methane, use of refrigerants etc?

Summary of responses: There were 10 responses to this question.

The majority of respondents (3) focused on the impact of heat pumps, with two respondents highlighting the reduced global warming potential of CO_2 and water source heat pumps. One respondent citing a 2014 DECC report, argued that there are no significant environment impacts from refrigerants.

Respondents also highlighted the importance of sustainable biomass with associated stringent emissions standards to the environment and deployment of renewable heat. Additionally respondents highlighted the low life-cycle carbon emissions of solar thermal.

Finally, respondents:

- Highlighted that deep geothermal developed from hydrothermal resources has no negative impact.
- Habitat loss due to construction of energy centres and pipe runs.
- Clear Skies Grant and Planning Policy Statement 22 supporting the growth of low carbon heating.

Call for evidence question 23	Response	Percentage
Blank	34	77%
Heat pumps	3	7%

Call for evidence question 23	Response	Percentage
Biomass	2	5%
Solar thermal	2	5%
Geothermal	1	2%
Habitat loss	1	2%
Planning policy	1	2%

Table 88

Government response

We consider that existing planning policy and our proposed approach for appraising CO2e (see pages 49-51) in the consultation are sufficient to ensure environmental impacts are mitigated and if this is not possible, are proportionate to the low carbon benefits of the heat network being developed.

Consumer protection and pricing

Call for evidence Question 24- How do you derive your prices for consumers? We are particularly interested in how you derive a connection charge, and fixed and variable prices. If you use a counterfactual, what is it?

Summary of responses: There were 14 responses to this question, spanning various means of deriving prices for consumers:

- Gas counterfactual common
- Fixed and variable prices benchmarked against gas (e.g. Heat Trust comparator). Connection charge is then balancing figure to make the project viable.
- Fixed charges tend to match whole life costs of heat (repair and maintenance and gas standing charges). Connection charges aim to be cost equivalent to gas connections, and avoided gas plant (e.g. boilers, flues).
- Prices derive from the connection charge and focus on the capital expenditure that otherwise would have been required to provide heat, tariffs (fixed and variable) based on the operational costs of generating the heat. Counterfactuals are used, but these vary by project and the local nature of what would otherwise have been the alternative solution.

- In terms of charges, we benchmark the cost to consumers of being connected to a heat network using the Heat Trust calculator, with costs to the consumer typically 10% lower than the equivalent "single system" cost, for the same consumption.

Call for evidence question 24	Response	Percentage
Blank	30	68%
Various	14	32%

Table 89

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 25- Does your counterfactual differ geographically and/or e.g. between type of load, new-build and existing properties, etc.? If so, how?

Summary of responses: There were 9 responses to this question.

The majority of respondents (5) highlighted that their counterfactuals did not differ according to variables.

Of those respondents that used different counterfactuals, these were based on the type of building and geographic location, the cost of local alternatives and wider aims, e.g. decarbonisation.

One respondent highlighted that for solar thermal supply, the counterfactual is based on the £/MWh delivered.

Call for evidence question 25	Response	Percentage
Blank	35	80%
No	5	11%
Yes-building and location specific	3	7%
Yes-£/MWh delivered	1	2%

Table 90

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 26- Does your pricing structure distinguish between different types of customer and the range of benefits they receive? If so, how? **-**

Summary of responses: There were 6 responses to this question.

The majority of respondents (3) distinguished between commercial and residential consumers:

- One respondent stated that residential pricing varies predominantly based on the number of beds in the property as an estimate of size. The pricing structure of commercial properties is more bespoke and based on m2 size of properties as well as specific heat exchanger sizing and estimated load/demand.
- Another respondent will propose to charge industrial users for cooling services as part of an ambient loop system. The higher value of this service and the CoP of the heat pumps will in turn subsidise residential consumers. For both categories of customer, the aim will be to ensure that neither are paying more than the counterfactual they are currently using.

Other respondents used variable pricing structures, based on £/MWh for solar thermal and social housing providers paying the connection fee on behalf of tenants, reducing debt risk, and allowing tenants to receive a lower rate.

Call for evidence question 26	Response	Percentage
Blank	38	86%
Yes-commercial and residential	3	7%
Yes-£/MWh delivered	1	2%
Yes-social housing providers	1	2%
No	1	2%

Table 91

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 27-Are there barriers to agreeing a pricing structure with different consumer types? If so, please describe them.

Summary of responses: There were 4 responses to this question.

The majority of respondents (3) highlighted barriers:

- Demand for a gas counterfactual.
- High fixed charges.
- Connection costs.
- Limited consumer knowledge of more complex tariff structures such as peak load, time of day use and flow rate charging and the improvements to system efficiency they can offer.
- Being able to guarantee availability and temperature of heat.
- Potentially State Aid when setting prices for commercial customers.
- One respondent suggested having one connection agreement for all types of customer, with variable pricing structures, to reduce cost and barriers.

Call for evidence question 27	Response	Percentage
Blank	40	91%
Yes	3	7%
No	1	2%

Table 92

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 28-Do your business models currently take account of consumer detriment? If so, how?

Summary of responses: There were 5 responses to this question, with differing interpretations of 'consumer detriment', with some focusing on consumer standards and support and others on pricing:

- One respondent aims to ensure no consumer is worse off, through price matching or discounts.
- Another also looks to ensure that no consumer is worse off.
- One respondent is working on consumer protection standards.
- One stakeholder ensures support for consumers and provides redress. They also argued for standardisation of consumer protection standards in line with other utility sectors.

- Finally, one respondent stated that taking account of consumer detriment was not necessary, as for shared ground loop systems, electricity is purchased on the competitive market, with the built-in consumer safeguards that come with this.

Call for evidence question 28	Response	Percentage
Blank	39	89%
No	5	11%

Table 93

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 29-Are you able to provide evidence that customers are creating demand for low-carbon heat?

Summary of responses: There were 13 responses to this question.

The majority of respondents (6) argued that:

- Two respondents argued that consumers perceive “heat” as being heat with cost being a major driver.
- Similarly, to the points made above on cost, a respondent argued that demand exists where there is a financial benefit in using low-carbon heat.
- One respondent argued that there is low awareness of the need to decarbonise heat and what this could look like.
- Two respondents argued for legislation to create a low carbon heat standard, with one stakeholder arguing that this legislation should mandate take-up of low carbon heat.

Respondents also flagged commercial and local authority targets as creating demand.

Finally, in contrast to the points above made on low demand/awareness of low carbon heat, a respondent cited take up of green gas energy tariffs and demand for the Green Homes Grant as evidence of a market existing.

Call for evidence question 29	Response	Percentage
Blank	31	70%
No	6	14%
Yes-Commercial	4	9%

Yes-Public sector	2	5%
Yes-Domestic	1	2%

Table 94

Government response

These responses have improved our understanding of the demand for low carbon heat. We consider that among the private and public sectors, there is considerable demand for low carbon heat. We are keen to discuss further with stakeholders how awareness and demand for low carbon heat among domestic consumers can be increased. This topic will form one of many planned for future discussions with stakeholders.

Call for evidence Question 30: Can you provide an example of heat as a service, the role that heat quality plays and how this is then presented against a counterfactual?

Summary of responses: There were 4 responses to this question.

The majority of respondents (3) thought that 'heat as service' modelling should measure the hourly heat demand, hourly energy delivery, along with flows and the temperatures involved.

Call for evidence Question 30	Response	Percentage
Blank	40	91%
Other	4	9%

Table 95

Government response

Responses to this question has fed into our thinking on the behaviours and project features the Innovation and energy efficiency metric should look to assess (see consultation question 55). In our response to question 55, we set out that we aim to publish guidance on the types of evidence we would look to assess, rather than the project features we would consider to represent innovation and energy efficiency.

Responses to this question have also fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Call for evidence Question 31: Can you summarise any evidence that moving to low-carbon heat generation has had an impact on consumer standards for heat networks e.g. has it affected their performance against Heat Trust standards?

Summary of responses: There were 7 responses to this question.

The majority of respondents (4) commented on the counterfactual, other contributions included the following points:

- Building fabric improvements should be allowed to be incorporated to the overall system cost.
- The counterfactual should be linked at least to the outgoing supply ie if direct electric, then that should be the counterfactual.
- There is a perception that heat pumps don't heat a house as effectively as conventional boilers.

Call for evidence Question 31	**Response**	**Percentage**
Blank	37	84%
No	4	9%
Other	3	7%

Table 96

Government response

Responses to this question have fed into our decisions on how consumer pricing and detriment should be assessed in the scheme design (please see our responses to consultation questions 31-37).

Barriers and misaligned incentives

Call for evidence Question 32: Can you provide evidence on the following (we are specifically looking to operators of larger gas CHP existing networks for this information)?

Call for evidence Question 32		
Call for evidence Question 32a	**Response**	**Percentage**
Blank	37	
Comment only	7	
Call for evidence Question 32b	**Response**	**Percentage**
Blank	38	86%
Comment only	6	14%

Call for evidence Question 32		
Call for evidence Question 32c	**Response**	**Percentage**
Blank	36	82%
Comment only	8	18%
Call for evidence Question 32d	**Response**	**Percentage**
Blank	37	84%
Comment only	7	16%
Call for evidence Question 32e	**Response**	**Percentage**
Blank	34	77%
Comment only	10	23%
Call for evidence Question 32f	**Response**	**Percentage**
Blank	39	89%
Comment only	5	11%

Table 97

Call for evidence Question 32a-Whether the contractual length and scope of existing heat network operational arrangements (concession or otherwise) incentivise or inhibit the longer-term decisions decarbonise and expand heat networks?

Summary of responses: There were seven responses to this question.

The majority of respondents (6) thought that the current long-term contracts for heat mean that there is no incentive to decarbonise.

Call for evidence Question 32b- Whether the scope of existing heat network operational arrangements (concession or otherwise) limit the ability to access third-party heat (i.e. recovered or industrial heat)?

Summary of responses: There were six responses to this question.

The majority of respondents (4) thought that the scope of existing heat network operational arrangements do limit the ability to access third-party heat. Comments included:

- Some contracts have operational spec which wouldn't allow for this;
- Yes, scope of heat network operational arrangements does limit this;
- Often recovered industrial heat or EfW heat is perceived to be more ‘risky’.

Call for evidence Question 32c- Whether reliance on private wire revenues inhibits a network's ability to decarbonise and/or locks in a particular type of heat generation (i.e. other CHP technologies)?

Summary of responses: There were eight responses to this question.

The majority of respondents (4) thought that reliance on private wire revenues would inhibit a network's ability to decarbonise and conversely, three respondents thought the use of private wire and the associated savings could support large-scale low carbon heat networks.

Call for evidence Question 32d- Whether secondary or tertiary upgrades will be required to enable lower carbon forms of heat and the indicative cost of these upgrades?

Summary of responses: There were seven responses to this question.

All the respondents (7) thought that secondary and tertiary upgrades would be required to enable lower carbon forms of heat to operate effectively, particularly to accommodate the lower temperatures of these networks.

Call for evidence Question 32e- Are tariffs pegged to the price of gas? If so, is there scope to legitimately peg them to low or zero-carbon generation in future?

Summary of responses: There were 10 responses to this question.

The majority of respondents (7) said that tariffs are pegged to the price of gas, and changing them would require renegotiating contractual agreements, although, two respondents said they are interested to explore linking prices to low or zero-carbon generation in the future.

Call for evidence Question 32f- Whether grid re-enforcement costs are an opportunity or barrier to the decarbonisation of networks at a project level, and the indicative cost of these upgrades? Is this considered a 'cost' due to reinforcement or a 'revenue' due to avoided costs of reinforcement under an electrification of heat pathway?

Summary of responses: There were five responses to this question.

Generally, respondents thought that grid reinforcement costs are a barrier to decarbonisation, although, one respondent though it could be viewed as an opportunity for flexibility and grid management.

Government response

These responses have fed into our decisions on the design of the GHNF, specifically with regards to consultation questions 6&7 (cost of accessing heat) and questions 31-37 (approach to consumer pricing).

Call for evidence Question 33: Can you provide us more information on distinguishable differences (both opportunities and challenges) which arise from constructing new low carbon heat networks, as opposed to decarbonising existing heat networks?

Summary of responses: There were 13 responses to this question.

The majority of respondents commented on system temperature and customer base, seven respondents thought that decarbonising existing networks poses particular challenges where network temperatures need to be reduced, and four respondents thought existing networks already have an established customer base which de-risks the demand.

Call for evidence Question 33	Response	Percentage
Blank	31	70%
System temperature	7	16%
Customer base	4	9%
Other comments	2	5%

Table 98

Government response

These responses have improved our understanding of the opportunities and risks both new and existing networks face; please see our response to questions 22-24 on how we will approach the treatment of new and existing networks in the scheme design.

Call for evidence Question 34: What other factors do you believe act as barriers to heat network decarbonisation?

Summary of responses: There were 20 responses to this question.

The majority of respondents (8) thought that the cheap cost of gas (the counterfactual) was the main barrier to heat decarbonisation, closely followed by the lack of support when the RHI closes (6).

Contributions included the following points:

- Lack of skilled heat pump designers and installers.
- Lack of certainty on grant funding and policy landscape.
- Lack of skilled workforce including planners/designers.

Summary of responses:

Call for evidence Question 34	Response	Percentage
Blank	24	49%
Cheap cost of gas	8	17%
Lack of support post RHI	6	13%
Other comments	10	21%

Table 99

Government response

The above themes have been consistently raised across both the consultation and call for evidence; we plan to discuss these further with stakeholders. With respect to upskilling the sector, please see our responses to consultation questions 47-51.

Call for evidence Question 35: Which are the most prominent barriers?

Summary of responses: There were 24 responses to this question.

The majority of respondents (8) thought that the low price of gas was the most prominent barrier, closely followed by the lack of support for industrial heat decarbonisation once the Non-Domestic RHI finishes (7).

Other contributions included the following points:

- Cost of counterfactual and future of carbon pricing.
- Capital and operational costs of installing and operating low carbon generation technologies.
- Lack of funding support for heat network pipework infrastructure (the network itself).
- The lack of knowledge and skills in the market.

Call for evidence Question 35	Response	Percentage
Blank	24	55%
Low price of gas	8	19%
Lack of support once RHI Closes	7	16%
Other comments	5	10%

Table 100

Government response

The above themes have been consistently raised across both the consultation and call for evidence; we plan to discuss these further with stakeholders. With respect to upskilling the sector, please see our responses to consultation questions 47-51.

With respect to operational costs and tariff counterfactuals, please see our responses to consultation questions 6&7 (cost of accessing heat) and questions 31-37 (approach to consumer pricing) respectively.

Call for evidence Question 36: Can you provide examples of what you believe are misaligned incentives that act against heat network decarbonisation?

Summary of responses: There were 22 responses to this question.

The theme of higher taxes on electricity compared to gas (8) continued in the responses to this question, the theme of the closure of the RHI and lack of support for heat networks also continued in these responses, SAP was also raised as an issue (4), particularly the way it deals with expanding heat networks.

Call for evidence Question 36	Response	Percentage
Blank	22	50%
Low price of gas	8	18%
SAP does not deal well with expanding heat networks	4	9%
Other comments	10	23%

Table 101

Government response

The above themes have been consistently raised across both the consultation and call for evidence; we plan to discuss these further with stakeholders.

Call for evidence Question 37: Which of these barriers do you believe would not be addressed by a funding intervention?

Summary of responses: There were 14 responses to this question.

The disparity between the price of gas compared to electricity was raised again in the responses (6) to this question.

Other contributions included:

- Market signals for high carbon solutions.

- Correct implementation of schemes and ongoing successful operation are often overlooked once commissioned.

Call for evidence Question 37	Response	Percentage
Blank	14	32%
Disparity between gas and electricity pricing	6	14%
SAP issues	2	5%
Other	22	50%

Table 102

Government response

The above themes have been consistently raised across both the consultation and call for evidence; we plan to discuss these further with stakeholders.

Call for evidence Question 38-Do you have any examples of either a) barriers or b) misaligned incentives that could be impeding producers of waste heat from utilising it for the provision of low or zero-carbon heating?

Summary of responses: There were 17 responses to this question, without specific reference to barriers or incentives:

- There is currently an unregulated market for buying and selling heat.
- Lack of focus on heat networks; waste heat producers focus on other opportunities.
- Sources of waste heat cannot necessarily be relied upon to be present for the lifetime of a heat network. This has the potential to create a risk premium which ultimately feeds through to the end consumer.
- Relatively low revenues from heat sales.
- The RHI has made it very difficult to utilise waste heat or encourage its use.

Call for evidence question 38	Response	Percentage
Blank	27	61%
Comment only	17	29%

Table 103

Government response

These responses have enhanced our understanding of waste heat and its utilisation in heat networks; we plan to discuss these further with waste heat producers and prospective users.

Call for evidence Question 39- Can any of the barriers that are not addressed by funding, be addressed outside of the fund by accompanying/supporting activity? If so, can you suggest how?

Summary of responses: there were 15 responses to this question.

There were a wide range of suggestions of how barriers could be addressed outside of the GHNF without a consensus, although, the majority of respondents raised issues related to waste heat, a range of the suggestions put forward are given below.

- A regulated heat market for buyers, sellers and network operators.
- Fair business rate treatment.
- Sources of waste heat and direct renewable heat production without air pollution should be "considered first".
- Obligation to connect and supply wasted heat where viable.
- Create a waste heat incentive to help optimise its use.

Call for evidence Question 39	Response	Percentage
Blank	26	59%
Yes	3	7%
Comment only	15	34%

Table 104

Government response

These responses have enhanced our understanding of waste heat and its utilisation in heat networks; we plan to discuss these further with waste heat producers and prospective users.

Scheme best practice

Call for evidence Question 40-What funding schemes do you believe have worked well in the past? Are there any lessons learned from them that should be adopted for GHNF? These can be any schemes – not just ones run by the government or specifically related to energy/heat.

Summary of responses: There were 18 responses to this question.

- **CfD:** The supply chain measures proposed in the Contracts for Difference, provided complexity is minimised, could be used for the GHNF. The CfD provided clear market signals and certainty for businesses, supporting investment and reduced costs.

- **Other-**The French government' Fond Chaleur (Heat Fund) which subsidised capex costs for the production of renewable heat and did not limit the size of projects, facilitating economies of scale.

- **RHI**-Respondents expressed support for the RHI tariff mechanism, with one respondent flagging that the Energy Company Obligation when combined with the Non-domestic RHI worked well for fuel poverty retrofit applications for Registered Social Landlords, but viewed the forthcoming closure of the Non-domestic RHI and COVID-19 adversely impacting this market.

- **ECO**- Further support was expressed for the ECO, citing its potential value when combined with other grants such as the Green Homes Grant to stimulate uptake and reduce cost equal to or below conventional heat sources. Another respondent cited the value of energy efficiency schemes in Scotland being combined with ECO funding, and a similar system in England could be of value in allowing the retrofit of homes for connection to lower-carbon heat networks.

- **Community Energy Program/HNIP Pilot-** The Community Energy Program had a simpler, more transparent application process, which fed back to the applicant how their application would be perceived by the granting authority. Stakeholders received useful support when engaging with administrators in the HNIP Pilot.

- **HNDU-** Their guidance and undertaking of initial feasibility studies into developing heat networks has been useful; local authorities have been held up in lengthy and expensive procurement/feasibility studies, which has affected the HNIP pipeline.

- **HNIP-** HNIP has been useful, given the substantial costs in heat networks, but support is needed to address R&D/training costs and network costs.

- **None-** One respondent did not view any funding scheme as having a positive effect on the heat network and cited the RHI scheme as a very ineffective intervention.

Call for evidence Question 40	Response	Percentage
Blank	26	59%
CfD	4	9%
Other	3	7%

Call for evidence Question 40	Response	Percentage
RHI	3	7%
ECO	2	5%
Community Energy Program/HNIP Pilot	2	5%
HNDU	2	5%
HNIP	1	2%
None	1	2%

Table 105

Government response

In reference to respondents' suggestions that we learn lessons from schemes such as the RO and RHI, we have engaged with both stakeholders and BEIS colleagues across a number of schemes (RO, RHI, HNIP, HNDU, ECO) to understand the impact of these programmes and reflect suggestions into our scheme design where possible. We plan to further discuss with stakeholders feedback on these schemes and examples of international schemes given in the call for evidence.

Call for evidence Question 41- What criteria do you feel eligibility and scoring should be predominantly based upon?

Summary of responses: There were 19 responses to this question.

The majority of respondents (8) suggested carbon savings/ £ per tCO2e saved should be the criteria.

Call for evidence Question 41	Response	Percentage
Blank	27	61%
Carbon savings/£ per tCO2e saved	8	18%
Heat price competitiveness	3	7%
In-use performance	2	5%
Energy efficiency	2	5%
Land use efficiency	2	5%

Table 106

Government response

These responses have fed into our considerations on the GHNF' eligibility criteria and scoring; please see our responses to consultation questions 42-44, 46 and 52-56.

Call for evidence Question 42- What lessons could be learned from HNIP and what changes do you feel should be implemented in the design of the GHNF to reflect these lessons learned?

Summary of responses: There were 12 responses to this question.

The majority of respondents focused on lessons learnt from the HNIP application process:

- The GHNF should have a clear, transparent application process and eligibility criteria, including sharing the FEAM model.
- With reference to EfW applications, clarity on what the generator needs to do to facilitate supply to a heat network.
- The GHNF should not fund any biomass or CHP, or any type of heat recovery from electricity generation.
- A value based approach to funding with separate categories (e.g. larger schemes £3m-30m and smaller schemes £300k-£3m), to allow smaller projects to compete under a streamlined, speedier application process.

A respondent also highlighted that there should be larger grant sizes, and these should be available for up to 100% funding.

Finally, another respondent argued there should be rolling or very frequent bidding rounds, to enable projects to submit bids in line with own development timetable. They also suggested being able to use GHNF funds to fund any element of the heat network.

Call for evidence question 42	Response	Percentage
Blank	32	73%
Application process	10	23%
Grant funding	1	2%
Bid round frequency	1	2%

Table 107

Government response

We will be publishing a range of scheme guidance to ensure the application process is as seamless and transparent as possible, with a view to reducing the time applicants need to spend to understand and prepare for applying to the GHNF.

Project pipeline development

Call for evidence Question 43: What does the industry need to ensure an effective pipeline for 2022?

Summary of responses: There were 17 responses to this question.

Suggestions included:

- Early clarity on the criteria for funding.
- A clear timetable for launch of the Fund.
- Business rates relief/ no business rates for heat networks.
- The RHI should be continued.

Call for evidence question 43	Response	Percentage
Blank	27	61
Comment only	17	39

Table 108

Government response

We will be publishing timelines on the launch of the Fund in addition to detailed and transparent scheme guidance well in advance of April 2022, to give prospective applicants as much certainty and clarity as possible.

Call for evidence Question 44-What worked well from HNIP and HNDU and what areas could be improved?

Summary of responses: There were 9 responses to this question.

Respondents highlighted several areas where HNIP and HNDU had worked well and others where improvements could be made for the GHNF:

- State Aid rules for public sector bodies should be clarified.
- One stakeholder viewed HNIP as arduous, but felt the scheme generally looks at the right areas. They felt that HNDU does good educational and matchmaking work.
- HNIP was effective at funding large projects, however there are a great number of smaller projects that were not supported that the GHNF could help.
- The fact that those programmes work across all elements (generation, heat sources, storage and pipework) of the heat network allows them to support integrated and holistic projects.

Call for evidence question 44	Response	Percentage
Blank	35	80%
Comment only	9	20%

Table 109

Government response

Following discussions with stakeholders and HNIP/HNDU colleagues, we have reflected on stakeholders' experiences of these initiatives and have adjusted our scheme design where possible to take these views into account. We plan to discuss these experiences further with stakeholders.

Call for evidence Question 45: How can we ensure continuity and a smooth transition between the two schemes.

Summary of responses: There were 8 responses to this question; the majority of respondents wanted to see a smooth transition between HNIP and GHNF with some also including NDRHI in their arguments. One respondent thought a better view of how the Government sees the role of heat networks in decarbonisation pathways, is needed along with a better view of long-term plans for heat networks funding and policy.

Call for evidence Question 45	Response	Percentage
Blank	16	67
Smooth transition	5	21
Role of heat networks in decarbonisation pathways	1	4
Comment only	2	8

Table 110

Government response

Please see our response to consultation questions 1-5 on ensuring continuity between HNIP and the GHNF.

This publication is available from: www.gov.uk/government/consultations/heat-network-metering-and-billing-regulations-2014-proposed-amendments

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