

Full Business Case for Green Heat Network Fund GHNf

APPROVAL HISTORY

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Purpose

The original Full Business Case for the Green Heat Network Fund obtained approval for a budget of £288m. This updated FBC covers formal approval for additional funding, as anticipated through upcoming £6bn energy efficiency allocations. It also seeks approval to deliver this funding by extending the existing delivery contract with the incumbent supplier.

[Note: The outcome of this business case was that the budget for the Green Heat Network Fund was allocated an additional £485m, as set out in an announcement published on 18 December 2023:

<https://www.gov.uk/government/news/families-business-and-industry-to-get-energy-efficiency-support>]

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1. Executive Summary

The **Green Heat Network Fund (GHNH)** launched in March 2022 supports the crucial role of heat networks in achieving the UK's net-zero emissions target. With over 14,000 existing heat networks serving 480,000 consumers, decarbonising these existing heat networks and building new low-carbon ones is pivotal, as the Climate Change Committee recommends increasing their share of UK heat from ~3% to ~20% by 2050. Heat Networks offer a cost-effective means of delivering low-carbon heat while fostering local regeneration.

To fulfil this mission, GHNH provides capital grant funding to support heat networks in adopting low and zero-carbon heat technologies. GHNH is part of the **Heat Networks Transformation Programme (HNTP)**.

In March 2023, HM Treasury (HMT) agreed to a further allocation of £220m to the HNTP, which included the GHNH. This was publicly announced as part of the Powering Up Britain publications.

Based on the strength of the pipeline, the successful delivery of GHNH to date, and its strategic importance of the GHNH to delivering our ambitions on growing heat network markets and successful implementation of Heat Network Zoning (HNZ), we are seeking agreement from HMT to further increase the value of the fund and extend it into a sixth year (27/28). This bid forms part of the process to agree forward allocations of the £6bn additional investment for energy efficiency and clean heat that has been committed between 2025-28 and is expected to conclude at the Autumn Statement.

This revised FBC has been developed now so that approval to these recommendations can be sought ahead of the Autumn Statement. This means that, if additional CDEL allocations are agreed, we can rapidly conclude contract variation negotiations with our delivery partner. In turn, this means that the GHNH Investment Committee (IC) will be able to continue approving projects, thus securing private sector investment and enabling individual projects in the pipeline to move into delivery.

1.1 Approval sought

The original GHNH FBC secured approval for a budget of £288m. This updated FBC covers formal approval for further potential spend to be confirmed at the Autumn Statement.

Specifically, this business case seeks approval to:

- Formally commit an additional £220m of CDEL funding, as previously agreed by HMT and announced in March 2023, over years 4 and 5 of the scheme;
- Formally commit up to an additional £265m of CDEL funding over years 4, 5 and 6 of the scheme, subject to the outcome of the £6bn allocations process expected to conclude at the Autumn Statement.
- Deliver this funding by extending the delivery contract with the incumbent supplier.

The commercial case sets out details of our commercial options assessment.

1.2 Lessons learnt from previous projects.

The original GHNH scheme design drew on lessons learnt from other projects, including learning from the predecessor Heat Network Investment Project (HNIP). GHNH has built on HNIP's track record of deploying grants and loans to heat network projects, leveraged its strong pipeline of applicants, and adopted, and (where required) refined its tested tools and process. HNIP's final gateway review (Gate 5) closed the project with a green Delivery Confidence Assessment RAG rating. GHNH's simplified application form can be completed by non-engineers, allowing self-assessment of whether applicants meet GHNH eligibility criteria (without requiring an Expression of Interest stage as under HNIP). Data management was improved by building a digital solution for a near real-time transfer of project-level data from the delivery partner to the Department.

Since its launch, GHNH has taken a continuous improvement approach to delivery, with regular reviews to ensure that lessons learned from each application round and from the ongoing independent evaluation are

integrated into scheme operations, processes and tools and considered in quarterly reviews of GHNf scheme design. For example, the evaluation found that scrutiny by GHNf assessors and the IC has increased the credibility of successful projects with investors. This finding has supported our engagement with the UK Infrastructure Bank (UKIB). As a result, the delivery partner now introduces projects that are eligible for UKIB investment to the bank prior to them applying to the GHNf, which enables the bank to consider offering the project a loan that is conditional on a GHNf award. This drives down the % of overall project costs funded by DESNZ.

Another example was an update to GHNf eligibility criteria ahead of Round 6 opening to applicants, when heat network projects that connect to primarily to newbuild residential developments were excluded from eligibility for GHNf funding. GHNf no longer supports projects that cannot demonstrate carbon savings against the counterfactual¹ or bring other significant strategic benefits. This ensures additionality of GHNf investment.

Scheme rules are also reviewed based on feedback from potential applicants and changes to the supporting legislative and political landscape; for example, this has led to adding requirements for projects to be ready for HNz regulations.

GHNf benefit targets have been revised based on what has been learned about the heat network market and GHNf projects and applicants. For example, the assumed length of time it takes to fully build a heat network was doubled based on recent analysis of the latest evidence from GHNf projects.

1.3 Preferred Option

This Business Case seeks approval to increase the value of the GHNf CDEL budget and to extend the length of the period when GHNf funding is made available to projects for drawdown by three years until the end of Financial Year (FY) 2027-28 (year 6 of the scheme). This proposal has been assessed alongside a 'do nothing' counterfactual option.

The cost benefit analysis (CBA) shows the preferred option (funding the GHNf budget increase by £485m) provides good value for money with a Net Present Social Value (NPSV) of £1,286m and a Social Benefit-Cost Ratio of 2.1. Additionally, the economic case forecasts carbon savings of 11.5 MtCO₂e over the appraisal period (equivalent to £1,901m in monetary terms) as well as delivering air quality and fuel saving benefits, with estimated total monetised benefits of £2,424m. We also propose updating GHNf benefits and benefit targets to reflect updated assumptions about the heat network market and take account of evidence from GHNf projects to date; details are in the Economic Case, including comparison against an alternative £220m funding option.

1.4 Commercial Issues

This Commercial Case recommends an extension to the existing Delivery Partner contract as the preferred way of administering additional CDEL funding.

1.5 Financial Issues

The Finance Case sets out the previous Capital and Resource Departmental Expenditure Limit (CDEL, RDEL) allocations for GHNf and asks for approval for additional CDEL funding alongside an extension of the scheme to 2027/28. The Finance Case also includes estimates of consequential increases to RDEL budgets that would be required in future years should the proposed additional CDEL be agreed. These costs are directly linked to the proposed increase in capital budgets. It also outlines the budget and grant management mechanisms and the approach to mitigating financial risks and asks for their approval.

1.6 Management Issues

The Management Case outlines the framework that sets out the key elements of GHNf project management and governance. This section delves deeper into the methodologies that have been put in place to highlight

¹Where the proposed heat network is supporting new build developments impacted by the 2025 Future Homes and Future Buildings Standards GHNf assessors test the project for additionality against an air source heat pump counterfactual.

areas where proactive management can lead to successful outcomes. The tools put in place include approach to benefits monitoring, risk management and governance structure for the GHNF, as well as the high-level approach to communications and stakeholder engagement. This section also explains how we propose to update scheme benefits to better reflect updated assumptions and more accurately reflect policy objectives. We are seeking approval for the overall approach described to achieve the schemes objectives and deliver sustainable benefits to stakeholders.

1.7 High-level Milestones

Table 1. GHNF high-level milestones

Milestone	Date
FBC approved by PIC	5/10/23
FBC approved by HMT (TAP)	19/10/23
First post-approval (Round 6) Investment Committee held	04/12/2023
Round 7 Investment Committee held	01/05/2024
First post-approval funding round (Round 8) opened	26/02/2024
Proposed date for scheme closing to new applications	March 2025

2. Strategic Case

2.1 Strategic Assessment

2.1.1 Background

Heat accounts for around a third of UK carbon emissions and almost half of the UK's energy usage. To meet the UK's Net Zero 2050 target and deliver future carbon budgets, it is necessary to decarbonise almost all heat. Heat networks are a crucial aspect of all heat decarbonisation pathways and offer a great UK investment opportunity. They present the most cost-effective low-carbon heating solution in areas of dense demand, such as urban centres and business parks, and are pivotal in decarbonising heat. As investment in building low-carbon heat networks and improving the efficiency of existing networks generate significant positive externalities through carbon savings, private investment is below the socially optimum level. GHNF grant funding delivers significant social value and carbon savings by leveraging external investment in low-carbon heat network projects offering high social returns, that would not otherwise be funded.

2.1.2 Current position

GHNF offers capital grant funding to both existing and new heat networks to utilise low and zero-carbon heat generation technologies. It is a critical component of the HNTP, a collection of complementary heat network projects which aim to grow and transform the heat network market.

To date, the GHNF IC has selected 39 projects for investment through its first five application rounds. The additional CDEL budget requested is projected to deliver further carbon savings – see section **2.2.1 Justification** for details.

The strategic aim of creating a low-carbon heat network market is reflected in GHNF design: to address market barriers limiting the development and decarbonisation of new and existing heat networks. The barriers mapping aligns with Theory of Change principles which illustrate how grant funding can increase consumer confidence and understanding, reduce risk for investors, and increase the capability and capacity of the supply chain, with the final result being the decarbonisation of existing heat sources, and better access to low cost, low-carbon heat.

Key market barriers include:

- **Funding gaps (and unattractive internal rate of return)** where most low-carbon heat network projects do not meet current hurdle rates for equity investors due to the high initial cost of infrastructure installation, causing them to opt for alternative heating system options, usually within each building and not part of a heat network.
- **Low-carbon technologies struggle to compete with the high-carbon counterfactual** - Low-carbon heat technologies are currently uncompetitive with gas on both cost and investor confidence.

A short list of intervention options to address these barriers are discussed in the Economic Case. Furthermore, GHNF indirectly impacts connection and demand risk and under-developed supply chains. It also works towards addressing key heat network market failures, primarily: greenhouse gas emissions (GHG) externalities, uncertainties for investors that markets are not able to price efficiently, and policy uncertainty. By overcoming these barriers, GHNF prepares the sector for planned low-carbon regulations and the introduction of HNZ policy.

The strong pipeline of current and future applications means that only applicants that maximise their project's potential secure GHNF investment. Applicants must pass a series of minimum gated metrics built into the application form/process containing multiple criteria - the final scores (incorporating a Deliverability assessment) of the applications are then assessed against one another. Projects that pass the gated metrics criteria and deliverability assessment get recommended to the IC for decision ensuring that only projects that

reflect the strategic aims of GHNF and deliver value for money for the taxpayer are selected for investment. Further information on scheme design can be found as part of the online GHNF Application Guidance².

Government support for the heat network sector will continue to be needed after GHNF as the new HNZ policy is being designed to increase confidence of connection and reduce capital costs but will not address all the market barriers to heat network development, additional information for this is provided in **Section 2.2.2**.

2.2 Rationale for Intervention

2.2.1 Justification

The Climate Change Committee set out the clear need for support to the heat network sector, identifying that to achieve the least-cost pathway for Net Zero, heat networks play a crucial role and require **£5.5bn of HMG spend through to 2030** (leveraging in £12bn of external investment)³.

<Content redacted due to for commercial sensitivity>⁴. To maximise investment from non-GHNF sources, guidance in future rounds will require applicants to investigate non-GHNF finance from lenders including the UKIB, Public Works Loan Board (PWLB) and BEIS Heat Investment Vehicle (BHIVE) investors when making an application. For further details on third-party funding see **Section 5.2.4**.

GHNF supports progress towards 18-20% of the UK's heat demand being met from heat networks by 2050, equivalent to 80TWh/year of low-carbon heat^{5,6}. The original GHNF FBC was estimated to contribute 1.81TWh/year towards this target. The new CDEL request of £485m is estimated to contribute a further 1.9TWh/year towards 18-20% deployment levels.

2.2.2 Strategic Fit (Departmental)

Table 2. Priority outcomes

Primary priority outcome this proposal contributes to	Ensure the UK is on track to meet its legally binding Net Zero commitments, support economic growth and deliver energy security by increasing the amount of heat deployed via low cost, low-carbon heat networks.
Secondary priority outcome this proposal contributes to	Ensure security of energy supply this winter, next winter and in the longer-term – bringing down energy bills and reducing inflation.

The **HNTF** under which GHNF sits represents a step change in the heat network ambition and brings together projects that jointly deliver increased volumes of low-carbon heat, new, regulated and more efficient heat networks, investment and job growth in heat network manufacturing and technology.

To accelerate delivery in the next phase of HNTF, GHNF will work alongside the HNZ legislation, including a package of measures that will strategically work together to enable **HNZ** which identifies locations that are the lowest cost low carbon heat solution and provides additional rights and powers to heat network developers reducing connection risk, to deliver heat networks faster, at greater scale, and with more private finance. Other related policies include the **Future Homes Standard** – which, when introduced in 2025, will require new build homes to be future proofed with low-carbon heating and very high fabric standards.

Another key interdependency consideration for GHNF is energy security and resilience. An increase in the number of connections to low-carbon heat networks will have a positive impact on energy security and resilience in the UK by:

- Reducing consumer reliance on the gas grid for heating, and deployment in some rural areas could also displace the use of oil for heating.

² <https://www.gov.uk/government/publications/green-heat-network-fund-ghnf>

³ Committee on Climate Change (2021), Policies for the Sixth Carbon Budget and Net Zero. <https://www.theccc.org.uk/wp-content/uploads/2020/12/Policies-for-the-Sixth-Carbon-Budget-and-Net-Zero.pdf>

⁴ <Redacted due to commercial sensitivity.>

⁵ Committee on Climate Change (2021), Policies for the Sixth Carbon Budget and Net Zero.

⁶ DESNZ (2021). Opportunity areas for district heating networks in the UK. National Comprehensive Assessment of the potential for efficient heating and cooling. OGL. September.

- Providing greater affordability to consumers where commercial tariffs tend to be lower than domestic and through thermal storage use flexible tariffs to the benefit of the end user.
- Offering diversity in energy supply (heating and cooling) since heat networks can utilise low-carbon energy sources.
- Helping energy consumers to transition away from fossil fuels and their attendant price fluctuations and availability issues.

Our market intelligence suggests that the impact of recent gas price surges on heat network operators has been minimal.

2.2.3 Wider Government Priorities

Government must work with industry to help deliver **the 2050 Net Zero target**, including the 78% target for Carbon Budget 6. GHNF contributes towards the plans and targets by delivering 11.5 MtCO₂e of carbon savings by 2050, which is projected to establish 8,800 direct, and 2,200 indirect green jobs in the UK. The CDEL request of £485m is estimated to deliver 7.38 MtCO₂e to 2050⁷ and lead to additional 12,141 direct and 2,992 indirect jobs, mostly in construction and heat network operation. See Economic Case for details.

The UK's path to meeting Net Zero emissions by 2050, is being delivered using clear strategies, including the Energy White Paper⁸, and Heat and Buildings⁹ and Net Zero¹⁰ strategies, which all make key commitments to the role of heat networks in improving the energy performance of buildings and homes, putting in place a strategy for transforming energy, supporting green recovery and **creating a fair deal for consumers**. GHNF assessment criteria require that there is no customer detriment. Further to this, reducing emissions from heating could **improve air quality**, a key opportunity highlighted in the **Clean Growth Strategy**¹¹.

The “Build Back Better: our plan for growth” sets out HMG ambition to support economic growth through investment in infrastructure, skills and innovation. Whilst GHNF is a demand led scheme, GHNF-supported projects are well spread across England. As such, GHNF benefits are being realised across England and support **HMG's work on Levelling Up**.

2.2.4 Strengthening the UK Union

Heat networks are a devolved matter. Following initial engagement, Scotland, Northern Ireland, and Wales decided to utilise the funding in a more bespoke way to reflect their unique needs and opportunities, as such the scope of GHNF covers England only.

2.3 Aims and outcomes

2.3.1 Scope

The key scope items of GHNF are:

- GHNF applies in England only. See **Section 2.2.4** for details.
- Both new and existing heat networks with higher carbon generation and all types of project sponsor (public, private and third sector) are eligible to apply for scheme support.
- GHNF supports the generation and agreed elements of heat network infrastructure including distribution network costs.
- It is separate to any other future low-carbon heat funding support and does not overlap with the Industrial Energy Transformation Fund for industrial waste heat utilisation.

⁷ Carbon savings (MtCO₂e) are 7.38 to 2050 and 11.46 to 2062 (final year of the 40 year appraisal period).

⁸ BEIS (2020), The Energy White Paper. Powering our Net Zero Future.

⁹ BEIS (2021), Heat and Building Strategy.

¹⁰ BEIS, (2021), Net Zero Strategy: Build Back Greener.

¹¹ BEIS (2017), The Clean Growth Strategy.

2.3.2 Objectives

The overarching aims of GHNF are to:

- **Achieve carbon savings and decreases in carbon intensity of heat supplied** (SMART: GHNF is expected to deliver an estimated 10.4MtCO₂ carbon savings by 2050¹² for Net Zero¹³).
- **Increase the total amount of low-carbon heat use in heat networks** (SMART: GHNF is expected to deploy an estimated 1.81TWh of low-carbon heat per year by 2030¹⁴).
- **Contribute towards market transformations across the investment landscape and supply chain that will better prepare the heat network sector for further decarbonisation** (SMART: GHNF is one component of HNTF and will focus on contributing towards market transformations by increasing investment leveraged in the market for further deployment of low-carbon heat networks. GHNF will aim to achieve an average of 55%+ external funding leveraged¹⁵ by scheme closure, however the minimum tolerance threshold for achieving this objective is 50% external funding leveraged).

GHNF applicants must provide a statement in which they set out their Market Transformation Commitments (MTCs).

Benefits being sought

GHNF primary benefits of GHNF are set out in Table 3. Secondary benefits which GHNF may contribute to have also been identified. These are monitored where possible to better understand GHNF's impact, but they are not key success measures for the project. The number of GHNF primary benefits has been reduced from five to four, with Benefit 4 (Increased use of recovered heat in heat networks funded via GHNF) being re-classified as a secondary benefit. The rationale for this change, approvals given and sought, and impacts being monitored are set out in Section 6.6.

¹² This shows potential heat delivery from installed capacities and connections by 2050. Project complexity means construction times are unique and variable and may impact deliverables achieved by this date.

¹³ This is a revised SMART objective for GHNF Objective 1 approved by the HNTF Board on 28/06/2022.

¹⁴ This shows potential heat delivery from installed capacities and connections by 2030. Project complexity means construction times are unique and variable and may impact deliverables achieved by this date.

¹⁵ This only refers to estimated external funding mobilised for project capital expenditure, which covers most project costs. External covers public and private sector funding raised externally to match GHNF grant funding.

Table 3. Primary Benefits from funding an increase to the GHNH budget

Benefit ID	Benefit name	Project Objective (SMART)	Departmental PVF Priority Outcome	Benefit type	Target Performance Unit	Lifetime Target Lower Range	Lifetime Target Upper Range	Benefits Realization Period	Appraisal Metric used in the VfM assessment	Key Performance Indicator, used in the M&E plan for data collection
GHNH B1	An increased volume of thermal energy supplied through low-carbon sources	Increase total amount of low-carbon heat utilisation in HNs	Net Zero by 2050	Energy Generation	TWh/Yr	0.99	1.88	Post Construction	Volume of thermal energy supplied from low-carbon sources via GHNH projects (TWh/yr). 1.88TWh per year once all work is complete.	Volume of thermal energy supplied from low-carbon sources via GHNH projects (TWh/yr) 1.88TWh per year once all work is complete.
GHNH B2	Decreased carbon intensity of heat delivered by GHNH supported heat networks	Achieve carbon savings & decrease in carbon intensity	Net Zero by 2050	Carbon	gCO ₂ /KWh	43	41	Post Construction	Carbon intensity of heat delivered by GHNH supported heat networks. 41 gCO ₂ /KWh	Carbon intensity of heat delivered by GHNH supported heat networks. 41 gCO ₂ /KWh Tracked on a grant by grant basis as well as an aggregate figure.
GHNH B3	Monetised carbon savings and air quality improvements	Achieve carbon savings & decrease in carbon intensity	Net Zero by 2050	Carbon	£m	1,274	2,301	Post Construction	Damage avoided benefit is monetised by applying Green Book carbon and air quality values to estimated carbon and fuel impacts. £1,942m in discounted terms over 40 year appraisal period, adjusted for additionality assumptions which subtract decarbonisation which is likely to have happened without GHNH.	Damage avoided benefit is tracked by applying Green Book carbon and air quality values to estimated carbon and fuel impacts. £2301m and £1,274m in discounted terms over appraisal period. This figure excludes the adjustment for additionality to make it trackable.
GHNH B4 [re-classified as a secondary benefit]	Increased use of recovered heat in heat networks funded via GHNH	Increase total amount of low-carbon heat utilisation in HNs	Net Zero by 2050	Energy Generation	TWh/yr	0.37	0.71	Post Construction	Thermal energy from recovered heat GHNH projects (TWh/yr)	Thermal energy from recovered heat GHNH projects (TWh/yr)
GHNH B5	Increased investment in the UK heat network market	Market readiness	Net Zero by 2050	Economic	% additional finance leveraged	50%	52%	Post Commercialisation	External funding leveraged (proportion of GHNH funding, private funding and other third-party funding to total CAPEX). 52% calculated in appraisal.	External funding leveraged (proportion of GHNH funding, private funding and other third-party funding to total CAPEX).

2.3.3 Inter-Dependencies, Assumptions & Constraints

Other funding schemes which may interface with GHNH have been identified, however, the success or continuation of these schemes are not critical to the success of GHNH. The most relevant examples are noted below.

Table 4. Examples of GHNH interdependencies

Scheme	Impact on GHNH	Engagement
BHIVE	Beneficial - crowds in external investment. Has a key role to play in securing the ongoing growth in low carbon heat networks.	Regular interaction as part of Heat Networks team
UKIB	Beneficial - offers loans to GHNH applicants and projects	Fortnightly calls with UKIB colleagues working on heat networks. UKIB also observe GHNH Investment Committee and engage with the Delivery Partner's relationship managers to introduce them to GHNH applicants /projects when requested.
Public Sector Decarbonisation Scheme (PSDS)	Beneficial - although PSDS does not have an impact on GHNH scheme design it can decarbonise some of the heat offtakes, meaning that co-funding different elements of a project may be possible.	Close working with PSDS team to leverage areas of mutual interest, identify any GHNH applications that propose to connect to heat off takers that have been decarbonised with support from PSDS, and also to mitigate the risk of double funding and compliance with Subsidy Control.

The GHNH team is regularly asked by other teams in DESNZ and elsewhere to share our experience of running GHNH, for example, GHNH shares experience with UKIB, members of which are observers to GHNH IC meetings.

The following constraints will apply to delivery of GHNH:

- **Funding allocation** – GHNH is dependent upon both the outcome of the HNTF mini-SR bid and the approvals outcomes of this FBC.
- **Timescales** – accounting rules and spend recognition can create difficult conditions for discharging funding within the confines of individual financial years. Project in-year spend is being closely monitored by the Delivery Partner and risks and issues are discussed with DESNZ at three levels: in fortnightly progress meetings, monthly Operations Board meetings, and ad-hoc when urgent.
- **Subsidy control** - subsidy of up to 50% of the total capital cost of a project has been agreed. A new assessment for the additional CDEL request is being prepared for consideration by the Competition and Markets Authority Subsidy Advice Unit.

2.4 Public Sector Equalities Duties

The Public Sector Equalities Duties (PSED) assessment of GHNH analysed existing evidence on the impact of heat networks on people with protected characteristics¹⁶ among the two main groups of GHNH beneficiaries: customers of heat networks and people employed in heat networks supply chains. The assessment results and recommendations were approved at FBC in 2022. The assessment concluded that people who are 65 years of age (and older) and people from BAME backgrounds are more likely to be connected to heat networks. The approach to impact monitoring is set out in Section 6.6.

2.5 High level potential risks

. Details on GHNH approach to risk management is set out in Section 6.7. GHNH had chosen to adopt the BEIS (previous department name) departmental risk appetite for the delivery of the GHNH objectives, recognising the need to ensure alignment with wider departmental delivery parameters. An exercise to plot risk scenarios against the BEIS Risk Appetite Statement (RAS) was undertaken prior to reaching the assertion that the risk appetite outlined in the BEIS RAS was applicable to the GHNH project. This now aligns with the updated DESNZ portfolio risk management framework.

¹⁶Protected characteristics considered by PSED are: age, disability, gender reassignment, marriage or civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation.



GHNF Key Risks

Key risks identified include limited capacity within the department's Intelligent Client Function (ICF) team, premature closure of the scheme due to full commitment of budget and lack of capacity within the supply chain to meet the scheme's needs. **Other risks were identified which are of a commercially sensitive nature and are therefore redacted.**

3. Economic Case (Options Appraisal)

3.1 Purpose

Heat networks provide the lowest cost, low-carbon heating option in many situations, by capturing or generating heat locally to provide for many homes and businesses communally. Heat networks will be integral to decarbonising heat, especially in a Net Zero world, with the Climate Change Committee forecasting that approximately one fifth of heat should be distributed through heat networks by 2050 to meet Net Zero. It is a government priority to take steps to grow and decarbonise the heat network sector, through increasing investor confidence to channel capital towards low-carbon heat network development.¹⁷

Heat networks currently account for ~3% of the wider heat market and have significant potential to grow. Early market growth came from mostly gas fuelled heat networks, as low-carbon heat networks face barriers in terms of attracting investment. Low-carbon heat networks are likely to deliver less return on investment than gas networks due to higher costs and provide fewer alternative revenue opportunities (such as combining gas-Combined Heat and Power (CHP) with thermal stores to balance electricity demand). They are also more likely to be perceived as higher risk investments due to the use of nascent technologies, which reduces investor confidence. With barriers to attracting investment and the market failure of mostly gas fuelled heat networks (Green House Gas emission externalities) the absence of government intervention means low-carbon heat network investment is likely to be below the socially optimum level.

GHNF projects are measured against strict application criteria,¹⁸ ensuring funding goes to projects with high social value and that would not otherwise be commercially viable. Shortfalls in commercial viability have been observed in project applications in previous funding rounds and grant funding has allowed these projects to go ahead. The extensive GHNF project pipeline shows there are many further prospective projects offering the opportunity for grant funding to leverage external funding and deliver high value for money and decarbonisation through low-carbon heat network projects. The intervention under consideration is therefore to increase the budget of GHNF to deliver these low-carbon heat network projects and realise the positive externalities of carbon emission reductions in the heat network market, whilst moving towards the socially optimal level of low-carbon heat network investment.

Although future schemes such as tradable carbon permits and price rebalancing mechanisms may mitigate some of the negative externalities of CO2 emissions, these are not available in the short term. Therefore, capital support and boosting investor confidence in low-carbon heat networks ensures we start tackling the negative externalities of low-carbon emissions in the heat network market today. In addition, increasing the budget of GHNF allows for the continuation of targeted support that ensures the decarbonisation benefits are realised now, that the sector continues to grow along a decarbonised pathway, and the sector can capitalise on future regulation such as Heat Network Zoning. Overall, increasing the GHNF budget would generate economic benefits which include delivering low-carbon heat and carbon savings in the short term, and in the longer term making low-carbon heat networks more cost-effective by enabling cost reductions, job creation, supply chain development and market expansion.

3.2 Long List and Critical Success Factors

The intervention under consideration is to increase the budget of an existing capital funding scheme. The options appraisal for the existing GHNF concluded that a scheme that would fund both existing and new build projects was the most likely to deliver the highest social value and achieve the policy objectives. This was based on a Multi Criteria Decision Analysis (MCDA) assessed using strategic fit, value for money, market development potential as Critical Success Factors, and achievability of six policy options (including a do nothing, regulation, and GHNF scenarios, that fund existing or new build projects only, and an option funding both).

We have carried this options appraisal forward and still consider its outcome valid – that the preferred option is to fund both existing and new build projects (achieved by increasing the budget of the existing GHNF scheme). Confidence in

¹⁷ DESNZ (2023) Heat Network Consumer Protection Consultation, <https://www.gov.uk/government/consultations/heat-networks-regulation-consumer-protection>

¹⁸ DESNZ (2023) Green Heat Network Fund <https://www.gov.uk/government/publications/green-heat-network-fund-ghnf>

this approach has been increased by the effectiveness of previous funding rounds and the cost effectiveness of utilising existing, successful approaches. Two options (excluding the counterfactual) are considered, the first being to fund the GHNf by an additional £485m, as requested through the £6bn allocations process. This was based on reviewing the GHNf project pipeline and estimating the level of good value project bids GHNf would receive. Given this request was within a wider HNTP funding envelope, this is deemed appropriate as the optimal level of funding required to achieve the intended scale to facilitate market growth whilst decarbonising heat and contributing towards Net Zero at the pace required. Secondly, a lower funding option of £220m has been appraised to ensure the allocation represents the best value for money option and is informed by a previous HMT announcement (Powering Up Britain). An option considering funding above £485m has not been included in the short list. The £485m allocation offered the best value for money option given consideration of HNTP projects.

Therefore, considering the previous options appraisal, we appraise 3 options.

1. Do nothing: Forms the analysis counterfactual
2. Option 1: Preferred option – Budget increase of £485m to GHNf CDEL over 2025-2028
3. Option 2: Budget increase of £220m to GHNf CDEL over 2025-2027 in line with HMT announcement in March 2023¹⁹

3.3 Short list of options

3.3.1 “Do nothing” counterfactual

“Do nothing” has been used as a counterfactual to see the net impact when calculating the NPSV and value for money. This option assumes that GHNf does not receive further funding, but the Future Homes Standard and HNZ policies continue to go ahead. This option does not make assumptions about unknown future decarbonisation policies though the level of additionality (the extent to which the results of the intervention would not have happened otherwise) is tested through sensitivity analysis.

3.3.2 Option 1: Preferred Option – additional GHNf CDEL funding of £485m

Funding this level of increase to the GHNf budget is the preferred option due to its ability to achieve the policy objectives (shown in the Strategic Case) and social value it delivers (Section 3.4). This intervention would continue to fund an existing capital scheme that has, to date, gone through five rounds of funding, and there is a substantial project pipeline offering high value for money (that would not go ahead under the “do nothing” option). The preferred option seeks to bridge the investment gap in the low-carbon heat network market by targeting projects with shortfalls in commercial viability. This will realise the positive externalities of carbon emission reductions and move towards the socially optimal level of investment in low-carbon heat networks.

3.3.3 Option 2 – additional GHNf CDEL funding of £220m

This funding level is significant enough to help maintain some market growth and investment momentum but would mean a significant number of high value for money, low-carbon heat network opportunities would go unfunded. This option demonstrates whether funding GHNf below that which has been requested through the £6bn allocations process could provide better value for money. This level of funding is in line with the March 2023 announcement by HMT and assumes that the full £220m allocated to HNTP is subsequently allocated to GHNf.

3.4 Quantitative Impacts Appraisal

To estimate the costs and benefits of increasing the GHNf budget, we have updated the existing Cost Benefit Analysis (CBA) model used for the original GHNf business case. In short, this CBA model estimates the low-carbon heat deployment possible, subject to a specified grant funding constraint with an assumed technology mix for a chosen balance of new and existing heat networks. It is worth noting that the heat deployment possible is calculated using a discounted cashflow model, meaning the CBA assumes the funding is targeting projects that would not otherwise be commercially viable. Previous assumptions have been updated in the analysis to reflect information from scheme delivery to date.

¹⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1148252/powering-up-britain-energy-security-plan.pdf

We then estimate the direct emissions of greenhouse gases in carbon equivalent terms, air quality impacts, as well as costs (capital, operational and opportunity forgone) and revenue. The equivalent calculation is conducted for the counterfactual to determine the NPSV by appraising the aggregated social costs and benefits of GHNf against the counterfactual's costs and benefits.

3.4.1 Key findings

Option 1: Preferred Option – additional GHNf CDEL funding of £485m

Funding the £485m increase to the GHNf budget has a NPSV of £1,286m, showing that the benefits of increasing the GHNf budget significantly outweigh the costs. Overall social benefit cost ratio (social BCR) including all costs and benefits is similar to that of the previous business case at 2.1²⁰. This means that for every £1 of overall cost we can expect £2.10 of benefit in present terms. Total discounted benefits are £2,424m and discounted costs are £1,138m. In terms of return on public spend, the public spend benefits to cost ratio (public spend BCR) is 2.6²¹, meaning for every £1 of grant funding spent we should expect £2.60 in net monetised discounted benefit, indicating this intervention is good value for public money. In the previous business case, the public spend BCR was significantly higher at 4.7, however we have improved the accuracy of our estimates through analysis of GHNf application data, a GHNf project pipeline, and additional learnings from HNIP. Another consideration results from an analysis of application data and showed that significantly more funding was allocated to new build projects (which has informed our funding split assumption for the CBA) rather than existing heat networks. New build projects typically have a lower public spend BCR (mostly due to higher costs), contributing to the overall reduction.²² New build projects also have additional unmonetised strategic benefits not reflected in the BCR, such as increasing low-carbon heat capacity to a greater degree. We are therefore confident that the public spend BCR of 2.6 is a reliable estimate and demonstrates the strong case for increasing the GHNf budget.

Option 2: additional GHNf CDEL funding of £220m

Funding GHNf at a lower level means a lower cost but also a lower level of external funding leveraged as some projects in the GHNf pipeline will not go ahead. This means analysis of the option shows lower value for money than Option 1, with a NPSV of £598.7. The social and public spend BCRs are 2.2 and 2.5 respectively. This represents lower value for money and a missed opportunity to realise decarbonisation benefits.

3.4.2 Summary of monetised benefits

The main benefits expected from Option 1 are the positive externalities of carbon savings. By increasing the level of investment in low-carbon heat networks, we realise these positive externalities, and move closer to the socially optimal level of low-carbon heat network investment. We also anticipate this intervention will produce fuel cost savings, heat generation operating expenditure savings and air quality improvements.

The preferred option targets 1.9 TWh of heat supplied annually through low-carbon heat networks displacing demand for high-carbon heat. We assume the heat demand remains the same but will be met with electricity-based technologies with typically higher generation efficiencies and lower running costs, such as heat pumps. This reduces the fuel demand associated with the heat demand and reduces the carbon emissions produced by burning fuel. This generates the benefits reported in Table 6.

²⁰ Overall BCR calculation: Present value of all benefits in appraisal period / Present value of all costs in appraisal period.

²¹ Public spend BCR calculation: NPSV / (CDEL + RDEL) * -1.

²² There are unmonetisable strategic and societal benefits to building new low-carbon heat networks and that are not reflected in the BCR.

Table 6. Monetised benefits of increasing the GHNF budget

£(m)	Option 1: £485m Net Impact	Option 2: £220m Net Impact
Fuel cost savings		
New heat networks	276.3	131.8
Existing heat networks	106.8	50.0
Heat generation technology running cost savings		
New heat networks	92.1	44.0
Existing heat networks	7.3	3.4
Carbon savings		
New build heat networks	889.9	422.8
Existing heat networks	1,010.6	474.3
Air quality improvements		
New build heat networks	19.2	9.0
Existing heat networks	22.0	10.4
Totals		
New build heat networks	1277.6	607.7
Existing heat networks	1146.7	538.2

Funding low-carbon heat networks generates significant fuel cost savings, for both existing and new build projects. This saving may not be fully passed on to consumers if suppliers recoup some upfront construction costs. GHNF applicants must provide information on their proposed tariffs, as well as a justification of tariff structure and comparison to the current tariff structure for existing schemes. In their application, applicants should also discuss the extent to which the tariff has or has not been explored with prospective /existing customers. The levelized tariff proposed in the application must be less than the counterfactual cost of low carbon heat. There are also significant heat generation technology running cost savings associated with this intervention, particularly for new build projects that mostly employ heat pumps or utilize energy from waste (EfW).

The majority of the monetised benefits are generated from the carbon emission savings (Table 7), monetised using the HMT Green Book carbon value series²³. Substantially fewer carbon emissions are emitted from the low-carbon heat generation technologies funded through GHNF than would have been emitted in the high-carbon, predominately gas boiler, counterfactual.

Table 7. Carbon emissions saved by funding low-carbon heat networks (traded vs non-traded)

Net greenhouse gas impacts, in MtCO ₂ equivalent					
	Carbon Budget 4 (2023-2027)	Carbon Budget 5 (2028-2032)	Carbon Budget 6 (2033-2037)	By 2050	Remaining appraisal period (2038-2062)
Option 1: Total	0.06	1.17	1.61	7.38	8.63
<i>Option 1: Traded</i>	0.04	0.45	0.48	2.29	2.38

²³ HMT Green Book (2023) <https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal>

Net greenhouse gas impacts, in MtCO ₂ equivalent					
	Carbon Budget 4 (2023-2027)	Carbon Budget 5 (2028-2032)	Carbon Budget 6 (2033-2037)	By 2050	Remaining appraisal period (2038-2062)
<i>Option 1: Non-traded</i>	0.02	0.72	1.14	5.09	6.25
Option 2: Total	0.03	0.58	0.75	3.49	4.04
<i>Option 2: Traded</i>	0.02	0.22	0.22	1.08	1.11
<i>Option 2: Non-traded</i>	0.01	0.36	0.53	2.41	2.93

3.4.2.1 Summary of monetised costs

The main costs of the preferred option are the grant funding provided and the external investment leveraged for GHNF projects. The majority of capital and operating costs will be provided by GHNF applicants, with CDEL grant funding only providing the difference required to make the projects commercially viable. Additionally, for the preferred option we estimate a cost of £138.5m from the electricity income forgone in the EfW business as a consequence of trading off electricity generation output to increase heat recovery. We also estimate a net cost of £140.7m associated with gas-CHP heat networks. Gas-CHP's also produce electricity, and thus in replacing them with low-carbon heat networks this electricity generation is lost and must be purchased, incurring a cost.

3.4.2.2 Grant funding

<Table showing the profile of expected grant funding redacted due to commercial sensitivities.>

3.4.2.3 Leveraged investment

Capital and operating costs required for GHNF projects beyond grant funding will be external investment provided by GHNF applicants. Approximately 52.2% of capital costs are expected to be funded by external investment, over the spending period to 2028.

<Table showing the GHNF budget increase leveraged external investment profile redacted due to commercial sensitivities>

3.5 Qualitative impacts appraisal

Non-monetised impacts will include benefits for energy security, levelling up, fuel poverty, and air quality. For brevity, this document only included the most impactful non-monetised benefits.

Table 10. Non-monetised impacts of increasing low-carbon heat network deployment.

Non-monetised impacts
Energy security - Low-carbon heat networks shift gas reliant, inefficient heat generation to high efficiency electricity powered heat generation. This increases energy security by reducing reliance on gas and mitigates sensitivity of heat prices to global shocks in fuel prices. The improved energy efficiency also reduces the likelihood of supply interruptions, because energy that is not used cannot be interrupted. ²⁴

²⁴ IEA (2019), *Multiple Benefits of Energy Efficiency*, IEA, Paris <https://www.iea.org/reports/multiple-benefits-of-energy-efficiency>, License: CC BY 4.0

Increasing the deployment of low-carbon heat networks will increase the demand on the electricity grid. Although this incurs a cost to reinforce grid capacity, the thermal stores of large heat networks could offer flexibility to provide demand response, smooth peak demands, and strengthen grid resilience, partially mitigating the impact. Though both Option 1 and 2 achieve this, Option 1 does so to a greater extent

Local impacts – GHNF covers England but is otherwise geographically agnostic. Increasing the GHNF budget is likely to continue bringing positive impacts to local areas, allowing low-carbon heat networks to enrich and support local decarbonisation strategies, and provide local populations more choices of low-carbon heat. We have estimated that the preferred option will lead to 12,141 direct and 2,992 indirect jobs, mostly in construction and heat network operation. The capital investment into local areas will stimulate economic growth, with positive gross value-added impact on local economies, and including spill-over impacts from project investments and increased local employment. This intervention will therefore bring benefits that contribute to wider HMG priorities such as Levelling Up and Build Back Better. Again, both Options 1 and 2 achieve this but Option 1 does so to a greater extent.

Health – The reduction emissions from low-carbon heat networks produces better air quality, which leads to improved health outcomes across society. Option 1 achieves this to a greater extent due to additional low carbon heat network roll out.

3.6 Risk and uncertainty appraisal

3.6.1 Key assumptions

Table 11. Key Assumptions Impact & Quality Ratings

<Some detailed assumptions derived from previous grant funding applications have been redacted due to commercial sensitivity.>

Funding and General Assumptions=	Quality Rating	Impact Rating	Risk Rating
The funding level (£485m over 3 years) acts as a hard budget constraint, interacting with the technology mix and cost profile to determine heat deployment. These came from Spending Review discussions. The alternative option 2 assumes (£220m over 2 years) £110m 25/26, £110m 26/27) based on HMT announcement earlier in the year.	High	High	Medium
The appraisal period is 40-years for social values and project cashflows (private values). This reflects the long lifetime of network assets and investor expectations of generating returns over the asset lifetime.	High	High	Medium
HMT's Green Book Supplementary Guidance - Fuel prices, carbon prices and air quality pollutant values from official sources.	High	High	Medium
HMT's Green Book Discount Rate – Discount rate of 3.5% applied to capture social time preference rate and wealth effect.	High	Medium	Low
Heat Deployment Assumptions			
A 70:30 split of funding to new and existing heat networks respectively is assumed. This reflects application data from previous rounds of GHNF funding and is adjusted to incorporate a scheme rule change that will impact the split.	Medium	Medium	Medium
The BAU counterfactual technology mix reflects predominantly gas-fired technologies derived from various published statistics (OPSS, ECUK, NEED, ND-NEED, BEES, MHCLG). Separate counterfactuals have been established for existing and new heat networks. HNDU data has also been used to incorporate a small portion of low-carbon heat networks into the counterfactual.	High	Medium	Medium

<p>The GHNf low-carbon technology mix reflects that most heat generation comes from heat pumps and waste heat recovery. Existing heat networks lean more towards heat pumps, whereas new heat networks are expected to recover more waste heat due to location flexibility. Whilst we expect some geothermal projects to apply for funding, we have excluded them from the technology mix due to insufficient reliable data on project costs and thermal capacity. This mix has been developed using the best available evidence to date, including GHNf application data, GHNf and project pipelines.</p>	Medium	High	High
Heat Network Cost and Performance Assumptions			
<p>Heat production cost and performance assumptions have been developed by HNDU engineers using HNIP data, techno-economic models, waste heat research and manufacturer data.</p>	Medium	High	High
<p>Distribution network costs and thermal losses, energy centre and thermal storage costs have been estimated from HNIP data. For existing networks, only 10% of these costs reflected by the expansion factor above is applied to capture expansion-only costs.</p>	Medium	High	High
<p>An optimism bias figure of 21% is applied to costs to mitigate risk of underestimation and uphold analytical consistency with other appraisals of clean heat policies.</p>	Medium	High	High

3.6.1.1 Sensitivity analysis

We have explored the sensitivity of monetised costs and benefits to variations in key inputs for the preferred option. We evaluated the impact of variation in heat network construction times and project costs, combined into a “project delivery” scenario, on the overall NPSV. Separately, we vary the split of new build and existing heat networks that receive funding and evaluate the impact on the NPSV. We also look at the impact of a greater funding level more generally. Finally, we conduct a break-even analysis on our additionality assumption, which accounts for the potential additionality risks GHNf may be exposed to.²⁵ The conclusion is that even under pessimistic assumptions, we still expect a positive SNPV therefore giving confidence that increasing the GHNf budget is good value for money.

²⁵ Additionality risk refers to the risk that some low-carbon heat network projects would get developed irrespective of GHNf support.

4. Commercial Case

4.1 Context and Requirements

Triple Point Investment Management LLP (TPIM LLP (GF-3)) were awarded the contract for a DP for GHNH on 3 March 2022 following a procurement exercise.

This case details how we will vary the existing contract to increase the scheme's fund value, contract price and duration. Any changes to RDEL are a direct result of increases to CDEL (fund value). No other changes are expected to service. This case details the procurement approach, options appraisal, preferred option, risk, and the contract management approach. A Delivery Model Assessment has not been carried out as this is a contract extension, instead an options appraisal has been done.

<Details of the commercial case have been redacted where they have been deemed to be commercially sensitive.>

The Commercial Case has been developed in accordance with relevant commercial and HM Government Policies (inc. HMT - Green Book, Managing Public Money, and the Sourcing Playbook).

4.1.1 Crown Commercial Service Advice

Crown Commercial Service (CCS) have advised that although RM6172 has now expired the contract can be extended.

4.2 Contract Management Strategy

4.2.1 Form of Contract

The GHNH Contract Order Start Date is 7 March 2023. It is governed by the call-off terms and order form as provided by CCS Grant Administration Services DPS (RM6172 - now expired but can use for existing contract).

4.2.2 Payment Model

The pricing and payment structure for the existing contract is outlined below and aligns with the stages of the delivery. The payment mechanism aims to incentivise the DP to deliver to time and quality at each stage of the contract, as well as to minimise the working capital costs to the DP of delivering the scheme.

Table 14. GHNH Pricing Model by Phase

Phase	Pricing	Payment
Implementation	Fixed	Two Milestone Payments following the Buyer's review and acceptance of the Milestone deliverables ⁶⁵ and the issue of a Satisfaction Certificate.
Funding Phase - Base Fee	Fixed	Base Fee, monthly fee (operating costs) payable over life of the contract for the service requirements, Application Period, Continuous Elements and Monitoring and Reporting. Any quality concerns will be flagged through Service Level Regime and Service Credits will be applied to monthly invoice as a deduction for the amount payable and appropriate.
Funding Phase - Deployment Fee	Volume Based	Paid in accordance with fund deployed each financial year (to incentivise the delivery partner to successfully deploy as much of the fund as possible).
Exit	Fixed	An "Exit Fee" based on successful, on-time supply of the deliverables agreed in the Exit Plan

4.2.3 Contract Management Resources

The Contract Management Plan is a live document and supported by the contract manager and commercial team.

4.2.4 Contract Reporting

As part of the contract management process, TPIM LLP is obligated to meet reporting obligations throughout the life of this gold contract on varying cycles: monthly, quarterly, or annually e.g., submission of annual financial reports, benefits realisation, and performance monitoring reports (inc. service levels and key scheme milestones to measure project progress).

5. Financial Case

5.1 Financial resources & budgets

At the time its launch in March 2022, the GHNf was a 3-year £288m capital grant scheme with this spend approved by HMT.

We are now seeking approval of further potential spend of £485m across the spending period 2025/26 to 2027/28.

In addition, we are seeking additional RDEL funding in order to be able to service the additional capital grant funding over the new spending period.

<Tables redacted for reasons of commercial sensitivity>

5.2 Budget arrangements & business planning

5.2.1 Investment Committee (IC)

GHNf CDEL funds will be allocated through an IC. The IC will consist of senior personnel from both DESNZ and the DP, however DESNZ will be the sole decision-making authority on the IC and the DP will only advise DESNZ on funding allocation through the IC. The governance of the IC has been described as part of the management case in Section 6.3.1.

The IC will have the authority to recommend funding awards in line with the GHNf Investment Mandate.

5.2.2 Grant Allocation

Grants will be awarded under:

- Section 31 of the Local Government Act 2003 to Local Authorities.
- Section 98 of the Natural Environment and Rural Communities Act 2006 to other government, NHS, universities and private sector organisations.

Grants are to be awarded to successful applicants of less than 50% of the capital value of their project.

DESNZ will own the Treasury function, making payment directly to project applicants to reduce the risk of money in transit with any potential Supplier.

GHNf will award grant funding to low-carbon projects, this reflects the challenges discussed in section 2.1.2 (i.e. low-carbon projects can often have an unattractive rate of return, and they struggle to compete with the high-carbon counterfactual). GHNf will not offer loans – the added cost of servicing loans could place an additional stress on the economics of the projects which can often be better dealt with through a grant to reduce the high up front capital cost. Furthermore, whilst a grant payment and loan payment hold similar values in budget recognition, the project impact is far greater when using grants.

The emphasis for providing loan funding will shift to BHIVE which will be used to help source loans from the financing markets and investors for those projects where they are suitable. The current omission of loans will also reduce the burden and risk to DESNZ in managing a loan portfolio. To ensure that the value added from loan funding is not lost (e.g. independent diligence and financial discipline) our gateway assessment process, notably the deliverability assessment combined with monitoring and reporting requirements will simulate this benefit.

5.2.3 Funding agreements

Successful applicants will receive a Funding Award Letter and be asked to sign a Funding Agreement. Projects will be able to draw down their grant funds from the GHNf when they have satisfied the conditions precedent in their funding agreements. It is likely that grant allocations will be made as follows:

- **Local Authorities (Section 31):** to be paid their grant in upfront payments for the work completed in each financial year.

-
- **Non-Local Authority and private sector (Section 98):** payments to be in arrears made in tranches according to pre-agreed schedule linked to evidence of spend and completion of work milestones.

The funding agreements (Memorandums of Understanding in the case of Local Authorities) will include clawback provisions setting out the repayment events that would trigger a request for the return of DESNZ funds. Grant recipients will be required, as a condition of funding, to provide monthly progress reports and comply with other monitoring and reporting requirements, including site visits. This will enable the Department and Delivery Partner to keep track of activity and assess the use of funds.

5.2.4 Third-party funding

Applicants are to be responsible for the securing of all remaining funds, whether equity or debt, that will be required to allow delivery of their heat network project.

BHIVE enables public-sector bodies to access funds for heat network investment from a range of potential third-party funders. It will be important in enabling the provision of such debt funding. It is hoped that with greater familiarisation with heat network projects and competition for projects on a respected platform that the cost of capital will reduce over time, albeit likely always to be significantly above the preferential rates of previous HNIP loans.

5.2.4.1 United Kingdom Infrastructure Bank

The UKIB now offers third-party funding in the form of either debt or equity. Private Infrastructure Investors are currently unwilling to proceed because of a present market failure, which is the uncertainty of heat loads to connect to planned or developing heat networks. Whilst policy action, such as Zoning, will overcome this market barrier in time, it has created an important role for UKIB in the sector. The development of a first loss/subordinated equity, possibly low-cost loan or guarantee offer from UKIB that would complement GHNF and work with the BHIVE platform would help mitigate this issue.

5.2.5 Subsidy Control

The team have agreed subsidy control thresholds with the Subsidy Control team. GHNF was assessed and notified before the Subsidy Control Act 2023 took effect and was thus out of scope of much of the Act. However, significant changes to the scheme, such as an increase in budget of more than 25%, will mean a new subsidy control principles assessment is required and will have to be considered by the CMA Subsidy Advice Unit.

5.3 Financial risk

Key financial risk areas identified include budget availability, compliance with scheme terms and fraud and gaming.

<Details of risks are of a commercially sensitive nature and are therefore redacted.>

6. Management Case

6.1 Milestones

Table 1. GHNH High-level milestones. (as shown in section 1.7)

Milestone	Date
FBC approved by PIC	5/10/23
FBC approved by HMT (TAP)	19/10/23
First post-approval (Round 6) Investment Committee held	04/12/2023
Round 7 Investment Committee held	01/05/2024
First post-approval funding round (Round 8) opened	26/02/2024
Proposed date for scheme closings to new applications	March 2025

6.2 Stakeholder management and communications

GHNH stakeholders have been identified with their corresponding levels of interest and influence assessed. This is a process that has been carried across from previous schemes (HNDU, HNIP) to the current GHNH scheme. Outputs of this exercise are built on by the Delivery Partner in quarterly reporting.

The Delivery Partner has a dedicated stakeholder engagement team which is in a regular engagement with the market. They identify potential new applicants to the scheme for targeted engagement e.g. at industry events. Once engaged, GHNH applicants are guided by GHNH Relationship Managers through the application process. Outcomes of their stakeholder engagement activities are reported to the Department quarterly, and are discussed at Operations Board meetings. Day-to-day implementation is discussed in a fortnightly working group (attended by the Head of Heat Networks Comms and sometimes also DESNZ Press Officer) to ensure alignment between GHNH activities and wider heat networks and Departmental stakeholder/communications priorities and objectives.

6.3 Pipeline of projects

GHNH and HNDU activities have developed a DESNZ pipeline of projects to support the demand for the scheme and reduce the risk of an underspend. The latest DESNZ Heat Networks Project Pipeline (Figure 2), published in August 2023, shows an active pipeline with a total capital cost of £2,655m, of which £315m is under construction and £1,881m relates to GHNH projects for which applications have been made²⁶.

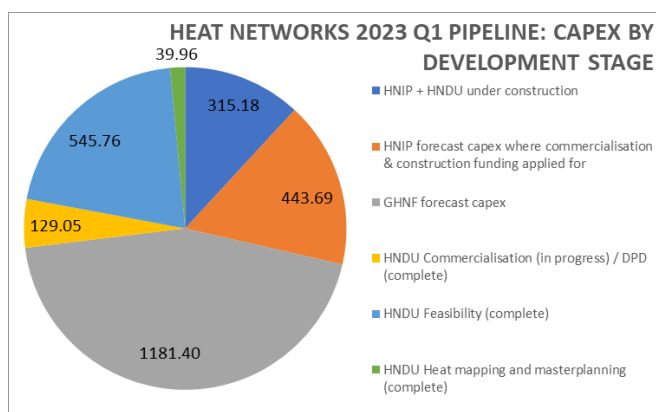


Figure 2. DESNZ Heat Networks Project Pipeline

²⁶ Quarter 1 Heat Network Pipeline report (2023) at <https://www.gov.uk/government/publications/heat-networks-pipelines>.

GHNH has its own dedicated pipeline of potential applicants, which is managed by Delivery Partner Relationship Managers and reported to the Department monthly. See Section 2.2.1 in the Strategic Case for further information.

6.4 Project governance

6.4.1 Internal governance arrangements

The SRO is ultimately accountable for delivery of the project including reporting to Ministers and the Department's Accounting Officer, and for ensuring that the appointed Delivery Partner is performing in a way that supports the delivery of GHNH objectives. GHNH is part of the HNTP, which is overseen by the HNTP Board, chaired by the Project Director, with other components of the programme also reporting to this board. The HNTP Board oversees the development and delivery of GHNH in line with its agreed objectives.

Governance beyond the HNPB is provided by the Heat and Buildings Portfolio Board (HBPB). The HBPB reports into the Net Zero Delivery Board (NZDB), which is chaired by the Director General for Net Zero Buildings and Industry and is the most senior level board with a remit for the GHNH.

6.4.2 Governance Arrangements with the Delivery Partner

Governance arrangements for the GHNH Delivery Partner have been developed through lessons learnt from HNIP, with further continuous improvements during GHNH delivery. GHNH has two primary platforms that govern the relationship between DESNZ and the Delivery Partner:

- A monthly **Operations Board** (chaired by DESNZ), where contractual performance and programme delivery updates are made and discussed and remedial actions (if required) are identified and monitored.
- A fortnightly **Progress Meeting** (chaired by the Delivery Partner), where scheme delivery and project performance and future forecasts are discussed, and emerging risks and issues are shared. Alternate meetings focus on project delivery and contract management.

6.4.3 Team structure

<Redacted>

6.5 Assurance & approvals

GHNH is part of the Government Major Projects Portfolio (GMPP) and as such, assurance sits with the Infrastructure and Projects Authority (IPA). The following assurance gateways are scheduled:

Table 19. GHNH Assurance

Gateway Reviews	GHNH dates
Gateway 1 (Business Justification)	Not required
Gateway 2 (Delivery Strategy)	Completed March 2021
Gateway 3 (Investment Decision)	Completed September 2023
Gateway 4 (Readiness for Service)	Not required (scheme already live)
Gateway 5a (Operations Review and Benefits Realisation)	TBC
Gateway 5b (Benefits Realisation/Project Closure)	TBC

6.6 Monitoring and Evaluation of Benefits

Four GHNH primary benefits are in place (see Strategic Case) that align with GHNH objectives, along with a suitable set of key indicators to track their progress.

Box 1 – Revision to the number of GHNH primary benefits

The number of GHNH primary benefits in the original GHNH FBC was five and these five benefits have been tracked by the Department and DP since first Round 1 projects started reporting in 2022. Following a discussion with GHNH SRO and HNTB Board in September 2023, it was agreed that GHNH Benefit 4 (Increased use of recovered heat in heat networks funded via GHNH) is re-classified as a secondary benefit. The argument being that although the Department and DP could choose to encourage and prioritise such projects, there is a limited control over which projects ultimately apply for funding. Making Benefit 4 a secondary benefit means that the Department and DP continue to track the progress made against it, but the benefit no longer features in the list of GHNH primary benefits.

This update has been reflected in this FBC and is subject to the FBC approval.

Additional secondary benefits are being monitored to understand GHNH's impact in areas that are not considered to be direct measures of project success.

All primary benefits are being tracked by the Delivery Partner and reported on to the Department monthly (Operation Board meetings) and annually. This includes assessment of progress made achieving each benefit target, with this assessment presented to the HNTB Programme Board where GHNH benefits are regularly discussed. GHNH benefits are also tracked through GMPP reporting.

The Delivery Partner also collects monitoring and reporting data from funded projects. The Department is building its own tools, processes, and capability to analyse such data independently of the Delivery Partner and together with data sets from other HNTB projects, primarily HNIP and HNES, with the view of informing future heat network policy. Substantial operational data from GHNH funded projects will not be available until at least 2025/26 and we are currently in the process of determining the precise parameters of the data we will require. A multi-year independent evaluation of the GHNH to understand what impact GHNH is having on the heat network market, customers, and carbon emissions is currently underway.

6.7 Risk management

The Delivery Partner and Department teams responsible for day-to-day delivery of the scheme (this includes DESNZ GHNH Scheme Delivery Manager and GHNH Project Manager) discuss risks in fortnightly calls. All identified risks capture RAG rating, owner, and mitigation measures (among other things). GHNH risks with the highest RAG rating, and those that sit outside of the GHNH Risk Appetite, are presented by the Delivery Partner to the Department in monthly Operations Boards. They are also reported to the HNTB Board and through the Department's internal reporting (ORB) and GMPP reporting.

Overall Risk and Issue governance for GHNH is managed through the HNTB Board. The board serves as a key point for escalating any risks and/or mitigation measures that the team requires. Where it is considered that a GHNH risk and/or issue falls outside of the remit of the GHNH project team or Operations Board to manage, there are agreed escalation routes.

The GHNH Risk Appetite (based on the Department's RAS) aligns with our Risk Management Framework to:

- **Identify risks:** through cross-functional fortnightly calls and other reporting of emerging risks to the Project Manager (including in ad hoc emails and conversations).
- **Assess risks:** through a probability and impact assessment to derive at a RAG rating using the GHNH Risk Appetite.
- **Address risks:** considering actions, controls and mitigations relative to the risk and assigning a risk owner and capturing these centrally.
- **Review and Report on risks:** through fortnightly reviews and interim risk owner updates, and providing reports monthly for review by Senior Management Team and as a standing item to the HNTB Board.

The strategic risks associated with GHNH are outlined in Section 2.5.

6.7.1 Overall Risk and Issue governance for GHNf is managed through the HNPB.

Where it is considered that a GHNf risk and/or issue falls outside of the remit of the GHNf project team or Programme Board to manage, there are agreed escalation routes.

Managing risks is a core part of the Delivery Partner's Programme Management Office (PMO) function. As part of this the Delivery Partner maintains a risk register for each aspect of the scheme and use it to monitor progress in reducing risks where possible. Risks are categorised by their degree of significance (high / medium / low) using the GHNf Risk Appetite Statement (which aligns with the updated DESNZ portfolio risk management framework) and the highest risk items are assigned work areas dedicated to addressing them. Risks are reviewed as part of the Delivery Partner internal updates and fortnightly calls with DESNZ. Where the DESNZ HNTF Board highlights points of concern, time is spent explaining or mitigating risk detail.